DOCUMENT RESUME

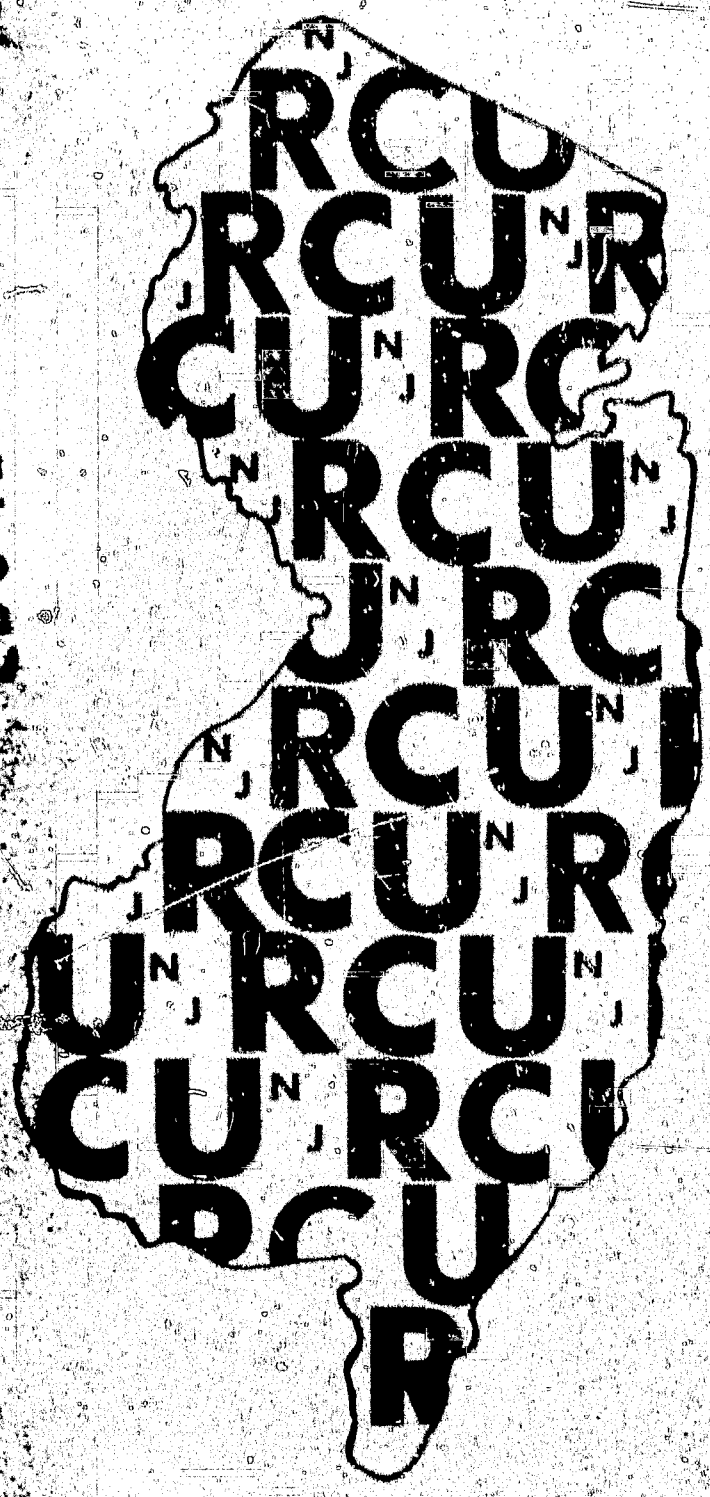
ED 041 110 VT 010 657

AUTHOR Brown, Walter E.
TITLE The Development and Testing of a Behavioral-Reference Groups Model for Evaluation of Vocational Education Pilot Programs. Occupational Research Development Monograph No. 4.
INSTITUTION Rutgers, The State Univ., New Brunswick, N.J. Dept. of Vocational-Technical Education.
SPONS AGENCY New Jersey State Dept. of Education, Trenton. Bureau of Occupational Research.
PUB DATE Jan 70
NOTE 85p.

EDRS PRICE EDRS Price MF-$0.50 HC-$4.35
DESCRIPTORS *Evaluation Techniques, Food Service Workers, *Models, *Pilot Projects, *Program Evaluation, Questionnaires, Research Methodology, *Vocational Education

ABSTRACT

The Vocational Education Act of 1963 (P.L. 88-210) specified that funded programs undergo periodic and regular evaluation to determine if participants are being adequately prepared for employment. A quasi-experimental method for objectively evaluating pilot programs is to use appropriate reference groups in lieu of the traditional experimental control group dyad. Appropriate reference groups may consist of similar people without instruction in the vocation, successful practitioners of the vocation, and students in regular vocational high school programs. Evaluation instruments should provide performance measures of those abilities and knowledges required by the vocation under study. Instrument design should duly consider whether the evaluation is summative or formative, that is, for administrative evaluation of the total program or for internal evaluation. When the behavioral performance-reference groups model was tested in a summative evaluation of pilot Commercial Food Service programs in New Jersey, graduates of regular vocational high school programs scored significantly higher than graduates of pilot programs. Although further study is necessary, the initial findings question the adequacy of training in pilot programs. The evaluation model can be readily used in summative evaluations. (CH)



THE DEVELOPMENT AND TESTING OF A BEHAVIORAL-REFERENCE GROUPS MODEL FOR EVALUATION OF VOCATIONAL EDUCATION PILOT PROGRAMS

by

Walter E. Brown

OCCUPATIONAL RESEARCH DEVELOPMENT

MONOGRAPH NO. 4

The Research Coordinating Unit for Vocational-Technical Education
Bureau of Occupational Research Development Division of Vocational Education
New Jersey State Department of Education Trenton, New Jersey 08625

Published by the Division of Vocational Education

New Jersey State Department of Education

225 West State Street, Trenton, New Jersey 08625

ACKNOWLEDGEMENTS

The following evaluation model was developed and tested while the evaluator was completing a doctoral internship. The sponsors were the N. J. State Department of Education, Division of Vocational Education, and Rutgers University, Department of Vocational-Technical Education.

The evaluator wishes to acknowledge the valuable assistance, advice, and cooperation of the following:

Dr. Bruce Tuckman
Associate Professor
Rutgers University
Graduate School of Education
New Brunswick, New Jersey

Advisor and Supervisor

Dr. Morton Margules
Director, Bureau of Occ. Res. Dev.
New Jersey Dept. of Education
Div. of Voc. Ed.
225 W. State Street
Trenton, New Jersey

Supervisor

Mr. Edward Butkiewictz
Training Supervisor
Food Service Trng. Project
N. J. Restaurant Assoc.
Parlin, New Jersey

Consultant and Rater

Dr. Po Yen Koo
Director, Program Evaluation
Bureau of Occ. Res. Dev.
State Dept. of Education
225 W. State Street
Trenton, New Jersey

Consultant

Mrs. Patricia Brooke
Food Service Teacher
Jackson, New Jersey

Consultant

Cooperating Schools with Pilot Programs

Bound Brook High School
Bound Brook, New Jersey
Dr. George Daniel
Superintendent

Brick Township School District
Brick Town, New Jersey
Dr. Warren Wolf
Superintendent

Clearview Regional H. S.
Mullica Hill, New Jersey
Dr. Earl Mattison
Superintendent

Freehold Regional H.S.
Freehold, New Jersey
Dr. William Satz
Superintendent

Gloucester City H. S.
Gloucester City, N. J.
Dr. Thomas Sykes
Superintendent

Jackson Township School District
Jackson, N. J.
Dr. Gerald Savage
Superintendent

Lower Camden County H. S.
Clementon, New Jersey
Dr. Leonard Westman
Superintendent

Madison Township School District
Old Bridge, New Jersey
Dr. Joseph Brust
Superintendent

North Hunterdon Reg. H. S.
Annandale, New Jersey
Dr. Clifford Singley
Superintendent

Piscataway Township School District
Piscataway, New Jersey
Dr. Theodore Schor
Superintendent

Cooperating Vocational High Schools

Camden County Vocational-
Technical Schools
Pennsauken, New Jersey
Donald C. Springle
Superintendent

Essex County Vocational-
Technical Schools
East Orange, New Jersey
Stephen Andrasko
Assistant Superintendent

Middlesex County Vocational-
Technical High Schools
Dr. Burr D. Coe
Superintendent

Monmouth County Vocational-
School District
Freehold, New Jersey
Donald P. Hoagland
Superintendent

Salem County Technical
Institute
Penns Grive, New Jersey
Herbert C. Donaghay
Director

Thomas Edison Vocational H. S.
Elizabeth, New Jersey
Stephen Poniatowski
Director

Trenton Public Schools
Trenton, New Jersey
Dr. Ersela Watson
Superintendent

Cooperating Establishments

The American Hotel
Freehold, New Jersey

The Chariot House
Edison, New Jersey

The Gaslight Inn
New Brunswick, New Jersey

The Perth Amboy Hospital
Perth Amboy, New Jersey

Rutgers University
Food Service
New Brunswick, New Jersey

St. Peter's Hospital
New Brunswick, New Jersey

Bell Laboratories
Automatic Retailers of America
Murray Hill, New Jersey

Colgate Research Laboratories
Automatic Retailers of America
Piscataway, New Jersey

The Parsonage Diner
Edison, New Jersey

Peter Pan Diner
South Amboy, New Jersey

Sleepy Hollow Inn
Scotch Plains, New Jersey

Wally's Tavern On The Hill
North Plainfield, New Jersey

TABLE OF CONTENTS

PART I - THE MODEL

PART II - TESTING THE MODEL

TABLES

PART I

A BEHAVIORAL PERFORMANCE - REFERENCE GROUPS MODEL FOR EVALUATING VOCATIONAL EDUCATION PILOT PROGRAMS

CHAPTER I - INTRODUCTION

Educators have long recognized the need for educational evaluation and have practiced various forms of assessment. The Vocational Education Act of 1963 (P.L. 88-210) has further specified that programs funded under the Act undergo periodic and regular evaluation.

The Problem

The evaluation method used must allow for any new instructional approach or procedure. The only restriction in this matter has again been dictated by P.L. 88-210. The Act defines vocational education in terms of preparing people for employment.[1] Thus, the only initial restriction that may be placed upon the program is to require the students to be employable as a result of the education received. The evaluation must also give immediate results. Decisions must be made regarding the program even as the students graduate, if not before the first class graduates.

It is also desirable that the method of evaluation be applicable to parts of the program as well as the program as a whole. Evaluation of the total program is quite satisfactory for external (summative) administrative evaluation, where the administrator only needs to decide whether or not he should keep on funding this or similiar programs. Evaluation of specific parts of the overall program are also necessary in order to make

---

[1] Vocational Education Act of 1963, Pub. L. 88-210, 88th Congress, 1963, H.R. 4955, p.6.

specific decisions. This type of internal (formative) evaluation is separate from, but not necessarily unrelated to, the overall summative evaluation which may lead to administrative decisions.

The question then is: do we have an objective method, or methods, of evaluating pilot programs?

Review Of The Literature

A recent national conference on the evaluation of vocational education considered several commonly accepted forms of evaluation. Papers were presented by experts in the use of each of these forms. Following is a brief review of each form.

