

AN ABSTRACT OF THE THESIS OF

Krista Lee Six for the degree of Master of Science
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Title: THE IDENTIFICATION OF COMPETENCIES AND CRITERIA
REQUIRED OF HOME ECONOMICS TEACHERS IN THE
AREA OF FOODS

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Purpose of the Study

The purpose of this study was to determine competencies that practicing home economics teachers believe future teachers must possess to show proficiency in the area of foods. The objectives were:

1. To evaluate, revise, and expand the competencies that have been identified by the Oregon State University Home Economics Education Department for assessing a student's behavior in the subject matter of foods.
2. To develop criteria in the taxonomic levels of knowledge, comprehension, application, analysis and synthesis that would set a standard against which behavior can be judged.
3. To seek professional opinions from secondary home economics educators currently in the field to determine the performance

indicators which exemplify competencies necessary for future teachers in the subject matter of foods.

Procedures

A mail survey questionnaire containing 98 criteria items with a five-point Likert-type scale was used to collect data. The criteria items consisted of foods subject matter content statements. The dependent variable was the score judgmentally assigned by the respondents to each criterion item. This score denoted the level of proficiency they believed a novice home economics teacher should possess.

A randomized sample of 250 practicing Oregon home economics teachers were sent introductory postcards asking their willingness to participate in the study. All 131 indicating a desire to participate were sent questionnaires. One hundred-one questionnaires (77%) were returned; 98 were used for data analysis which consisted of factor analysis, using the R- and Q-techniques, and the computation of mean scores and standard deviations, of the criteria items.

Selected Findings

The Q-technique analysis provided a measure of commonality among respondents as it indicated that secondary home economics teachers resembled one another according to the criteria items in

the study.

The R-technique analysis generated criteria items with a high degree of correlation into factors. A three-factor solution accounted for 53 criteria items, with two items overlapping in two factors. All items were accounted for as either clustering within a factor with a factor loading of $\pm .470$, or under a factor as a spurious criterion item. The three factors were identified and assigned titles by the researcher as follows:

Factor I: Influences that Contribute to Food Choices and Safety in Food Handling

Factor II: Preparation Principles of Various Food Groups

Factor III: Influences of Chemical Composition and Physical Properties on the Use and Quality of Foods

The mean score and standard deviation for each criterion item were determined. Twenty-six criteria items had mean scores of >4.00, 55 had mean scores in the 3.00-3.99 range, and 17 had mean scores below 3.00.

Conclusions

The clustering of criteria items listed in the questionnaire into the factors generated in the R-technique analysis revealed three groups of criteria items that had high levels of correlation. The factors derived from this study may be used as one reference from

which to develop curriculum in foods subject matter. In some cases the factors generated overlapped in terms of content and showed a lack of content congruence within a factor. A possible explanation for this occurrence was that the criteria statements may not have been specific enough to clearly group the items into discernible factors. The mean scores derived in this study for each of the criteria items were concluded to be of significance and should be considered in curriculum development in the subject matter of foods.

The Identification of Competencies and Criteria
Required of Home Economics Teachers in
the Area of Foods

by

Krista Lee Six

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THE IDENTIFICATION OF COMPETENCIES AND CRITERIA
REQUIRED OF HOME ECONOMICS TEACHERS IN
THE AREA OF FOODS

I. INTRODUCTION

Background for the Study

Competency-Based Teacher Education (CBTE) has emerged in response to the criticisms that many educators expressed in the mid-1960's against the system that was being used for preparing future teachers. Many expressed the concern that there existed a lack of congruence between the actual teaching abilities of teacher education graduates and the program of preparation through which they were trained. CBTE has been initiated in hopes of creating a new pattern of teacher education that will bridge the gap between what the teacher has been prepared to do and what the teacher is actually expected to do in a teaching situation (AACTE, 1974).

Competency-Based Teacher Education appeared as a result of increasing demands for productivity and accountability in education. The expectations for education were shifted from the acquisition of knowledge to the ability to use the knowledge acquired in actual functional practices (Weinstein and Houston, 1974). Additional factors that contributed to the CBTE movement are the increased focus on cost-effective schooling, the demand for relevance in education, the

desire to gain effectiveness in certification of teachers, and the press for personalization and individualization in education (Kohlman, 1975; and Schmieder, 1973).

Traditional teacher education programs have been experience-based and time constant; certification has typically been granted on the basis of attendance at a teacher training institution. A Competency-Based Teacher Education program is performance-based and time varied for the individual student; a student is granted certification only after exhibiting competence in the particular attitudes, skills, understandings, and behaviors that are specified in advance as being those needed by a future teacher to promote desirable learning (Elam, 1971). CBTE also differs from conventional programs in its greater emphasis on field-based experiences and its use of professionals from every level of education in defining teacher performances that are related to student learning and in implementing the teacher education program (McCarty, 1973).

Models for Competency-Based Teacher Education programs are currently being developed and used in institutions of higher education in many states. Instructional materials, modules, and assessment devices of teacher behavior are being designed and procedures are being derived to guide prospective teachers to specified levels of concept and skill attainment.

Statement of the Problem

The central problem of this study is to determine the attitudes, behaviors, skills, and understandings which future educators must demonstrate in the subject matter area of foods.

Purpose of the Study

The overall purpose of this study was to determine those competencies that practicing home economics teachers believe future teachers must possess in order to show proficiency in the subject matter area of foods. The objectives of the study were:

1. To evaluate, revise, and expand the competencies that have been identified by the Oregon State University Home Economics Education Department for assessing a student's behavior in the subject matter area of foods.
2. To develop criteria in the taxonomic levels of knowledge, comprehension, application, analysis and synthesis that would set a standard against which behavior can be judged.
3. To seek professional opinions from secondary home economics educators currently in the field to determine the performance indicators which exemplify competencies necessary for future teachers in the subject matter area of foods.

Rationale for the Study

The shift towards Competency-Based Teacher Education programs in universities across the nation is becoming increasingly apparent. A study by Finch and Hamilton (1975) reveals that teacher education institutions in all of the states are either totally committed to CBTE, involved in the planning stages of such a program, or are studying the possibilities of a performance-based teacher education program.

The American Home Economics Association (A. H. E. A.) has recognized for many years the importance of identifying and assessing professional abilities of all home economists involved in the educative process. From the accumulative work of the A. H. E. A. , the need has been identified for performance-based competencies to be developed for home economics teachers.

There are strong indications that competencies are becoming a major basis for determining the effectiveness of professional programs in assessing the professional's job performance. . . . Statements of expected competencies will serve as guidelines for developing evaluative criteria related to the educative process (A. H. E. A. , 1974, p. 1).

A program based on competencies offers a rational and systematic way of dealing with the complexity of methods, styles, strategies, and other tools of education as the study by Joyce, Soltis, and Weil (1974) suggests. They also stated that this type of program puts to work some of the valuable empirical knowledge used in teacher

training methods. In Darcy's article (1974), concerning the competency-based teacher education programs, he contends that,

Competency-based education begins with the concept that one can analyze the behaviors needed to fulfill a role, and that once these behaviors are analyzed one can design instruction to produce them (p. 325).

A great deal has been written about competencies, what they are and how they are identified; and much has been discussed about designing and implementing a CBTE program. Many states have already designated the professional education competencies - the attitudes, skills, understandings, and behaviors - that are needed by future teachers in order to be effective in the classroom setting. Instructional materials, modules, and assessment procedures have been developed and are now being used at many institutions of higher education. Much more research and study still needs to be done in the identification of particular behaviors that should be demonstrated by a competent teacher (Maxim, 1974).

In addition to professional education competencies, there also exists the need to identify competencies and criteria in the subject matter areas. The prospective teacher not only should possess competence in the ability to teach, but also should have competence in the content area that he will be teaching (AACTE, 1974). Some educational institutions have called upon their subject matter staff, often with the help of advisory committees, to identify the competencies and criteria needed for teaching subject matter content

(Andreyka and Briley, 1975; and Blankenship, Bennett, and Vickers, 1974).

The identification of specific content to be included in home economics curriculum is essential if a Competency-Based Teacher Education program is to be complete and successful in preparing competent teachers. The purpose of this study is to identify those competencies and criteria, in the subject matter area of foods, that future home economics teachers should possess before they begin their novice teaching experience. By evaluating, revising, and expanding identified subject matter competencies and by developing criteria necessary for evaluation of these competencies, the performance indicators upon which a competency-based program in the content area of foods for home economics teacher education will be established. The information gained from this study may be helpful to the Department of Foods and Nutrition at Oregon State University in the event that they move to a competency-based approach to preparing future home economics teachers to teach foods content.

The decision to investigate and include a set of criteria by which teacher effectiveness can be evaluated was based on the necessity to explicate the broader concept of competencies. The use of criteria statements in the explanation of competencies offers a more flexible, easily adapted set of standards to meet the needs of an ever-progressing teacher education program. Crabtree and Hughes (1974)

emphasize that competencies, as well as criteria statements, should be re-evaluated and adjusted to meet changes in societal needs and to account for the identification of new knowledge in home economics subject matter and the related disciplines. A challenge is set by recognizing the worth and the need for specific competencies in each subject matter area of home economics.

With the new emphasis on competencies in public secondary education, the need for competencies at the teacher education level is imperative. The certification requirements for Oregon teachers speak to competencies and their criteria as a means of assessing their preparation. The present need is to establish a set of competencies and criteria by which teachers in a given field of education can be evaluated.

Definition of Terms

Bipolar Factor: A factor extracted in the factor analysis of data that includes both positive and negative factor loadings. All factor loadings are considered equally significant, with the items of negative factor loadings measuring the negative aspect of the other items in the factor.

Competency: An attitude, behavior, skill or understanding demonstrated at a specified performance level; broad in scope

(A. H. E. A. , 1974, p. 4).

Competency-Based Teacher Education (CBTE): A teacher education program based on competencies and criteria used for curriculum planning, student evaluation, and professional improvement. CBTE usually includes such program factors as: individualization of instruction for students; field-based experiences; emphasis on exit requirements, rather than entrance requirements; program time varied for individual students; differentiated staffing of teacher education personnel.

Criteria: A defined standard against which a competency can be judged in relation to the degree to which an expected level of attainment exists (A. H. E. A, 1974, p. 4).

Factor Analysis: A statistical clustering procedure which is useful for analyzing a large number of measures at a time.

Factor Loading: A value assigned to each criterion item indicating the relative weight of each for the purpose of clustering them together.

Q-technique: A factor analytic technique which indicates the extent to which respondents are alike or resemble each other with regard to the criteria items listed in the questionnaire.

R-technique: A factor analytic technique which examines the relationship of every criterion item with every other criterion item, and provides for a clustering of common criteria items. The method orders criteria items according to respondents.

Spurious Criteria Item: A criterion item whose factor loading is less than $\pm .470$. It is tentatively identified as clustering with a factor in which its highest factor loading occurred even though its loading is less than $\pm .470$.

Assumptions

The overall assumption of this study is based on the premise that Competency-Based Teacher Education is a successful and valuable means by which to prepare home economics education students to become competent teachers in the future. The personalization of such a program, and the emphasis on competence of performance achievement, allows the individual student to become a better prepared teacher than ever before.

This study is based on the assumption that the competencies and criteria needed by a novice home economics teacher can be effectively identified by home economics teachers presently in the field, and that the questionnaire is an effective means by which to acquire this information. It is also assumed that the information gained from this study can contribute at the university level to the development of a competency-based curriculum in the content area of foods.

The use of factor analysis, as a statistical tool for examining data with several potential sources of common variance, has been found in other educational research studies to identify clusters of

competencies that have common proficiency levels. The results of factor analysis reveal which competencies can be studied together rather than separately. It was assumed in this study that criteria items could likewise be clustered, as a means for identifying subject matter competencies and criteria, with the use of the factor analysis tool.

