

EVALUATION OF PROGRAMMED TEXTBOOK PRESENTATION
FOR TRAINING FOOD SERVICE EMPLOYEES

by

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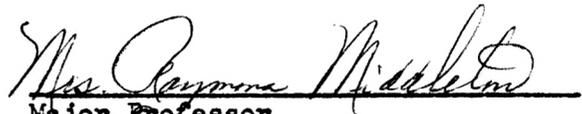

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INTRODUCTION

Foremost in today's problems of the food service industry is labor. The revision of the minimum wage law has added extra expenditures to the already high kitchen operation costs. Rate of turnover has been increasing, new employees have to be trained, and technological advances necessitate the retraining of old employees. The Department of Labor reported increasing demand for employees which will increase rapidly during the next decade (Weckslar, 1966). Training a new worker costs a food service operation approximately \$252 (Kotschevar, 1966). Thus is shown the necessity of training employees to use good techniques of food preparation and service.

Training should be a continuous and an organized process beginning before the employee starts the job and continues as long as the employee is with the organization. Even when a worker has mastered one task or one part of it, there still is a need to train him either for another job, for newer techniques of doing things, for new regulations, for new equipment, and for new food developments in the market. Bushnell (1964) emphasized the importance of retraining by stating that a person's skills must be upgraded or revised several times to keep up with technological advances. However, the maintenance of continuing employee training programs always has been a difficulty encountered in food service establishments. Hartman (1964) attributed the difficulty to: a) shortage of personnel capable of developing and carrying out effective programs, b) insufficient time of supervisory personnel, and c) the problem of arranging schedules for group training. Middleton and Konz (1965) added other factors, such as: a) supervisor being not a good teacher, b) supervisor's lack of knowledge

of efficient methods, and c) training need being usually for one or two employees at a specific location and time rather than large class sizes on a standard schedule.

Programmed instruction could well be an answer to solving many training problems that food service managers and dietitians face repetitively. It is a new and rapidly progressing technique for training and education, defined by Schramm (1962, p. 1) as "the kind of learning experience in which a program takes the place of a tutor for the student and leads him through a set of specified behaviors designed and sequenced to make it more probable that he will behave in a given desired way in the future...." Programmed instruction has proved effective in other industries. Its use in the food service industry has not been extensively studied, hence this study was conducted to investigate its effectiveness in training employees on two typical tasks encountered frequently in various feeding operations. The hypothesis tested was whether programmed instruction presented in a book form with colored photographs would be applicable for teaching food service workers the techniques of tasks encountered on the job.

REVIEW OF LITERATURE

Programmed Instruction - Potential for Adult Learners

The growth of programmed instruction in industry has increased greatly. The sudden outgrowth was caused by the great potential it offered for industrial training. According to Shoemaker and Holt (1965, pp. 685, 687) programmed instruction was virtually not in existence in 1960 but in 1963 a survey disclosed some 40 companies of a sample of 277 were producing their own programs. Of these surveyed companies, 43 per cent had used or

intended to use programmed instruction while the 57 per cent had no plans for its use. Lysaught (1962, p. 43) and Shoemaker and Holt (1965 p. 685) believed that programmed instruction has definitely established its place in the industry.

Adult Learners. In any industrial situation, workers are widely varied in age, aptitude, formal education, and prior experience (O'Donnell, 1963, p. 115). These people are, in the opinion of Altmaier (1965), adults who are unaccustomed to studying and reading tests, have been away from school for many years, and are learning practical job tasks. Lundberg and Armatas (1964, p. 75) characterized food science employees as having a tendency to drift from one job to another, having a low educational attainment, and as being emotionally unstable.

The potential for learning does not improve with age (Flanagan, 1963). It takes a little longer for the adult to learn in comparison with younger students. Martin (1963) therefore stressed the importance of knowing the physiological and psychological changes and particular needs and characteristics as they affect learning and behavior.

Industrial Workers. At Du Pont, Altmaier (1965) questioned the usage of programmed instruction for industrial workers but after a study was convinced of its benefit. Direct training costs were reduced, personnel were trained better in a shorter period of time, and there was a reduction in instructor hours.

Eastman Kodak Co., utilized programmed instruction techniques on employees who needed a good working knowledge of logarithms, and found results to be gratifying (Christian, 1962). International Business Machine Corporation also proved to be successful in their programmed

training courses (McNamara and Hughes, 1961, p. 57). The material was completed by trainees in 27 per cent less time and scores were higher when compared with conventionally trained workers.

Programmed instruction training for bank tellers at Elmhurst National Bank was reported by Ofiesh (1965, pp. 223, 224). Training effectiveness was increased, time was reduced, and teller training was uniform for everyone. Trainees gained more confidence, awareness, and understanding of their jobs, and as a result had developed more interest in their work.

The Denver plant of the Martin Company programmed a technical training course and observed that the test scores of the subjects using the programmed instruction method increased by nine per cent and length of training time decreased by 34 per cent when compared with conventionally trained people (Ofiesh, 1965, p. 290).

The programmed principle was applied in the development of a Video-sonic, an audio-visual system which aided in training or retraining assembly workers and technicians at Hughes Aircraft Co. (Anonymous, 1962). Savings in time and cost and increase of productivity were achieved. The system incorporates both slides and step by step recorded commentaries. Abbott (1962) described it as a pedagogical relative of the teaching machine. The difference lies in the presentation aspect. The teaching machine presents a course of study while a training system repeats a program throughout the time worker is engaged in the task. Konz and Dickey (1967) referred to the former as work training because the learner is expected to study and memorize procedures and to the latter as work instruction because there is no expectation for the learner to memorize the methods since instructions are in front of him all the time.

Hershfield (1967) believed that audio-visual systems could drastically change personnel training techniques, enabling quicker provision of skilled help to the industry.

Food Service Workers. The food service industry is complicated because it involves storing, manufacturing, selling, and consuming right on its premises (Vocational Division Bulletin No. 261, 1961). Consequently, the food service worker performs varied jobs unlike his partisan the industrial worker who is generally only responsible for a specific job. However, vocational experience is not regarded by Stokes (1960, p. 25) as a requirement for food service work. Welch (1966) attributed the unimportance of vocational experience to the following reasons: complications involved in the wide variety of food service establishments, size, location, hours of operation, and clientele. Welch (1966) further explained that the type of work the employee does involves a number of work sequences leading to a specific end or result. In smaller establishments, varied independent work sequences are performed by the worker.

A United States Department of Labor survey (Bulletin No. 1400, 1963) showed women to approximate nearly 60 per cent of the 1,300,000 non-supervisory employees. This predominance was explained by West et al. (1966, p. 391) on the need of increasing or supplementing the family income. Other reasons given by the author were: women wanting to utilize their skills and abilities and enjoying outside interests and contact without neglecting home and family.

A survey of the literature showed few studies done on programmed instruction in the area of food service. More specifically, only three investigations have been reported on the possible use of this auto-

instructional technique in training food service personnel on the varied tasks encountered in the kitchen.

A basic course in sanitation was programmed and tested by Carter et al. (1964) for use in training employees. Results indicated that programmed instruction has potentiality for effective training of unskilled food workers. Age, educational attainment, and previous food service experience did not significantly affect programmed instruction.

At Kansas State University was Apley's research (1965) on audio-visual programmed instruction method. Duties of waitresses in setting a banquet place cover and serving the banquet dinner plate, rolls, and coffee were programmed and waitresses' learning and retention were tested and evaluated. Scores revealed effectiveness of programmed instruction.

In their first study, Middleton and Konz (1965) used slides plus recorded commentaries in instructing food service employees on two techniques for breading foods. The authors believed that programmed instruction can help solve the problem of employee training by enabling workers to instruct themselves.

Another study by Middleton and Konz (1966) compared different presentation techniques of programmed instruction: 1) slides with words, 2) slides with words and pictures, 3) slides with words and tape recorded commentaries, and 4) slides with words, pictures, and tape recorded commentaries. Analysis of results showed that employees can effectively teach themselves using step-by-step teaching methods.

Patients' knowledge of diabetic diets were strengthened and reinforced with the programmed type of instructional media. However, several difficulties were encountered, such as: insufficient reading ability,

inadequate vision, and other types of physical incapacity (McDonald and Kaufmann, 1963).

Hoelscher (1966) emphasized the need of the food service industry for a training method that could answer the training crisis faced in order that its place in the business community could be retained. The method to be used should not resemble the classroom type situation because Lundberg and Armatas (1964, p. 75) explained that the average semi-skilled employee is not interested in the classroom type of training; only in a kind that has a real, immediate objective. They stressed the need for continuously reminding the employee of the benefits he would get from this training.

Characteristics of Programmed Instruction. The successful achievement of learning in programmed instruction can be attributed to characteristics which are non-existent in other instructional methods:

1. Small steps. Instructions are presented in what have been called "optimally sized increments" (Pipe, 1966, p. 6). By this, Cook and Mechner (1962, p. 4) explained, the increment of difficulty between any two steps should be narrow for mastery to be possible and the sequence should be arranged to enable mastery of each step by the learner without referring back to earlier material or looking ahead to further instructions.

A review of some research studies showed varying opinions on the most effective size of step. Kapel (1966) found both large and small step size sequences effective in terms of achievement and retention, attributing this to the mode of presentation rather than to the step size. He concluded that since both step sizes were equally efficient, the large step sequence was favorable due to its being less voluminous. Rate of error was not consequential, and significantly less time was needed for

completion of the program with larger steps. Smith and Moore (1962, p. 206) believed that 1) short steps could have been overemphasized, and 2) larger steps could have greater motivational value since larger size steps were found to teach as much in less time.

Contrary to these opinions was Stolurow's (1961, p. 93) belief that small steps would allow flexibility in meeting individual differences. The learner could proceed according to how much knowledge he has of the subject matter. A study by Maccoby and Sheffield (1961, p. 82) showed better results with small steps leading to high probability of correct student's responses.

Skinner (1954), founder of programmed instruction, specified no argument on the steps being small but expressed doubt as to the optimal step size for efficient learning. Several ideas on this matter were given : presentation method and performance of trainee should determine the step size (Rummler, 1965 and Kapel, 1966). Rummler (1966) defined a small step as the largest step that the trainee could answer successfully. Green (1962, p. 115) advocated basing the step size determination on the type of responses suggested by the program.

The size of step for effective transfer of learning by programmed instruction is a controversial matter. What step size to use should depend on the existing situation where training is taking place.

2. Active participation. Another characteristic of programmed instruction was described by Christian (1962), Feldman (1962), and Pipe (1966, p. 6) as that wherein students are continually made to participate actively in the learning process. Students may be asked to count a number of items in a column, fill in the blank, or identify some important points

in the illustrated drawing. In any case, they are forced to interact with the stimulus. An advantage is a high motivation for learning. General findings claimed by Walker and Stolurow (1962) showed more learning for those who actively participated than those who passively received instructions. According to Skinner (1954), the student learns faster if he is engaged actively in the subject matter. Passive exposure to the learning material does not make sure that the learner is responding to it. There is no assurance that the material is being incorporated into his own behavior (Cook and Mechner, 1962, p. 3).

With the incorporation of the active participation element to the programmed instruction method, students are forced to give their full concentration on the subject matter being taught, making it possible for learning to take place.

3. Immediate knowledge of results. The immediate information to the student of the correctness or incorrectness of his response was stated by Lysaught and Williams (1963, p. 18) as an advantage of programmed instruction. They explained this by saying that reinforcement or extinction, as the case may be, is more effective when check or feedback is more rapidly followed by the response.

Reinforcement was defined by Deterline (1962, p. 27) as the "occurrence of a consequence which strengthens the behavior that produced that consequence, that is, the occurrence of an event which increases the probability that the same response will occur again in the presence of the same stimuli." He described extinction as the "weakening of a response" caused by the lack of reinforcement for a response. Extinction weakens the relationship between stimulus and response.

In the opinion of Skinner (1958), it is from these relationships that knowledge and understanding are made up. Delaying the knowledge of results according to Stolurow (1961, p. 76) and Taber et al. (1965, pp. 23-24) lessens effectiveness of the reinforcing stimuli, thereby affecting learning critically. Informing the learner of his responses, whether correct or incorrect, gives him a continuing sense of achievement (Bolt, 1963) and keeps him from corresponding error (Lysaught and Williams, 1963, p. 18). Study by Krumboltz and Kiesler (1966) manifested increasing reinforcement to result in fewer errors and more appeal to the subjects.

Contrary to these concepts was a study by Eigen et al. (1960) who investigated four variations of knowledge of results (KOR) in the school system of Denver, Colorado, and Wauwatoosa, Wisconsin. There were no significant differences in achievement due to variations in knowledge of results for 100 per cent KOR, 67 per cent KOR, 33 per cent KOR, and no KOR.