Accreditation is a method of educational evaluation which has long been in use. The acceptance of accreditation is one of logic. Accreditation assumes that if certain facilities, conditions, and attitudes are present, quality education is the outcome.[2] Probability usually supports this logic, and accreditation is recognized as a long term national force in the improvement of education. The recognition of the success of the concept of accreditation is so widespread that many evaluative criteria checklists are published as unofficial offshoots of accrediting activities.

The self-evaluation of the accrediting procedure should not be discounted. Without this procedure educatiors are frequently kept so busy "minding the store" that they do not voluntarily take time to examine it in detail. But when one is examining a new experimental program what must

---

[2]Frank C. Dickey, Accreditation by Regional Accrediting Associations as a Technique for Evaluating Vocational and Technical Education Programs, A paper presented at the National Conference on Evaluating Vocational & Technical Education Programs, Atlantic City, N. J., Oct. 6, 1968, appendix A.

he look for?

Accrediting agencies insist that schools be accredited as a unit.[3] They hesitate to consider a single program, or major. Despite the strong contribution of accreditation to educational evaluation, its very broadness makes it inappropriate for evaluating individual or pilot programs.[4] Should an accrediting agency get involved in evaluation of such specificity, it would have to develop new procedures, having none of its own to draw upon.[5]

The follow-up study is very impressive as a method of evaluating vocational education. It is a time honored method that assumes vocational education should produce successful workers. While the follow-up study may elicit other information, the prime function is to measure the level of related employment of the graduates.[6] The follow-up study analyzes the employment pattern of the graduates of a program or school at a reasonable time after their graduation. This period of time varies, with typical times being some combination of two, three, five, or ten year intervals.[7] The worth of the program is largely based upon the employment

---

[3]Ibid

[4]An operational definition of the term pilot program is included in the definitions section of this report.

[5]Robert E. Stake, Toward a Technology for the Evaluation of Educational Programs, A.E.R.A. monograph series #1, Chicago: Rand McNally, 1967, p. 1-12.

[6]Burr D. Coe & Henry Zanzilari, After Ten Years, Middlesex County Vocational High Schools, New Brunswick, N. J., 1963.

[7]Laura M. Sharpe, Student Follow-Up Study Proceedings as a Technique in Evaluating Vocational & Technical Education Programs, A paper presented at the National Conference on Evaluating Vocational & Technical Education Programs, Atlantic City, N. J. Oct. 6, 1968,

record of the graduates.

The relative strengths of the follow-up study seem, however, inappropriate to this discussion because the follow-up study simply takes too long to complete. Decisions about pilot programs must be made now, not five or ten years from now.

Standardized examinations have overcome many of the subjective pitfalls of evaluation. The standardized test has proven its consistency, relative difficulty, and validity.[8] This is a method of evaluating those trades and technical fields that require a very high level of literacy. Tuckman and Birchenall have, however, demonstrated the invalidity of pencil and paper tests for many vocational students.[9]

A Basic requirement of the standardized test is the need for a large group of subjects to standardized the test. This requirement removes the standardized test from serious consideration as a method of evaluating pilot programs at this time. The total enrollment in pilot programs of any one occupation, or cluster of occupations, may not exceed more than one hundred students per state. Furthermore, the standardized test is designed to place students on a score continuum. Standardized examination questions are frequently constructs which do not give enough consis-

---

[8]Ohio State Department of Education, Standardized Examination for Trade & Industrial Education, Columbus, Ohio, 1968.

[9]Bruce W. Tuckman, The Development and Testing of an Evaluation Model for Vocational Pilot Programs, Rutgers-The State University, New Brunswick, N. J., 1967.
Joan M. Birchenall, A Study of the Value of Student Exposure to Health Agencies During the Pre-Clinical Portion of the Practical Nursing Program, An unpublished masters dissertation, Rutgers University, New Brunswick, N. J., 1969, p. 44.

tency to measure achievement. The measuring error often exceeds the growth.[10]

Most states have adopted a procedure for licensing practitioners of various occupations. There are nine occupations that usually require a license to practice.[11] The examinations for a license usually have both a written and a performance section. The practice of licensing has almost guaranteed at least a minimum level of preparation. Unfortunately, in practice the licensing examination has tended to develop an unrealistically high minimum standard for employment.[12] The examination becomes an easy method of controlling occupational entry, and thus wages.[13] When the licensing board is a local group, as it often is, this outcome is even more noticeable. To establish licensing procedures in other occupations would require extensive social change in those occupations.

Only a limited number of pilot programs are in the nine areas now commonly licensed. To use licensing procedures as a method of evaluating pilot programs seems burdensome, if not undesirable.

One would certainly hope that a survey was conducted before any pilot program was established. In that sense alone, the presence of a survey might be given some weight in an evaluation. If a survey shows a great local need, this might also be considered in any evaluation of a

---

[10] op cit Stake, p. 27.

[11] Benjamin Shimberg, A paper presented at the National Conference for Evaluation of Vocational & Technical Education Programs, Atlantic City, N. J., Oct. 1968, p. 8.

[12] Ibid p. 9.

[13] Ibid p. 11.

program designed to meet that need. A pilot program that produces two or three times more graduates than comparable existing programs should be given some credit for doing so, providing the graduates are qualified to enter the occupation where a shortage exists. It is not customary, however, for the survey to consider the curriculum or the results of the program.

As with the survey, the use of an industrial advisory committee is a strong positive factor. An active industrial advisory committee can do much to keep the program up to date and realistic. The advisory committee should not be expected to evaluate the program for us. The advisory committee has no specific procedure of its own to draw upon. At best this committee has an incomplete impression of whether or not the graduates of a given program are satisfactory employees.

The hiring or the failure to hire graduates of a program is sometimes considered the ultimate evaluation. Such conclusions are not valid except for unusually incompetent or very outstanding students. Hiring or failure to hire is influenced by the labor market more than by a worker's competence. Only gross incompetence would cause a graduate to be fired when there is an extreme labor shortage. Likewise, no one is good enough to be hired when qualified men in the same trade are being laid off. There is certainly a need for more consistent ways to evaluate job competence.

A review of the six named methods of evaluation seems to indicate no shortage of methods of evaluating long standing programs of vocational education where there are relatively heavy enrollments. On the other

hand, not one of these methods is effective if you wish to evaluate a program to prepare graduates for a new occupation or, if you wish to evaluate specific parts of the curriculum. Many of the methods are ineffective except for very literate students. None of the methods named above can be used to provide an immediate answer to an administrator making decisions at the time the first class graduates.

The methods of evaluation listed above also share the common denominator of using general non-specific criteria that must be applied to the entire educational experience. In most of the cases where specifics are tested, a construct is used to facilitate mass testing. One is never quite sure if the construct really tests the specific part of the program intended.

Gagne suggests that curriculum evaluation be done in terms of specific objectives, objectives that we desire the students to be able to accomplish as a result of the curriculum.[14] He further suggests that we can evaluate effectiveness of sub-objectives and the order of presentation if we state the objectives as behaviors. He also cites the need for a base comparison group that does not receive the instruction.[15] The purpose of that group is to see what knowledge was indigenous to the student population before the instruction was given.

---

[14]Robert M. Gagne, Characteristics of a Structural Learning Program, an unpublished paper, 1961.

[15]Robert Scriven, Michael Gagne, Perspectives of Curriculum Evaluation, AERA Monograph Series of Curriculum Evaluation No. 1, Rand McNally and Co., Chicago, 1967, p. 19-38.

The following is a quote from "The Evaluation of Occupational Education Programs" by Jerome Moss Jr.[16]

> "The criteria by which instructional programs are to be evaluated must be the outcomes, the products of instruction. Program characteristics cannot be used as evaluative criteria, for, by so doing we assume rather than prove, that those characteristics are good. Almost none of our cherished 'principles' of vocational education practice have been empirically validated. Many of them, in time, may prove to be pedagogically sound. But the point is they remain to be proven.

Dr. Donald Tresmin emphasizes the need for experimental controls in evaluation. He points to the many factors that must be considered in experimental design, noting that failure to consider these factors brings the whole question of invalidity into the evaluation.[17]

---

[16]Jerome Moss, The Evaluation of Occupational Education Programs, Minnesota Research Coordination unit, September 1968, p. 1-2.

[17]Donald A. Tresmin, Experimental Design and Educational Resources, Educational Testing Service, Princeton, N. J., 1966, p. 77-84.

CHAPTER II - THE EVALUATION MODEL

The evaluation method proposed here is a quasi-experimental model. The model accounts for several factors affecting internal and external validity, thus controlling or testing those critical factors rather than accepting them on faith.

A quasi-experimental approach calls for the use of at least two groups. A group that has received the experimental treatment, usually called the experimental group, and a group that has not received the treatment, usually called a control group. In some cases there are more than two groups in the design, but two is the minimum.

The Reference Group Method

When a pilot program is evaluated, there is no hesitance in identifying the experimental group; our pilot group. There is little difference whether the treatment is: a lesson taught in a new way, a unit of study derived in a special manner, or merely the environment of instruction. All can be considered experimental treatments.

Identification of a control group is a different matter. There is frequently no clear cut meaningful control group. By adopting an appropriate number of reference groups instead of a control group, this difficulty may be overcome. In the case of vocational education, one obvious reference group consists of "similar" people who have not received instruction in the vocation we are evaluating. This provides some evidence of the effectiveness of the treatment in question, as well as a base line for our measuring instrument. This base line group gives an indication of how maturation and chance affect the scores on the instrument.

A second obvious reference group consists of successful practitioners of the trade in question. This should be the high scoring or upper reference group. Should any other group score significantly higher there is serious question of the validity of either the test or the practice (treatment) unless this was anticipated. Such a case of anticipation would be expected if we were educating people for a high level occupation but still wanted them to be competent at an intermediate level.

In the case of vocational pilot programs the next obvious reference group is the existing standard, the regular vocational high school programs preparing students for the same occupation. A regular vocational school evaluating its program would be likely to substitute a group made up of successful people who are relatively new to the trade, such as successful young people who are approximately one year in the trade.

There is no limit to the possible number or types of other groups that might be sampled. The number actually used should be determined by the reference points needed to give the evaluation realistic meaning. When appropriate reference groups have been selected there will be no question of the relative effectiveness of the treatment. Excess reference groups merely extend the measuring effort.

The selection and use of reference points is somewhat analogous to the procedure used by the scientist doing instrumental analysis. He must standardize his instrument, using a known series of concentrations of a standard material; for without the standardization procedure, his

instrument readings have no meaning. The model uses known reference group scores to give meaning to a measuring instrument that is yet to be designed.

The Measuring Instrument

Except in those few instances where the students are likely to be very literate, it has already been shown that pencil and paper tests do not reflect actual vocational abilities. This limits the field to some type of performance measure.

The philosophy of what to use as a criterion is already fixed by the Vocational Act of 1963. The act stated that the prupose of the funding was to initiate or extend programs that would make people employable. The instrument should thus determine if the program produces graduates that are employable as a result of the program (treatment).

The Potential Pool of Test Items

Using the method of Gagne, the final objectives of the program (treatment) are stated. These objectives are abilities, or knowledges needed to make a person employable. An advisory committee, or the past results of an advisory committee, serves as an excellent source of objectives. A later trial administration of the instrument to the experienced successful reference group will determine the accuracy of the information. Until then, a temporary assumption that the advisory committee is reasonably accurate allows continued preparation.

The final program objectives taken from above are now restated in action terms. This converts the objectives into performance tasks.