II. REVIEW OF RELATED LITERATURE

Our present society has shifted its demands to greater accountability and personalization in education. In an attempt to meet the social changes of our time,

... teacher educators have sought to help prepare the teacher to accommodate and initiate change while fostering the growth of children. In response to these realities, a new approach to teacher education has been forged (Weber, 1970, p. 14).

This new approach is Competency-Based Teacher Education (CBTE).

Essentially, CBTE is based on the idea that prospective teachers should be trained to have the 'competencies' - the knowledge, skills, and ways of acting - that they can use most effectively in their classrooms. Adherents of CBTE maintain that the skills that make for good teachers should be identified and made public and that student teachers should be judged on how well they can demonstrate those skills rather than on how much time they have spent in school (Dyer, 1974, p. 38).

The CBTE concept is based on the premise that the teacher's performance in the teaching situation is what counts. Kohlman contends that, "We can no longer judge a teacher's ability to perform solely on the basis of a demonstrated product or output" (1975, p. 19).

What is CBTE?

The American Association of Colleges for Teacher Education's (AACTE) committee on Performance-Based Teacher Education views CBTE as a

... process for improving the preparation and development of educational personnel. Process is defined as a series of operations leading towards [particular] ends. The process itself does not come from a particular philosophical or psychological framework; it can accommodate different and divergent positions on the training of educational personnel (Drummond, 1975, p. 3).

This process, according to the committee, includes five interrelated operations:

1. The basis for decision making about development and implementation is clearly defined. . . .
2. Outcomes for students and programs are specifically and operationally defined. . . .
3. Program design is congruent with both student and program outcomes.
4. Student and program outcomes are evaluated periodically. . . .
5. Operations within the process are revised and/or specifications are changed according to feedback from the evaluations (Drummond, 1975, p. 3-4).

A Competency-Based Teacher Education program is one that specifies the role and performances of a teacher and assesses the competencies possessed by the student involved in the educational program. According to Darcy, "CBTE begins with the concept that one can analyze the behaviors needed to fulfill a role, and that once these behaviors are analyzed one can design instruction to produce them" (1974, p. 325). A CBTE program explicitly states the competencies that need to be acquired by a prospective teacher and the criteria applied in assessing the attainment of competencies.

Specifying particular teacher competencies serves three purposes, according to Dodl (1973): 1) it describes the desired product of a program; 2) it establishes major goals for the instructional program; and, 3) it serves as a basis for student assessment providing evidence upon which to base recommendations for certification.

For the teacher, competencies specified by those involved in the program are those particular attitudes, skills, understandings, and behaviors they feel facilitate the intellectual, social, emotional, and physical growth of children (Weber, 1970, p. 3).

Weber suggests a three-fold criteria for establishing competencies:

1) the knowledge criteria - to determine the student's cognitive understanding; 2) the performance criteria--to assess teaching behaviors; and 3) the product criteria - to assess effectiveness in teaching. A CBTE program emphasizes the performance and product criteria, rather than the knowledge criteria.

A CBTE program "... is by definition different from traditional approaches to teacher education because it involves the use of behavioral objectives and performance assessment techniques in line with those objectives" (Sinatra, 1973, p. 60). As Elam (1971) and Weber (1970) explain, a traditional teacher education program emphasizes entrance requirements and the completion of courses; it is time constant and performance-based only as it requires a certain level of grade achievement. A traditional program does not specify what a prospective teacher needs to be able to do at the completion of the

program. A CBTE program emphasizes exit requirements and competence of performance achievement; it is time varied to the individual, with goals specified and agreed upon in detail in advance. The student must either be able to demonstrate his/her ability to promote learning or exhibit behaviors known to promote it. "CBTE differs from conventional programs in its greater emphasis on field-based experiences"; there is a "... more direct immersion in teaching itself at all stages in the training process" (McCarty, 1973, p. 32).

Competency-Based Teacher Education advocates the demonstration of competencies in knowledge and skill as related to teaching; it emphasizes meeting acceptable standards of performance based on clearly defined criteria. Elam (1971) has proposed three levels of characteristics that synthesize the components of CBTE. Elam states that a teacher education program is performance-based if it has the characteristics listed in the essential level. These characteristics are:

1. Competencies (knowledge, skills, behaviors) to be demonstrated by the student are: derived from explicit conceptions of teacher roles; stated so as to make possible assessment of a student's behavior in relation to specific competencies; and made public in advance.
2. Criteria to be employed in assessing competencies are: based upon, and in harmony with, specified competencies; explicit in stating expected levels of mastery under specified conditions; and made public in advance.
3. Assessment of the student's competency: uses his performance as the primary source of evidence; takes into

account evidence of the student's knowledge relevant to planning for analyzing, interpreting, or evaluating situations or behavior; and strives for objectivity.

4. The student's rate of progress through the program is determined by demonstrated competency rather than by time or course completion.
5. The instructional program is intended to facilitate the development and evaluation of the student's achievement of competencies specified (1971, p. 6-7).

Elam suggests that the second level of characteristics seem to be implied in the list of essential elements and are typically found in competency-based programs are:

1. Instruction is individualized and personalized. . . .
2. The learning experience of the individual is guided by feedback. . . .
3. The program as a whole is systemic. . . .
4. The emphasis is on exit, not on entrance, requirements. . . .
5. Instruction is modularized. . . .
6. The student is held accountable for performance, completing the preparation program when, and only when, he demonstrates the competencies that have been identified as requisite for a particular professional role (1971, p. 7 and 9).

The third level characteristics that Elam lists as related and desirable in a competency-based program are:

1. The program is field centered. . . .
2. There is a broad base for decision making. . . .

3. The materials and experiences... focus upon concepts, skills, knowledge... which can be learned in a specific instructional setting....
4. Both the teachers and the students... are designers of the instructional system....
5. It is likely to have a research component; it is open and regenerative.
6. Preparation... is viewed as continuing throughout the career of the professional....
7. Role integration takes place.... (1971, p. 9-11).

CBTE or PBTE: What's in a Name?

Many individuals have approached the question of whether to use the term Performance-Based Teacher Education (PBTE) or Competency-Based Teacher Education (CBTE) when dealing with this new approach to instructing prospective educators. Houston states that

Performance-based refers to the way in which teachers demonstrate teaching knowledge and skills. That demonstration is observable (and their objectives are to 'write', 'do', 'describe'; not to 'understand', 'perceive', etc., which are non-observable). Further, performance reminds us that knowledge of content and teaching strategies are not sufficient in teaching - overt action is important. Competency-based, on the other hand, emphasizes a minimum standard; it adds criterion-levels and quality to the definition of the movement. Competency advocates note three levels for criteria - cognitive, performance, and consequence, and press for the latter as the real measure of effectiveness (1972, p. 5-6).

Houston believes that performance-based focuses on objectives while competency-based focuses on criteria.

Lindsey (1973) feels that the concept of performance is a limiting one. She states that competence is what educators are expected to possess and demonstrate, including performance and the knowledge, attitudes and values relevant to performance. Competency-Based Teacher Education, in her opinion, allows looking at the competencies needed for the complex role of a teacher from a broader spectrum. Elam (1971) agrees with Lindsey as he contends that PBTE tends to focus on only the performance criteria, rather than the performance plus knowledge criteria and product criteria which he believes play an equal part in determining competence to be acquired in a teacher education program.

Pitman suggests that the majority of educators use the two terms interchangeably, but he recognizes that some individuals believe there is a difference. According to him, "Competency-based teacher education is a broader interpretation of teacher education, in terms of time and the relationships among discrete performances, than is performance-based teacher education" (1973, p. 5).

The Advantages and Disadvantages of CBTE

The CBTE movement has hit the teacher education system with great impact. Many educators and writers have reacted to the CBTE approach, evaluating the advantages and disadvantages of such a program. According to Joyce, Soltis, and Weil (1974), CBTE offers

a rational and systematic way of dealing with the complexity of methods, styles, and strategies involved in teaching; it puts to work some of the empirical knowledge available concerning teacher training methods. Multimedia instructional systems can be used in a CBTE program for teacher candidates to teach themselves the complex skills and strategies of teaching.

The competency orientation offers teacher education these advantages: 1) more sharply defined teaching roles than before; 2) systematic, direct training for developing competencies to carry out those roles; 3) program management techniques which permit research on teaching effectiveness to be a central part of the training process; and 4) program improvement based on research evidence (Joyce, Soltis, and Weil, 1974, p. 3).

One of the immediate valuable outcomes of a CBTE program is a means by which the communication can be opened between all of the participants in the educational system.

Competency-based teacher education is an attempt at creating a system that ties together the school of education, the public school, the teachers, and the community in the definition of teacher performances that are to be related to student learning (Griffiths, 1974, p. 39).

Such a coalition of individuals is likely to result in the provision of experiences needed by students to learn the reality of teaching in real life situations (Ishler, 1974). Weber (1970) sees the sharing of program responsibilities among individuals involved in teacher education as a means for utilizing teaching staff and educational resources more efficiently. The education of prospective teachers becomes the

responsibility of professionals involved in every phase of the education system.

Competency-Based Teacher Education "... is a powerful model, minimizing waste in the learning process by clearly defining goals and by the continuous use of feedback" (AACTE, 1974, p. 8). Specifically stated goals and objectives allows everyone involved in the education of teachers to know exactly what the learner is expected to do. It alleviates disagreement over terms and evaluation that do not fit the stated goals (Pitman, 1973).

Kay (1975) believes that specifically stating teacher competencies, defined in terms of the functions, skills, and tasks of teaching, has the advantage of enabling students to more accurately perceive the part that their program plays in their personal goals of preparation to teach. She believes that the transition from preservice preparation to inservice job performance is made easier for the student when statements of teaching competencies are clearly defined from the onset of the program.

Thompson (1974), a student at the University of Houston CBTE program, sees the advantages of such an instructional process as the following: 1) the instructional goals are made public and stated in precise, measurable terms; 2) the student is allowed to accept both the responsibility of demonstrating competence and the freedom to decide his own pace, sequence, and manner of pursuing the program

objectives; 3) better rapport is developed between teacher and student through CBTE instruction; 4) CBTE is both person-centered and reality-centered; and 5) the emphasis is on the performance of the instructional objectives rather than merely on the student's participation in the learning activities.

Massanari (1973, p. 246-247) contends that the advantage of a Competency-Based Teacher Education program is that effectiveness in teacher education is improved as educators are pushed to:

1. design educational personnel development programs in their totality and in relation to the competencies required for particular roles.
2. define professional roles more clearly.
3. relate preservice preparation programs more closely to the schools and the profession.
4. explicate program objectives and make them public.
5. provide instruction and learning experiences which facilitate the achievement of the desired objective.
6. individualize and personalize instruction and learning experiences.
7. push those who provide instruction to facilitate learning rather than merely dispense information.
8. develop and use new kinds of training materials.
9. develop and use new kinds of management systems.
10. obtain or develop and apply appropriate assessment techniques.
11. conduct research and provide direction for research activity.

12. broaden the decision-making base.
13. be accountable for what they do.
14. be able to change more effectively than in the past.

Certification based on the completion of a CBTE program has the advantage of being achievement-based rather than being based on the completion of courses as in traditional teacher certification programs.

The competency-based teacher education movement shifts the criterion for certification away from completion of a prescribed program at an accredited institution to presentation of evidence of particular expertise. Competency-based teacher certification will come about with the full blessing of teacher educators and their allies in the organized profession as research establishing the relationship between teacher behavior and effective school operation undergrids the teacher training program (Rosner, 1973, p. 28).