Another study by Moore and Smith (1962, pp. 193, 198) had four variations also: 1) no knowledge of results (KOR), 2) immediate KOR where the correct response was exposed after the learner had made his response, 3) immediate KOR; a light flashed when the correct response was made, and 4) immediate KOR plus extrinsic reward. Results showed no significant differences among the groups.

In his experiment, Becker (1964, p. 231) withheld reinforcement and realized that students could learn equally well without the usual confirmation when steps were kept small and well prompted. This could be explained by the theory that problems are self-reinforcing when new and

challenging. Becker (1964, p. 231) pointed out the irrelevancy of correctness of solution. He believed that an individual is reinforced when he thinks he has found an adequate solution to the problem. Similar results were observed by Grace and Cantor (1966) who indicated that patients showed interest, were motivated, became curious, and were not bored by redundancy. However, this could be due to the program itself since answers were found in the context of the following frames.

The conflicting opinions and studies on knowledge of results point out the need for further study to determine how immediate knowledge of results should be for achieving optimum learning from the programmed instruction method.

4. Self-pacing. Individuals learn at different rates. In a classroom situation, teachers generally tend to gear their teaching to the average level of the group resulting in boredom for bright students and inability for slower learners to keep up with the pace (Keith, 1963). Keith further stated that there would be difficulties with classes larger than six. With its self-pacing attribute, programmed instruction is able to meet these individual differences. The brighter students can go through the material more quickly while the slower students can take more time to understand the subject matter (Hughes, 1962b, p. 50). After reviewing previous researches, Goldberg et al. (1964) concluded that programmed instruction helps slower learners in obtaining a direct familiarity with the course material. In his experiment with programmed learning, Holt (1963, p. 33) found that individual completion times varied considerably but the study indicated that the self-pacing feature was especially beneficial for trainees with low aptitudes.

Flanagan (1963) believed that trainees should be competing with themselves rather than with one another, thus getting encouragement from their own continued learning. Adults have their work and possible security at stake when they go into a classroom situation--the reason why they are hesitant to participate in further education (Bushnell, 1964, p. 112).

The self-pacing feature present in programmed instruction will help adults to work at their own speed of learning without fear or restraint from anyone. The slow learners will eventually learn the programs as much as the fast learners.

Modes of Response. Goldstein (1964, p. 223) described overt response as "one in which the learner actually makes a motor response and produces some sort of written record which may then be compared with the correct answer" whereas, in covert response, the trainee merely "thinks" of what the answer might be. Several investigations conducted by Michael and Maccoby (1961, p. 290), Kanner and Sulzer (1961, p. 440), and Walker and Stolurow (1962) showed that the effectiveness of these two forms of responses on learning and retention were not significantly different but significance in completion time was evident from studies of Walker and Stolurow (1962), Lambert et al. (1962), and Hughes (1962a). Overt response took more time for completion of the program than covert response. Cummings and Goldstein (1962) had a contradictory finding. Overt responding was more effective than covert responding when subjects studied a difficult and an unknown lesson. According to McGuire (1961, p. 419) more advantages for overt participation would result when subject was poorly motivated and Eigen and Margulies (1964, p. 253) discovered

that difficulty of response was a determining factor for the significance of overt responding. Lumsdaine (1961, p. 4) believed in the overt method since responses could be observed and therefore, checked on and effectively controlled.

For instructions on motor skills, McGuire (1961, p. 419) and Deterline (1962, p. 39) believed that only by responding overtly could the desired modifications for students' behavior be achieved. Simply reading about them or being told about them would unlikely cause learning to take place.

Since past researches have evidenced varying opinions on the choice of mode of response for programmed instruction, the selection of overt or covert response should depend on the type of individual or group being instructed, on the difficulty of response, and on the type of skills or knowledge being imparted.

Retention. How good retention and recall will be depends on how good the initial information is (Heaviside, 1966). Alter (1963) found that when learners of varying intelligence were equated in initial proficiency, retention was not significantly different with the individuals' mental capabilities.

Most studies manifested less retention of instructions with the programmed method in comparison with the conventional type. Strong (1964, p. 226) did not regard this finding as a disadvantage for using the programmed method since he credited reasons of forgetting to events which were present before learning. According to Goldberg et al. (1964), this loss of retention should not be considered a detrimental factor, for trainees in industry would not wait an extended period of time before

applying what was learned. Employees who would immediately engage in the activities learned would more likely retain knowledge than those who did not (Shoemaker and Holt, 1965, p. 731). Southwestern Public Service Co. was reported by Ofiesh (1965, p. 343) to support Shoemaker and Holt's belief when a study with programmed instruction showed retention of trainees to be directly related to the amount and frequency that the instructions learned were applied. Relevancy of material and practice affect retention (Stolurow, 1961, p. 93, and Taber et al., 1965, p. 126). The more practice and the more meaningful tasks are, the less chances for them to be forgotten.

In evaluating different instruction methods, the amount of instructions retained by the person should not be considered a critical factor, since retention is affected by factors which are irrelevant to the media.

Modes of Program Presentation

Programs are presented in different ways; common among these are programmed textbooks and teaching machines. A number of studies compared these two devices. No significant differences were reported but trainees on programmed texts showed savings in time (Goldstein and Gotkin, 1962 and Eigen et al. 1962). Holt and Hammock (1962, p. 55) and Goldberg et al. (1964) reported finding no such distinct advantage of proficiency with either device.

A great criticism of the machine was the absence of standardization of design causing the machine to dictate the kind of program employed (Gilbert, 1960, p. 478, and Carter, 1966). The key factor should be

the program and not the device used in its presentation. Other problems associated with machines are: initial expense, storage and accessibility, supervision of machine operation, maintenance, unreliability (breaking down), acceptance of machine in the organization, and novelty effect (Jacobs, P. et al., 1966 and Green, 1962, p. 135). Novelty interest was noted by Goldberg et al. (1964) to manifest itself at the initial stage but declined over the three-week period so that at the end of the course, the machine group showed the least interest.

The machine's greatest advantage was cited by Green (1962, p. 134) and Foltz (1961, p. 48) as the prevention of cheating. A person using the textbook could easily look at the answers before making a response and could decide what items to complete or not to complete, thus defeating the purpose of programmed instruction (Foltz, 1961, p. 48). Lysaught (1962, pp. 30, 31, 42) and Foltz (1962, p. 236) enumerated other disadvantages of the textbook as: it is nondurable, consumes a large volume of paper, needs more storage space, does not keep the learner in a rigid sequence of presentation, and costs are greater since additional materials are needed to provide feedback to the student. Advantages of the book are: the convenience of carrying the book around, it could be read anytime at any place, it is more compact, initial cost is less, no machine is required for each trainee, and changing of programs is uncomplicated (Goldstein and Gotkin, 1962 and Green, 1962, pp. 133-134).

Progress is continuously being made in the design of the teaching machine so findings which showed no significant differences between these two devices may not hold true in the future. Goldstein and

Gotkin (1962) predicted that machines may prove better. A decision between books or machines for the organization should depend mainly on the subject matter, economics, personal preference, and administrative convenience.

For the food service industry, the selection of a book would be more applicable since the tasks to be taught vary greatly from one establishment to another. Instructions could be revised to suit the particular operation's needs easily with the book rather than with the machine.

Motivation

Verner (1964, p. 22) defined motivation as "a goal directed behavior which grows out of the needs of an individual at a specific point of time in a specific situation." Before any learning could take place, Packard (1962) believed that the learner should have a genuine personal desire to learn and this is influenced, according to Lundberg and Armatas (1964, p. 80) and Verner (1964, p. 22) to several factors: knowledge of the task, entire past experience, outlook on life, values and personal adjustment, social role, perception of education, and general health. Results of programmed instruction studies at Atlantic Refining Co. emphasized the important role played by motivation on learning (Ofiesh, 1965, p. 191). It was suggested that motivation be present before any attempt could be made on learning by programmed instruction or other methods.

Motivating the adult is a difficulty attributed by Wagner (1964) to the fact that the adult already has solved many problems in life and therefore sees no reason or desire for acquiring new skills or for competing with another person. This results in both inertia and satisfaction. A majority of unskilled production workers were ascribed by

Janes (1966) as having few ambitions for themselves, their aspirations being centered on their children alone. Lundberg and Armatas (1964, p. 75) pointed out the lack of real motivation of restaurant employees for their work. Economic necessity seemed to be their only motivation.

Much better results according to Carter (1966) could be expected when trainees could be encouraged to take a course for reasons other than economics. Bushnell (1964, p. 113) stressed the urgent need for a new way to motivate adult workers to want to learn. This new technique, as suggested by Bushnell (1964, p. 110) should permit the student to proceed at his own rate of learning without fear of failure and without competition with anyone.

Programmed instruction is a relatively new technique and unfamiliar to many trainees. A need for motivation through proper orientation and explanation of the purpose and characteristics of programmed instruction is necessary so that the trainee thoroughly understands how to use the materials and how it can benefit him. The attitude of the student can determine whether or not he will finish the program (Vanderschmidt, 1964, p. 212). He was convinced that attitude determines student success. The student can hardly be expected to learn what the program purports to teach if he finds it too dull or too punishing to complete. In one California adult school using programmed texts, Phelan et al. (1965) found motivation as the most important factor leading to success for adult learners. The same thing resulted for trainees at Union Carbide Chemicals Co. (Ofiesh, 1965, p. 374).

O'Donnell (1964) suggested that the material be written in a way that the learner could respond correctly 95 per cent of the time. He,

like Schrader (1965), Altmaier (1965), and Rummel (1965), believed that self-sustained interest resulting from the learner's knowledge of his correct response is the incentive that makes him proceed through the course.

Employees at International Business Machine Corporation were taught with programmed instruction (Hughes and McNamara, 1961). Results indicated reduction in training time and improvement in learning achievement but trainees expressed boredom of too much repetition and page turning. This showed the need for preparing more stimulating programs within reasonable time limits. Cress (1966) corroborated this finding when he discovered that the program's effectiveness was decreased by boredom. He believed more remarkable results would be achieved if the problem of monotony could be overcome. Green (1962, p. 199) found no such relationship of boredom with the teaching device even though it was increased as students progressed through a program. A report by Ofiesh (1965, p. 337) revealed that trainees at Quaker Oats Co. were not bored, attributing this to the fact that the program was aimed at a specific skill which the student would subsequently have to demonstrate. Monotony was not present in programs of short duration (Jacobs J. et al., 1966).

Significant results from programmed instruction could be due to a novelty effect. Bolt (1963) and Popham (1964) believed that student's heightened motivation could have resulted from the new format of the instruction method. An experiment by Goldberg et al. (1964) manifested a high level of initial interest due to novelty but insufficient to maintain throughout the program. Popham's investigation (1964) did not show any novelty effects. Students using the teaching machines learned as much as those on the conventional method.

Motivation is a critical factor for student's success in learning. Proper measures should be taken in the construction of programs to insure no detrimental effects from novelty and boredom.

PROCEDURE

Development of the Programmed Textbook

Two tasks investigated were: portioning, cutting, and serving a pie (representing a relatively simple task) and cleaning a food slicer (representing a difficult task). They were programmed into detailed step by step instructions. Colored 3 1/2" x 5" photographs were taken of all these instructions, mounted on 8" x 11 1/2" plain white paper, incased within plastic slip covers, and bound in a folder. Under each picture were additional explanations and fill-in-the-blank type questions (Appendix D). The questions were constructed in such a way that the subject usually would fill in the missing word correctly. Provisions were made for obtaining the answers directly from the pictures or from the preceding explanations. The appropriate answers to the questions were placed on the right hand side of each page so that subject could check her own answers which she had written down in a separate piece of paper. To discourage cheating, a 2" x 6" hard paper cover board was given the trainee to hide the answers of the book before she had the chance to write her own responses (Appendix D). All the words used in the book were checked from "Teacher's Word Book of 30,000 Words" to include the 6th grade level subjects (Thorndike and Lorge, 1944).

Set-up of Tasks

Supplies and equipment needed to perform the tasks were assembled in a work area before the start of the experiment. These included:

Portioning, Cutting, and Serving a Pie. Frozen cherry pies were used. The pie was baked for an hour at 425° F in a rotating oven. Baking was done a day before the individual training session. A set-up of the work area is shown in Appendix B, Figure 1. The working area was made to look like the photograph except for one difference. Instead of having four pies on the tray, only one pie was portrayed. The subject was required to mark, cut, and position the six pieces of pie on the plates.