If it is impossible to convert an objective into action terms, the original objective must be examined to find the fault. Close examination should reveal a flaw in the original statement of the objectives. This list of behavioral objectives constitutes a potential pool of test items. It will be the eventual source of the tasks given to the subjects to perform. In some cases, the items might be subdivided to give smaller tasks and consume less testing time on any one item.

The verified pool of test items

The behavioral objectives, which are a list of general tasks it is believed a worker should be able to perform, are arranged on a convenient checklist and reproduced. Interviews are arranged with several successful people working in the occupation in question, as well as with supervisors of people working in the occupation. They are asked to check those tasks that they feel a worker at the specified level should be able to perform. Any level can be selected, but newly trained people are usually only hired at certain levels or jobs. Any task that might normally be part of an advanced job, but cannot be learned on the job, could also be included in the checked items. When the checklist is complete the person completing the list is asked about any items that may have been omitted. The conversation should be primed with a few promising leads and a few false leads. The interviewing continues until only repetitous information is collected. Using the interview information, any new items are added to the master list and any items consistently termed out of date or inappropriate are dropped. This completes the master list of general tasks it is anticipated a person graduating from the evaluated program

should be able to perform. This is the master verified pool of potential test tasks that may be included in the instrument.

The rating sheet

The master list has three major disadvantages as a performance instrument. If a rater is asked to rate a subject for his performance ability, the rater's prejudices are a very critical factor. Failure to perform a specific step might cause the rater to reject the entire task as inadequate. On the other hand, if the general task is broken into its critical sub-steps, the rater can reject just that sub-task. This gives a much more accurate reflection of the subject's abilities. If the final result is good, the sub-tasks are also satisfactory. However, if the final result is unsatisfactory, the rater can still recognize successful performance of any sub-step. In effect, the evaluated program is credited for specific strengths even in the face of an overall weakness.

The procedure of using sub-steps solves a second major disadvantage of the master list, that of what weight to apply to different major items. The more complicated items will have more sub-steps and thus automatically get more weight.

The sub-step procedure has another definite advantage. A problem with any measuring instrument is the reaction of the subject. The subject is always trying to guess the desired answer and to some extent provides his best guess of what he believes will please the rater. If we do not show the subject the sub-steps, he has no idea of the specifics in question. He must perform the task to the best of his ability and hope he is right.

Therefore, before any further decisions are made, the master list of behavioral tasks (the list derived from the interviews) is sub-divided into sub-behavioral objectives. This may be done by examining each listed objective for immediate major sub-abilities that are needed to perform the specified task. If one of the sub-abilities that is listed would normally be incorporated into another ability, a step was skipped. The sub-abilities are then examined for sub-sub-abilities needed to perform the sub-abilities and so on until the assumed starting abilities of the students, previous to the program, are reached. Specific instructions for this procedure are contained in a manual by Tuckman.[1] The services of an accepted expert in the occupation being evaluated should be sought for this procedure.

The described procedure provides a lengthy but comprehensive chart of specific tasks that comprise the stated level of competence in that occupation. This is also a potential instrument for evaluating any part of the program.

It is much too lengthy for summative evaluation however. A summative instrument could not possibly include all of the items and be practical to administer. Any occupation that justifies a program to prepare a student to enter it would take several hours to test.

When the instrument is to be used for a summative evaluation the complete list is examined in terms of specific sub-tasks so that representative tasks may be selected. The complete list contains many repetitions of specific tasks. All but one listing for each task can be

---

[1]Bruce W. Tuckman, Manual for Evaluating Educational Programs, Rutgers - The State University, New Brunswick, N. J., 1967.

eliminated. This reduction of repetitive tasks leaves a smaller number of items to be grouped in preparation for a representative sampling. The sampling should be such as to allow inclusion of specific tasks into broader tasks. A representative sampling should include the widest variety of abilities that can be tested in the time allowed, probably 30 to 45 minutes. Existing equipment usually limits performance testing to a one-at-a-time procedure.

This final list of major tasks becomes the instrument that the subject sees. The sub-tasks that are associated with the major items on this final list become a checklist for the rater to use. The rater judges the subject's performance on a pass-fail basis. Reasonable competence is considered sufficient.

Testing content validity of the instrument

When the rater checklist and the student performance sheet have been duplicated, the test is administered to a few experienced, successful people who are working at the level to be evaluated in the occupation in question. These people should be able to perform at least part of each task on the instrument. If, after testing several people, no one is able to do a specified task, this may be evidence that the advisory committee did not give accurate information on this item. The item must be deleted. The same is true for any sub-task that everyone skips without detriment to the product. The assumption that it was a critical sub-task was false. After these revisions, the instrument is content valid. If performance time is important in the evaluated occupation, judgement can be made using the mean time of one or more of the reference groups as a basis.

Checking the discrimination of the instrument

The instrument is now administered to a few inexperienced, untrained people. These people should get relatively low scores. The scores should represent chance performances and abilities inherent in the population from which the students are drawn. If the mean scores are very low compared to the mean scores of experienced successful people, the instrument has discriminative power. This is not the usual item discrimination associated with testing. The only concern here is the ability to separate groups. If the discrimination is satisfactory, the instrument is ready for use. If there is no discrimination between groups, it is necessary to go back to the cognition stage, for the instrument indicates that no preparation is necessary for successful entry into the occupation.

CHAPTER III - APPLICATION OF THE MODEL

Upon completion of the instrument, appropriate reference groups must be selected. In the case of school groups, a listing of at least 5 to 10 schools having the required group is obtained. These schools should be representative of the type of group in question. The name of every student in the graduating class of that group of students is then obtained from each school. All of the names are placed on a list for the group, and each name in the group is assigned a sequential number from 1 through the total number of names in the group. Between thirty and forty names are then randomly selected. The names selected are the subjects to be tested. By selecting more than thirty students, normal attrition should still leave about thirty students for testing.

The collection of demographic data may be desirable for school groups, especially if there is reason to suspect a difference in inherent or initial abilities of the group of students. This data may be examined using a series of statistical tests. If the tests show a significant difference in the initial or inherent abilities of the groups, this would naturally be considered in the final conclusions. Note, the demographic data should have existed in the record prior to exposure of the subjects to the treatment (program).

In most cases, the untrained, inexperienced students will also be selected from the schools. This is a relatively simple procedure. While the rater is in the school testing a group of subjects, he tests a few seniors who are not in the program being evaluated. The seniors selected should be of the ability and background of the students in the program

being evaluated. The rater can randomly select such students from other class groups, as he does not know them. Such a selection would be unbiased. The selected students are asked to help on a test and given the same instructions as other subjects. If the rater finds it necessary to help one of the untrained subjects to get him to complete the test, he does not count the items he helped with.

The experienced, successful, reference group will probably be the most difficult group to obtain. This group should be representative of the appropriate level in the occupation. The local Federal Employment Service Agency should be able to assist by providing typical places and situations of employment. The telephone directory can then be used for the names and addresses of an appropriate number of employers. No more than two or three employees per location should be selected. The large number of employers allows a more representative sample. Approximately thirty people are desired for this reference group. Special care should be taken to see that the selected employers are representative of the occupation. Some cases may require a consideration of geographic distribution.

Arrangements should be made to test all of the subjects as near the end of the program as possible. To avoid bias, no group should be allowed to get nearer to the completion of instruction than another. To accomplish this, the daily testing should be alternated between the groups of subjects, giving none an advantage.

The data may be analyzed using a one way analysis of variance. Variance between any two groups may be tested using a simple F test, as

it was designed for posteriori comparisons. Both tests can use the greater number of degrees of freedom associated with the total sample.[2]

---

[2] B. J. Winer, Statistical Principles in Experimental Design, McGraw Hill, New York, 1962.

PART II

TESTING THE PERFORMANCE-REFERENCE GROUPS MODEL FOR EVALUATION OF VOCATIONAL EDUCATION PILOT PROGRAMS

CHAPTER I - INTRODUCTION

New Jersey pilot Commercial Food Service programs were selected to test the "behavioral performance-reference groups model" for evaluating vocational education programs. This group offered enough difficult conditions to be a realistic test for the model.

Commercial Food Service programs must prepare students for a closely related cluster of occupations. They must also do this without becoming one sided. A program with polychotomus but equistressed purposes introduces considerable confusion into the curriculum construction process.

There is no official group that sets standards of employee preparation in the Commercial Food Service industry. Seemingly, every chef has opportunity to enforce whatever standards he chooses. In practice, at this point in time, the chef generally feels lucky to find a reasonably qualified person. The standard would also seem to vary with the type of establishment the person is working in, as much as by job title.

The Problem

The purpose of this study was to evaluate, as a group, those New Jersey pilot Commercial Food Service programs that were graduating their initial class in June of 1969. The evaluation was to use the behavioral performance-reference groups model derived above. Thus, the purpose of the study was to evaluate the pilot Commercial Food Service programs and to test the model concomitantly. This was a summative evaluation to be used administratively to determine the relative effectiveness of the

pilot Commercial Food Service programs, as compared to the regular vocational high school Commercial Food Service programs used in the New Jersey high schools to prepare Commercial Food Service workers.

Hypotheses

For the purposes of this study, the following null hypotheses were generated.

1. There is no significant difference among the four groups of subjects in performance of the criteria behaviors.

2. There is no significant difference between the inexperienced, untrained group of subjects and the pilot Commercial Food Service group of subjects, in performance of the criteria behaviors.

3. There is no significant difference between the pilot Commercial Food Service group of subjects and the regular vocational high school Commercial Food Service group of subjects, in the performance of the criteria behaviors.

4. There is no significant difference between the experienced successful group of subjects and the group with the highest mean score from hypothesis 3 in the performance of the criteria behaviors.

5. There is no significant difference in the demographic information of the two student groups of subjects as measured by: a. Intelligence Quotient, b. Reading Level, c. Mechanical Aptitude, d. Father's Occupation.

Rationale For The Hypotheses

The first hypothesis was a test of instrument discrimination. The design of the model was based upon the ability of an instrument to separate groups that the design accepted as reference groups.

There is at least one primary recognition involved. The recognition that the experienced, successful group should score significantly higher on a performance instrument than total strangers to the occupation, here represented by the untrained, inexperienced subjects.

Two secondary recognitions also contributed to the formulation of the first null hypothesis. It was recognized that any meaningful vocational education program would produce subjects who would also score significantly higher on a performance instrument than untrained, inexperienced subjects. The third recognition was not critical to the model. Functionally, however, it is desirable for an evaluation instrument to separate the group being evaluated from all other groups.

On the negative side, failure to reject the first hypothesis would have rendered any other results questionable. The model was predicated upon the ability of a performance instrument to discriminate between reference groups. Secondly, the model accepted behavioral analysis as a procedure for reducing subjectivity in the construction of the instrument.

The second hypothesis was to test whether the pilot Commercial Food Service programs produced graduates with the criteria performance abilities and knowledges at a significantly higher level than students who were not exposed to such a program. The custom most commonly used in the past has been to assume that the program was better than no program at all. The opposite assumption has also been used by the opponents to a program. That is to say that some opponents have felt free to say that a program that does not produce a certain quality graduate is worthless.

Thus rejection of this hypothesis when the pilot program subjects have the higher mean score would lead to the conclusion that the pilot program was at least partially successful. The use of further hypotheses that compare reference groups gives a better indication of success.