The problems related to the establishment of a Competency-Based Teacher Education program and the disadvantages of implementing such a program have been brought out by some individuals in the field of education. Three possible weaknesses in the application of a CBTE program, as cited in an AACTE publication (1974, p. 8) are:

- 1) A tendency to move too quickly on too large a scale without adequate preparation and resources, and hence to achieve superficial results; and a corresponding compulsion to 'try to do everything' by a performance-based application, including attainment of objectives which, at the time, its advocates are not prepared to state in assessable terms; 2) A tendency to adopt too eclectic an approach, identifying numerous unrelated competencies without a guiding conceptualization of the teacher's role, resulting in a

badly fragmented view of the teaching task; 3) A counter tendency to make too narrow an interpretation of PBTE unduly restricting its application as though its rationale were pertinent only to limited aspects of teacher education. . . .

The AACTE committee on PBTE (Drummond, 1975) sees two other existing problems of a performance-based instructional process. First, there is an inadequate knowledge base for designing educational programs for teachers, and second, the instrumentation and procedures needed to assess the performance of educators is not adequately available. Dyer (1974) agrees that there are problems in the application of CBTE due to the facts that specific skills and behavior patterns of teachers have not yet been identified and that experimental studies of the cause and effect relationship between teacher and student learnings are very difficult to make.

The problems of identifying the competencies desired of prospective teachers and of getting educators to arrive at a consensus as to which behaviors should be demonstrated by a competent teacher, what kinds of content to emphasize, and the validity of each competency so identified, are concerns emphasized by some writers (Maxim, 1974; Popham, 1974; Darcy, 1974). The generality of teacher preparation makes it difficult to relate instructional background to the competencies required for specific teaching performance; teacher educators are faced with the problem of identifying teacher competencies based on the role or job assumptions which have some

relative stability (Dodl, 1973).

Many educators who criticize the CBTE instructional approach do so because they feel that learning is fractionated by breaking down teaching into too many small parts, which when put together will not equal the total experiences needed in a true teaching situation (Schmieder, 1973; Ishler, 1974). Rising (1973, p. 54) states that "performance criteria are specifications. By their very nature they break the teaching function down into discrete parts." Rising argues against listing criteria for performance, because he believes that the teaching and learning roles become mechanized. He feels that lists of criteria used in CBTE: 1) invite equal consideration for each item; 2) invite fractionalization of the teacher training effort; 3) are too extensive; 4) invite conservatism; 5) give only an illusion of a basis for judgment, and that teaching is not subject to such categorization. Shepardson (1972) and Pitman (1973) agree that there is a danger in a performance-based program to work only with those performances that can initially be identified and specified. "Explicitness is a weakness or danger in that goals and objectives selected may tend to focus on low level competencies which are easiest to state and evaluate" (Pitman, 1973, p. 14). The result of a program based on trivial skills would be inadequate preparation of effective teachers.

The Promise of CBTE

Despite the suggested weaknesses and problems of CBTE, it is the opinion of many educators that the CBTE concept is the hope and promise for continual improvement in teacher education programs.

There is within the PBTE process an opportunity to blend the conventional wisdom of teacher education with an expanding research base and a number of new and promising ideas. The convergence of these elements into an overall strategy offers promise to the improvement of preparation and career development programs for educational personnel (Drummond, 1975, p. 5).

Rosner (1973, p. 26) contends that

Performance-based (competency-based) teacher education is on the catalyst that can revitalize the teacher education enterprise by inviting and demanding an evaluation of individual and institutional effectiveness at every level. The effort to identify teacher behavior associated with pupil performance is, of course, based on the premise that effective teacher education can assist teachers to acquire generalizable knowledge and skills that can ultimately influence the performance of pupils in school settings.

Elam (1971) has listed ten factors that he feels contribute to the promise of performance-based teacher education. These contributing factors are:

1. the focus is on objectives, formulated in a sharing process in advance, used as a basis for evaluating performance;
2. a large share of the responsibility for learning is shifted to the student from the teacher;
3. efficiency is increased through the use of feedback, motivating and guiding learning efforts;

4. greater attention is given to the individual student and his abilities, needs and interests;
5. learning is tied to the objectives achieved rather than the resources used to attain them;
6. prospective teachers are taught in the manner in which they are expected to teach;
7. the method of teacher education is consistent with democratic principles;
8. it is an approach to instruction that is consistent with the psychology of learning;
9. integration of theory and practice is permitted;
10. a better basis for designing research is provided in a performance-based approach to teacher education.

Houston (1972) sees the greatest promise of CBTE to be the emphasis it places on the objectives achieved, not the learning activities used to achieve them. After the objectives are defined in advance, the activities are created "...to contribute to the student's demonstration of objectives" (p. 5).

Rosner and Kay (1974, p. 292-294) see the promises of CBTE to be divided into four time spans. The long range promise of CBTE, as they see it, is "...to improve the quality of instruction in the nation's schools as a consequence of improved teacher education." They believe that the intermediate range promise of Competency-Based

Teacher Education is that

... teacher education institutions will have the demonstrable capability of preparing knowledgeable and skillful teachers in curricula whose component parts have been tested for validity against criteria of school effectiveness.

CBTE's short range promise is the

... wide range professional recognition of the hypothetical, tentative nature of various teacher education curriculum elements, professional consensus on the need to validate such elements against criteria of school operations, and a commitment to tool up for the necessary development and research.

The almost immediate outcomes and promises of CBTE, according to Rosner and Kay, are: 1) the development of stronger relationships between teacher educators, public schools, and the organized teaching profession; 2) teacher education students are likely to express greater satisfaction with CBTE programs; and 3) teacher education programs will have an increase in accountability.

Identifying Competencies

The identification of teacher competencies in a CBTE program must maximize the probability of teacher success. Some individuals and groups believe that the particular behaviors that constitute good performance in a teacher can be defined. "The problem occurs when one tries to define particular teaching behaviors that all teachers should possess" (Pitman, 1973, p. 11). Pitman gives these generalizations about identifying competencies:

1) Competencies can be identified by various groups involved with teacher education, 2) Agreement over general areas of teacher competency (groups of competencies) can be achieved with little difficulty, 3) Agreement among and between groups as to specific teaching competencies will be more difficult and subject to considerable discussion, and, 4) It is most important that competencies be clearly stated so that they may be tested and validated (1973, p. 12).

Four bases from which one might choose to generate teacher competency statements are proposed by Cooper, Jones, and Weber (1973):

1. Philosophical Base - This "base must explicate assumptions and values regarding the nature of man, the purpose of education, and the nature of learning and instruction" (p. 17). Given these basic assumptions of the program, competencies needed in the role of a teacher can be specified.

Using this base, the validity test for these competencies lies in the degree of consistency with the conceptualized role, desired pupil outcomes, and the assumption statements (p. 18).

2. Empirical Base - Many educators believe that teacher competencies must be derived from this base, that

... teacher competencies must be linked to knowledge derived from experience or experiment. Empirically based knowledge is considered in its broad rather than narrow sense, that is, the validated knowledge derived from the behavioral and social sciences (p. 18).

Competencies from this base would include some that are cognitive in nature, others that are related to actual skills and performances needed in teaching, and some defined in terms of concepts, principles,

and theories directly related to pupil outcome.

3. Subject Matter Base - This base is primarily cognitive in nature, using the various disciplines and subject matter areas of which the teacher is expected to teach as the basis for competency identification. Problems of this base include decisions regarding the knowledge and skills that should be required as evidence of competency in subject matter, and whether competencies should reflect current curriculum. "If valid knowledge changes so rapidly, what subject matter competencies are most likely to stand the test of time?" (p. 19).

4. Practitioner Base - This base is derived from a job analysis of what effective teachers actually do as they perform teaching tasks. Cooper, Jones, and Weber contend that not any one of the four bases should be used alone when determining CBTE program competencies.

While teaching competencies can be and should be generated from empirical, subject matter and practitioner bases, they must be screened through a philosophical base and the conceptualized model of the teacher's role (p. 19).

These same educators identify three kinds of competencies that need to be specified in a teacher education program:

1) Knowledge competencies which specify cognitive understandings that the teacher education student is expected to demonstrate; 2) Performance competencies which specify teaching behaviors and attitudes the teacher education student is expected to demonstrate; and 3) Consequence competencies which specify pupil behaviors that are taken as evidence of the teacher education student's teaching effectiveness (p. 19).

They believe that the personnel involved in specifying teacher

competencies for a CBTE program should include university faculty, public school administrators, teacher and pupils, parent and community representatives, individuals from professional organizations and the state department of education, and teacher education students. The input from the institution's existing teacher education program, other CBTE programs, students, school personnel and researchers all can serve as sources of information for determining competencies.

Houston (1973) discusses six procedures that can be followed in specifying competencies for a teacher education program: 1) Course translation is a method of reformulating existing courses into competency-based terms by rewriting goals in behavioral objectives and changing methods of instruction; 2) A task analysis of the professional roles of a teacher can be determined and a list of competencies identified from the teachers' prescribed performances; 3) The needs of the school learners (ambitions, values, and perspectives) can be identified and competency statements derived from these needs; 4) A needs assessment approach to competency identification examines the consequences of teacher actions and designs a program to prepare students for coping with these consequences; 5) A theoretical approach to competency identification begins with a theoretical position being specified and then the teacher education program being designed from that position; and 6) The cluster approach identifies general program areas which are individually analyzed to identify

competencies in that domain.

Kay (1975) believes that before competency selection can take place in the development of a CBTE program the questions of who will be determining the competencies, what resources are available, and what program philosophy will serve as a guideline, should be answered. She believes that an inventory of constraints and resources needs to be set down in order to help make competency selection. Three approaches to competency selection have been offered by Kay; from least to most operational they are the theoretical approach, task analytical approach, and course conversion approach. In the theoretical approach to competency selection,

... a network of relationships between teaching, learning, and the contexts in which they take place are hypothesized and programs are devised to educate teachers to perform roles consistent with the hypothesized positions (p. 9).

This approach requires a great deal of research along with a high degree of technical and conceptual expertise; it can be useful only to the extent that the underlying theories reflect key factors in the reality of teaching and that these features are then translated into the program. The task analytical approach analyzes the teacher role in order to discover the skills needed to perform this role in the classroom. This approach is pragmatic in that it links the teacher education program to the real teaching world, perhaps at the risk of not including enough new theoretical knowledge. The course conversion approach is the "... reformulation of current courses with

course requirements rewritten as behavioral objectives" (p. 27).

Either individual courses or course programs are isolated and translated into teacher competencies. This approach is not likely to result in any major changes, and the chance of fragmentation in the program is a strong possibility. Kay contends that due to the numerous strengths and weaknesses of the various approaches, program designers would probably find it advantageous to use elements of all three when developing a CBTE program.

In the field of home economics, work has been done in identifying competencies and criteria for professional education. According to an American Home Economics Association report seven assumptions are basic to the development of competencies and criteria. They are:

- 1) Competence in the educative process is needed by all professional home economists.
- 2) Home economics graduates are employing the educative processes in nonschool as well as school settings.
- 3) The development of programs to provide for the achievement of competencies will vary from institution to institution according to philosophy and resources available.
- 4) Competencies serve as a basis for developing instructional strategies.
- 5) The pattern of attainment of competencies by individuals must be adaptable to varying requirements in employment.
- 6) The primary arena for the development of competencies for the home economist is in the field.

7) Research will be needed to validate the criteria for measuring competency attainment, but this should not inhibit the use of competencies as a basis for developing professional programs (A. H. E. A. , 1974, p. 4).