Cleaning a Food Slicer. Supplies and equipment were assembled near a three-compartment sink having two swing faucets as shown in Appendix B, Figure 2. Three pieces of different color cloths were used: one for washing, one for rinsing, and one for sanitizing. These were laid on the table adjoining the wash sink. The three-compartment sink was filled with sudsy water, rinse water, and water with sanitizing agent. Sudsy water had the proportion of 2 1/4 cups of liquid detergent to 11 gallons of hot water; rinse water contained 11 gallons of hot tap water; and water with sanitizing agent had 1/3 cup Roccal solution to 11 gallons of hot water. Temperature of the water was 110° F. The food slicer was situated at a right angle to the wash sink. A slicer which had been used for slicing meat was simulated by spreading a mixture of 1/4 cup salad oil (Mazola) and two tablespoons ground beef around places where meat drippings and scraps usually accumulated when slicing meat: on receiving tray (two tablespoons), meat holder (one tablespoon),

knife plate (one tablespoon), inside of upper and lower guards (one tablespoon), and the frame behind the lower guard (one tablespoon). The blade indicator on the slicer was set to number seven.

Description of the food slicer. The slicer used in the investigation was Hobart Model 1512 Meat Slicer Machine (Hobart, 1954 - see picture #4 in Appendix D). This machine has parts that are removable, such as meat holder, knife plate, lower guard, and upper guard; also parts that are fixed, such as knife blade, receiving tray, frame, and base. The focal point of the machine is the knife blade. It is kept covered and safe from danger by the knife plate, upper guard, and lower guard. Only when these are removed for cleaning does the blade become dangerous.

Cleaning process. Cleaning mainly involved disassembling the machine, cleaning the blade and the removed parts, reassembling the parts except the meat holder, cleaning the rest of slicer, and finally assembling the meat holder to the machine.

Selection of Subjects

Subjects were 11 food service women employees from the three residence hall food service units at Kansas State University. They were selected by the Personnel Director to represent a population typical of the food service industry. (See Appendix A, Table 1 for subjects' characteristics). The only requirement specified was that they had no previous experiences in portioning and serving of pies in a volume feeding operation or in cleaning a food slicer. The training sessions were done outside the subjects' working hours but they were paid for serving in the experiment.

Method

Each subject served as her own control. She learned both tasks using the programmed book. All trainees started with the easy task first to ease any tension that might ensue.

Subjects were trained individually. The training session started with an introduction on programmed instruction. The trainee was given the book and was instructed on how to use it. Oral instructions given to the trainee were typed on sheets to enable the investigator to say the same words to each subject (Appendix C). Subjects were requested not to discuss this research with any other person during the experiment period. Emphasis was stressed on its underlying effect on the reliability of the experimental results.

The subject went through the programmed book as many times as needed until she felt confident to take a test. The test was given verbally. The investigator had the questions and the answers of the test typed on sheets for easy checking of subject's responses (Appendix C). After the test, the trainee was shown the test paper with her grade score. Mistakes were pointed out and the subject referred to the book to determine how mistakes were made. When a trainee obtained a score of 90 per cent or above, she went to another room and actually performed the job she just learned. If the score did not meet the required standard, then the trainee had to go through the programmed book again.

For the actual performance, the subject was informed that she would be timed and her work evaluated. Time was recorded by a decimal minute stop watch starting from the moment she said she was ready until the last step was completed. To evaluate the performance of the subject,

a check list was developed on all operational procedures of the task (Appendix C). Scores were calculated as agreements with these methods. Quality of her work was rated with numerical score values of one to five and one-half, one being excellent while five and one-half was poor (Appendix C). The subject was then given a 5-minute rest after which she was tested on the second task using the same procedure. One week after training, the subject was tested for retention. She was given the oral tests, test grades reviewed, and mistakes were pointed out after which she actually performed the tasks. Time was recorded, performance evaluated by a check list, and quality of work rated. A final testing took place a month after the training session. To eliminate bias, the investigator used different evaluation sheets each time so her knowledge of trainee's previous performance would not affect her evaluations.

After completion of the study, a questionnaire was given to each subject to obtain information about age, level of education, length of experience in food service, and job classifications held to determine whether these variables had an effect on the results obtained (Appendix C). The subject was also given an opinionnaire to answer in her home with a self-enclosed stamped envelope to find out her feelings towards the instructional method followed (Appendix C). She was asked not to sign her name so responses would reflect best her honest feelings.

RESULTS AND DISCUSSION

Biographical Data

The four criteria of the study were: scores on the oral test, methods agreement, quality, and length of time in doing the task. The subject's biographical age, educational attainment, and length of experience in food service were analyzed for possible correlations with each of the four criteria and with the length of learning time. Age of subjects ranged from 19 to 65 years, with an educational level varying from 11 to 15.5 grades, and with experience extending from .25 years to 11.5 years. Except for the relationship between the length of experience and the time of performance on the slicer program, none of the Spearman correlation coefficients (Siegel, 1956, pp. 202-213, 284) were significant--that is, persons with wide variations in age, educational attainment, and food service experience did similarly well as measured by the oral test, methods agreement, quality, and on the length of time for the actual performance and for learning the tasks (Table 2). Time in the slicer program was significantly correlated with experience at the 1% level in the unexpected direction; the more the experience, the longer the time taken by the subject to perform the task.

Learning Time

Time for learning the programmed instructions varied greatly with the individual person and with the difficulty of the task studied, ranging from 10.6 to 29.86 minutes for the pie program and 18.58 to 47.29 minutes for the slicer program (Appendix A, Table 3). Personal history

Table 2. Spearman correlation coefficient between scores, length of time in performing the task, and learning time, to age, educational attainment, and experience. Only the .79 is statistically significant.

Personal history	Pie					Slicer				
	Oral test	Methods agreement	Quality	Time	Learning time	Oral test	Methods agreement	Quality	Time	Learning time
Age	.14 ^a	.02 ^a	.02	.07	.32	.47 ^a	-.23	.12	.30	.26
Educational attainment	.15	.03	-.19 ^a	-.38	-.19	-.38 ^a	.04	-.03 ^a	-.17	-.01
Experience	-.32 ^a	0	-.28 ^a	.42 ^a	.50 ^a	.07	-.45 ^a	-.15 ^a	.79 ^{**a}	.38 ^a

** Significant at the 1% level.

^a Unexpected direction.

data of the subjects did not have any effect on how long it took the person to learn the task (Table 2). The scores on the test, methods agreement, and quality and time of performance, in turn, were not influenced by the length of learning time (Table 4). These data were equally the same for the person who spent more time in learning the subject matter and for the other person who did not study as much. However, further analysis showed only the methods agreement and quality scores on the slicer program tended to follow the expected directions; the longer time spent for learning, the higher the methods agreement score and the better the quality of work. The reason for the discrepancies of the data on the other criteria could be that the faster learners were more intelligent and could have better reading ability than the slower learners.

Table 4. Spearman correlation coefficient between scores and length of time in doing the task to the amount of learning time taken by the subjects. No values are statistically significant.

	Pie				Slicer			
	Oral test	Methods agreement	Quality	Time	Oral test	Methods agreement	Quality	Time
Learning time	-.24 ^a	-.05 ^a	-.36 ^a	.53 ^a	-.21 ^a	.26	.06	.23 ^a

^a Unexpected direction.

Learning and Retention Results

Learning Scores. The subjects' learning was good as evidenced from the oral test and methods agreement scores; means of these scores were 93.4% and 92.5%, respectively for the pie task and 87.7% and 87.6% for the slicer (Tables 5 and 6). After using the program once, one subject in the pie task had a grade below the required standard of 90% although there were six subjects in the slicer task who originally were not able to meet the specified grade. After studying the book for the second time, all subjects passed the oral test.

Retention Scores. The next series of tests compared performance between trials with Wilcoxon Matched Pair Signed Ranks tests (Siegel, 1956, pp. 75-83, 254). Mean test scores on the pie task were 93.4% for the immediate test (trial 1), 98.4% after a week (trial 2), and 98.9% after four weeks (trial 3) and corresponding scores on the slicer task were 87.7%, 93.2%, and 97.3% (Tables 5 and 6). The degree of significance for differences between trials showing amount of learning retained is shown in Table 7. Differences between trials 3 and 1 were significant at the 1% level for the pie program and 5% level for the slicer program. The greatest improvement occurred after a week on the pie task. Between trials 3 and 2, there was no significant increase of learning showing that rate of learning decreased with successive practice sessions. With the slicer program, the only significance was found in the difference of scores between trials 3 and 1. All the other conditions were not significant and thus subjects had retained their original learning.

Similar results on retention were achieved with the methods agreement scores. Both the pie and slicer programs manifested significant

Table 5. Oral test, methods agreement, and quality scores and length of time for the pie task.

Subject	Oral test scores			Methods agreement scores			Quality scores			Length of time, minutes		
	Trials			Trials			Trials			Trials		
	1	2	3	1	2	3	1	2	3	1	2	3
1	100	100	100	86.8	93.4	100	3.5	2.5	1.0	2.81	1.60	3.69
2	90	100	97.5	93.4	100	100	3.0	1.0	1.0	2.99	2.78	3.38
3	92.5	95	97.5	96.7	100	100	2.5	1.0	1.0	6.93	3.32	3.70
4	100	100	100	93.4	100	93.4	1.0	1.5	1.5	4.33	4.30	2.88
5	75	92.5	100	90.1	93.4	96.7	3.5	1.5	1.5	8.39	6.78	4.78
6	95	100	100	93.4	93.4	100	2.5	3.5	2.5	6.20	5.14	2.51
7	97.5	100	100	100	100	100	1.0	1.0	2.5	4.00	4.24	3.61
8	90	100	100	100	100	100	1.5	1.5	2.0	3.79	4.59	3.81
9	95	95	92.5	83.5	100	96.7	3.5	1.5	3.0	3.94	4.55	4.99
10	95	100	100	80.2	93.4	96.7	3.5	1.5	1.0	5.44	4.24	4.82
11	97.5	100	100	100	100	100	1.0	1.5	1.5	3.80	3.39	3.50
Ave	93.4	98.4	98.9	92.5	97.6	98.2	2.4	1.6	1.7	4.78	4.08	3.99

Table 6. Oral test, methods agreement, and quality scores and length of time for the slicer task.

Subject	Oral test scores			Methods agreement scores			Quality scores			Length of time, minutes		
	Trials			Trials			Trials			Trials		
	1	2	3	1	2	3	1	2	3	1	2	3
1	95	85	97.5	88.1	98.3	93.2	1.5	2.5	1.5	7.78	11.14	11.94
2	80	90	100	88.1	100	100	2.5	1.0	1.5	18.30	13.90	12.69
3	82.5	95	100	88.1	100	96.6	3.0	1.5	1.5	17.24	9.43	7.65
4	95	92.5	90	91.5	91.5	96.6	2.5	2.5	2.5	15.36	8.79	8.46
5	80	100	100	83	93.2	94.9	2.5	2.0	1.0	16.89	17.51	11.96
6	90	97.5	90	89.8	91.5	89.8	3.5	4.0	4.0	19.66	12.48	9.35
7	95	95	100	89.8	89.8	91.5	1.5	1.5	1.0	21.98	15.78	16.74
8	86.8	87.5	100	88.1	100	100	3.0	2.0	1.5	14.76	13.80	11.83
9	77.5	87.5	97.5	81.3	84.7	91.5	2.5	2.5	3.5	23.42	13.50	10.72
10	87.5	95	100	83.7	86.4	94.9	3.0	3.0	2.5	20.95	17.28	12.55
11	95	100	95	91.5	96.6	94.9	2.5	2.0	2.0	16.73	9.79	10.15
Ave.	87.7	93.2	97.3	87.6	93.8	94.9	3.1	2.7	2.5	17.53	13.04	11.28

Table 7. Results of retention. All the statistically significant values are improvements.

Criterion	Degree of significance between trials		
	1 week versus initial (trials 2 & 1)	4 weeks versus 1 week (trials 3 & 2)	4 weeks versus initial (trials 3 & 1)
Pie program			
Oral test	**	equivalent	**
Methods agreement	*	equivalent	*
Quality	*	equivalent	equivalent
Time	equivalent	equivalent	equivalent
Slicer program			
Oral test	equivalent	equivalent	*
Methods agreement	**	equivalent	**
Quality	equivalent	equivalent	equivalent
Time	*	**	**

* Significant at the 5% level.

** Significant at the 1% level.

differences between trials 2 and 1 and between trials 3 and 1 and insignificant differences between trials 3 and 2, again demonstrating the effect of practice in decreasing rate of learning.

In general, quality was not affected by the amount of learning and retention of knowledge. Statistical analysis disclosed significance a week after the learning session and only with the pie program. The other trial conditions were not significant but quality was equivalent when compared with the other sessions. This improvement with the pie program could be due to the greater care taken by the employee to place pieces of pie on plates in order to create a good impression of how much they had retained after a week's time, the pie task being the first one performed in all the training sessions.