The third hypothesis was designed to compare the pilot Commercial Food Service programs with the existing high school standard for the preparation of Commercial Food Service employees, the regular vocational high school programs. When the data for these two groups rejects this null hypothesis the mean scores also becomes important. With the rejection of this hypothesis it can be concluded that the group with the highest mean score was better prepared in terms of the criteria behaviors. Thus, the evaluator has evidence that one program was more effective than the other.

A failure to reject the third hypothesis is also possible in this model. Such failure would indicate the inability to measure a difference in the criteria behaviors. This in turn leads to the conclusion that, at the measured level of significance, neither program can be considered superior to the other.

The fourth hypothesis is an attempt to get more use from the data gathered to measure the discrimination, and content validity of the instrument. Except for special cases the mean score of student groups should be significantly lower than that of experienced, successful subjects. When this occurs there is partial assurance of content validity. However, a very successful program could be indicated by rejection at a

lower level of significance, such as .05. Failure to reject this hypothesis could even indicate an extremely successful program without nullifying the instrument validity.

If there was a rejection of the hypothesis, and the experienced, successful subjects had the lower mean score, serious philosophical questions would have to be answered.

There would have to be reasons present that should have been predictive of this result, even before the evaluation was conducted. If that result were not anticipated, another procedure of assessing the instrument validity would have to be used.

As can be seen from the above discussion, rejection or failure to reject this hypothesis is subject to interpretation. Application of the test of the hypothesis can offer more evaluative information, but the information tends to require a degree of subjective interpretation.

If one student group of subjects had higher performance scores than the other there is an immediate question about the inherent ability of each group of students. There is also the question of initial starting point. Did the homelife of one student group consistently give it an edge over the other student group? A true experimental design would randomly assign students to each reference group for the treatment. However, this is impractical in most situations and we must settle for a quasi-experimental design, assuming no significant difference in the initial inherent abilities of the students.

Hypothesis five is a limited attempt to check on the assumation of a lack of significant difference in the initial inherent abilities of the

groups of student subjects. Even when no significant difference is found we cannot assume a true experimental design. Untested factors may have contributed to an unidentified interaction.

Definitions

The following definitions are used for the purposes of this study:

Behavioral Criteria - A set of criteria based upon an analysis of the tasks actually performed by successful practitioners of an occupation. These tasks include personal attitude displays that are considered to affect successful practice.

Intelligence Quotient - The intelligence quotient as determined by the Otis Quick Scoring Intelligence Test.

Inexperienced Vocational Subjects - A group of randomly selected high school students with the same general demographic backround as the commercial Food Service Students, but without exposure to a Commercial Food Service program.

Mechanical Aptitude - The test scores on the Differential Aptitude test battery.

Pilot Programs - Those vocational-technical programs funded by the federal government and the state of New Jersey between the years of 1963 and 1969, but not located in a county vocational school.

Regular Vocational School Program - Any program that occurs in the county vocational schools and is not considered to be new or experimental by them.

Successful, Experienced Commercial Food Service Employees - Those commercial food service employees that have eighteen or more months of experience and whose employers identify them as highly successful practitioners. These employees will be employed below the level of cook/chef but at least at the level of salad man.

CHAPTER II - METHODS

Subjects

A search of the records revealed 12 New Jersey schools with a pilot Commercial Food Service program that was scheduled to graduate an initial class in the spring of 1969. These schools were contacted and asked to participate in the study.

All 12 superintendents responded favorably and the evaluator visited each school to interview the teacher of the program. The interview was designed to find the stated objectives of each program as perceived by the teacher, to check the adequacy of facilities for performance testing, and to discover any other unexpected differences in the programs.

Two schools were preparing post high school students. Those two schools were removed from the sample with the assumption that inclusion of those students would introduce selection and age biases into the study. Nine of the remaining ten schools had the same stated objectives. That was, to prepare students to enter the Commercial Food Service industry at less than the cook/chef level. The tenth school, in a rural area, considered this to be only part of its objectives. Their reasoning was primarily based upon the lack of a large number of such employment opportunities in their immediate locale. A second reason was the local difficulty of recruiting male students for this industry. The objectives of the school included the preparation as specified above and also concentrated upon a specialized type of employment in private homes. This employment incorporated cooking and catering as well as certain kinds of homemaking tasks. The evaluator retained this school with the reservation that if the

scores were considerably lower than the mean for the group, the scores would be discarded. This decision was based upon the fact that Commercial Food Service was only part of the purpose of that program. The scores of subjects from this school were above the mean for the group and retained.

All ten of the schools were asked for the names of their Commercial Food Service students who were scheduled to graduate in June of 1969. These names were assembled on one roster of 112 students. Each name was assigned a consecutive number starting with one. Forty numbers were randomly selected as the pilot Commercial Food Service program subjects. The names were not announced to the local schools until a day or two before the student was tested.

The regular vocational high school Commercial Food Service program subjects were selected in much the same manner. Seven regular ongoing Commercial Food Service programs were identified and the schools were asked to participate in the evaluation. All seven schools readily agreed to participate. Subsequently, one program was removed from the study due to the death of the teacher. The total number scheduled to graduate from these programs was 64. Thirty students were randomly selected as sample subjects. Again the schools were not notified which names were selected until a day or two before testing.

It had been originally planned to use newly hired, untrained people from the industry as the inexperienced, untrained subjects. This proved impractical as people working at appropriate levels were trained, or had been around the kitchen for several years as pot washer, dish washer, etc. It was necessary to find another source of inexperienced, untrained subjects that would be as similar as possible to the two student groups. The

inexperienced, untrained subjects were subsequently selected from both types of schools. While the rater was in the building rating the other subjects he asked permission to test a few students who were not in the Commercial Food Service program and not in a college preparatory program. All of the schools cooperated and allowed the rater a random choice of such students. Thirty inexperienced, untrained subjects were selected in this manner.

The experienced, successful subjects were somewhat harder to obtain. The evaluator was fortunate to have the services of a consultant who was both associated with the New Jersey Restaurant Association and conducting an "on the job training" program, with several types of Food Service establishments as training stations. His established friendly relationships were used to obtain the names of successful, experienced employees working at the appropriate level. Twenty-five of these names were randomly selected as the experienced successful subjects.

Tasks

The interview checklist

The model suggests the use of an industrial advisory committee, or the results from such a committee, as a starting point. The "Commercial Food Service Curriculum Guide," in use at the Middlexex County Vocational Schools, served as a basis for an initial interim checklist.[1] The Middlesex County Vocational Schools, with the assistance of their advisory committees up-date their curriculum guides every five years. Their

[1]Middlesex County Vocational Schools, Commercial Foods Curriculum Outline, New Brunswick, N. J. 1966.

curriculum guides appear to be quite thorough and include a complete subject matter outline of each course offered. The information was reviewed for all of the courses and included on a checklist for employers and experienced workers to review and verify (Appendix A).

The verified interview checklist

The New Jersey Employment Service provided information about the types of establishments hiring Commercial Food Service employees (Appendix B). Supervisors for all kinds of establishments present in the service area of the pilot program schools were scheduled for interview. The evaluator then proceeded to interview several of each of the categories of employers. Each person interviewed provided information used to complete the interview checklist. This interview procedure was terminated after several interviews when no further new information was evidenced. The verified interview checklist is included as Appendix C.

The interview quickly revealed two major classifications of employees in the Commercial Food Service industry. The first class included the titles Chef and Cook. Chefs and cooks are allowed freedom to express artistic, original talent in the preparation and serving of food. They are also part of the "management team." There are many subclassifications of the two titles, depending upon the establishment, but creative and management functions are always present in varying degrees. Every employer specified that chefs and cooks must have experience in addition to schooling. They would not consider a person who hadn't already proven successful in the kitchen. They noted that, in a typical

situation, a candidate for this level of employment would have had many short experiences at work, gained when the kitchen was temporarily shorthanded.

The second classification is somewhat disdainfully called "kitchen help." This classification can again be broken into two groups. One group must have many knowledges and abilities to function at all effectively. This somewhat extensive repertoire must be mastered to the extent of not requiring conscious thought in most situations. To have a person convenient to tell these employees what to do in each situation would defeat the purpose of hiring them. The second group in the "kitchen help" classification can be hired "off the street" and function after a very short break-in period, sometimes minutes.

It was seen that if a program was to produce a graduate that was employable <u>on the basis of an education</u>, it would have to aim at the upper half of the "kitchen help" category. While there are many subclassifications, these workers come under the typical titles of Salad Man, Grill Man, and Short Order Cook. This is not to deny that a few institutions have Pastry Bakers and other such workers. On the other hand, to prepare Dishwashers and Potwashers is a virtual waste of time, unless a program is attempting to train handicapped persons. Present practice does not require any experience or training for most individuals entering those levels of employment. As has been noted, all but one of the pilot Commercial Food Service programs recognized the appropriate level of preparation. That one program agrees with the appropriateness of the level of preparation, but had other reasons for modifying their program.

On the basis of the interviews, the verified checklist only included the items for preparing the upper classification of "kitchen help," those levels from Salad Man through Short Order Cook.

The behavioral criteria

The verified checklist was then used to produce a detailed list of suggested performance tasks for each checked category (Appendix D). Gross inspection revealed that many of the tasks were repeated in different categories. The basic performances required at this level of employment were limited in number. For instance, there were many "measuring" operations. However, most of these operations used the same units of measure, only the actual substance to be measured was different. Many tasks involved "arranging." As important as "arranging" is to the industry, it involves essentially the same abilities, whether the arrangement be a platter or a dessert.

As a result of the inspection, several representative tasks were selected. These tasks included all the categories on the verified checklist that were practical to test under the conditions of this study. The tasks selected were considered to be quite representative of the total behavioral criteria for the specified level of employment in the Commercial Food Service industry. While no effort was made to make them do so, the tasks represented eight of eleven categories of tasks suggeste in a state guide for evaluation of pilot programs.[2]

The tasks selected were prepared in the form of a "duplicate order," usually referred to as a "dupe," for each subject to prepare (Appendix E).

---

[2]Morton Margules, Assessment Guidelines for Occupational Education Pilot Projects, State of New Jersey, Department of Education-Vocational Division, Trenton, 1965, p. 9.

This is the typical form of instructions that a person working the job would receive and must be able to cope with. The subject was required to make a tossed salad, with Italian dressing, a tuna fish salad platter, a turkey club sandwich, a chopped steak platter, a ham omelet and a sole of fish platter.

Most employers had made a point of specifying that an employee must be literate enough to read both a duplicate order and a recipe. A copy of a recipe for an Italian dressing was duplicated for each of the subjects (Appendix D) to use.

The tasks on the duplicate order were then analyzed for critical steps as suggested by Gagne. The critical sub-steps (the behaviors in the hierarchy) were listed as performances on a checklist. The resulting checklist had thirteen categories. Six of the categories simply reflected items listed on the "dupe." Those categories were: the tossed salad, tuna salad platter, turkey club sandwich, omelet, sole of fish platter, and the chopped steak and vegetable platter. Seven other categories were needed to organize the criteria behaviors. These categories were the sequence, Italian dressing, tuna salad, chopped sirloin, the French knife, spices, and safety and sanitation.

The critical behaviors were then listed as sub-items under each item. There was place for a check mark beside each behavior. This format allows equal weight for each behavior. The consultants had initially questioned an equal weighting. They felt that some major tasks were more important than others. However, it became evident that the more important major tasks had more critical behaviors. Those tasks contributed

more to the total score. The consultants felt that the final checklist had weighted itself in a satisfactory fashion.