Crabtree and Hughes (1974) believe that competencies identified for home economics CBTE programs "... should be stated in accordance with the needs of society. What we value in a democratic society provides direction for appropriate experiences for our future teachers" (p. 27). They contend that in order to implement a CBTE program in home economics teacher education, general areas of competence must be first identified. Five competency areas, and criteria for assessing stated competencies, were suggested by Crabtree and Hughes. The competency areas are: 1) Educational philosophy in home economics; 2) Professional role in home economics; 3) Program planning for education in home economics; 4) Educative process in home economics; and 5) Research in home economics and education.

It is anticipated that home economics teacher competencies will never be static and that they must be adjusted in terms of changing social needs and identification of new knowledge in subject-matter areas and related disciplines (Crabtree and Hughes, 1974, p. 29).

In the field of home economics, the search for competencies and criteria in the subject matter areas has just begun. Individual research projects, investigating subject matter competencies, are being carried out at many institutions. A few of those already completed

are studies in the subject matter areas of clothing and textiles (Hotchkiss, 1976, and Miller, 1974) and child care occupations (Johnson, 1976). Other CBTE program developers have combined the talents of home economics teacher educators, subject matter specialists, secondary home economics teachers, and other home economics groups for the identification of competencies in content areas (Blankenship, Bennett, and Vickers, 1974). The need still exists to identify competencies and criteria in other areas of home economics subject matter.

Conclusion

Many states and institutions are at present deeply involved in Competency-Based Teacher Education programs, and many more are joining the CBTE movement each year.

As of late 1972 - . . . 17 states had initiated legislative and/or administrative support for CBTE. Fourteen others were actively working on new certification standards and approaches which focus on CBTE (Finch and Hamilton, 1975, p. 7).

A questionnaire sent out to teacher education institutions at that time showed 125 had CBTE programs, 366 were in the planning and development phases, and 288 were not involved in CBTE programs. More recent information on the CBTE movement showed an increase in the involvement of states and institutions; all states were at least studying the possibilities of becoming involved in CBTE programs, if they had

not already begun the steps in CBTE program development (Schmiëder, 1974).

Eurich (1962, p. 15-16) has stated five principles of learning; they seem to directly apply to the principles of teacher education that are the basis upon which CBTE has been designed. Eurich's principles are:

1. Whatever a student learns, he must learn for himself - no one can learn for him.
2. Each student learns at his own rate, and, for any age group, the variations in rates of learning are considerable.
3. A student learns more when each step is immediately strengthened or reinforced.
4. Full, rather than partial, mastery of each step makes total learning more meaningful.
5. When given responsibility for his own learning, the student is more highly motivated; he learns and retains more.

The promise of the CBTE movement is to make the education of the future teacher one that is meaningful to him and one that will produce teachers with the knowledge and skills needed to teach the children in our public schools. According to Allington,

While teachers should be provided the theoretical base from which teaching methods flow, they likewise should be provided with the practical experience of applying these methods to teaching children (1974, p. 519).

It is competence in the ability to teach subject matter content that teachers are expected to possess and demonstrate, and it is through

the Competency-Based Teacher Education movement that future teachers can achieve this competence.

III. DESIGN OF THE STUDY

Description of Research

The major focus of this study was to examine the foods subject matter competencies needed for novice home economics teachers.

The initial stages of this study were done in conjunction with Hotchkiss (1976) who has completed a similar study by investigating the subject matter competencies needed in clothing and textiles, exclusive of construction.

The theoretical construct of this study was to empirically investigate the content needed by novice secondary home economics teachers in the subject matter of foods. The information needed to develop a set of competencies and criteria statements-necessary for novice teachers was acquired by the survey method. A questionnaire was sent to secondary home economics teachers in the field, who were asked to determine the criteria they felt were important for the preparation of the novice teacher.

The competencies and criteria that were identified as a result of this study may be used in part, or in full, as a basis for evaluating and modifying foods subject matter courses to be taken by future home economics teachers.

Preparation of the Instrument

The instrument used in this study was a mail survey questionnaire containing 98 criteria items. A five-point Likert-type scale was used which enabled the respondent to judgmentally assign a score for the level of proficiency necessary for each criterion item for a novice home economics teacher. The format of this instrument was derived from the one used by Gunderson, Lindahl, Miller, and Courtney (1971) in a technical report of studies conducted to determine the professional education competencies of community college instructors. The instrument included a set of directions for completing the questionnaire, and 98 short criteria statements with a rating scale.

The criteria items that made up the questionnaire were derived from a working paper on competencies and a taxonomy listing of foods subject matter developed by the Oregon State University Home Economics Education Department in conjunction with the Foods and Nutrition Department. By evaluating, revising, and expanding these previously developed materials, 98 criteria items were established and included in the questionnaire.

Each of the criteria items was written in the cognitive domain in an attempt to eliminate any misinterpretation of the meaning of the statement. The level of understanding within the domain was

designated by placing an abbreviation of the level, within parentheses, behind each criterion item. The abbreviations used were: K = Knowledge, C = Comprehension, Ap = Application, An = Analysis, S = Synthesis, and E = Evaluation. An assumption was made that each respondent would read each of the items in the questionnaire and that each statement would be understood as it was meant to be.

A sample questionnaire was developed and presented to 20 Oregon State University home economics education standard certification and graduate students for the purpose of evaluating its format, content and clarity. No revisions were required prior to the preparation of the final instrument. The complete instrument, including instructions, is found in Appendix A.

The Dependent Variable

The dependent variable in the study was a score assigned by the respondents to denote the level of proficiency they considered necessary for novice home economics teachers for each of the 98 criteria items. Respondents, home economics teachers presently in the field, were asked to evaluate the importance of each criterion statement in relation to the needs of a novice teacher. The criteria items were assigned ratings based upon the following Likert-type scale:

1. A novice teacher should have No proficiency with this activity.

2. A novice teacher should have Slight proficiency with this activity.
3. A novice teacher should have Moderate proficiency with this activity.
4. A novice teacher should have Considerable proficiency with this activity.
5. A novice teacher should have Complete proficiency with this activity.

Selection of the Sample

The population used in the study consisted of secondary home economics teachers in Oregon. The sample was identified from a list prepared by Pauline Goodwin, Home Economics Specialist, Oregon Department of Education, of the home economics teachers employed in the secondary schools in the 1974-75 school year. From the 610 teachers, 250 were randomly selected, through the use of a table of random numbers, to receive introductory postcards (see Appendix B) which explained the purpose of the study and the survey questionnaire. The teachers were asked to acknowledge their willingness to participate by returning the attached postcard response. The sample population for the parallel study by Hotchkiss (1976) was selected concurrently in order to prevent an overlap in the respondents selected for use in the two studies. The same introductory postcard was sent to both populations.

A letter (see Appendix C) was sent to Mr. Thomas Clinton asking permission for the home economics teachers in the Portland Public School District to participate in this or the Hotchkiss (1976) study. It had been learned previously that this district holds a ruling that permission must be granted before any materials are sent or teachers are asked to participate in a research study. After further communication with Mr. Victor W. Doherty, Assistant Superintendent for Evaluation, permission was secured for the home economics teachers in the Portland Public Schools to be included in the sample population.

Of the 250 postcards sent to the home economics teachers, 140 were returned. Nine of these responses indicated a lack of willingness to participate and 131 indicated a desire to participate in the study. All of the 131 teachers were sent questionnaires dealing with the foods criteria items. From the questionnaires sent out, 101 were returned, giving a 77% response. Three questionnaires were eliminated because they were not answered completely. The remaining 98 questionnaires were used for data analysis.

Data Analysis

The data collected from the questionnaires were transferred to punch cards for analysis on an Oregon State University System (OS3), using the CDC 3300 computer. The two procedures used in the data

analysis for the study included 1) a factor analysis of the criteria items included in the instrument, and 2) the computation of the mean score and standard deviation for each of the criteria items. The two methods of factor analysis utilized were the Q-technique and the R-technique.

A primary application of factor analysis is in the reduction of a number of descriptive concepts required to describe some phenomena (Helmstadter, 1970). In effect, factor analysis identifies items that can be added and studied together thus limiting the number of variables with which one must work, and helps identify unities of a particular conceptual structure (Kerlinger, 1964). As a research tool, factor analysis offers the possibility of reducing a large number of test items to a smaller number of items, known as factors. It also allows one to group items into empirically meaningful subsets or to purify a scale by eliminating those items which do not load heavily on that which the total scale measures (Helmstadter, 1970).

The Q-technique essentially involves the ordering of respondents according to the criteria items included in the study. This form of analysis provides a measure of commonality among the respondents comprising the sample. A 98 variable (respondents) inter-correlation matrix based upon data furnished on 98 criteria items was generated following the Q-technique rotation method. It indicated the extent to which the home economics teachers resembled

each other with regard to the 98 criteria items in question.

The R-technique is one which orders criteria items according to the respondents included in the study. This form of analysis examines the relationship of every criterion item with every other criterion item and provides for a clustering of common criteria items in a manner that best accounts for the largest percentage of common variance. A 98 variable (criteria items) intercorrelation matrix based upon data collected from the 98 respondents was generated following the R-technique rotation method.

The decision regarding the factor loading level to be used as a cut-off value for inclusion of a criterion item within a factor derived from the R-technique analysis was based on two considerations. First, Fruchter (1954) states that loadings of .2 or less are usually regarded as insignificant, loadings of .2 to .3 as low, .3 to .5 as moderate, .5 to .7 as high, and above .7 as very high. Second, it was desirable to identify a factor loading level that allowed the greatest number of criteria items to be accounted for in the factors, with few overlap of items between factors. For this study, factor loadings of $\pm .500$, $\pm .470$, and $\pm .450$ were considered for inclusion of an item within a factor or cluster. The $\pm .470$ level was selected because it retained a moderately high degree of correlation for each criterion item within a factor, and because it accounted for the greatest number of criteria items loading in the factors with few overlapping items.

The selection of the appropriate factor solution to use in data analysis was based on the following criteria:

1. The solution chosen had to result in the greatest number of criteria items with loadings of $\pm .470$ or greater being accounted for in the extracted factors.
2. The chosen solution had to show few overlapping factor loadings of $\pm .470$ or greater between factors.
3. The criteria items with loadings of $\pm .470$ or greater had to be distributed among the extracted factors.

The criteria items that resulted in factor loadings of less than $\pm .470$ were considered as spurious criteria items. These items were listed separately under the factor where their highest factor loading occurred.

The mean score identified for each criterion item indicated its relative importance in relation to the other items listed in the questionnaire. For this study, criteria items that received mean scores of ≥ 3.00 were considered to show adequate importance to be used for curriculum purposes. The standard deviations computed for the items indicated the amount of agreement among the respondents' reactions for each criterion item.

IV. PRESENTATION OF FINDINGS

The results of this study are presented in the following sections:

1) Results of Q-Technique Analysis; 2) Results of R-Technique Analysis; and 3) Results of Mean Score and Standard Deviation Analysis.

Results of Q-Technique Analysis

The function of the Q-technique was to indicate the extent to which respondents resembled one another according to values assigned to each of the 98 criteria items. It essentially involved the ordering of respondents (home economics teachers) according to the criteria items in the study, and provided a measure of commonality among the respondents.

The Q-technique generated only one factor. The results showed that all of the 98 respondents had factor loadings from .92 to .99. The oneness or likeness of the results was indicated by the fact that the one factor generated accounted for 96 percent of the common variance among the home economics teachers. The high percentage of variance accounted for in this factor indicated that the group in the study was homogeneous. (See Appendix D)

Results of R-Technique Analysis

The R-technique provided for the identification of clusters or groups of criteria items in which, according to generated factor

loadings, there existed a high degree of correlation with the extracted factors. Essentially, the R-technique examined the relationship of every criterion item with every other criterion item and ordered them according to respondents.