There was no significant decrease nor was there a tendency of an increase in the length of time in performing the pie task between sessions 1, 2, and 3. The reason for this insignificant difference could be due to the pie itself. Though cherry pies were all bought at the same time, frozen at the same temperature, and baked under the same conditions, there could be a possibility of some crusts being more short than others causing difficulty in cutting and placing pieces of pie on plates.

With the slicer task, which was the more difficult task, subjects showed significant increase in the length of time for doing the task between sessions 1, 2, and 3. Cleaning the slicer required more thought, concentration, and skill since it involved not only application of proper cleaning procedures but also knowledge of disassembling and reassembling the parts to the slicer. With practice, the subject could have experienced less fumbles, delays, and hesitations and could have developed

faster hand motions (Barnes, 1964, p. 630). A week after the training session, length of time decreased significantly ($p < .05$). Four weeks after, significance increased to 1%. The same significant difference was found between trials 3 and 2.

Interrelation of the Criteria

Analysis was done to determine the correlation between criteria using the Spearman Correlation Coefficient Test (Siegel, 1956, pp. 202-213, 284). Results are shown in Table 8.

Oral Test and Methods Agreement. Mean scores for a subject of both tasks for oral test and methods agreement showed no relationship with each other. A high score in the oral test did not necessarily assure for the subject a high grade on the methods agreement. Further analysis, however, showed that there were significant positive relationships at the 1% level for trials 1 and 3 of the slicer task. In these sessions, subjects who got high grades in the oral test also obtained high grades in the methods agreement.

Oral Test and Quality. Mean test scores for a subject were not significantly correlated with the mean quality scores for either task but there was a significant positive correlation at the 1% level in trial 3 of the slicer program. This meant that subjects who achieved good grades in the oral test performed better quality of work on cleaning the slicer a month after their training session.

Oral Test and Time. Conflicting correlations were observed between the scores of the oral test and the performance time of the person. A significant negative relationship ($p < .05$) existed between the means

Table 8. Spearman correlation coefficient of the four criteria used in evaluating pie and slicer programs.

Criteria	Pie	Slicer
Oral test versus methods agreement		
Trial 1	.02	.81**
Trial 2	.17	-.12 ^a
Trial 3	.11	.73**
Mean of trials	.15	.18
Oral test versus quality		
Trial 1	.37	.36
Trial 2	.14	.06
Trial 3	.10	.73**
Mean of trials	.37	.21
Oral test versus time		
Trial 1	-.27	-.38
Trial 2	-.05	.16 ^a
Trial 3	-.01	.63* ^a
Mean of trials	-.62*	.20 ^a
Methods agreement versus time		
Trial 1	.08 ^a	-.28
Trial 2	-.02	-.23
Trial 3	-.13	-.03
Mean of trials	-.31	-.55*
Methods agreement versus quality		
Trial 1	.87**	.16
Trial 2	.74**	.59*
Trial 3	.36	.33
Mean of trials	.64*	.43
Time versus quality		
Trial 1	-.02 ^a	-.14 ^a
Trial 2	-.22 ^a	-.01 ^a
Trial 3	.03	.53
Mean of trials	.20	.50

* Significant at the 5% level.

** Significant at the 1% level.

^a Unexpected direction.

of a subject on the oral test and the time of performance on the pie program but the significant relationship was positive between scores in trial 3 on the slicer program. The correlations expected were negative but trials 2, 3, and mean on the slicer task did not seem to follow the projected hypothesis.

Methods Agreement and Time. The only significant relationship ($p < .05$) which existed between the methods agreement score and the length of time it took the subject to perform the task was when mean scores were calculated for the slicer program. The better the methods agreement score of the subject, the less time it took her to do the task. The other data, though insignificant, were as expected except for the relationship found in trial 1 of the pie task.

Methods Agreement and Quality. When trial 1, trial 2, and mean scores for a subject for the methods agreement and quality on the pie task were calculated, there were significant positive correlations between these two criteria. The higher the methods agreement grade of the subject, the better the quality of her work. With the slicer task, only the second trial was significant ($p < .05$). The rest of the data showed the anticipated positive relationship but the values were not statistically significant.

Time and Quality. The previous assumption that the more the time spent in performing the task, the better would be the quality of work was not found true in this research. No significant relationship existed between the length of time it took the person to perform the job and the quality of work she did. Trials 1 and 2 in both tasks disclosed unexpected negative relationships which meant that the shorter

the time spent in working the prescribed steps, the better the quality of the subject's performance. The correlation coefficients (r) were so minute that these results could have happened only by mere chance.

Anticipated positive relationships existed between oral test and quality and between methods agreement and quality which meant that the higher the scores on the oral test or on the methods agreement, the better the quality of work of the subject. However, these relationships were not found to be significant in all the trials. Conflicting results were achieved when the other criteria were interrelated showing no relationship existing between these criteria; oral test and methods agreement, oral test and time, methods agreement and time, and time and quality.

Comparison of the Two Programmed Tasks

To determine whether the person who did well on one program would do likewise on the other, the data on the scores and the length of time on both tasks were tested for correlation (Table 9). In trial 1, subjects who rated high on the oral test and methods agreement scores of the pie program also were rated high on the slicer program and vice versa. Significant positive correlation was achieved only in this trial probably because trial 1 was a learning session. Trials 2 and 3 had retention to consider. Retention is affected by many factors which are independent of the instruction method, such as time, interest, newer stimuli, and psychoanalytic reasons (Heaviside, 1966). Each individual is different so amount and kind of information retained varies widely.

Table 9. Spearman correlation coefficients of pie versus slicer programs.

Criteria	(r)
Oral test	
Trial 1	.81**
Trial 2	.05
Trial 3	.14
Mean of trials	.41
Methods agreement	
Trial 1	.68*
Trial 2	.34
Trial 3	.27
Mean of trials	.59*
Quality	
Trial 1	.32
Trial 2	.89**
Trial 3	.41
Mean of trials	.35
Time	
Trial 1	.33
Trial 2	.33
Trial 3	.24
Mean of trials	.43

* Significant at the 5% level.

** Significant at the 1% level.

It was previously hypothesized that subjects who would perform good quality of work in the pie task would do the same for the slicer task. This hypothesis was found true ($p < .01$) only in trial 2 wherein subjects were rated well in quality of work with both tasks.

The length of time it took the subjects to perform the pie task did not statistically correlate with that taken to clean the slicer. Some subjects were fast in portioning, cutting, or serving the pie but were slow in cleaning the slicer or vice versa.

Opinionnaire Survey

Results of the opinionnaire survey showed the favorable attitudes of the subjects toward the programmed textbook (Tables 10 and 11). All the subjects liked to learn from this kind of teaching. They considered the book helpful and an interesting training method for food service workers. When asked about the mechanics of the book, they did not suggest any changes--preferred the book the way it was, said instructions were easy to follow, and liked the idea of having the correct answers available so that they could check their own answers.

Seven subjects expressed the desire to study the book in their own homes while three would prefer to study it at work, and one did not have any preference. All the subjects, however, were willing to study the book in their own free time (Table 11).

Without exception, subjects commented that they learned from the first training session. They believed that the programmed textbook could help solve the training problem especially for those who will just be starting to work in the food service industry.

Table 10. Summary of responses to opinionnaire concerning the mechanics of the programmed textbook.

Question	Responses		
	Yes	No	No opinion
1. Would you prefer learning by pictures alone (without words)?	0	11	0
2. Would you prefer learning by words alone (without pictures)?	0	11	0
3. Would you prefer the book the way it was (with pictures and words)?	11	0	0
4. Did you like the idea of having the correct answers available so you could check your answers?	11		
5. Did you think the book was too long?	0	11	0
6. Was studying the book			
	1. too easy		0
	2. easy		11
	3. no opinion		0
	4. hard		0
	5. complicated		0

Table 11. Summary of responses to opinionnaire concerning the possibility of the book as a training technique for food service workers.

Question	Responses		
	Yes	No	No opinion
1. Do you like to learn from this kind of teaching?	11	0	0
2. Did you learn from the first training session?	11	0	0
3. Do you think you would learn better if you studied the book at your own home in your own free time?	11	0	0
4. Do you think this kind of teaching could help solve the training problem in the food service industry?	11	0	0
5. By which methods do you prefer to be trained?	A.	1. by dietitian	0
		2. training book	2
		3. both	7
	B.	1. supervisor	0
		2. training book	3
		3. both	6
	C.	1. another employee	0
		2. training book	5
		3. both	3
	D.	1. classroom training	1
		2. training book	2
		3. both	5
	E.	1. no training	0
		2. training book	9
6. Method you like best	1.	classroom training	4
	2.	dietitian	2
	3.	training book	2
	4.	another employee	1
	5.	supervisor	1

Table 11. (continued)

Question	Responses	
7. What do you think of this book as a training technique?	1. very helpful 2. helpful 3. no opinion 4. not helpful 5. confusing	7 4 0 0 0
8. Did you find the book	1. very interesting 2. interesting 3. indifferent 4. not interesting 5. boring	7 4 0 0 0
9. Where would you prefer to study this book?	1. at home 2. at work 3. no preference	7 3 1
10. Would you be willing to study this training book	1. at home 2. at work 3. both	2 0 9

SUMMARY

Shortage of personnel, increased labor cost, and technological advances have emphasized the need for a more efficient training method to help alleviate the labor problems in food service establishments. The success of the programmed instruction technique for industrial workers led to the investigation of its applicability in training food service employees. A programmed textbook containing colored photographs and detailed step-by-step instructions of two food service tasks was developed and evaluated by eleven employees from the residence hall food service at Kansas State University. The subjects were tested immediately after the first training session (trial 1), a week after (trial 2), and a month after (trial 3) to find out how much they had learned and retained. Four criteria for measuring the textbook's effectiveness were: scores on the oral test, methods agreement, quality, and the length of time for performance of the tasks. Age, educational attainment, food service experience, and length of learning time were analyzed for possible relationships with the above criteria. An opinionnaire survey was conducted for the purpose of securing information regarding attitudes of employees toward the programmed book.

Results showed that the subject's personal history data and length of learning time, with the exception of the unexpected significant relationship ($p < .01$) between the length of experience and time of performance on the slicer program, were not significantly correlated with each of the four criteria. Furthermore, the length of learning time though varying greatly, was not affected by the subject's characteristics.

Learning and retention scores were good. There was no decrease of learning in the week or the month after the initial training session, indicating that subjects either improved or retained their original learning.

When the criteria were interrelated, conflicting results were achieved except for the relationships existing between the oral test and quality and between methods agreement and quality. Of the 48 computed correlations between criteria, nine were not anticipated, one of which was significant at the 1% level (trial 3 of the oral test versus time condition on the slicer program).

Analysis for positive relationships between the pie and slicer programs disclosed significance on the oral test ($p < .01$) and methods agreement ($p < .05$) only in the first trial, showing retention as a causative factor for the insignificant relationship found in the other two trials. The quality of work between programs was significant ($p < .01$) in the second trial while no significant relationship existed between the length of time it took the subject to do the pie task and that taken to clean the slicer.

Employees' attitudes on the programmed textbook were favorable. The employees felt the need for more training and believed that this book could be of definite value as a training aid in the food service industry.

CONCLUSIONS AND RECOMMENDATIONS

Data in this research showed the applicability of programmed instruction method for trainees widely diversified in age, educational attainment, and length of food service experience. The length of time

for learning was regarded a trivial matter in the investigation since it was not significantly correlated with the biographical data of the subjects nor did it affect the criteria of the study. Learning time mainly depended on the individual person.

Scores on the oral test and methods agreement showed learning taking place after studying the programmed textbook. Retention of knowledge, though difficult to control due to an interplay of several factors, disclosed significant improvements or equivalence with scores and length of performance time in the week or the month after the initial training session.

Based on the learning and retention scores and attitudes of trainees toward the programmed textbook, a recommendation for its use as a training technique for food service workers seems warranted. The other four studies on programmed instruction, three at Kansas State University (Apley, 1965, Middleton and Konz, 1965, and Middleton and Konz, 1966) and one at the University of Missouri (Carter et al., 1964) support the present findings, signifying the unlimited potential of autoinstructional method in the food service field.

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APPENDIX A

Table 1. Characteristics of subjects.

Subject	Age	Educational attainment	Food service experience
	Years		
1	45	15	1/3
2	20	12	2
3	53	11	2 1/2
4	19	13	1/4
5	19	12	1/2
6	24	12	4
7	63	12	11 1/2
8	25	15 ^a	2 1/2
9	41	15 1/2 ^a	8
10	58	11	4 1/3
11	25	12	1/2

^a not reliable information.

Table 3. Learning time of subjects for the two programmed tasks.