An examination of the checklist, included as Appendix E, shows that 111 different critical behaviors were represented. One critical behavior appeared six times, once under each of six categories. The consultants insisted that this was such a critical behavior that it should be a reflex action. This behavior was the cleaning up of the station at the end of each operation. Later visits to commercial kitchens did reveal that this is a minimum essential for sanitation.

In a commercial kitchen speed is important. The kitchen is staffed to handle peak loads, a slow employee is not acceptable in many operations. It was decided to time each subject. At the end of the testing, the average time used by the total number of subjects would be determined and used as a standard. Any subject who completed the tasks in less time would be awarded the equivalent of two checks per minute of time difference. This is of course subjective. The value was chosen because it seemed very conservative. Subsequent experience showed an average of four checks per minute for all subjects and better than seven per minute for the experienced, successful subjects. It is quite possible that more value should have been allowed for rapid work.

The rater was to observe the subjects, during testing, to determine if the cited steps were performed in a reasonably satisfactory manner. The items on the checklist were the actual tasks expected of the subjects, the behavioral criteria. The testing instrument thus, consisted of three parts, the dupe, a recipe, and the rater's checklist. The complete instrument is Appendix E.

Pretest of instrument validity and discrimination

The design of the model was depended upon to test the validity of the tasks. Following the model, the instrument was pre-tested for validity and discriminability. Two experienced, successful people and two inexperienced, untrained people were tested. The validity of the instrument seemed reasonable. Both experienced, successful subjects completed almost every item on the checklist in almost the exact sequence the items appeared on the list. The items had been listed in an anticipated best sequence, to ease the raters job. Neither experienced successful subject missed more than three items. The inexperienced, untrained subjects scored 15 and 21 respectively. There seemed little doubt of the ability of the instrument to discriminate between subject categories.

Independent Variables

The Vocational Education Act of 1963 provided funds for the expansion of vocational enrollments and for the development of new vocational education programs. New Jersey attempted to do both in one plan. Pilot programs in various occupations were initiated, primarily in the comprehensive high schools. This was an attempt to increase vocational enrollments. Previous to this plan, vocational education was only offered in separate county vocational high schools and three city vocational schools.

In many respects, the new setting constituted a different student treatment. For this study, the combination of activities of several

pilot Commercial Food Service programs was considered one treatment.

The combined Commercial Food Service programs of the regular vocational high schools were considered to be another treatment. In both cases, there are program variations in each school. There are, however, many more commonalities within each grouping than there are differences.

The lack of any treatment was also a treatment in the context of this study. Baseline information was critical for an accurate interpretation of the worth of pilot Commercial Food Service programs.

The experienced, successful group constituted a fourth treatment. The treatment of this group is a past condition. It did, however, produce a level of proficiency that can be measured for the dependent variable.

Dependent Variable

The dependent variable consists of the scores as measured on the criteria behaviors instrument. These scores are summations of nominal data. A checkmark with a value of one point was awarded for the reasonable performance of each item. The lack of such a performance was scored as a zero on that item. There was no attempt to score the performances in relative degrees of success. Thus, there was no interval data on individual items. A score of two points per minute was also awarded to each subject who completed all major tasks in less than the maximum alloted time. The summation of these points, of course, produced interval data.

Procedure

The subjects were selected as outlined above. The rater then traveled to the school, or work site, of the subjects. The rater organized a work station there for the administration of the instrument. The work station was organized in the fashion that is usual for the industry, with a salad station and a grill station. All of the materials needed were organized in a manner considered most convenient by the Chef consultant. Extra materials were included to test the subject's judgement on critical tasks. After each subject was finished, the station was restored to order. Each subject started with the same station organization and there was little variation in conditions from location to location.

Each subject was given a duplicate of an order to prepare. Any item needed for the order, but not to be fully prepared by the subject, was provided as part of the station set-up. The order was for five people with each person ordering a different platter. The subject was instructed to prepare the order as if he were in charge of his own kitchen. The subject was to use his own judgment on everything except the preparation of an Italian salad dressing. A recipe was provided for the dressing and the subject was to follow the recipe exactly. The subject was also told that elapsed time was part of the score, but not the most important part. The subject was then informed that he had a maximum time of thirty-five minutes, and that he would be instructed not to start any new items at the first station if twenty minutes elapsed before he finished there. The subject was further instructed that no questions would be answered during the test and was asked if he had any questions before the test started.

The rater observed the subject during the test. The rater was a professional Chef of long experience. Checkmarks were awarded for each successful performance of any item on the checklist.

No subjects were informed of their scores until all subjects at any location were tested. In addition the instrument security was protected by not showing the checklist to anyone until all testing was completed, for the entire evaluation.

The test was administered during the first three weeks in May 1969. This was as close as practicable to the graduation of the student subjects. The testing was scheduled to alternate between groups of subjects on consecutive testing dates.

After all testing was complete the teacher at each school was asked for the following information from the school records: the Intelligence Quotient, the Reading Level of the students tested with dates the reading scores were taken, the mechanical aptitude, and the Father's Occupation. All of this information was to be taken from school records that existed prior to the exposure to the program.

When the data was received the reading level was reduced to three categories. Any student reading within one year of his grade level was designated average reading ability with a score of 2. Students below that level were designated low reading ability and assigned a score of 1. Those students above the average level were assigned a score of 3 and called above average.

The mechanical aptitude scores were handled in a similar fashion. More latitude was given to the average range of mechanical aptitude scores.

All scores between the 30th percentile and the 70th percentile were designated average.

The father's occupation was broken into three categories: unskilled and semi-skilled with a score of 1, skilled assigned a score of 2, and professional assigned a score of 3.

The Intelligence Quotient scores were analyzed as received.

Data Analysis

The independent variable was nominal and the dependent variable was interval. The smallest group of subjects consisted of 26 people. These conditions allowed the data to be analyzed using a one-way analysis of variance.[3]

The second, third, and fourth hypotheses were tested using Scheffes S Test.[4] Since there were only a priori assumptions it was possible to use the error term of the total sample.

The demographic data gathered for the two groups of student subjects was also analyzed to determine if one group was initially different from the other. Four factors were considered: I.Q., Reading Ability, Mechanical Aptitude, and the Father's Occupation. The I.Q. data was analyzed with a Ranks Test. The reading ability, and mechanical aptitude data were analyzed with a t-test. The father's occupational data was analyzed with a sign test.

---

[3]B. J. Winer, Statistical Principles in Experimental Design, McGraw Hill, New York, 1962, p. 87.

[4]George A. Ferguson, Statistical Analysis in Psychology and Education, McGraw Hill, New York, 1966, p. 296.

CHAPTER III - RESULTS

HYPOTHESIS: There is no significant difference among the four groups in the performance of the criteria behaviors.

This hypothesis was tested using a one way analysis of variance. Table 1 is a summary of the data.

Table 1 - Analysis of Variance of Performances as a Function of Program

SOURCE	df	MEAN SQUARE	F
WITHIN	3	81,955	34.2**
BETWEEN	114	2,382	
TOTAL	117		

** p less than .01

The total sample consisted of 118 subjects. The mean scores for each group were in a regular sequence. The inexperienced, untrained subjects had the lowest mean score 16.6. The pilot program subjects were next with a mean score of 42.0. The regular vocational high school subjects had a mean score of 66.5. The experienced successful subjects were high with a mean score of 141.8.

The raw data of the experienced subjects showed a very narrow range with scores ranging from 122 to 159. Most of that variation was due to differences in the time of completion. The experienced, successful subjects almost invariably completed the test in the exact order the items

were placed on the checklist, with only a few items not completed.

The inexperienced, untrained subjects also had a narrow range of scores, with a low of 8 and a high of 32. The student subjects displayed a much wider range of scores, with a range of 15 to 90 for the pilot subjects and 31 to 102 for the vocational subjects.

The data for the four groups yields an F value of 34.2 The critical value of F for the .01 level of significance is 3.95. The hypothesis was rejected at less than the .01 level of significance.

The Scheffe's Test is considered sufficiently rigorous to be accepted for a-posteriori tests. Thus this test may be used for either a-priori or a-posteriori assumptions with this model.

Table 2 - Mean Scores and Comparisons Among Mean Scores for the Four Groups

INEXPERIENCED UNTRAINED SUBJECTS	PILOT PROGRAM SUBJECTS	REGULAR VOCATIONAL HIGH SCHOOL SUEJECTS	EXPERIENCED SUCCESSFUL SUBJECTS
16.6*	42.0*	66.5*	141.3*

*Different from all other means at less than the .01 level of significance by a Scheffe's Test.

HYPOTHESIS 2: There is no significant difference between the inexperienced, untrained group of subjects, in performance of the criteria behaviors.

The mean score for the inexperienced untrained subjects was 16.6. The mean score for the Pilot Program subjects was 42.0. The calculated

value of F was 46.4. This value is greater than 6.90 the critical value of F for the .01 level of significance. The hypothesis was rejected at less than the .01 level.

HYPOTHESIS 3: There is no significant difference between the Pilot Commercial Food Service group of subjects and the Regular Vocational High School Commercial Food Service group of subjects, in the performance of the criteria behaviors.

The mean scores of the Pilot and Regular Vocational High School groups were 42.0 and 66.5 respectively. The within group variance was 15.1. The calculated value of F was 39.7 This value was greater than the critical value of F for the .01 level of significance. The hypothesis was rejected at less than the .01 level of significance.

HYPOTHESIS 4: There is no significant difference between the experienced, successful group of subjects and the group with the highest mean score from hypothesis 3, in the performance of the criteria behaviors. The Regular Vocational High School subjects had the highest mean score of the group tested for hypothesis three. The mean scores of the Regular Vocational High School group and the experienced, successful group were 66.5 and 141.3 respectively. The calculated value of F was 329.0. This was greater than the critical of F at the .01 level. The hypothesis was rejected at less than the .01 level of significance.

HYPOTHESIS 5: There is no significant difference in the demographic information of the two student group of subjects as measured by:

a. Intelligence Quotient

Part a of hypothesis 5 was first attempted with a t-Test. This was not possible because the variances were not normally distributed.

For this information see Table 3a.

Table 3a - Summary of I.Q. Data of the Student Groups for a t-Test

GROUP	PILOT SUBJECTS	REGULAR VOCATIONAL HIGH SCHOOL SUBJECTS
N	26	16
Mean Score	102	87
Mean Square	191	755
F		3.95*

*Critical F, .05 level = 2.89

The number of pilot subject I.Q. s was 26. The number of regular Vocational High School subject I.Q. s was 16. The mean score for pilot subjects was 102. The mean score for Regular Vocational High School subjects was 87. The variance of the pilot subjects was 191. The variance of the Regular Vocational High School subjects was 755. The calculated F was 3.95. This is greater than the critical value for the .05 level of significance (2.89) and the t-Test cannot be used.

The Intelligence Quotient information was then analyzed using a Rank Test For Independent Samples.[1]

When z was calculated from data collected the value of z was 3.39. The critical value of z at the .01 level of significance is 2.58. The hypothesis for part a Intelligence Quotient is rejected at better than

[1] George A. Ferguson, Statistical Analysis in Psychology and Education, McGraw Hill, New York, 1966, p. 358-359.

the .01 level of significance. Since the actual mean rank of the pilot group was greater than the expected mean rank of the pilot group we can conclude that the pilot program subjects came from different populations with the I.Q. of the pilot group being significantly higher than the Regular Vocational High School group.

b. Reading Scores

Part b of hypothesis 5 was tested using a t-Test. Table 3b is a summary of the reading score data for the two groups.