The data were initially analyzed for 3-, 4-, 5-, and 6- factor solutions. Table 1 lists the common factor variance accounted for in the 6-factor solution, which also contains the common factor variances found in factor solutions five, four, and three. The cumulative percentage of the common variance accounted for in the analysis increased as the number of factor solutions was increased.

Table 1. Percentage of common variance for the R-technique analysis.

Factor	Percentage	Cumulative Percentage
1	39.23	39.23
2	16.75	55.98
3	9.61	65.59
4	6.31	71.90
5	6.21	78.11
6	5.43	83.55

Factors generated by the R-technique analysis resulted in factor loadings that accounted for the correlation of each criterion item to each factor. All negative loadings within a given factor were considered in absolute terms. The six-factor solution accounted for

31 criteria items with factor loadings of $\pm .470$ or greater, with only one criterion item clustering in Factor V, no criteria items clustering in Factor VI, and one overlapping item; this factor solution accounted for 83.55 percent of the common variance. The five-factor solution accounted for 64 criteria items with factor loadings of $\pm .470$ or greater, with only one criterion item clustering in Factor VI, no criteria items clustering in Factor V, and five overlapping items; this factor solution accounted for 78.11 percent of the common variance. The four-factor solution extracted 52 criteria items with factor loadings of $\pm .470$ or greater, with only two criteria items clustering in Factor IV, and two overlapping items; this factor solution accounted for 65.59 percent of the common variance. The three-factor solution extracted 53 criteria items with factor loadings of $\pm .470$ or greater and showed two overlapping items; it accounted for 55.98 percent of the common variance.

The three-factor solution was selected for use in this study because it accounted for the highest number of items with factor loadings of $\pm .470$ or greater, with only two overlapping items. The three-factor solution had criteria items more evenly distributed among the factors. Results of the R-technique analysis using the three-factor solution appear in Tables 2-4. Each table is illustrative of a factor and the criteria items which have factor loadings of $\pm .470$ or greater. Each table also contains a separate listing of spurious

Table 2. Results of R-technique analysis for Factor I: Influences that Contribute to Food Choices and Safety in Food Handling.

Factor	Item No.	Title of Criterion Item	Factor Loading
I	55	evaluate meals on the basis of aesthetic quality, nutritive value, flavor, and economy.	+.634
	77	demonstrate the cultural aspects of food selection and use.	+.600
	87	store fish and shellfish to retain safety, texture, flavor, and nutritive quality.	+.590
	54	select freezing techniques to retain safety and palatability of a variety of foods.	+.583
	94	recognize the influence of psychological factors in the development of food habits.	+.582
	50	select foods to meet the nutritional needs of various family members.	+.550
	52	consider yield, grade, freshness, use and economy in selecting and purchasing meats.	+.547
	13	modify basic methods of poultry preparation to achieve a variety of dishes.	+.539
	10	relate social customs to food use.	+.538
	12	select appropriate storage and preservation methods for various foods.	+.530
	11	revise menus based on the availability of foods.	+.529
	84	evaluate protein-rich foods, including "new protein foods," in regard to use, nutritive and economical factors.	+.524
	59	differentiate between safe and unsafe methods of handling and storing poultry.	+.522
	51	plan for management of money in making consumer food choices.	+.500
	*56	recognize the influence of the chemical composition of fats and oils on nutritive value, keeping qualities, and use.	+.500

*Criterion item 56 showed overlap by loading in both Factors I and III.

Table 2. (Continued)

Factor	Item No.	Title of Criterion Item	Factor Loading
I	32	consider time, energy, cost, and family preference in choosing between convenience, partially prepared, and home prepared food items.	+ .497
	36	select fruits and vegetables on the basis of nutritional and economical factors.	+ .484
	23	recognize factors causing food spoilage.	+ .483
	39	demonstrate the techniques involved in canning.	+ .479
	68	explain how family values and goals affect food choices.	+ .479
	38	evaluate the use of resources in preparation of meals.	+ .472
<u>Spurious Criteria Items</u>			
	98	modify basic methods of meat preparation to achieve variety of dishes.	+ .451
	28	choose between dry heat and moist heat methods of preparing different meat cuts.	+ .446
	48	apply the principles of protein cookery in preparation of various milk products.	+ .440
	41	modify basic methods of fish and shellfish preparation to achieve a variety of dishes.	+ .438
	74	prepare poultry using basic methods appropriate for desired end product.	+ .435
	22	prepare vegetables in a manner to conserve color, flavor, and nutritional content.	+ .429
	92	identify the composition of meats.	+ .424
	97	select fish and shellfish products on the basis of quality and use.	+ .422
	6	plan for the use of human and nonhuman energy resources in food preparation.	+ .418
	7	identify the functions of fats and oils in food preparation.	+ .406
	73	compare the nutrient composition of meats, poultry, and fish.	+ .405

Table 2. (Continued)

Factor	Item No.	Title of Criterion Item	Factor Loading
I	76	identify retail meat cuts and the wholesale cuts from which they come.	+.398
	64	prepare meats using basic methods appropriate for desired end product.	+.389
	95	use methods of cold storage which will insure safety and high quality of foods.	+.388
	49	use nuts in food preparation to add flavor, texture, and nutritive value.	+.383
	18.	select cereal products for use in meals.	+.379
	57	relate control of crystallization to the preparation and storage of various foods.	+.372
	47	recognize the animal source of meat cuts.	+.358
	80	use adequate safety measures when cooking with fats and oils.	+.355
	66	select beverages for a meal on the basis of nutritive value, color, and palatability.	+.354
	1	select different milk products for use in a variety of ways.	+.343
	15	choose milk products according to quality, form, and use.	+.322
	83	select poultry on the basis of yield, use, grade, and economical factors.	+.281
	17.	explain the steps in marketing of meats, poultry, and fish.	+.256

Table 3. Results of R-technique analysis for Factor II: Preparation Principles of Various Food Groups.

Factor	Item No.	Title of Criterion Item	Factor Loading
II	65	demonstrate the appropriate methods of mixing cookies.	-.767
	31	demonstrate appropriate methods of mixing cakes.	-.732
	86	demonstrate the appropriate methods of mixing pastries.	-.703
	53	demonstrate the appropriate methods of mixing yeast breads.	-.671
	46	identify the functions of the ingredients in batters and doughs.	-.657
	82	serve eggs in a variety of ways.	-.650
	61	select eggs on the basis of grade, size, and use.	-.628
	63	demonstrate preparation of starch and cereal products.	-.624
	5	demonstrate the appropriate methods of mixing quick breads.	-.587
	60	demonstrate a variety of ways of preparing fruits.	-.582
	96	demonstrate a variety of ways of preparing vegetables.	-.557
	72	recognize the nutrient value of eggs.	-.501
	33	apply proper storage methods of fats and oils to retain quality.	-.554
	75	identify proper methods of storing dried and prepared starch and cereal products.	-.549
	27	practice proper handling and storage methods for eggs in relation to safety and sanitation.	-.548
	85	select different starches and cereals for their thickening quality.	-.528
	**43	identify the structural parts of eggs.	-.501
	14	store fresh produce to retain nutritive value, color, texture, and flavor.	-.485
	45	recognize the nutritive value of starch and cereal products.	-.479
	16	apply principles of protein cookery in preparation of eggs.	-.479
	93	relate the ingredients and preparation methods of batters and doughs to the structure of the end product.	-.470

**Criterion item 43 showed overlap by loading in both Factors II and III.

Table 3. (Continued)

Factor	Item No.	Title of Criterion Item	Factor Loading
<u>Spurious Criteria Items</u>			
II	89	prepare fish using basic methods appropriate for desired end product.	-. 466
	42	prepare fruits in a manner to conserve nutritional content, color, and flavor.	-. 442
	44	use proper methods of storage for meats, poultry, and fish.	-. 436
	90	demonstrate the techniques involved in freezing.	-. 427
	58	use a variety of seasonings, including herbs and spices, to give variety to foods.	-. 382
	9	store nuts and seasonings to retain freshness.	-. 371
	19	demonstrate the appropriate methods of preparation of beverages to retain nutritive value, color, and palatability.	-. 360
	81	categorize fruits and vegetables according to their classifications.	-. 353
	8	apply the principles of sugar cookery in preparation of a variety of foods.	-. 350

Table 4. Results of R-technique analysis for Factor III: Influences of Chemical Composition and Physical Properties on the Use and Quality of Foods.

Factor	Item No.	Title of Criterion Item	Factor Loading
III	62	identify the structure of fish and shellfish products.	+ .673
	67	identify the origin of various seasonings.	+ .632
	26	identify the chemical composition of milk products.	+ .612
	30	describe the methods of processing of various forms of milk, cheeses, ice creams, and other milk products.	+ .543
	91	recognize the structure of different vegetables.	+ .533
	40	plan a meal with variety in color, flavor, texture, and temperature.	- .528
	*56	recognize the influence of the chemical composition of fats and oils on nutritive value, keeping qualities, and use.	+ .518
	37	identify the effect that the composition of gelatin has on its method of preparation.	+ .507
	29	identify the parts of grain products.	+ .483
	**43	identify the structural parts of eggs.	+ .482
	20	analyze the use of gelatin products in different foods.	+ .470
<u>Spurious Criteria Items</u>			
	34	prepare a wide variety of beverages.	+ .468
	79	arrange for safety procedures applicable to food preparation.	- .456
	35	recognize the nutrient composition of nuts.	+ .453
	24	prepare stirred and still-frozen desserts.	+ .446
	4	explain the methods of processing starch and cereal products.	+ .442
	25	recognize the composition of fruits in relation to their handling and storage.	+ .438

*Criterion item 56 showed overlap by loading in both Factors I and III.

**Criterion item 43 showed overlap by loading in both Factors II and III.

Table 4. (Continued)

Factor	Item No.	Title of Criterion Item	Factor Loading
	71	identify the composition of a variety of vegetables.	+. 427
	70	recognize the influence of ingredients and their combination on the nutritive value and palatability of frozen desserts.	+. 426
	69	value the importance of sanitation in food handling.	-. 398
	88	arrange meal service in a socially acceptable manner.	-. 396
	21	manage the resource of time in food preparation.	-. 394
	3	recognize the structure of various fruits.	+. 382
	2	identify the structure of poultry products.	+. 365
	78	organize meal plans and preparation according to equipment available.	-. 357

criteria items, which are defined as those loading highest under one factor but with loadings of less than $\pm .470$. The titles of the factors were arbitrarily designated after the data were analyzed, and are assumed to be indicative of the general content of the criteria items which loaded under each factor. All criteria items were accounted for in one of the three factors as either loading at $\pm .470$ or greater or as a spurious criterion item. The two overlapping items were identified in both factors under which they loaded at $\pm .470$ or greater, and are designated as overlapping by the use of an asterisk (*).

Factor I: Influences that Contribute to Food Choices and Safety in Food Handling

A total of 21 criteria items clustered under Factor I with factor loadings of $\pm .470$ or greater. One of these items showed overlap by loading in both Factors I and III. Factor I contained 24 spurious criteria items and accounted for 39.23 percent of the common variance among the criteria items. Table 2 presents the results of the 45 criteria items which loaded under this factor.

Factor II: Preparation Principles of Various Food Groups

Twenty-one criteria items with factor loadings of $\pm .470$ or greater clustered in Factor II. One of these items showed overlap by loading in both Factors II and III. Nine spurious criteria items

loaded in Factor II. This factor accounted for 16.75 percent of the common variance among the criteria items. Table 3 shows the analysis of results of the 30 criteria items that clustered under Factor II.