Subject	Learning time		
	Pie (minutes)	Slicer (minutes)	
1	14.52	33.29	
2	13.30	29.50	
3	14.92	21.70	
4	11.13	18.58	
5	15.30	20.62	
6	21.43	24.65	
7	18.25	23.24	
8	29.86	47.29	
9	12.60	21.42	
10	28.80	26.31	
11	10.60	20.52	
	Ave.	17.34	25.19

APPENDIX B

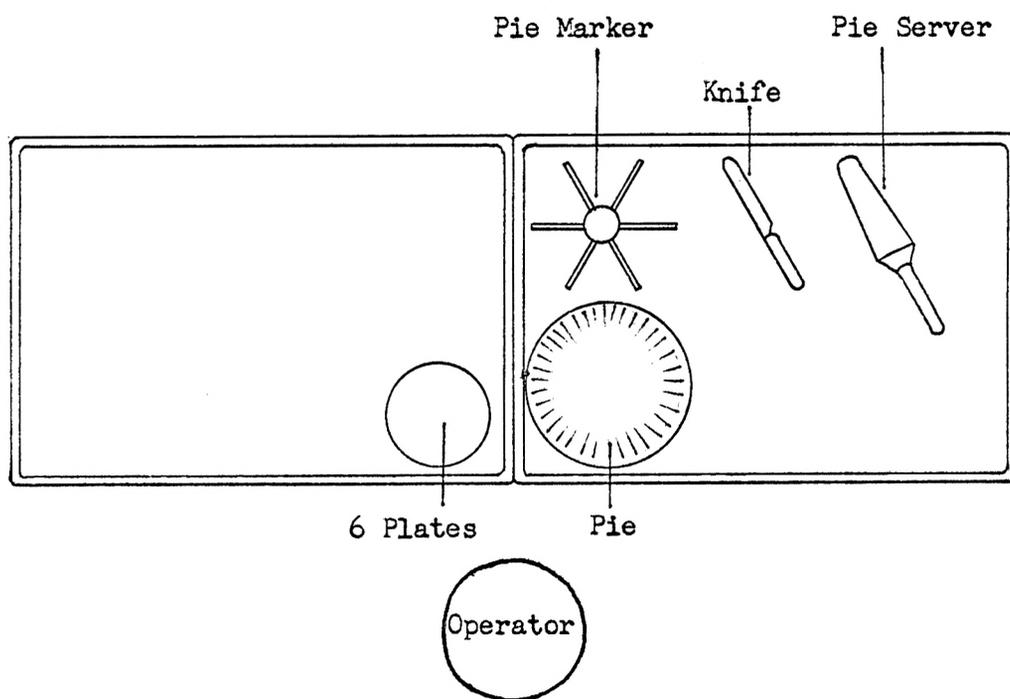


Figure 1. Portioning, cutting, and serving a pie - arrangement of the work area.

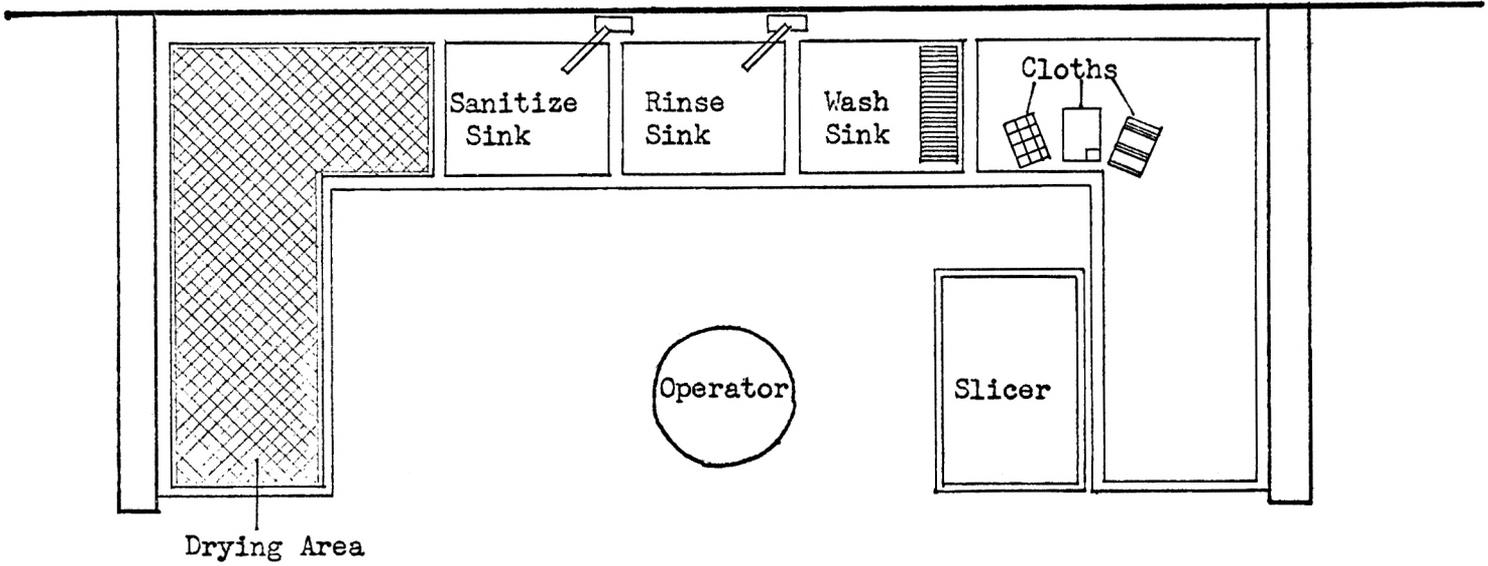


Figure 2. Cleaning a food slicer - arrangement of the work area.

APPENDIX C

Typed Instructions

This book has pictures, explanations, and fill-in-the-blank-type questions. Please look at the pictures, read the explanations below the pictures, and answer the questions on this sheet of paper. After you have finished writing your answer, look at the right hand side of the page and check your answer with that in the book. If your answer is correct, go on to the next picture. If your answer is wrong, look at the picture again and read the explanations. Then you will find out where you made a mistake. Cover the answers with this cover board before you write your answer. In this way you will not be tempted to look at the answer before you read the question or before you try to answer it. It is not difficult to answer the questions because the answers are found in the pictures themselves or in the explanations below the pictures.

You can read through the book as many times as you want to. As soon as you feel confident that you can do the task, tell me, and I will ask you some review questions. Then you will actually perform the task. After doing the task you will come back to this room and you will learn another program.

Any questions?

Subject No. _____

Name _____

Date _____

Trial _____

ORAL TEST - PORTIONING, CUTTING AND SERVING A PIE

SCORE	QUESTION	ANSWER
	1. What is the lesson you have just studied?	cutting pies
	2. What are the 3 utensils you use when cutting pies?	pie marker, knife, pie server
	3. Which one of the 3 utensils do you use for marking pies?	pie marker
	4. Which utensil do you use to take out portions of pie from pan?	pie server
	5. For better pie marking, do you hold the pie marker in - one hand or both hands?	both hands
	6. Do you have to center the pie marker on the crust before pressing it down?	Yes
	7. When marking pies, do you press the marker down ONLY lightly?	yes
	8. Why?	marker is supposed to mark pies - not cut them
	9. When your right hand is cutting pie, what does your other hand do?	hold the pie pan
	10. Do you cut on all the marked lines at once or do you cut them each time you remove one out?	cut all at once
	11. When you transfer the pie to the plate you use both the pie server and the _____?	knife
	12. Why do you use the knife in transferring pie to the plate?	to steady pie and to guard filling from falling out.
	13. Is it necessary to center portion of pie on plate?	yes
	14. Why?	for a more attractive plate
	15. When removing the pie off the server, do you use the knife to slide it off or do you just pull the pie server out?	use the knife to slide it off.
	16. At what corner of the tray do you put the first plate of pie?	upper left corner

ORAL TEST - PORTIONING, CUTTING AND SERVING A PIE (cont.)

SCORE	QUESTION	ANSWER
	17. All pieces of pie on the tray should face what direction - same direction or any direction?	same direction
	18. Why?	easier for the next employee who is going to serve them out
	19. What are you going to do with the remaining filling on the pan when all the portions have been dished out on plates?	distribute them
	20. Why?	to avoid waste

_____ % correct - (5% per number)

ORAL TEST - CLEANING A FOOD SLICER

SCORE	QUESTION	ANSWER
	1. What is the machine you have just studied?	food slicer
	2. What is the very first thing you should do before cleaning the slicer?	pull plug
	3. At what number do you set the dial or the blade indicator before cleaning the slicer?	at 0
	4. The wash sink contains hot _____ water	sudsy
	5. The rinse sink contains hot _____ water	rinse or clean or tap
	6. The sanitize sink contains hot water with _____ agent or solution.	sanitizer
	7. Do you use the 3 cleaning cloths separately?	yes
	8. How many parts do you take out of the machine?	4
	9. When removing or putting back the upper guard, what do you slide down so that upper guard can be released or inserted in?	knob
	10. The cover of the blade is the knife plate. When you take it out or put it in, you always hold the knob. Why?	for safety reasons
	11. The lower guard is found in the inner portion. It is removed by pushing it around till it comes to a _____.	stop
	12. There are 2 kinds of guards: lower guard and the upper guard. Which one does not have the prong?	lower guard
	13. After removing the parts from the slicer, where do you put them?	in wash sink
	14. After removing the parts, does the blade become exposed?	yes
	15. Name the 4 steps required for easy and sanitary cleaning of the parts?	washing, rinsing, sanitizing, air drying
	16. Do clean towels have germs in them?	yes

ORAL TEST - CLEANING A FOOD SLICER (cont.)

SCORE	QUESTION	ANSWER
	17. What are the 4 steps required for cleaning top and bottom parts of the blade?	washing, rinsing, sanitizing, air drying
	18. When cleaning bottom of blade, you use your other hand to turn top of blade. Why?	so that bottom of blade can be easily cleaned.
	19. After you have finished cleaning the blade, do you return the removed parts back to the machine before cleaning the rest of slicer?	yes
	Why?	so that blade becomes covered.
	20. There is one part that you do not return to the machine until the very end. This is called the _____.	meat holder

_____ % correct - (5% per number)

METHODS AGREEMENT - PORTIONING, CUTTING AND SERVING A PIE

I. Marking

- _____ 1. Pie marker marks pie.
- _____ 2. Pie marker held in both hands when marking pie.
- _____ 3. Hands hold both ends of pie marker (instead of in handle).
- _____ 4. Pie marker held between forefingers and thumbs.
- _____ 5. Pie marker centered in pie.
- _____ 6. Pie marker pressed down lightly.
- _____ 7. 6 guide marks clearly seen on top of crust.

II. Cutting

- _____ 8. Knife cuts pie.
- _____ 9. Knife held with index finger pointing along top of blade.
- _____ 10. All portions of pie cut at one time by knife.
- _____ 11. Portions of pie cut in marked lines by knife.
- _____ 12. One hand steadies pan while other hand cuts pie.

III. Serving First Portion

- _____ 13. Pie server takes portion out of pie pan.
- _____ 14. Pie server slid under one portion.
- _____ 15. One hand steadies pan and holds knife while other hand slides pie server under a portion.
- _____ 16. Pie server removes portion while transferring it to plate.
- _____ 17. Knife steadies portion while transferring to plate.
- _____ 18. Portion centered on plate.
- _____ 19. Knife slides portion off server.
- _____ 20. First plate of pie placed in upper left corner of tray.

IV. Serving Other Portions

- _____ 21. Empty plates not placed in tray.
- _____ 22. Pie server removes all portions out of pie pan.
- _____ 23. One hand holds knife and steadies pan while other hand slides pie server under portions.
- _____ 24. Knife steadies portions while transferring to plate.
- _____ 25. Portions centered on plates.
- _____ 26. Knife slides all portions off server.
- _____ 27. All portions of pie removed from pan.
- _____ 28. All portions face same direction.
- _____ 29. Left over filling distributed to pies.
- _____ 30. No filling left in pie pan.

A check mark in front of the number means that the subject has done the item correctly.

Time started: _____

Time ended: _____

METHODS AGREEMENT - CLEANING A FOOD SLICER

I. Dismantling Machine

- _____ 1. Plug pulled first.
- _____ 2. Blade indicator at zero before dismantling machine.
- _____ 3. Meat holder removed.
- _____ 4. Meat holder placed in sudsy water.
- _____ 5. Upper guard removed by sliding knob.
- _____ 6. Upper guard placed in sudsy water.
- _____ 7. Knife plate removed by holding knob.
- _____ 8. Knife plate placed in sudsy water.
- _____ 9. Lower guard pushed around to stop by right hand.
- _____ 10. Lower guard removed by left hand.
- _____ 11. Lower guard placed in sudsy water.