Table 3b - Summary of Reading Score Data for the Two Groups

GROUP	PILOT SUBJECTS	REGULAR VOCATIONAL HIGH SCHOOL SUBJECTS
N	23	10
Mean Score	1.78	1.70
Mean Square	.54	.27
F		2.0
t		.03

F critical .05 = 4.80
t critical 31 df at .05 = 2.04

The sample sizes were 23 pilot subject scores and 10 Regular Vocational High School subject scores. The mean scores were 1.78 and 1.70 respectively. The mean squares were .54 for pilot subjects and .27 for Regular Vocational High School subjects.

The critical value of F was not exceeded, leading to the conclusion that the variances were normal, allowing continued analysis with a t-Test.

The value calculated for t was .03. The critical value of t at the .05 level of significance with 31 degrees of freedom is 2.04. Part b of hypothesis 5 was not rejected.

c. Mechanical Aptitude

Part c of hypothesis 5 was tested using a t-Test. Table 3c is a summary of the Mechanical Aptitude data for the two groups.

There was data for 20 pilot subjects and 13 Regular Vocational High School Subjects. The mean scores were 1.85 and 1.23 respectively. The sum of squares for its pilot subject scores was 77. The sum of squares for the Regular Vocational High School subject scores was 22.

Table 3c - Summary of the Mechanical Aptitude Data for the Two Student Groups

GROUP	PILOT SUBJECTS	REGULAR VOCATIONAL HIGH SCHOOL SUBJECTS
N	20	13
Mean Score	1.85	1.23
Mean Square	.42	.17
F		1.7
t		.30

F critical .05 = 2.54
t critical for 31 df at .05 level = 2.04

The calculated F value was 1.7. This was well below the 2.54 value for the .05 level of significance and the t-Test was continued. The calculated value for t was .30. The critical value of t for 31 degrees of freedom and the .05 level of significance is 2.04. Part c. of hypothesis 5 Mechanical Aptitude, was not rejected.

d. Father's Occupation

Part d of hypothesis 5 was tested using a Sign Test as its data was only nominal.[2] The test is an adaptation of the Chi Square Test.

The value of Chi square calculated was 3.28. The critical value of Chi Square is 3.84 for the .05 level of significance. Part d. of hypothesis 5 was not rejected.

---

[2]Ibid p. 19-38.

CHAPTER IV - DISCUSSION

The conclusions of this study are presented in three parts. The first part deals with the conclusions of the Commercial Food Service pilot programs evaluation. The second part contains the conclusions about the model for evaluation. The third part is a general discussion section.

The Pilot Commercial Food Service Program Evaluation

The rejection of the first hypothesis was an indication of the testing instrument's discriminability. This rejection was well above the .01 level of significance. Thus the instrument showed excellent discrimination characteristics. The mean scores of the four groups also indicated a high degree of content validity. The scores of the experienced, successful subjects were more than twice as high as the best student group. The relatively narrow range of scores by the experienced, successful subjects was also an indication that the performance criteria used were basic to the trade. The use of valid but peripheral criteria would have resulted in a wider range of scores by those subjects.

Rejection of the second hypothesis established that the pilot programs made a significant contribution to the preparation of Commercial Food Service employees. The pilot students are at least at a level that is significantly above the untrained, inexperienced people. It is also evidence that students do not become capable of doing this work just through maturation and everyday experience. The rest of the data also supports this second conclusion.

The third hypothesis was used to determine whether there was a significant difference between pilot and regular vocational high school Commercial Food Service programs. The rejection of this hypothesis at better than the .01 level of significance indicated a very significant difference. The regular vocational high schools were doing a significantly better job of preparing their students for employment. This placed the pilot programs, as a group, below the existing yardstick of preparation. Further comparison is needed to see if the level of preparation of the pilot students is still high enough for the students to gain employment on the basis of their training. That is, are the graduates of the pilot programs going to get and hold jobs at the salad man level or above. Also are the pilot program graduates getting jobs at that level in the better paying institutions.

Rejection of the fourth hypothesis showed that the experienced, successful Commercial Food Service employees are also significantly better than the regular vocational high school students. The very high F Ratio brings doubt as to the effectiveness of the regular vocational high school Commercial Food Service programs. If there is doubt about the regular vocational Commercial Food Service preparation, there is in turn very serious doubt about the pilot programs and the ability of their graduates to enter employment on the basis of their vocational education. A fifth reference group of workers judged by their employers to be barely satisfactory would have served to remove all doubt. Now a follow-up survey is desirable.

The fifth hypothesis contained four parts, all dealing with factors known to affect student performance. This evaluation has shown the reg-

ular vocational high school subjects to have demonstrated a significantly better performance than the pilot subjects. There was now need to find if there was a significant difference in the ability of the students of each group. Failure to reject the parts of the hypothesis dealing with Reading Ability, Mechanical Aptitude, and Father's Occupation indicated no significant difference in the two groups on the basis of that information. There was a significant difference in the I.Q. of the two groups at the .01 level. However, the I.Q. of the regular vocational high school subjects proved to be significantly lower. This tends to make the significantly higher scores of the regular vocational Commercial Food Service programs even more significant. If I.Q. is a measure of learning potential, it is reasonable to assume that the regular voctional high schools started with students of lower potential and still produced a significantly better food service worker.

The Evaluation Model

This evaluation model starts with the behavioral analysis suggested by Gagne and further developed by Tuckman. The analysis started with end objectives and used a systematic method of deriving the sub-objectives. The sub-objectives are performances required to accomplish the end objectives. Much of the subjectivity of determining objectives is removed. If the sub-objective does not directly contribute to the end objective it must be discarded.

This method leaves three places for subjectivity to creep into an evaluation. The original end objectives are arbitrarily selected, and therefore open to subjective opinion. The sub-objectives are limited to what an experienced expert believes are necessary performances to accomplish the end objectives. These beliefs are admittedly those of an expert, but the expert is also a subjective human being. The third point of subjectivity is the initial philosophy. What is the student to be prepared for?

The second part of the evaluation model used here eliminates two of the three points of subjectivity. The use of reference groups gives an objective measurement of both the end objectives and of each specific sub-objective. The performance of the experienced, successful group is a direct test of the applicability of any objective.

In this study, the ability of virtually every subject in the experienced, successful group to perform every end objective proved the objectives to be of a central nature to the work in the job category. The model provided for the rejection of end objectives mistakenly selected through subjectivity, but no such rejections were necessary.

Again, a second place for subjective bias is tested by the experienced, successful group. Any sub-objective not performed by a number of workers who produced a satisfactory end product (result) is obviously a mistaken subjective choice and can be dropped or modified in the initial trial of the instrument. This evaluation did not produce a need to modify the sub-objectives of the instrument.

The proposed model does not include a systematic method for establishing an initial philosophy of the purpose of the educational program. This is often a difficult problem to resolve. For the purposes of pilot vocational programs the problem has been resolved by the Congress, in the Vocational Education Acts. The purpose of pilot programs is specified. They are to make people employable. The only decisions remaining when a pilot program is instituted relate to selection of an occupation to prepare people for and then the selection of the appropriated level of preparation. These two decisions are, of course, open to individual philosophy.

The evaluation model proved to be quite successful in this first test of its key concepts. There was no question that the "technology" incorporated in the model can be readily used in summative evaluations. After at least one more test to prove the efficacy of the model, much effort and expense could be saved by testing a smaller number of subjects in each reference group and using non-parametric statistics.

General Discussion

While the design of the evaluation of the pilot Commercial Food Service programs did not allow rigorous examination of factors not included in the hypotheses, four subjective observations were made. These observations were constant enough to deserve further and preferably somewhat exact proof.

There was a definite tendency for those subjects whose teachers were experienced both in the occupation and at the appropriate level to score higher. This was so evident that the rater who didn't have the information, tried to guess at exactly what level the teacher had worked,

if any. This guess was based upon the student performances. The observation also coincides with an old vocational education tradition requiring several years of trade experience (usually 6 to 8) for certification. It should be noted that the rater could usually guess the relatedness of the teacher's experience, but not the length of experience. Thus the indication of a need of further study in light of present certification trends.

A second predictor of higher scores was a program that served lunches to at least 30 people daily. This is contrasted with the serving of special groups. All of the programs had served special groups. Those students that prepared lunches daily exhibited a higher degree of dexterity than the others. They also had a critical quality labeled "hustle." This quality is very important to survival in the kitchen because of staffing practices. A well run kitchen is staffed to just get by the rush hours. This is usually excessive staff during the rest of the day. The ability to "hustle" is always a limiting factor as to place of employment, and as a result to wages. Further attention to methods of providing a realistic daily experience seems to be very important to most of the pilot programs and some of the vocational programs.

The third observation was to notice an inconsistency. The various Commercial Food Service programs were run for various lengths of time, ranging from one to four years. Observation of the students during the test, or otherwise, gave no indication of the length of training. To illustrate the difference, all the students from one pilot program and all the students from one regular vocational program scored much higher than the other students. The high scores from the pilot program were in a one year

program. The regular vocational school high scorers were in a four year program. The scores of the two schools were similar and indicative of well prepared future employees. Further study in this area is essential. If a one year program is sufficient training, costs can be greatly reduced. Also a student need not commit himself to an early career choice.

The last of the four observations dealt with a hypothetical minimum satisfactory score. That is, what is the lowest score a subject could get on the evaluation instrument and still function effectively in a typical commercial kitchen. To hold a job on the basis of his training the Chef rater felt that a score between 70 and 80 was minimum. He based this upon the appearance of dishes prepared, the number of basic dishes the subject could prepare, and upon his estimate of minimum "hustle" and dexterity with the french knife. It is to be noted that this is a totally subjective figure.

The opinion does have significance to the vocational high schools. There was no attempt to evaluate those programs, thus the lack of an appropriate reference group to make the scores of their students meaningful for such an evaluation. However, since the majority of the regular vocational high school subjects scored below seventy there is need for further investigation on this point. The evaluator hopes that this information will be helpful despite its high degree of subjectivity.

There is a need of at least two further studies to adequately test the application of this model for educational evaluation. There is a need of a replicate study, preferably in another vocational occupation. The levels of significance were well above the .01 level, but there is always a small possibility that these findings were chance happenings.

A replicate study, if effective, would remove any doubt of that possibility.

The model has not yet been used for a formative evaluation. Could this model be combined with the check technique developed by Tuckman.[2] If so, it would reduce some of the subjectivity. Using both procedures, a curriculum could be evaluated while it was still in the design stage.

---

[2] Bruce W. Tuckman, The Development and Testing of an Evaluation Model for Vocational Pilot Programs, Rutgers - The State University, New Brunswick, N. J., 1967, p. 16, 17.

REFERENCES

Birchenall, Joan M., "A Study of the Value of Student Exposure to Health Agencies During the Pre-Clinical Portion of the Practical Nursing Program," An unpublished masters dissertation, Rutgers University, New Brunswick, N. J., 1969.

Coe, Zanzilari &, "After Ten Years," The Middlesex County Vocational Schools, New Brunswick, N. J., 1963.