Factor III: Influences of Chemical Composition and Physical Properties on the Use and Quality of Foods

Eleven criteria items clustered under Factor III. Ten criteria items had positive factor loadings of $\pm .470$. One criterion item showed a negative factor loading of -0.53 ; it was considered as a significant negative projection, and indicated that this is a bipolar factor. Fourteen spurious criteria items loaded under Factor III. Two criteria items showed overlap by loading in both this factor and Factors I and II. Factor III accounted for 9.61 of the common variance among the criteria items. Table 4 shows the results of analysis for the 25 criteria items that clustered under Factor III.

In summary of the R-technique analysis, three factors were generated from the 98 criteria items and accounted for 65.59 percent of the common variance. Fifty-three of the items had factor loadings of $\pm .470$; 23 had loadings of $\pm .400$ -. $.470$; 21 had loadings of $\pm .300$ -. $.399$; and two had loadings of less than $\pm .300$. The factor loading of -0.767 occurred on item 65, Factor II, and was the highest in the study. The factor loading of $+.281$ occurred on item 83, Factor I, and was the lowest in the study.

Results of Mean Score and Standard Deviation Analysis

The mean scores and standard deviations were determined for each of the criteria items. The mean scores indicated the relative importance of each item, and the standard deviation indicated the amount of agreement among the respondents' reactions to each item. Table 5 summarizes data on the mean scores and standard deviations of the 98 criteria items.

Twenty-six criteria items had mean scores of ≥ 4.00 , 55 had mean scores in the 3.00-3.99 range, and 17 had mean scores below 3.00. Of the 26 criteria items with mean scores of ≥ 4.00 , 14 loaded under Factor I, six loaded under Factor II, and six loaded under Factor III. Of the 17 criteria items with mean scores of <3.00 , three clustered in Factor I, one clustered in Factor II, and 15 clustered in Factor III. The highest mean score was for item 40, plan a meal with variety in color, flavor, texture, and temperature; it had a mean score of 4.54. The lowest mean score in the study was for item 67, identify the origin of various seasonings; it had a mean score of 2.19.

Five criteria items had standard deviations ≥ 1.00 and 93 had standard deviations of <1.00 .

Table 5. Results of Mean Score and Standard Deviation Analysis.

Item No.	Title of Criterion Item	Mean	Standard Deviation	Clustered in Factor
40	plan a meal with variety in color, flavor, texture, and temperature.	4.54	0.73	III
5	demonstrate the appropriate methods of mixing quick breads.	4.48	0.68	II
51	plan for management of money in making consumer food choices.	4.48	0.64	I
69	value the importance of sanitation in food handling.	4.44	0.75	III*
22	prepare vegetables in a manner to conserve color, flavor, and nutritional content.	4.43	0.61	I*
80	use adequate safety measures when cooking with fats and oils.	4.42	0.76	I*
14	store fresh produce to retain nutritive value, color, texture and flavor.	4.41	0.70	II
79	arrange for safety procedures applicable to food preparation.	4.41	0.71	III*
21	manage the resource of time in food preparation.	4.38	0.67	III*
28	choose between dry heat and moist heat methods of preparing different meat cuts.	4.33	0.81	I*
16	apply principles of protein cookery in preparation of eggs.	4.31	0.71	II
32	consider time, energy, cost, and family preferences in choosing between convenience, partially prepared, and home prepared food items.	4.30	0.69	I
23	recognize the factors causing food spoilage.	4.28	0.71	I
44	use proper methods of storage for meats, poultry, and fish.	4.25	0.86	II*

*Clustered under factor as spurious criterion item.

Table 5. (Continued)

Item No.	Title of Criterion Item	Mean	Standard Deviation	Clustered in Factor
55	evaluate meals on the basis of aesthetic quality, nutritive value, flavor, and economy.	4.24	0.69	I
11	revise menus based on the availability of foods.	4.22	0.78	I
50	select foods to meet the nutritional needs for various family members.	4.21	0.82	I
78	organize meal plans and preparation according to equipment available.	4.20	0.70	III*
12	select appropriate storage and preservation methods for various foods.	4.19	0.71	I
52	consider yield, grade, freshness, use and economy in selecting and purchasing meats.	4.13	0.74	I
59	differentiate between safe and unsafe methods of handling and storing poultry.	4.13	0.83	I
42	prepare fruits in a manner to conserve nutritional content, color, and flavor.	4.12	0.76	II*
36	select fruits and vegetables on the basis of nutritional and economical factors.	4.10	0.71	I
64	prepare meats using basic methods appropriate for desired end product.	4.09	0.76	I*
53	demonstrate the appropriate methods of mixing yeast breads.	4.05	0.84	II
88	arrange meal service in a socially acceptable manner.	4.02	0.76	III*
27	practice proper handling and storage methods for eggs in relation to safety and sanitation.	3.98	0.78	II
48	apply the principles of protein cookery in preparation of various milk products.	3.97	0.81	I*
95	use methods of cold storage which will insure safety and high quality of foods.	3.95	0.83	I*
72	recognize the nutrient value of eggs.	3.95	0.77	II

*Clustered under factor as spurious criterion item.

Table 5. (Continued)

Item No.	Title of Criterion Item	Mean	Standard Deviation	Clustered in Factor
46	identify the functions of the ingredients in batters and doughs.	3.95	0.86	II
54	select freezing techniques to retain safety and palatability of a variety of foods.	3.94	0.81	I
38	evaluate the use of resources in preparation of meals.	3.94	0.93	I
96	demonstrate a variety of ways of preparing vegetables.	3.89	0.74	II
93	relate the ingredients and preparation methods of batters and doughs to the structure of the end product.	3.85	0.87	II
15	choose milk products according to quality, form, and use.	3.82	0.81	I*
68	explain how family values and goals effect food choices.	3.82	0.90	I
39	demonstrate the techniques involved in canning.	3.80	1.00	I
31	demonstrate appropriate methods of mixing cakes.	3.79	0.88	II
65	demonstrate appropriate methods of mixing cookies.	3.78	1.04	II
86	demonstrate the appropriate methods of mixing pastries.	3.77	0.82	II
33	apply proper storage methods of fats and oils to retain quality.	3.76	0.88	II
90	demonstrate the techniques involved in freezing.	3.75	0.91	II*
87	store fish and shellfish to retain safety, texture, flavor, and nutritive quality.	3.72	1.04	I
45	recognize the nutritive value of starch and cereal products.	3.68	0.77	II
82	serve eggs in a variety of ways.	3.66	0.88	II

*Clustered under factor as spurious criterion item.

Table 5. (Continued)

Item No.	Title of Criterion Item	Mean	Standard Deviation	Clustered in Factor
6	plan for the use of human and nonhuman energy resources in food preparation.	3.66	0.93	I*
1	select different milk products for use in a variety of ways.	3.66	0.72	I*
47	recognize the animal source of meat cuts.	3.65	0.91	I*
63	demonstrate preparation of starch and cereal products.	3.64	0.81	II
98	modify basic methods of meat preparation to achieve variety of dishes.	3.63	0.79	I*
94	recognize the influence of psychological factors in the development of food habits.	3.63	0.84	I
76	identify retail meat cuts and the wholesale cuts from which they come.	3.62	0.99	I*
74	prepare poultry using basic methods appropriate for desired end product.	3.60	0.83	I*
8	apply the principles of sugar cookery in preparation of a variety of foods.	3.58	0.78	II*
60	demonstrate a variety of ways of preparing fruits.	3.58	0.66	II
18	select cereal products for use in meals.	3.56	0.76	I*
73	compare the nutrient composition of meats, poultry, and fish.	3.53	0.79	I*
61	select eggs on the basis of grade, size, and use.	3.47	0.88	II
84	evaluate protein-rich foods, including "new protein foods," in regard to use, nutritive and economical factors.	3.43	0.82	I
89	prepare fish using basic methods appropriate for desired end product.	3.38	0.85	II*
58	use a variety of seasonings, including herbs and spices, to give variety to foods.	3.38	0.75	II*

*Clustered under factor as spurious criterion item.

Table 5. (Continued)

Item No.	Title of Criterion Item	Mean	Standard Deviation	Clustered in Factor
83	select poultry on the basis of yield, use, grade, and economical factors.	3.37	0.91	I*
66	select beverages for a meal on the basis of nutritive value, color, and palatability.	3.37	0.90	I*
9	store nuts and seasonings to retain freshness.	3.36	1.07	II*
7	identify the functions of fats and oils in food preparation.	3.36	0.84	I*
75	identify proper methods of storing dried and prepared starch and cereal products.	3.35	0.85	II
13	modify basic methods of poultry preparation to achieve a variety of dishes.	3.34	0.80	I
25	recognize the composition of fruits in relation to their handling and storage.	3.31	0.82	III*
17	explain the steps in marketing of meats, poultry, and fish.	3.30	0.92	I*
10	relate social customs to food use.	3.30	0.78	I
85	select different starches and cereals for their thickening quality	3.24	0.87	II
19	demonstrate the appropriate methods of preparation of beverages to retain nutritive value, color, and palatability.	3.24	0.88	II*
77	demonstrate the cultural aspects of food selection and use.	3.21	0.81	I
97	select fish and shellfish products on the basis of quality and use.	3.18	0.86	I*
92	identify the composition of meats.	3.13	0.84	I*
41	modify basic methods of fish and shellfish preparation to achieve a variety of dishes.	3.08	0.84	I*
81	categorize fruits and vegetables according to their classifications.	3.07	1.00	II*

*Clustered under factor as spurious criterion item.

Table 5. (Continued)

Item No.	Title of Criterion Item	Mean	Standard Deviation	Clustered in Factor
3	recognize the structure of various fruits.	3.07	0.92	III*
71	identify the composition of a variety of vegetables.	3.03	0.84	III*
2	identify the structure of poultry products.	3.02	0.88	III*
43	identify the structural parts of eggs.	2.98	0.97	II & III
4	explain the methods of processing starch and cereal products.	2.97	0.87	III*
29	identify the parts of grain products.	2.96	1.03	III
56	recognize the influence of the chemical composition of fats and oils on nutritive value, keeping qualities, and use.	2.88	0.93	I & III
70	recognize the influence of ingredients and their combination on the nutritive value and palatability of frozen desserts.	2.88	0.86	III*
20	analyze the use of gelatin products in different foods.	2.86	0.74	III
91	recognize the structure of different vegetables.	2.86	0.89	III
30	describe the methods of processing of various forms of milk, cheeses, ice creams, and other milk products.	2.85	0.85	III
49	use nuts in food preparation to add flavor, texture, and nutritive value.	2.85	0.79	I*
35	recognize the nutrient composition of nuts.	2.81	0.95	III*
37	identify the effect that the composition of gelatin has on its method of preparation.	2.79	0.87	III
57	relate control of crystallization to the preparation and storage of various foods.	2.72	0.90	I*
34	prepare a wide variety of beverages.	2.71	0.85	III*
24	prepare stirred and still-frozen desserts.	2.65	0.77	III*

*Clustered under factor as spurious criterion item.

Table 5. (Continued)

Item No.	Title of Criterion Item	Mean	Standard Deviation	Clustered in Factor
62	identify the structure of fish and shellfish products.	2.64	0.89	III
26	identify the chemical composition of milk products.	2.42	0.96	III
67	identify the origin of various seasonings.	2.19	0.89	III

*Clustered under factor as spurious criterion item.

V. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

A number of conclusions may be drawn from the findings of this study on foods subject matter competencies of novice home economics teachers. The following conclusions are based on the data derived from this study.

1. The conclusion of commonality among the respondents was strengthened by high correlations in the Q-technique analysis. The data generated indicated that Oregon home economics teachers participating in this study resembled each other in their responses to the foods subject matter criteria items.