II. Cleaning Removed Parts

- _____ 12. Meat holder washed in sudsy water.
- _____ 13. Upper guard washed in sudsy water.
- _____ 14. Knife plate washed in sudsy water.
- _____ 15. Lower guard washed in sudsy water.
- _____ 16. Meat holder rinsed in rinse water.
- _____ 17. Upper guard rinsed in rinse water.
- _____ 18. Knife plate rinsed in rinse water.
- _____ 19. Lower guard rinsed in rinse water.
- _____ 20. Meat holder sanitized in sanitize water.
- _____ 21. Upper guard sanitized in sanitize water.
- _____ 22. Knife plate sanitized in sanitize water.
- _____ 23. Lower guard sanitized in sanitize water.
- _____ 24. Meat holder air dried.
- _____ 25. Upper guard air dried.
- _____ 26. Knife plate air dried.
- _____ 27. Lower guard air dried.
- _____ 28. Removed parts cleaned before blade.

III. Cleaning Blade

- _____ 29. Bottom of blade washed by wash cloth.
- _____ 30. One hand turns top of blade while right hand washes bottom part.
- _____ 31. Top of blade washed by wash cloth.
- _____ 32. Bottom of blade rinsed by rinse cloth.
- _____ 33. One hand turns top of blade while right hand rinses bottom part.
- _____ 34. Top of blade rinsed by rinse cloth.
- _____ 35. Bottom of blade sanitized by sanitize cloth.
- _____ 36. One hand turns top of blade while right hand sanitizes bottom part.
- _____ 37. Top of blade sanitized by sanitize cloth.
- _____ 38. Top of blade not dried by cloth.
- _____ 39. Bottom of blade not dried by cloth.

METHODS AGREEMENT - CLEANING A FOOD SLICER

IV. Assembling Parts to the Machine

- _____ 40. Meat holder not assembled before cleansing rest of slicer.
- _____ 41. Upper guard assembled before cleaning rest of slicer.
- _____ 42. Knife plate assembled before cleaning rest of slicer.
- _____ 43. Lower guard assembled before cleaning rest of slicer.
- _____ 44. Lower guard and upper guard differentiated.
- _____ 45. Lower guard in place.
- _____ 46. Knife plate held in knob when inserting it in machine.
- _____ 47. Knife plate in place.
- _____ 48. Knob slid down to insert upper guard.
- _____ 49. Upper guard in place.

V. Cleaning Rest of Slicer

- _____ 50. Rest of slicer washed by wash cloth.
- _____ 51. Rest of slicer rinsed by rinse cloth.
- _____ 52. Rest of slicer sanitized by sanitize cloth.
- _____ 53. Rest of slicer air dried.
- _____ 54. Receiving tray washed by wash cloth.
- _____ 55. Receiving tray rinsed by rinse cloth.
- _____ 56. Receiving tray sanitized by sanitize cloth.
- _____ 57. Receiving tray air dried.

VI. Assembling Meat Holder on Slicer

- _____ 58. Meat holder in place.

A check mark in front of the number means that the subject has done the item correctly.

Time started: _____

Time ended: _____

QUALITY SCORES - PORTIONING, CUTTING AND SERVING A PIE

Quality Score Values:

- 1 - Excellent _____ a) each pie is centered on the plate.
 b) " " " " facing the same direction in tray.
 c) " " " " of uniform size.
 d) no filling left in the pie pan.
- 1.5 - - - - - any of the above plus unclean plate edge.
- 2 - Very Good _____ a) one portion is not centered on plate.
 b) " " " " facing the same direction.
 c) " " " " of uniform size.
 d) " " - unclean plate edge.
 e) filling left in pie pan.
- 2.5 - - - - - any of the above plus unclean plate edge.
- 3 - Good _____ a) 2 portions - not centered on plates.
 b) " " - " facing the same direction.
 c) " " - " of uniform size.
 d) " " - unclean plate edge.
 e) filling left in pie pan.
- 3.5 - - - - - any of the above plus unclean plate edge.
- 4 - Fair _____ a) 3 portions - not centered on plates.
 b) " " - " facing the same direction.
 c) " " - " of uniform size.
 d) " " - unclean plate edge.
 e) filling left in pie pan.
- 4.5 - - - - - any of the above plus unclean plate edge.
- 5 - Poor _____ a) more than 3 pies - not centered on plate.
 b) " " " " - " facing the same direction.
 c) " " " " - " of uniform size.
 d) " " " " - unclean plate edge.
 e) filling left in pie pan.
- 5.5 - - - - - any of the above plus unclean plate edge.

Quality Score _____

QUALITY SCORES - CLEANING A FOOD SLICER

Quality Score Values:

- 1 - Excellent _____ all parts of the slicer are clean.
2 - Very Good _____ one part of the slicer is not clean.
3 - Good _____ two parts of the slicer are not clean.
4 - Fair _____ three parts of the slicer are not clean.
5 - Poor _____ more than three parts of the slicer are not clean.

Parts of the food slicer:

1. knife blade - (upper portion)
2. knife blade - (lower or bottom portion)
3. knife plate
4. upper guard
5. lower guard
6. meat holder
7. receiving tray
8. frame - base

Quality Score _____

QUESTIONNAIRE

Subject No. _____

Name _____

Date (Session 1) _____

Date (Session 2) _____

Date (Session 3) _____

Age _____

Educational Attainment _____

Length of experience in food service _____

Job classifications held in food service _____

OPINIONNAIRE

Thank you for helping me with my research project. You have been very cooperative. I am now conducting a survey of your opinions toward the training book you have studied. Please read and answer questions carefully and honestly. Your answers will be used to evaluate the book as a possible training method for food service employees.

ANSWERS WILL BE KEPT CONFIDENTIAL. DO NOT SIGN YOUR NAME.

PLEASE ANSWER THE QUESTIONS BY PLACING A CIRCLE AROUND THE WORD OR NUMBER THAT BEST DESCRIBES YOUR FEELING. ONLY 1 ANSWER TO A QUESTION.

I. Concerning your job at the Residence Hall Food Service

1. When you first started working, were you trained in the job?

1. yes
2. no

2. If yes, who trained you in your present job?

1. dietitian
2. supervisor
3. another employee
4. other? _____

3. In your opinion, did you get enough training?

1. yes
2. no

4. How long were you trained on the job? _____

(Give approximate length of time - days or hours)

5. Do you feel you need more training on your job now?

1. yes
2. no

II. Concerning the TRAINING BOOK you have studied

6. By which method do you prefer to be trained?

1. dietitian
2. training book
3. both dietitian and book

7. By which method do you prefer to be trained?

1. supervisor
2. training book
3. both supervisor and book

8. By which method do you prefer to be trained? 1. another employee
2. training book
3. both employee and book
9. By which method do you prefer to be trained? 1. classroom training
2. training book
3. both
10. By which method do you prefer to be trained? 1. no training
2. training book
11. Circle the method you like best.
dietitian, supervisor, training book, another employee,
classroom training
12. Choose the number that best describes your feeling on the training book.
1. the book was very good
2. the book was good
3. no opinion
4. did not care for the book
5. did not care for the book at all
13. What do you think of this training method?
1. very helpful
2. helpful
3. no opinion
4. not helpful
5. confusing
14. Did you find the book
1. too easy?
2. easy?
3. no opinion
4. hard?
5. complicated
15. Would you prefer learning by pictures alone? (Without Words?)
1. yes
2. no
3. no opinion
16. Would you prefer learning by words alone? (Without Pictures?)
1. yes
2. no
3. no opinion

17. Would you prefer the book the way it was?
(With Pictures and Words?)
 1. yes
 2. no
 3. no opinion

18. Did you like the idea of having the correct answers available so you could check your answers?
 1. yes
 2. no
 3. no opinion

19. Did you think the book was too long?
 1. yes
 2. no
 3. just right

20. Did you find the book
 1. very interesting?
 2. interesting?
 3. indifferent? or no opinion?
 4. not interesting?
 5. boring?

21. Do you like to learn from this kind of teaching?
 1. yes
 2. no

22. Did you learn from the first training session?
 1. yes
 2. no

23. Do you think you would learn better if you studied the book at your own home in your own free time?
 1. yes
 2. no
 3. no opinion

24. Where would you prefer to study this book?
 1. at home
 2. at work
 3. other? _____

25. Would you be willing to study this training book
 1. at home
 2. at work
 3. both

26. Do you think this kind of teaching can help solve the training problem in the food service industry
1. yes
 2. no

THANK YOU SO MUCH.

PLEASE RETURN IN ENCLOSED ENVELOPE IMMEDIATELY.

APPENDIX D





WHEN CUTTING PIES, YOU NEED A TRAY WITH PIES AND ALSO A TRAY WITH _____.
FOR UTENSILS, YOU NEED A PIE MARKER, A KNIFE, AND A _____.

DISHES OR
PLATES
PIE SERVER



WITH BOTH HANDS, HOLD PIE MARKER AS SHOWN FOR:
1. MORE ACCURACY IN MARKING PIE
2. SEEING BETTER THE CENTER OF PIE

THE PIE MARKER IS HELD IN BOTH HANDS. THIS WILL MAKE FOR MORE ACCURACY IN _____ PIE. HANDS DO NOT COVER THE _____ OF PIE.

MARKING
CENTER



THIS IS A CLOSE UP VIEW OF HOW THE FINGERS HOLD THE PIE MARKER SO THAT MARKER CAN BE POSITIONED BETTER IN CENTER OF PIE.

THIS UTENSIL BEING HELD BETWEEN FINGERS IS CALLED
A _____.

PIE MARKER



THE REASON FOR PRESSING MARKER DOWN LIGHTLY IS BECAUSE ONLY GUIDE MARKS ARE NEEDED.

THE PIE MARKER IS NOT SUPPOSED TO CUT PIE,
ONLY _____ IT.

MARK



THERE ARE 6 GUIDE MARKS ON TOP OF CRUST. THERE ARE ONLY 6 PORTIONS IN THIS PIE BECAUSE THE PIE MARKER USED HAS 6 ARMS. IF YOUR PIE MARKER HAS MORE ARMS, THEN YOU WILL HAVE MORE _____. THIS IS A WELL MARKED PIE BECAUSE MARKS CAN BE SEEN CLEARLY.

PORTIONS



KNIFE IS HELD WITH INDEX FINGER POINTING ALONG TOP OF BLADE SO THAT LESS WORK AND ENERGY ARE INVOLVED.

WITH THE INDEX FINGER ON _____ OF BLADE, KNIFE IS GRASPED READY FOR CUTTING PIE.

TOP



THE LEFT HAND IS NOT FREE FROM DOING WORK. IT CAN BE VERY USEFUL IN HOLDING PIE PAN WHEN OTHER HAND IS CUTTING PIE. THEREFORE BOTH HANDS ARE USED WHEN _____

CUTTING



CUT ALL PORTIONS OF THE PIE YOU NEED AT THE SAME TIME. USE THE _____ LINES TO GUIDE YOU WHEN CUTTING PIE.

MARKED



PICK UP PIE SERVER AND SLIDE IT UNDER ONE PORTION. THE LEFT HAND IS HOLDING THE KNIFE AND AT THE SAME TIME HOLDING THE PIE PAN.

KNIFE IS HELD IN THE _____ HAND TO AVOID EXTRA EFFORT AND TIME IN PICKING IT UP SINCE IT IS GOING TO BE USED FOLLOWING THIS STEP.

LEFT



PORTION IS THEN REMOVED TO THE PLATE USING THE SERVER. USE THE KNIFE TO STEADY PORTION AND TO GUARD ITS FILLING FROM DROPPING OUT.

PORTION IS REMOVED FROM THE PAN USING THE SERVER WITH THE HELP OF THE _____.

KNIFE



CENTER PORTION OF PIE ON PLATE.

HAVING PORTION OF PIE ON _____ OF PLATE
MAKES THE PIE MORE APPETIZING.