Dickey, Frank C., "Accreditation by Regional Accrediting Associations as a Technique for Evaluating Vocational and Technical Education Programs," A paper presented at the National Conference on Evaluating Vocational & Technical Education Programs, Atlantic City, N. J., Oct. 6, 1968.

Ferguson, George A.,"Statistical Analysis in Psychology and Education," McGraw Hill, New York, 1966.

Gagne , Robert, Scriven Michael, "Perspectives of Curriculum Evaluation," AERA Monograph Series of Curriculum Evaluation No. 1, Rand McNally and Co., Chicago, 1967.

Gagne , Robert M., "Characteristics of a Structural Learning Program," An unpublished paper, 1961.

Middlesex County Vocational Schools, "Commercial Foods Curriculum Outline," New Brunswick, N. J. 1966.

Moss, Jerome, "The Evaluation of Occupational Education Programs," Minnesota Research Coordination unit, September 1968.

Margules, Morton, "Assessment Guidelines for Occupational Education Pilot Projects," State of New Jersey, Department of Education-Vocational Division, Trenton, 1965.

Ohio State Department of Education, "Standardized Examination for Trade & Industrial Education," Columbus, Ohio 1968.

Shimberg, Benjamin, "Licensing Procedures As a Form of Evaluation of Vocational Education," A paper presented at the National Converence for Evaluation of Vocational & Technical Education Programs, Atlantic City, N. J., Oct. 1968.

Sharpe, Laura M., "Student Follow-Up Study Proceedings as a Technique in Evaluating Vocational & Technical Education Programs," A paper presented at the National Conference on Evaluating Vocational & Technical Education Programs, Atlantic City, N. J., Oct. 6, 1968.

Stake, Robert E., "Toward a Technology for the Evaluation of Educational Programs," A.E.R.A. monograph series #1, Chicago: Rand McNally, 1967.

Tresmin, Donald A., "Experimental Design and Educational Resources," Educational Testing Service, Princeton, N. J., 1966.

Tuckman, Bruce W., "The Development and Testing of an Evaluation Model for Vocational Pilot Programs," Rutgers - The State University, New Brunswick, N. J., 1967.

Tuckman, Bruce W., "Manual for Evaluating Educational Programs," Rutgers-The State University, New Brunswick, N. J., 1967.

Unknown, "Guidelines for Developing Pilot Programs in Vocational Education," An unpublished paper presented at a National Conference for State Vocational Education staffs, 1966.

"Vocational Education Act of 1963," Pub. L. 88-210, 88th Congress 1963, H. R. 4955.

Winer, B. J., "Statistical Principles in Experimental Design," McGraw Hill, New York, 1962.

Appendix A

There is a need to evaluate New Jersey's Commercial Food Service pilot programs in terms of employer needs. To do this we need an accurate opinion from you. The following form was designed as an attempt at getting the maximum information from you in the minimum time. Please check those items that apply to your employment and operational needs. In most cases some items will not apply to your operation.

Please be sure to check only those items that apply to your operation. If you wish to add items we have omitted in any category, space has been provided. This form is only to give you ideas. Should you feel a need to use a different format please do not hesitate.

I employ people in each category checked.

____Hostess ____Kitchen Assistant ____Storeroom Man

____Waiter or Waitress ____Cook Assistant ____Short Order Cook

____Busboy or Busgirl ____Dishwasher ____Salad & Sandwich man

____Porter

Other below Chef category:

The following checklists are to include all categories you checked above. Do not make any effort to separate the job classifications.

SAFETY

The employee must care for the floors, including:

____mopping ____waxing

____sweeping ____general picking up

other:

The employee must receive and store supplies:

____opening & emptying crates ____stacking supplies on shelves

____lifting moderate weights ____transferring some foods and supplies to new more appropriate containers

____avoid blocking safety exits and safety equipment

other:

The employee must be able to safely operate;

____a gas range

____commercial steam equipment

____commercial mixers

____slicers

____a dishwasher

____commercial peelers

other:

The employee should know how to safely;

____use the french knife

____use towels and heat mitts

____use cleavers and saws

____pour and handle hot beverages and foods

other:

The employee must know how to prevent injury by safely;

____handling broken glassware

____handling trays

____separating glassware from pots etc.

____handling knives

other:

VEGETABLES

The employee should be able to correctly;

____cook fresh vegetables

____cook frozen vegetables

____steam cook vegetables

____boil vegetables

____cream vegetables

____fry vegetables

____braise vegetables

____saute vegetables

____season vegetables

____store cooked vegetables

____arrange the vegetable serving attractively

other:

FRUITS

The employee should be able to;

____prepare fresh fruit salads and fruit cups

____prepare fruit dressings

____prepare fresh fruit for serving whole or cut

other:

SALADS & SANDWICHES

The employee should know how to;

____prepare fresh green salads

____identify salad dressings by name

____prepare tossed salad

____prepare salad dressings using a recipe

____prepare vegetable, meta and fish salads

____prepare molded jellied salads

other:

The employee should be able to;

____prepare open faced sandwiches

____prepare toasted sandwiches

____prepare rolled sandwiches

____prepare hot sandwiches

____prepare grilled sandwiches

____prepare sandwich fillings and spreads

other:

____prepare club sandwiches

____prepare pinwheel sandwiches

____prepare two-tone sandwiches

____prepare checkerboard sandwiches

____prepare ribbon sandwiches

____arrange sandwiches attractively

____wrap sandwiches

BEVERAGES

The employee should be able to prepare;

____coffee ____tea ____hot chocolate

other:

SAUCES

The employee should be able to;

____prepare fricassee (Velante) sauce

____prepare cream sauce

____correctly store sauces

____prepare cold sauces and salad dressings

____prepare Hollandaise sauce

____prepare gravies

other:

MEAT & POULTRY

The employee should be able to;

____prepare pot roasts

____prepare clams

____prepare clams

____prepare crabs

____prepare oysters

____prepare lobsters

____bone ham and turkey

____make stuffing

____broil ham & turkey

____saute (pan fry) meats

____broil meats

____deep fry fish

____bake fish

____broil fish

____saute fish

____simmer meats & poultry

____stew & braise meats

____boil, poach & stew fish

other:

SOUPS & PUREES

The employee should be able to:

____prepare white stock

____prepare brown stock

____prepare soups

____prepare creamed soups

____prepare purees

____prepare bisques

other:

DESSERTS

The employee should be able to;

____make gelatin desserts

____make puddings

____make sauces for desserts

____make fruit desserts

____store desserts correctly

other:

BREAKFAST FOODS

The employee should be able to;

____make batters

____make toast

____prepare cured meat items

____prepare hot cereals

other:

EGGS

The employee should be able to;

____boil eggs

____fry eggs

____poach eggs

____scramble egge

____make omelets

____make shirred eggs

____work with dehydrated eggs

____work with frozen eggs

other:

FOOD SERVICE COUNTER

The employee should be able to;

____operate the cash register

____operate steam tables and associated equipment

____arrange the counter for service

____handle, dishes, glasses and silver correctly

____operate an adding machine

____clean the counter

____serve the food at the counter

other:

FOOD SERVICE-DINING ROOM

The employee should be able to;

____place the linen

____set a standard cover

____stack the tray correctly

____follow the order of service

____describe entree items on the menu

____clear the table

____seat guests

____carry the tray correctly

____make table and flower arrangements

____greet guests

____check the bill

____prepare the serving station

____make counter, window & case displays

other:

HEALTH

The employee should know;

____basic personal cleanliness

____how diseases are transmitted

____state and local health regulations

____the causes of food poisoning

____the need to keep food areas sanitary

other:

PERSONAL

The employee should;

____be pleasant to customers

____be able to make friends with other staff members

____be loyal to the employer

____know wage and hour regulations

____have a neat clean appearance

____be able to handle money without direct supervision

____understand payroll deductions

____be punctual

Appendix B

RAYMOND F. MALE
COMMISSIONER

State of New Jersey

DEPARTMENT OF LABOR AND INDUSTRY
DIVISION OF EMPLOYMENT SECURITY

EDWARD J. HALL
DIRECTOR

OFFICE OF THE MANAGER
NEW JERSEY STATE EMPLOYMENT SERVICE
Affiliated with United States Employment Service

LOCAL EMPLOYMENT SERVICE OFFICE:

65 Morris Street
New Brunswick, N. J.

January 22, 1969

Rutgers University
Mr. Walter Brown
Curriculum Laboratory
Department of Vocational-Technical Education
Graduate School of Education
New Brunswick, New Jersey

Dear Mr. Brown:

I am supplying the following information requested by you over the telephone earlier this week:

The great majority of Food Service Industry employees are located in the following establishments:

Restaurants	Ocean Liners
Hotels and Motors	Industrial Plants
Private Clubs	Caterers
Railroad Dining Cars	Government Institutions
Hospital and Nursing Homes	

I am also enclosing two Job Guides on Cook and Baker for possible additional information.

If I may be of additional service, please call on me.

Very truly yours,

Neal R. Clemens
Manager

NRC:rf
Encs. 2

PUBLIC EMPLOYMENT SERVICE
SERVICE FOR EVERYONE
LOCAL • STATE • NATIONAL

Appendix C

The Verified Interview Checklist

Safety:

The employee must be able to operate;

____a gas range

____commercial steam equipment

____commercial mixers

____slicers

The employee should know how to safely;

____use the french knife

____pour and handle hot beverages and foods

____use towels and heat mitts

The employee must know how to prevent injury by safely;

____handling broken glass

____handling trays

____separating glassware from pots etc.

____handling knives

Vegetables:

The employee should be able to correctly;

____fry vegetables

____arrange the vegetable serving attractively

____store cooked vegetables

Fruits:

The employee should be able to;

____prepare fresh fruit salads and fruit cups

____prepare fresh fruit for serving whole or cut

Salads & Sandwiches:

The employee should know how to;

____prepare fresh green salads

____prepare tossed salad

____prepare vegetable, meat and fish salads

____identify salad dressings by name

____prepare salad dressings from recipes

The employee should be able to;

____prepare open faced sandwiches

____prepare toasted sandwiches

____prepare grilled sandwiches

____arrange sandwiches attractively

____prepare club sandwiches

____prepare hot sandwiches

____prepare sandwich fillings and spreads from recipes

____wrap sandwiches

Sauces: NONE

Beverages:

The employee should be able to prepare;

____coffee ____tea ____hot chocolate

Meat & Poultry:

The employee should be able to;

____help prepare clams and oysters

____broil ham & turkey

____broil meats

____bake fish

____saute fish

____bone ham & turkey

____saute (pan fry) meats

____deep fry fish

____broil fish

Soups & purees: NONE

Desserts:

The employee should be able to;

____make gelatin desserts

____make puddings

____prepare fruit desserts

____store desserts correctly

Breakfast Foods:

The employee should be able to;

____make batters

____prepare cured meat items

____make toast

____prepare hot cereals

Eggs:

The employee should be able to;

____boil eggs

____scramble eggs

____fry eggs

____make omelettes

____poach eggs

Food Service Counter:

The employee should be able to;

____operate the cash register

____clean the counter

____arrange the counter for service

____operate steam tables and associated equipment

____serve the food at the counter

____handle dishes, glasses, and silver correctly

Health:

The employee should know;

____basic personal cleanliness

____the causes of food poisoning

____how diseases are transmitted

____the need to keep food areas clean

____state and local health regulations

Personal:

The employee should;

____have a neat clean appearance

____be loyal to the employer

____understand payroll deductions

____know wage and hour regulations

____be able to read orders and recipes

Appendix D

List of Suggested Performances

I. Equipment

1. Demonstrate how to light the oven unit, broiler unit, and top-of-the-range units, or the gas range, equipment. Set the burners at simmer, set the broiler for a half-inch steak, and the oven at 350°F.
2. Turn on the steam kettle and cook 3 lbs of spaghetti in it. Drain the spaghetti and clean out the kettle.
3. Given a pour-pound box of cake mix and a supply of eggs, mix the cake batter in a 20 or 30 quart commercial mixer. Turn out the batter into an 18" by 26" sheet pan and clean out the mixer.
4. Take a 3 lb. block of American cheese, put it on an electric slicing machine and slice to the proper thickness for sandwiches.