2. The factors generated in the R-technique revealed clusters of criteria items that have high levels of correlation. It was concluded that 53 of the 98 criteria items could be classified into three factors. Upon examination of the content within the factors, titles were assigned as: Factor I: Influences that Contribute to Food Choices and Safety in Food Handling; Factor II: Preparation Principles of Various Food Groups; Factor III: Influences of Chemical Composition and Physical Properties on the Use and Quality of Foods.

3. Factor analysis was shown in this study to be one method of grouping criteria items into clusters for competency identification. The groupings extracted from the analysis are in some ways similar to those that curriculum planners have traditionally used to teach foods subject matter courses. However, in some cases the factors generated overlapped in terms of content and showed a lack of content congruence within a factor. Thus, this writer concludes that the

factors extracted should be viewed as possible references from which to identify competencies and develop curriculum, but should not be used exclusively for curriculum development.

4. Even though the factors derived from the analysis in this study showed some overlapping and lack of congruence, certain general trends and characteristics can be identified in each grouping. Conclusions concerning the nature of the three factors are the following:

1) Factor I: Influences that Contribute to Food Choices and Safety in Food Handling clustered most of those statements that were general to all foods in terms of food choices, the role of food in meeting needs, and safety in the handling, storing, and preservation of foods. The items clustered in this factor dealt primarily with the participant understanding food usage rather than dealing with the actual preparation of foods.

Possible competencies that could be identified for Factor I, on the basis of the content of the criteria items that were extracted in this factor, are the following: 1) The Participant should be able to Evaluate the Role of Food in Meeting the Psychological and Social Needs of Man; 2) The Participant should be able to Select Foods and Food Combinations on the Basis of Resource Management, Nutritional and Aesthetic Factors; 3) The Participant should be able to Demonstrate Safe Means of Food Handling, Storage, and Preservation; and 4) The Participant should be able to Modify Basic Methods of Poultry Preparation to Achieve a Variety of Dishes.

2) Factor II: Preparation Principles of Various Food Groups

clustered those statements that were more specific to various classifications of foods. The items generated under this factor dealt almost exclusively with the demonstration of skills that relate to selecting, handling, storing and preparing specific types of foods. The spurious criteria items that grouped under Factor II also related to specific food groups, with the exception of item 90 that dealt with general freezing techniques.

The content of the criteria items that clustered under this factor suggests that the following competency statements may be proposed: 1) The Participant should be able to Select, Store, and Prepare Starch and Cereal Products; 2) The Participant should be able to Recognize the Nutritive Value and Structure of Eggs and Practice Appropriate Principles of Egg Selection, Storage, and Preparation; 3) The Participant should be able to Demonstrate Appropriate Methods of Preparing Batters and Doughs and Apply Knowledge of the Functions of Ingredients to the Preparation; 4) The Participant should be able to Demonstrate Methods of Storing and Preparing Fruits and Vegetables; and 5) The Participant should be able to Apply Proper Storage Methods of Fats and Oils to Retain Quality.

3) Factor III: Influences of Chemical Composition and Physical Properties on the Use and Quality of Foods clustered all of those criteria items dealing with the composition, structure, or

physical properties of various foods. This factor was the most concise as to the specific content that it grouped together.

Criteria item 40, plan a meal with variety in color, flavor, texture, and temperature, was the only item that had a negative factor loading among the positive factor loadings in Factor III. The statistical explanation for the negative factor loading is that Factor III is a bipolar factor. It showed a significant negative projection, which can be regarded as measuring the negative aspect of the other items in this factor. In other words, this item measured "negative - the demonstration of knowledge of the chemical composition and physical properties of food items." It suggests, to this writer, a broader approach to the knowledge of composition and properties of food, in that color, flavor, texture, and temperature are additional, opposing, properties that need to be considered as influences on the use and quality of foods.

Item 20, analyze the use of gelatin products in different foods, was the only statement that did not deal specifically with the chemical composition or physical properties of a food. It did, however, directly relate to item 37 which dealt with the composition of gelatin. In addition, the statement is considered by this writer to imply the relationship of a gelatin product as an ingredient to the final structure of a food.

The spurious criteria items that grouped under Factor III were divided between those with positive factor loadings and those with negative factor loadings. The statistical explanation for the occurrence of both positive and negative loadings under the same factor is that Factor III is a bipolar factor. The positive spurious criteria items grouped all additional statements dealing with chemical composition and physical properties that did not have factor loadings of $\pm .470$ or greater. Two items dealing with frozen desserts and one item concerning the preparation of beverages were also grouped as positive spurious items. The five negative spurious criteria items included statements about meal planning and service, safety and sanitation.

Competency statements that may be identified for this factor, on the basis of the content of the criteria items loading under it, are the following: 1) The Participant should be able to Demonstrate a Knowledge of the Chemical Composition and Physical Properties of Food Items; 2) The Participant should be able to Analyze the Use of Gelatin Products in Different Foods; and 3) The Participant should be able to Plan a Meal with Variety in Color, Flavor, Texture and Temperature. 4) The two criteria items that had loadings high enough to be considered in two factors were regarded as overlapping items.

These items appeared to have a logical relationship to the other criteria statements generated in both factors under which they clustered. Item 43, identify the structural parts of eggs, was congruent in content with both Factors II and III. Item 56, recognize the influence of the chemical composition of fats and oils on nutritive value, keeping qualities, and use, logically grouped in both Factors I and III in regard to the content of the criteria items in each.

5. A possible explanation for the reason that factor analysis did not account for easily discernible groupings of criteria items is offered by this writer. The criteria statements listed in the questionnaire may not have been specific enough due to the vast amount of subject matter considered necessary to include and the desire to keep the instrument within a reasonable length. Many of the criteria statements dealt with more than one concept (*i. e.*, select fruits and vegetables on the basis of nutritional and economical factors). This may have been the reason for overlapping of content between factors and a lack of content congruence within a given factor.

6. The mean scores derived in this study for each of the criteria items were concluded to be of significance and should be given thoughtful consideration for developing competency-based curriculum in the area of foods for future home economics teachers. Several spurious criteria items with factor loadings less than $\pm .470$ were among those

receiving high mean scores. These items should be given equal consideration to those items that clustered within a factor with factor loading of $\pm .470$ or greater and had equally high mean scores.

7. There were 14 of the 26 criteria items with mean scores of ≥ 4.00 loading under Factor I: Influences that Contribute to Food Choices and Safety in Food Handling. This indicated that the home economics teacher respondents felt that this factor was of greater importance in foods curriculum for future teachers than the other factors. The criterion item ranking highest in mean score was item 40, plan a meal with variety in color, flavor, texture, and temperature. It clustered under Factor III and should be considered as the most important criterion item for curriculum development.

8. Fifteen of the 17 criteria items with a mean score of < 3.00 loaded under Factor III: Influences of Chemical Composition and Physical Properties on the Use and Quality of Foods. This indicated that the home economics teacher respondents felt that this factor was of least importance in the preparation of the future home economics teacher. The criterion item with the lowest mean score was item 67, identify the origin of various seasonings. It clustered under Factor III and should be considered the least important criterion item for curriculum development.

Recommendations

The following recommendations are based on the findings and conclusions of this study in an effort to aid in the continuous improvement of preparation for future home economics teachers.

1. The curriculum designers involved in the preparation of future home economics teachers should consider the judgment of practicing home economics teachers as one means of identifying needed competencies and criteria on which to base their program.
2. The factors and criteria identified in this study could be one source of reference upon which to identify competencies and build competency-based foods subject matter curricula.
3. The mean scores identified for the criteria items in this study with a mean score of ≥ 3.00 should be given consideration in curriculum development.
4. A similar study, or a group of studies, should be conducted using a questionnaire with more specifically stated criteria items. The criteria statements should be limited to one concept of food analysis (i. e., structure, storage, selection, preparation, etc.) or to one food classification (i. e., meat, fruits, milk products, batters and doughs, etc.). Such a study may provide more discernible factors and additional information for curriculum development may be derived.

5. A similar study using a more specific sample population, perhaps of only beginning teachers or only the most qualified home economics teachers, should be conducted to provide a comparative set of results that could be used in determining competencies and criteria for novice home economics teachers in the subject matter area of foods.
6. Each of the factors extracted in this study should be analyzed in another study in order to determine subgroupings of the criteria items and thereby identify competency statements. Professionals in the area of foods and/or teacher education staff should be considered as the sample population for such a study.
7. Once competencies have been identified from the factors extracted in this study, behavioral objectives, and instructional and evaluative methods should be developed and used in an experimental setting.
8. A similar study dealing specifically with nutrition subject matter should be conducted to offer a more comprehensive set of competencies and criteria needed for future home economics teachers in the area of foods and nutrition.

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APPENDICES

APPENDIX A

To: Home Economics Teacher

From: Krista Six
Graduate Assistant
Home Economics Education Department
Oregon State University

Thank you for indicating your willingness to respond to the following questionnaire. It has my name, address, and postage on the back so you need only to refold and staple or tape it together before mailing. Please return at your earliest convenience. Thank you for your cooperation.

HOME ECONOMICS EDUCATION SUBJECT MATTER
COMPETENCIES QUESTIONNAIRE

- A. This questionnaire contains subject matter competencies in the area of foods for home economics educators. You are being asked to indicate the level of proficiency YOU FEEL is NECESSARY for each competency in relation to the needs of a novice teacher.
- B. Do not take too much time in thinking about any particular item. Please do not leave out any item--there are no right or wrong answers. I am primarily concerned with how YOU FEEL about the competencies needed by first year home economics teachers.

C. Each competency item has been written in the cognitive domain. In an effort to eliminate confusion I have designated the level of understanding within the domain by placing the initial of the level, in parenthesis, after each item. The initials represent the following:

- K represents Knowledge
- C represents Comprehension
- Ap represents Application
- An represents Analysis
- S represents Synthesis
- E represents Evaluation

D. For each item please circle the rating (1 2 3 4 5) which most closely represents YOUR FEELING. If your exact feeling is not found in one of the choices, pick the one which comes closest to your true feeling.

Here is an example:

What proficiency must a novice home economics teacher have in her work as an instructor in the ability to:

	no	slight	moderate	considerable	complete
1. prepare milk products in a variety of ways. (S)	1	2	3	4	5

This person, in marking the "4" rating, felt that the novice teacher's job required considerable proficiency with this activity.