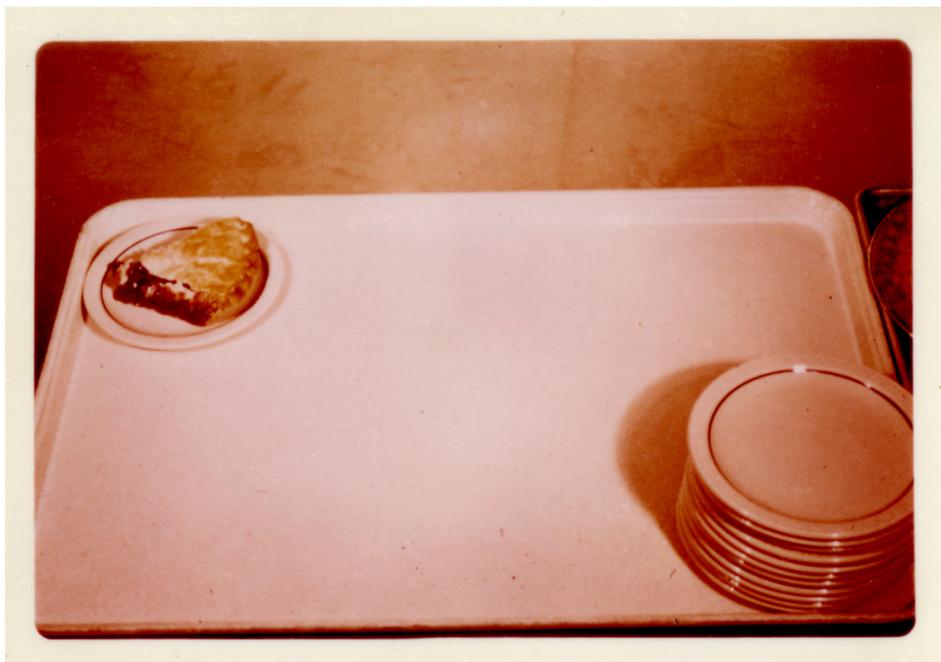
CENTER



TO REMOVE PORTION FROM SERVER, USE KNIFE TO SLIDE
IT OFF. THEN GENTLY REMOVE PIE SERVER.

PORTION OF PIE IS REMOVED FROM SERVER AND SET IN
PLACE WITH THE AID OF THE _____.

KNIFE



TAKE PLATE WITH PORTION OF PIE FROM THE STACK OF PLATES AND PLACE ON THE UPPER _____ CORNER OF THE TRAY. WORK IS THUS DONE IN AN ORDERLY MANNER.

LEFT



CONTINUE REMOVING _____ OF PIE FROM THE PIE PAN USING THE SAME METHOD SHOWN BEFORE.

PORTIONS,
PIECES OR
SLICES



ALL PIECES OF PIE ARE CENTERED ON THE PLATE AND ARE FACING THE SAME DIRECTION. THIS ENABLES THE COUNTER PERSON TO SERVE WITH LESS EFFORT.

ALL PIECES OF PIE FACE THE _____ ON THE TRAY FOR THE BENEFIT OF THE COUNTER PERSON. SAME DIRECTION



SOME FILLING MIGHT BE LEFT ON THE PIE PAN. DO NOT BE WASTEFUL, SO _____ FILLING TO THE PORTIONS OF PIE ON THE PLATES.

DISTRIBUTE





- 3 SINKS ARE NEEDED FOR EASY AND SANITARY CLEANING:
1. WASH SINK CONTAINS HOT _____ WATER.
 2. RINSE SINK CONTAINS HOT _____ WATER.
 3. SANITIZE SINK CONTAINS _____ SOLUTION.

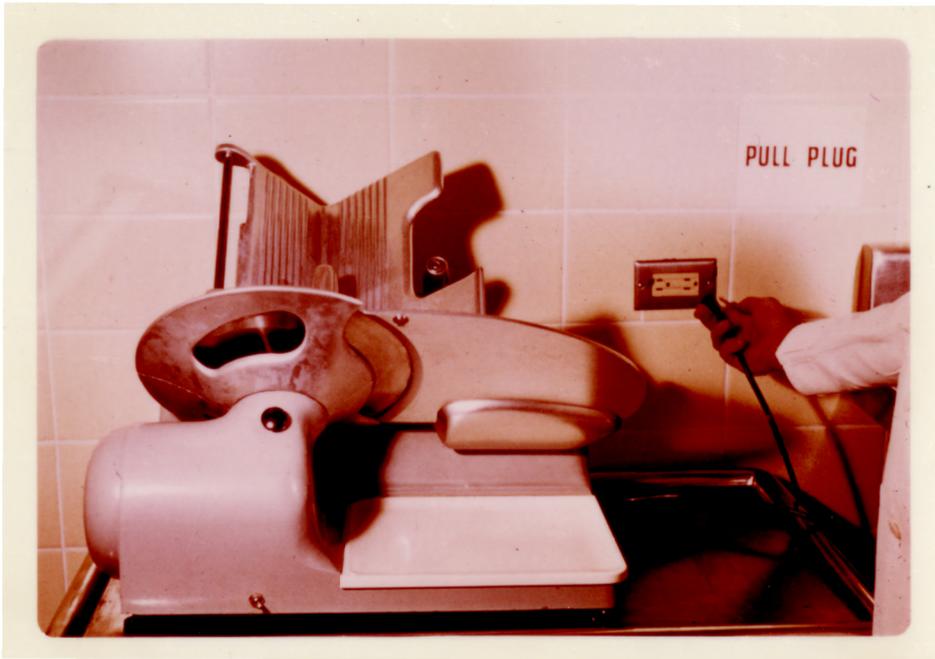
SUDSY
CLEAN
SANITIZER



HERE YOU SEE 3 DIFFERENT CLOTHS. USE THEM SEPARATELY.

1. WASH CLOTH IS DIPPED IN _____ WATER.
2. RINSE CLOTH IS DIPPED IN _____ WATER.
3. SANITIZE CLOTH IS DIPPED IN _____ SOLUTION.

WASH
RINSE
SANITIZER



THE VERY FIRST THING YOU HAVE TO DO IS TO PULL THE PLUG. THIS WILL INSURE PROTECTION FROM ELECTRIC SHOCK AND TURNING ON OF THE MACHINE BY MISTAKE.

BEFORE YOU DO ANYTHING ELSE, IT IS IMPORTANT TO _____ PLUG FIRST FOR SAFETY PURPOSES.

PULL



THIS DIAL IS A BLADE INDICATOR SINCE IT CONTROLS THE BLADE'S OPENING. IT DETERMINES THE THICKNESS OF FOOD BEING CUT. BY HAVING THE DIAL AT ZERO, BLADE IS NOT OPENED.

THIS DIAL SETS THICKNESS OF FOOD SLICES DESIRED, SO BEFORE CLEANING IT, SET THE DIAL AT _____.

ZERO



THIS PART OF THE SLICER IS CALLED THE MEAT HOLDER.
IT IS BEING LIFTED OFF FROM THE _____.

STUD



AFTER TAKING OUT FROM SLICER, PLACE IN SINK
CONTAINING HOT SUDSY WATER.



BEFORE LIFTING OFF UPPER GUARD, YOU HAVE TO SLIDE KNOB DOWN AND HOLD IT THERE.

IT IS IMPORTANT TO SLIDE _____ DOWN AND HOLD IT THERE SO THAT UPPER GUARD CAN BE RELEASED.

KNOB



PLACE IN SUDSY WATER.

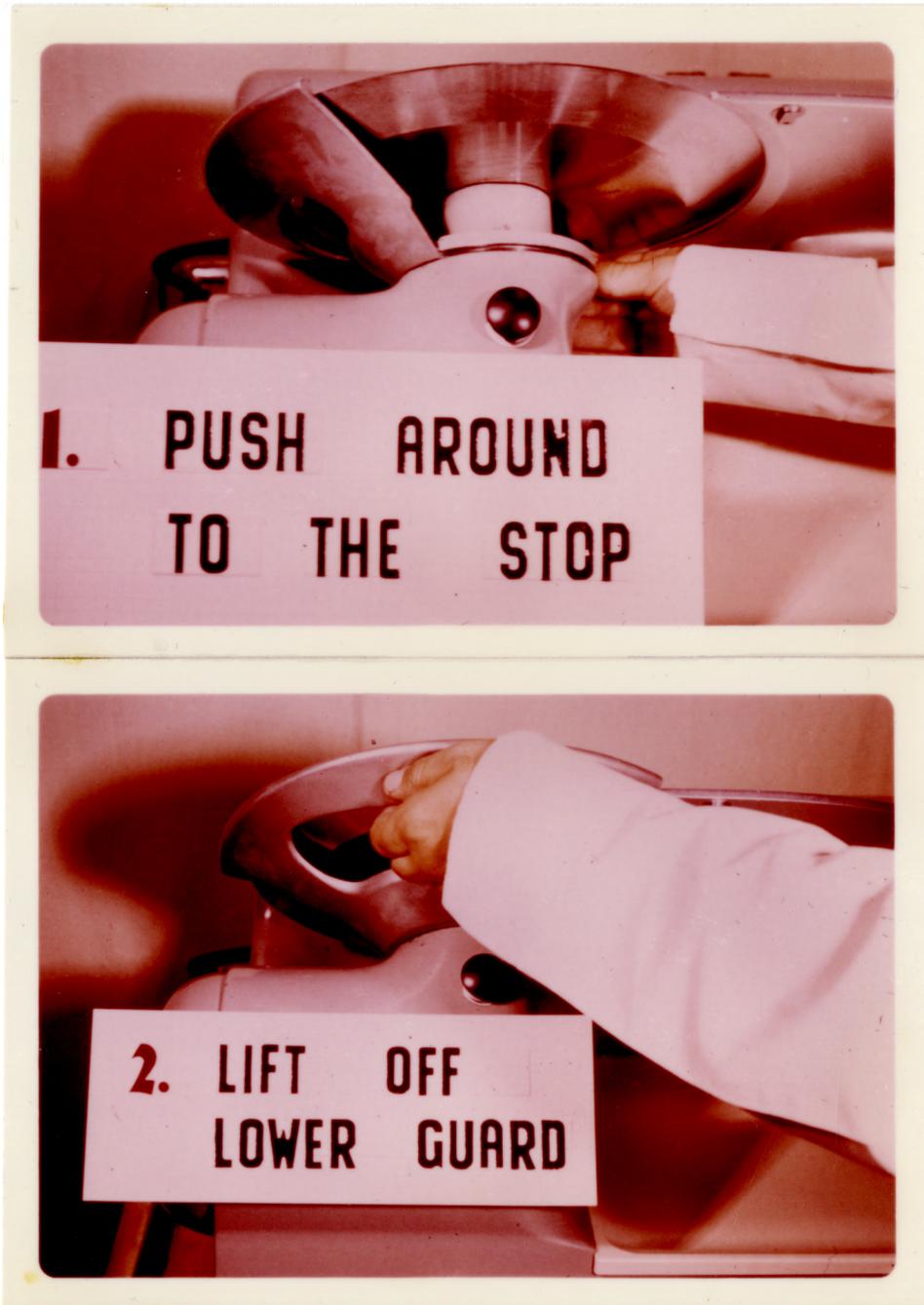


THE KNIFE PLATE COVERS BLADE. TO REMOVE IT, HOLD THE SMALL KNOB FOUND ON ITS TOP SO CUTTING OF YOUR HAND IS AVOIDED.

WITHOUT KNIFE PLATE, BLADE IS EXPOSED BECAUSE KNIFE PLATE COVERS _____. BE CAREFUL.



PLACE IN SUDSY WATER.



THE LOWER GUARD, FOUND IN THE INNER PORTION OF SLICER, IS NEXT REMOVED BY:

1. PUSHING IT AROUND TO THE STOP USING THE RIGHT HAND. ONLY IN THIS WAY CAN IT COME OFF.
2. LIFTING IT OFF BY THE LEFT HAND

USE YOUR _____ HAND TO PUSH LOWER GUARD AROUND TO THE STOP AND YOUR _____ HAND TO LIFT IT OFF.

RIGHT
LEFT



PLACE IN SUDSY WATER.



CLEAN THE REMOVED PARTS IN 4 STEPS:

1. WASHING
2. RINSING
3. SANITIZING
4. DRYING BY AIR

THERE ARE _____ STEPS REQUIRED FOR EASY AND SANITARY CLEANING.

**AIR DRY PARTS
EVEN CLEAN TOWELS
HAVE GERMS**

DO NOT WIPE WITH A TOWEL BECAUSE GERMS ARE FOUND
EVEN IN A _____ TOWEL.