Clean the machine.

II. Tools

1. Given a bunch of celery, a french knife, and a cutting board, cut five stalks of celery into a size suitable for chicken chow mein.
2. Handling Hot Foods:
   a. Remove a large roast or casserole from the oven.
   b. Dish out two portions of hot soup, using a ladle into two nowls.
   c. Pour two cups of hot water into cups to be served with tea bags.

III. Safety Measures

1. Clean up some broken glass that is mixed with food.
2. Given a large container for soiled dishes, stack six glasses, 24 assorted pieces of silverware, six plates, 6 cups and saucers, and two small saucepans to be carried to the dishwashing area.
3. Put ten pieces of silverware, a paring knife, and a french knife on a tray. Demonstrate how to wash and dry them.

IV. Vegetables

1. Using the proper attachment on the commercial mixer, slice cabbage to be used for making cole slaw.
2. Clean, and dice one pound of carrots to be cooked and used on a vegetable plate.
3. Given a bunch of fresh broccoli or asparagus, clean it.
4. Take a pound of white potatoes, peel, cut, and French fry them in a deep fat fryer. Demonstrate how to drain and serve them.
5. Prepare a pint basket of fresh mushrooms for cooking.
6. Given a pound of yellow onions, peel, slice and saute them to be served over meat.

7. Open a small can of whole kernel corn, cut green beans, asparagus spears, and whole boiled onions. Arrange a vegetable plate using a portion of each vegetable.

V. Desserts

1. Measure out and make enough gelatin for six portions.
2. Given a home size package of chocolate pudding and milk, prepare and dish out four portions.
3. With the aid of a standard recipe, make a custard sauce which could be served over a pudding.
4. Using a standard recipe, prepare and bake a small pan of creamy rice pudding.
5. Take a pound of dried prunes, cook and serve them in dessert dishes.
6. Separate two eggs and make a meringue with the whites which could be used as a topping for a pie.
7. Using a simple recipe, prepare a basic butter frosting with 1 lb. box of confectioner's sugar.

VI. Breakfast Foods

1. Take a standard recipe for pancakes, make the batter and cook six pancakes on the grill.
2. Given: 6 slices white bread, 2 eggs, salt, and milk; prepare and cook French toast.
3. Cook a pound of breakfast sausage links. Drain and place on a serving platter.
4. Using a standard recipe, make up a quart of hot oatmeal.
5. Using a precooked portion of breakfast ham, fry it to be served with eggs.

VII. Eggs

1. Cook and serve two three minute boiled eggs.
2. Fry two eggs sunny-side up.
3. Fry two eggs, over light.
4. Poach two eggs and serve on toast.
5. Scramble two eggs "soft" and serve.
6. Scramble two eggs "dry" and serve.
7. Make a plain omelette and serve.

VIII. Food Service Counter

1. Ring up the sale and make change for a customer with a dinner check for 3.65 and 5.32.
2. Change the tape on the cash register.
3. Arrange a hot meal of meat, gravy, and two vegetables on the steam serving table.

4. Using a cafeteria counter, serve a "hot plate" for six consecutive customers on line.

5. At the end of the lunch period, clear off the counter of all the remaining food, clean the counter and the steam-table.

6. Fill a coffee cup and a soup bowl and pass both over the counter to a prospective customer.

IX. Fruits

1. Given a fresh grapefruit, cut it in half and prepare each half for serving as a half grapefruit. Broil one half before serving.

2. Section a fresh grapefruit and a fresh orange in such a fashion that no pulp or membranes are left on the pieces of fruit. Arrange to be served as a salad.

3. Cut up fresh fruit and arrange the cut pieces in sherbert glasses to be served as fruit cups.

X. Salads & Sandwiches

1. Given a head of iceberg lettuce, two tomatoes, one cucumber, endive and radishes prepare a tossed salad to be served in one large salad bowl.

2. Using assorted greens such as, chicory, romaine, and watercress, prepare four individual tossed green salads.

3. Given a can of tuna, celery, mayonnaise and lemon juice, prepare the tuna as a sandwich spread.

4. Given lettuce, apples, celery, walnuts, and mayonnaise, prepare two portions of waldorf salad.

5. Following a basic recipe, make enough macaroni salad to serve 4 t0 6 persons.

6. Take the ends from a canned ham and make a sandwich spread.

7. Using a few basic materials make an open faced tea sandwich.

8. Make a BLT sandwich.

9. Make and garnish a club sandwich.

10. Make two grilled cheese sandwiches.

11. Make a chopped egg sandwich filling.

12. Make and wrap two ham and cheese sandwiches.

13. Make two hot roast beef sandwiches.

XI. Beverages

1. Using a commercial urn make 30 cups of coffee.

2. Make six portions of iced tea and put them in the proper serving glasses.

3. Using hot chocolate powder mix, prepare and serve four cups of hot chocolate.

4. Take a #5 can of tomato juice, serve two portion, and store the rest.

XII. Meat & Poultry & Fish

1. Given a slice of young beef liver, saute the meat and serve.
2. Take a pound size whole mackeral or blue fish, bone, and broil until ready to serve.
3. Given a package of breaded, fresh frozen shrimp, deep fry two portions and serve properly garnished.
4. Using a half pound portion of swordfish, saute the steak and serve.
5. Given four pieces of chicken, flour, season, and deep fry until cooked. Drain and serve.
6. Using either a shell steak, or a small T-bone steak, broil and serve medium rare.
7. Using chopped chuck, make a three ounce hamburger; grill and serve on a toasted bun.

Appendix E

Experienced____Inexperienced____Pilot Student____Voc Student____

THE SEQUENCE
____Read entire order upon receipt
____Checked equipment for proper temp. setting
____Checked the supply of vegetables and gravey
____Made the Italian dressing first
____Made the tossed salad next
____Made the other cold dishes next

ITALIAN DRESSING
____Was able to read and understand the recipe provided
____Measured the correct quantity
____Measured accurately
____Used all the proper ingredients
____Attempted to chill the dressing
____Mixed the dressing before using
____Used a reasonable amount on each salad
____Cleaned up station after making dressing

THE SALADS(tossed)
____Used all three greens provided
____Removed cores before chopping
____Cut greens uniformly
____Did not chop excessively large or small chunks
____Washed greens thoroughly
____Drained greens well
____Mixed greens uniformly
____Filled bowls to a reasonable level
____Covered excess greens with damp cloth
____Refrigerated excess greens
____Wedged tomatoes, or chopped them
____Placed tomatoes on top of salad
____Cleaned up station

TUNA SALAD
____Used commercial opener correctly to open can of tuna
____Drained can of tuna
____Broke up tuna before adding mayonaise
____Diced celery uniformly

TUNA SALAD (Continued)
____Used appropriate celery size
____Used less than half as much celery as tuna
____All ingredients were thoroughly mixed adding mayonaise as needed
____Consistency of final product was smooth and firm enough to retain shape when formed
____Excess salad was covered and refrigerated
____Cleaned up station

TUNA SALAD PLATE
____An appropriate amount of crisp clean greens were used as a bed
____Salad was neatly formed with a scoop and placed on bed
____A reasonable portion was used
____Selected five or six garnish from those provided
____Arrangement was neat and colorful
____Cleaned up station

SOLE FISH PLATTER
____Used a six to eight ounce portion
____Cooked fish to a golden brown crisp appearance.
____Removed fat by placing fish in a pan lined with a towel
____Wedged lemon
____Garnished with tarter sauce and lemon wedge
____Final appearance of the dish was acceptable
____Cleaned up the station

CHOPPED SIRLOIN
____Used a six to eight ounce portion
____Formed a smooth oblong patty
____Cooked the meat to the right degree of doneness
____Started the meat before the fish or omelette
____Cleaned up the station
____Started with clean utensils

TURKEY CLUB SANDWICH

____Assembled all items in an appropriate sequence of preparation
____White bread was used
____Used three slices of fresh toast
____Used mayonaise on at least two slices of toast

FIRST DECK

____Used sliced turkey topped with lettuce
____Was able to slice turkey on slicer or with knife
____Topped first deck with a slice of toast

SECOND DECK

____Used two to three pieces of crisp fried bacon
____Added thinly sliced tomato
____Topped with a lettuce leaf
____Added third slice of toast
____Inserted toothpicks about one-half inch from edge and in midpoint on each side
____Trimmed crust
____Was not wasteful in trimming crust
____Cut sandwich into four triangular pieces with two diagonal cuts
____Arranged sandwich on plate with peaks up
____Garnished with materials available
____The pieces did not fall apart
____Cleaned up station
____Quarters of sandwich were uniform

OMELET

____Diced the ham into 1/8 inch pieces
____Used two eggs
____Beat ham and eggs thoroughly to mix
____Wiped skillet clean before using
____Used butter or margarine when preheating the pan
____Added mixture and stirred with a fork until mixture set
____Flipped over and cooked until done
____Folded omelet in half as it was placed on the dish
____Served omelet without excess fat
____Cleaned up the station

CHOPPED STEAK & VEGETABLE PLATTER

____Covered chopped steak with gravy leaving a good appearance
____Selected the correct ladle from a choice

CHOPPED STEAK & VEG.(continued)

____Demonstrated reasonable skill in pouring the gravy
____Selected a slotted spoon for the peas
____Drained peas well
____Used a reasonable portion of peas
____The peas were clumped together on the plate
____Selected a solid spoon or scoop for the potatoes (mashed)
____Garnished the plate
____Used a reasonable portion of french fries
____French fries were done to a golden brown
____Shook off excess grease before removing from the basket
____Fries were poured from basket onto a towel to absorb fat
____Transferred fries to the plate placing them together
____Garnished the plate

THE FRENCH KNIFE

____Used a cutting board
____Knife was clean
____Knife was sharp
____The steel was used occaisionally
____Fingers of the hand holding the item were bent and held clawlike
____Knife was wiped clean and dry after each use
____Knife was stored properly when ever it was not in the hand
____Reasonable dexterity was exhibited

SPICES

____Was able to identify five unlabeled spices by sight and smell

SAFETY & SANITATION(where not covered)

____Avoided splashing hot grease
____Used a dry towel when handling hot utensils
____Wiped up any spillage
____Used clean dishes
____Used clean utensils

RECIPE - ITALIAN DRESSING

1 1/2 cups Olive Oil
1/2 cup Wine Vinegar
1 tsp Salt
1/2 tsp White Pepper
1 clove Garlic

5 SALADS
ITALIAN

1 TUNA SALAD PLATE
1 TURKEY CLUB

1 CHOPPED SIRLOIN MEDIUM
MASH PEAS GRAVY
1 FRIED SOLE
F. FRIES
1 HAM OMELETTE
PEAS