What proficiency must a novice home economics teacher have in her work as an instructor in the ability to:

	no	slight	moderate	considerable	complete
1. select different milk products for use in a variety of ways. (S)	1	2	3	4	5
2. identify the structure of poultry products. (C)	1	2	3	4	5
3. recognize the structure of various fruits. (C)	1	2	3	4	5
4. explain the methods of processing starch and cereal products. (C)	1	2	3	4	5
5. demonstrate the appropriate methods of mixing quick breads. (Ap)	1	2	3	4	5

what proficiency must a novice home economics teacher have in her work as an instructor in the ability to:

	no	slight	moderate	considerable	complete
6. plan for the use of human and nonhuman energy resources in food preparation. (S)	1	2	3	4	5
7. identify the functions of fats and oils in food preparation. (C)	1	2	3	4	5
8. apply the principles of sugar cookery in preparation of a variety of foods. (Ap)	1	2	3	4	5
9. store nuts and seasonings to retain freshness. (E)	1	2	3	4	5
10. relate social customs to food use. (An)	1	2	3	4	5
11. revise menus based on the availability of foods. (S)	1	2	3	4	5
12. select appropriate storage and preservation methods for various foods. (E)	1	2	3	4	5
13. modify basic methods of poultry preparation to achieve a variety of dishes. (S)	1	2	3	4	5
14. store fresh produce to retain nutritive value, color, texture, and flavor. (E)	1	2	3	4	5
15. choose milk products according to quality, form, and use. (E)	1	2	3	4	5
16. apply principles of protein cookery in preparation of eggs. (Ap)	1	2	3	4	5
17. explain the steps in marketing of meats, poultry, and fish. (C)	1	2	3	4	5
18. select cereal products for use in meals. (E)	1	2	3	4	5
19. demonstrate the appropriate methods of preparation of beverages to retain nutritive value, color, and palatability. (Ap)	1	2	3	4	5
20. analyze the use of gelatin products in different foods. (An)	1	2	3	4	5
21. manage the resource of time in food preparation. (S)	1	2	3	4	5
22. prepare vegetables in a manner to conserve color, flavor, and nutritional content. (S)	1	2	3	4	5
23. recognize the factors causing food spoilage. (C)	1	2	3	4	5

what proficiency must a novice home economics teacher have in her work as an instructor in the ability to:

	no	slight	moderate	considerable	complete
24. prepare stirred and still-frozen desserts. (S)	1	2	3	4	5
25. recognize the composition of fruits in relation to their handling and storage. (C)	1	2	3	4	5
26. identify the chemical composition of milk products. (C)	1	2	3	4	5
27. practice proper handling and storage methods for eggs in relation to safety and sanitation. (E)	1	2	3	4	5
28. choose between dry heat and moist heat methods of preparing different meat cuts. (E)	1	2	3	4	5
29. identify the parts of grain products. (C)	1	2	3	4	5
30. describe the methods of processing of various forms of milk, cheeses, ice creams, and other milk products. (C)	1	2	3	4	5
31. demonstrate appropriate methods of mixing cakes. (Ap)	1	2	3	4	5
32. consider time, energy, cost, and family preferences in choosing between convenience, partially prepared, and home prepared food items. (E)	1	2	3	4	5
33. apply proper storage methods of fats and oils to retain quality. (Ap)	1	2	3	4	5
34. prepare a wide variety of beverages. (S)	1	2	3	4	5
35. recognize the nutrient composition of nuts. (C)	1	2	3	4	5
36. select fruits and vegetables on the basis of nutritional and economical factors. (E)	1	2	3	4	5
37. identify the effect that the composition of gelatin has on its method of preparation. (C)	1	2	3	4	5
38. evaluate the use of resources in preparation of meals. (E)	1	2	3	4	5
39. demonstrate the techniques involved in canning. (Ap)	1	2	3	4	5
40. plan a meal with variety in color, flavor, texture, and temperature. (S)	1	2	3	4	5
41. modify basic methods of fish and shellfish preparation to achieve a variety of dishes. (S)	1	2	3	4	5

What proficiency must a novice home economics teacher have in her work as an instructor in the ability to:

	no	slight	moderate	considerable	complete
42. prepare fruits in a manner to conserve nutritional content, color, and flavor. (S)	1	2	3	4	5
43. identify the structural parts of eggs. (C)	1	2	3	4	5
44. use proper methods of storage for meats, poultry, and fish. (Ap)	1	2	3	4	5
45. recognize the nutritive value of starch and cereal products. (C)	1	2	3	4	5
46. identify the functions of the ingredients in batters and doughs. (C)	1	2	3	4	5
47. recognize the animal source of meat cuts. (C)	1	2	3	4	5
48. apply the principles of protein cookery in preparation of various milk products. (Ap)	1	2	3	4	5
49. use nuts in food preparation to add flavor, texture, and nutritive value. (Ap)	1	2	3	4	5
50. select foods to meet the nutritional needs for various family members. (E)	1	2	3	4	5
51. plan for management of money in making consumer food choices. (S)	1	2	3	4	5
52. consider yield, grade, freshness, use and economy in selecting and purchasing meats. (E)	1	2	3	4	5
53. demonstrate the appropriate methods of mixing yeast breads. (Ap)	1	2	3	4	5
54. select freezing techniques to retain safety and palatability of a variety of foods. (Ap)	1	2	3	4	5
55. evaluate meals on the basis of aesthetic quality, nutritive value, flavor, and economy. (E)	1	2	3	4	5
56. recognize the influence of the chemical composition of fats and oils on nutritive value, keeping qualities, and use. (C)	1	2	3	4	5
57. relate control of crystallization to the preparation and storage of various foods. (An)	1	2	3	4	5

What proficiency must a novice home economics teacher have in her work as an instructor in the ability to:

	no	slight	moderate	considerable	complete
58. use a variety of seasonings, including herbs and spices, to give variety to foods. (An)	1	2	3	4	5
59. differentiate between safe and unsafe methods of handling and storing poultry. (An)	1	2	3	4	5
60. demonstrate a variety of ways of preparing fruits. (Ap)	1	2	3	4	5
61. select eggs on the basis of grade, size, and use. (E)	1	2	3	4	5
62. identify the structure of fish and shellfish products. (C)	1	2	3	4	5
63. demonstrate preparation of starch and cereal products. (Ap)	1	2	3	4	5
64. prepare meats using basic methods appropriate for desired end product. (S)	1	2	3	4	5
65. demonstrate appropriate methods of mixing cookies. (Ap)	1	2	3	4	5
66. select beverages for a meal on the basis of nutritive value, color, and palatability. (E)	1	2	3	4	5
67. identify the origin of various seasonings. (C)	1	2	3	4	5
68. explain how family values and goals effect food choices, (C)	1	2	3	4	5
69. value the importance of sanitation in food handling. (E)	1	2	3	4	5
70. recognize the influence of ingredients and their combination on the nutritive value and palatability of frozen desserts. (C)	1	2	3	4	5
71. identify the composition of a variety of vegetables. (C)	1	2	3	4	5
72. recognize the nutrient value of eggs. (C)	1	2	3	4	5
73. compare the nutrient composition of meats, poultry, and fish. (An)	1	2	3	4	5
74. prepare poultry using basic methods appropriate for desired end product. (S)	1	2	3	4	5
75. identify proper methods of storing dried and prepared starch and cereal products. (C)	1	2	3	4	5

What proficiency must a novice home economics teacher have in her work as an instructor in the ability to:

	no	slight	moderate	considerable	complete
76. identify retail meat cuts and the wholesale cuts from which they come. (C)	1	2	3	4	5
77. demonstrate the cultural aspects of food selection and use. (Ap)	1	2	3	4	5
78. organize meal plans and preparation according to equipment available. (S)	1	2	3	4	5
79. arrange for safety procedures applicable to food preparation. (S)	1	2	3	4	5
80. use adequate safety measures when cooking with fats and oils. (Ap)	1	2	3	4	5
81. categorize fruits and vegetables according to their classifications. (S)	1	2	3	4	5
82. serve eggs in a variety of ways. (S)	1	2	3	4	5
83. select poultry on the basis of yield, use, grade, and economical factors. (E)	1	2	3	4	5
84. evaluate protein-rich foods, including "new protein foods," in regard to use, nutritive and economical factors. (E)	1	2	3	4	5
85. select different starches and cereals for their thickening quality. (E)	1	2	3	4	5
86. demonstrate the appropriate methods of mixing pastries. (Ap)	1	2	3	4	5
87. store fish and shellfish to retain safety, texture, flavor, and nutritive quality. (E)	1	2	3	4	5
88. arrange meal service in a socially acceptable manner. (S)	1	2	3	4	5
89. prepare fish using basic methods appropriate for desired end product. (S)	1	2	3	4	5
90. demonstrate the techniques involved in freezing. (Ap)	1	2	3	4	5
91. recognize the structure of different vegetables. (C)	1	2	3	4	5
92. identify the composition of meats. (C)	1	2	3	4	5

What proficiency must a novice home economics teacher have in her work as an instructor in the ability to:

	no	slight	moderate	considerable	complete
93. relate the ingredients and preparation methods of batters and doughs to the structure of the end product. (An)	1	2	3	4	5
94. recognize the influence of psychological factors in the development of food habits. (C)	1	2	3	4	5
95. use methods of cold storage which will insure safety and high quality of foods. (Ap)	1	2	3	4	5
96. demonstrate a variety of ways of preparing vegetables. (Ap)	1	2	3	4	5
97. select fish and shellfish products on the basis of quality and use. (E)	1	2	3	4	5
98. modify basic methods of meat preparation to achieve variety of dishes. (S)	1	2	3	4	5

Krista Six
 Home Economics Education Dept. Room 20
 Oregon State University
 Corvallis, Oregon 97331

APPENDIX B

Dear Home Economics Teacher,

We are presently doing Masters degree research at Oregon State University under the direction of Dr. Sylvia Lee. Will you help us by responding to a questionnaire of not more than 99 items dealing with subject matter competencies needed by home economics teachers? The items will deal with one area of home economics, or a portion of one area. Those items that are ranked highest, most frequently, on a five point rating scale will be compiled to develop competency statements. Without the cooperation of home economics teachers this study will not be possible.

Please indicate on the attached postcard whether or not you are willing to assist us. The questionnaire will be mailed to you in late April or early May. Your prompt response would be appreciated.

Sincerely
Kristie Hotchkiss
Krista Six

Yes, I will respond to the questionnaire. _____

No, I will not respond to the questionnaire. _____

Name _____

Address _____

APPENDIX C

Home Economics Education, rm. 20
April 15, 1975

Mr. Thomas Clinton
6318 SW Corbett Street
Portland, Oregon 97201

Dear Mr. Clinton:

We are graduate students in Home Economics Education at Oregon State University under the direction of Dr. Sylvia Lee, and are currently doing research in subject matter competencies needed by home economics teachers. The design of our study includes random selection of secondary home economics teachers in Oregon for our sample, sending a questionnaire containing competency statements and compiling the results. It is hoped the results of our study will be helpful to the home economics education pre-service program.

Included is a list of teachers from the Portland School District that has been drawn for our sample. With your permission, these teachers will receive a postcard asking if they are willing to participate in the study. The final sample for the study will be drawn from those teachers indicating their willingness to participate. Also included is a sample of statements that will be a part of our questionnaire. The final questionnaire will contain no more than 99 items.

Your prompt response will be appreciated.

Sincerely,

Kristie Hotchkiss
Krista Six
Home Economics Education
Graduate Students

APPENDIX D

RESULTS OF Q-MODE ANALYSIS

Respondent Number	Factor Loading	Respondent Number	Factor Loading	Respondent Number	Factor Loading
01	.99	34	.98	66	.98
02	.99	35	.99	67	.98
03	.97	36	.98	68	.97
04	.97	37	.99	69	.98
05	.94	38	.99	70	.99
06	.97	39	.99	71	.99
07	.98	40	.98	72	.99
08	.98	41	.98	73	.98
09	.98	42	.99	74	.98
10	.99	43	.98	75	.98
11	.97	44	.97	76	.98
12	.99	45	.99	77	.99
13	.98	46	.99	78	.97
14	.99	47	.97	79	.99
15	.99	48	.97	80	.97
16	.98	49	.94	81	.95
17	.96	50	.99	82	.92
18	.97	51	.98	83	.99
19	.98	52	.99	84	.99
20	.99	53	.99	85	.98
21	.98	54	.97	86	.99
22	.98	55	.96	87	.99
23	.98	56	.99	88	.99
24	.98	57	.98	89	.99
25	.99	58	.98	90	.97
26	.97	59	.98	91	.99
27	.98	60	.98	92	.99
28	.97	61	.99	93	.97
29	.98	62	.99	94	.98
30	.99	63	.98	95	.98
31	.98	64	.99	96	.96
32	.99	65	.99	97	.98
33	.97			98	.97