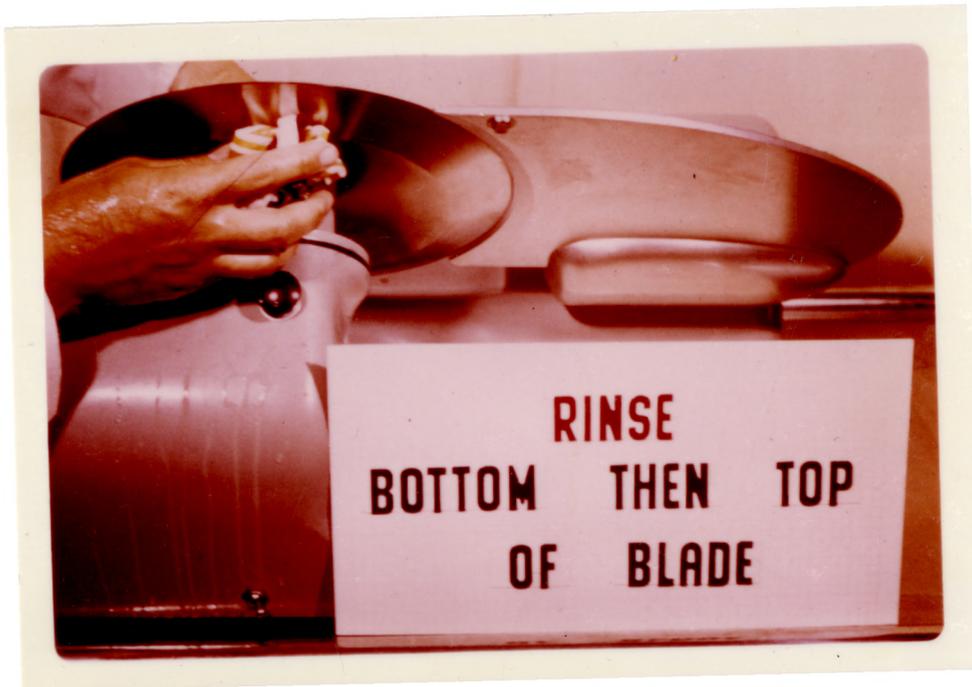
CLEAN



NOW CLEAN BLADE. WASH WITH WASH CLOTH. LEFT HAND
TURNS TOP OF BLADE SO THAT RIGHT HAND CAN CLEAN THE
BOTTOM PART EASILY.

TOP OF BLADE IS _____ BY THE LEFT HAND SO THAT
RIGHT HAND CAN CLEAN THE BOTTOM PART.

TURNED



AFTER WASHING, THE NEXT STEP IS _____.

RINSING



THE SANITIZING CLOTH IS USED TO _____ BOTTOM AND TOP OF BLADE.

SANITIZE



RETURN THE REMOVED PARTS BACK TO THE MACHINE SO THAT IT IS SAFE TO CLEAN THE OTHER PARTS.

THE FIRST PART TO PUT BACK IS THE LOWER GUARD. IT IS ONE WITHOUT THE PRONG. UPPER AND LOWER GUARDS LOOK EXACTLY THE SAME EXCEPT FOR THE PRONG.

THE GUARD WITHOUT THE PRONG IS THE _____ GUARD.

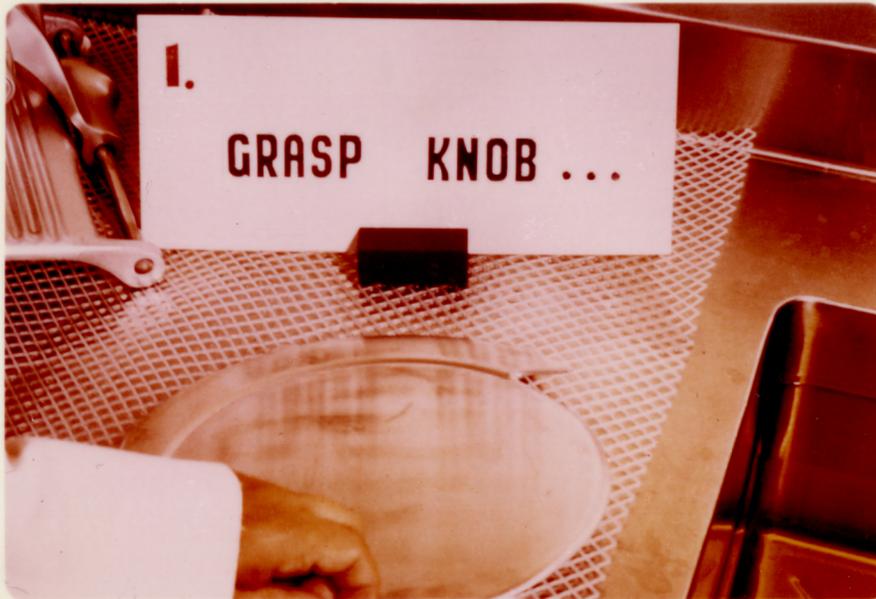
LOWER



LOWER GUARD IS RETURNED TO THE MACHINE BY:

1. INSERTING IN _____.
2. ROTATING GUARD AROUND TO THE LEFT UNTIL IT COMES TO A STOP. THIS SETS IT IN PLACE.

GROOVE



KNIFE PLATE IS NOW RETURNED TO THE MACHINE:

1. GRASP KNOB - THIS KEEPS HAND SAFE FROM THE CUTTING EDGE OF BLADE.
2. SET INTO SLITS - 2 PROJECTIONS FOUND ON THE KNIFE PLATE CAN BE INSERTED INTO SLITS. THE SLITS KEEP KNIFE PLATE IN PLACE.

IN RETURNING KNIFE PLATE TO THE MACHINE, YOU HAVE TO:

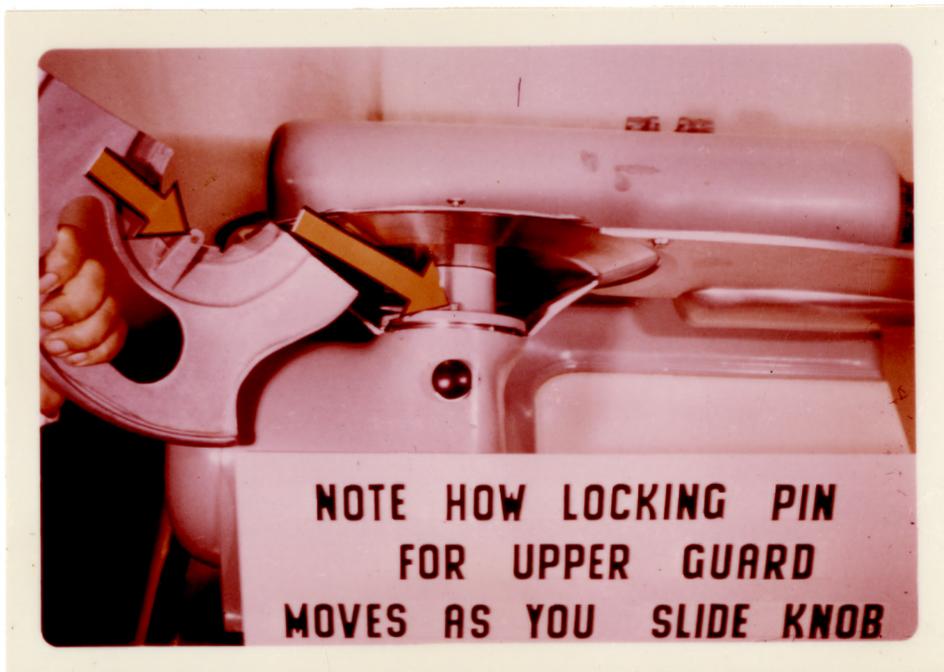
1. GRASP _____
2. SET INTO _____

KNOB
SLITS



AFTER THE KNIFE PLATE COMES THE UPPER GUARD. EXCEPT FOR THE PRONG, THE UPPER GUARD LOOKS EXACTLY LIKE THE _____ GUARD.

LOWER



A LOCKING PIN, WHICH KEEPS THE UPPER GUARD IN PLACE, MOVES DOWN WHEN YOU SLIDE _____ DOWN. UPPER GUARD CAN THEN BE INSERTED IN.

KNOB



THEREFORE, IT IS IMPORTANT TO SLIDE THE KNOB DOWN AND HOLD IT THERE SO THAT UPPER GUARD CAN BE _____ AND LOCKED IN PLACE.

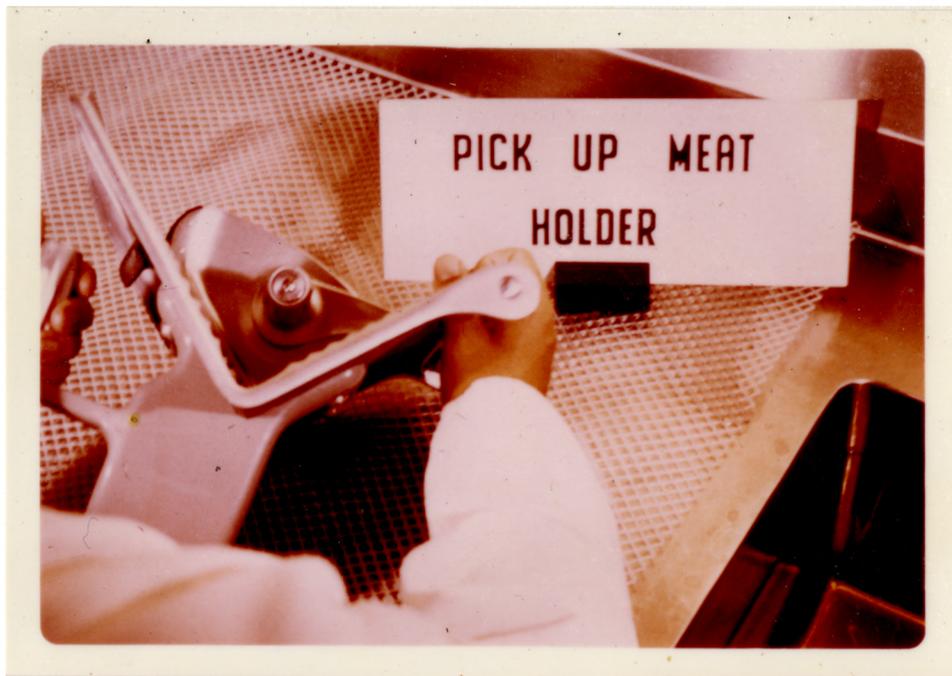
INSERTED



CLEAN THE REST OF SLICER ONLY WHEN YOU HAVE PLACED THE REMOVED PARTS EXCEPT THE MEAT HOLDER BACK TO THE MACHINE. USE 3 SEPARATE CLOTHS.

IT IS SAFE TO CLEAN THE OTHER PARTS OF THE SLICER ONLY WHEN THE _____ ARE PLACED BACK IN THE MACHINE.

REMOVED PARTS



WITH BOTH HANDS, PICK UP THE LAST PART TO PUT BACK ON THE MACHINE. THIS IS THE _____ .

MEAT HOLDER



SLIDE MEAT HOLDER ON THE STUD. THIS STUD IS LOCATED BEHIND THE MACHINE. NOTE ARROW.

YOU NOW HAVE A CLEAN AND SANITARY MACHINE.

EVALUATION OF PROGRAMMED TEXTBOOK PRESENTATION
FOR TRAINING FOOD SERVICE EMPLOYEES

by

SUSANA LACSON SUMBINGCO

B. S., University of Sto. Tomas, Philippines, 1962

AN ABSTRACT OF A MASTER'S THESIS

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MASTER OF SCIENCE

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Shortage of personnel, increased labor cost, and technological advances have emphasized the need for a more efficient training method to help alleviate the labor problems in food service establishments. The success of the programmed instruction technique for industrial workers led to the investigation of its applicability in training food service employees. A programmed textbook containing colored photographs and detailed step-by-step instructions of two food service tasks was developed and evaluated by eleven employees from the residence hall food service at Kansas State University. The subjects were tested immediately after the first training session (trial 1), a week after (trial 2), and a month after (trial 3) to find out how much they had learned and retained. Four criteria for measuring the textbook's effectiveness were: scores on the oral test, methods agreement, quality, and the length of time for performance of the tasks. Age, educational attainment, food service experience, and length of learning time were analyzed for possible relationships with the above criteria. An opinionnaire survey was conducted for the purpose of securing information regarding attitudes of employees toward the programmed book.

Results showed that the subject's personal history data and length of learning time, with the exception of the unexpected significant relationship ($p < .01$) between the length of experience and time of performance on the slicer program, were not significantly correlated with each of the four criteria. Furthermore, the length of learning time though varying greatly, was not affected by the subject's characteristics.

Learning and retention scores were good. There was no decrease of learning in the week or the month after the initial training session,

indicating that subjects either improved or retained their original learning.

When the criteria were interrelated, conflicting results were achieved except for the relationships existing between the oral test and quality and between methods agreement and quality. Of the 48 computed correlations between criteria, nine were not anticipated, one of which was significant at the 1% level (trial 3 of the oral test versus time condition on the slicer program).

Analysis for positive relationships between the pie and slicer programs disclosed significance on the oral test ($p < .01$) and methods agreement ($p < .05$) only in the first trial, showing retention as a causative factor for the insignificant relationship found in the other two trials. The quality of work between programs was significant ($p < .01$) in the second trial while no significant relationship existed between the length of time it took the subject to do the pie task and that taken to clean the slicer.

Employees' attitudes on the programmed textbook were favorable. They felt the need for more training and believed that this book could be of definite value as a training aid in the food service industry. From a classroom training situation, the subjects could immediately perform the tasks in a simulated work area. In addition, they retained this work skill for at least a month. Thus, the hypothesis that programmed textbook presentation would be applicable for teaching food service personnel the tasks encountered on the job was found true in this research.