# DEVELOPMENT OF AN ITEM POOL FOR ADVANCED STANDING EXAMINATIONS IN BASIC CLOTHING CONSTRUCTION

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DEVELOPMENT OF AN ITEM POOL FOR ADVANCED

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# CHAPTER I

## INTRODUCTION

Educators are continually searching for means by which to advance the capable and well-prepared student in selected academic areas. Comparatively little has been done and progress has been slow in accelerating qualified students in home economics. Each year, beginning home economics students enter college with varying degrees of experience and skill in clothing construction. An assessment of the experience and skills of beginning students could aid in the effective guidance and planning of experiences to more suitably meet their needs.

According to Dressel (1961, p. 9), one segment of curriculum planning is "organization of experience." Three criteria noted for the process of organizing these experiences were continuity, sequence, and integration. Continuity must be assisted by sequence, in that learnings in earlier experiences are used in later ones. If the learning is to take on its full meaning it must be related to learning in other courses, other disciplines, and to experiences outside the classroom.

The Oklahoma State Regents for Higher Education (OSRHE) have recognized that an increasing amount of learning is taking place outside the classroom.

> The recent emergence of nontraditional learning patterns such as individualized study, external degrees, educational television, experiential learning, and the like have provided an alternative to traditional teaching and learning

> modes in formal classroom situations. These new developments call for new responses on the part of colleges and universities to find ways of evaluating the new learnings which have taken place outside the formal higher education structure (OSRHE, 1972, p. 1).

One attempt by colleges and universities to recognize nontraditional learning is the use of advanced standing credit. According to the OSRHE (1972, p. 1):

> Students should receive proper recognition for academic learning which has occurred outside the formal college classroom setting, including learning which has taken place in high school, proprietary school, vocational-technical school, the military service, or through educational television or individualized study.

Faculty at Oklahoma State University during the recent past have offered a pre-assessment examination to students enrolling in clothing construction courses in an attempt to determine proficiency in clothing construction. Through the years the examination has been used in different ways and has included various combinations of written and practical items. At one time those students who passed the examination were allowed to enroll in a more advanced clothing construction course. At another time students who passed were given advanced standing credit for the basic course. During 1976 the examination was discontinued because of a need for concentrated review and revision.

Results of studies from other institutions have shown that there is difficulty in making an accurate assessment of a student's ability in clothing construction. A need exists to develop an instrument to measure both knowledge and skill which is valid, inexpensive, and not excessively time consuming to administer and score. This instrument could be used to allow students who were already proficient in clothing construction to progress to a more advanced level and/or to receive

credit for the basic course.

## Purpose and Objectives

The purpose of the study was to develop an item pool from which advanced standing examinations can be compiled for use in basic clothing construction. Data used in the study were drawn from two sets of data: 1) a comparison of experience checklist scores and advanced standing examination scores of students who took the examination for advanced standing credit between fall 1972 and fall 1975, inclusive, and 2) a comparison of written examination scores and practical assignment scores of all students enrolled in the basic clothing construction course between fall 1975 and fall 1977, inclusive. Item analysis data from the written examinations currently being used in basic clothing construction were used to determine items which would be acceptable for inclusion in the item pool. Specific objectives of the study were to:

1. Determine the correlation between the scores from the advanced standing examination and the experience checklist scores of students who took the clothing examination for advanced standing credit from fall 1972 to fall 1975, inclusive.
2. Determine the correlation between written examination scores and practical assignment scores of students enrolled in the basic clothing construction course from fall 1975 to fall 1977, inclusive.
3. Critically review the item analysis data from the current written examinations used in the basic clothing construction course to determine items which would be acceptable for inclusion in the item pool.

4. Develop an item pool from which selected examinations can be compiled for use in basic clothing construction.

## Assumptions

The following assumptions were basic to the study:

1. Students enter college with a wide range of knowledge and skill in the area of clothing construction.
2. Evaluation is necessary to determine the extent of student knowledge and skill.
3. An instrument can be devised which will measure both knowledge and skill in the area of clothing construction and therefore can be used to determine the degree of proficiency held by students in this area.

## Hypotheses

The following hypotheses were examined in the study:

1. There will be no significant correlation between the advanced standing examination scores and the experience checklist scores of students who took the advanced standing examination between fall 1972 and fall 1975, inclusive.
2. There will be no significant correlation between written examination scores and the practical assignment scores of students enrolled in basic clothing construction from fall 1975 to fall 1977, inclusive.

## Definition of Terms

The following are definitions of terms as used in the study:

Basic clothing construction course (CTM 1103) - the most elementary clothing construction course offered at Oklahoma State University. It has no prerequisites and includes fabric selection, basic fitting, and sewing techniques.

Written examination - an objective instrument designed to evaluate factual knowledge of clothing construction.

Practical or performance examination - a measure designed to evaluate psychomotor skills, including a series of processes actually performed by students involving manipulation of equipment and materials used in clothing construction.

Placement examination - an instrument used with entering students to ascertain the extent of their subject matter knowledge prior to specific instruction and generally used to section students according to their knowledge and skill in the subject.

Advanced standing examination - a comprehensive examination of the subject matter in a particular course through which the student, having attained a specified level of achievement, receives credit for the course.

Experience checklist - an instrument used by the student to enumerate his/her own experiences in clothing construction.

Item analysis - the breakdown of responses to each item on a written examination to determine item difficulty and discriminating power.

## Limitations

The study was limited to the development of the item pool; subsequently, the reliability and validity of the item pool were not

tested. However, upon completion of the rough draft of the item pool, it was critiqued by a professor of clothing and textiles and by a class of eight graduate students who were completing a graduate level evaluation course. The nine people evaluated the items for sentence structure, clarity, understandability and agreement of answer with item, and made suggestions for the revision of items. When the copies of the item pool were returned to the researcher, suggestions from the evaluators were considered and corrections were made on the basis of their comments.

# CHAPTER II

## REVIEW OF LITERATURE

Throughout the United States, at various colleges and universities, there has been a great deal of interest in the placement of students according to their capabilities. According to Cross (1973, p. 6):

> Most teachers are aware that students enter their classes with differing amounts of both knowledge and skills and with a variety of attitudes and values. The result is that some students have more distance to cover to reach excellency than do others.

One way that teachers can evaluate student growth more effectively is by measuring what the student can do at the beginning and at the end of a series of learning experiences (Cross, 1973). The instructor who is aware of the experience level of each student could contribute to effective guidance and planning of learning experiences. Unless the present status of the student is known, neither the teacher nor the student can determine what changes need to be made. Neither are they able to plan what instruction should be given to bring about such changes (Arny, 1953).

### Evaluation in Home Economics

Clothing construction teachers at the university level have recognized that student background varies considerably within the area of clothing construction and ranges from no experience to extensive

experience. Hence, evaluation becomes very important so that unnecessary repetition may be avoided and the time of students may be used to greater advantage. The needs of the student with little experience vary greatly from that of the student with a great deal of experience.

In home economics there is a lack of diagnostic instruments which permit teachers to identify deficiencies and determine work necessary to insure understanding of the material and to improve skills. Greater progress has been made in this direction in fields other than home economics. More instruments need to be developed and tested for use in home economics.

## General Evaluation Instruments

Instruments which have been used most widely in recent years have primarily been used to: 1) waive classes and allow students to move into more advanced courses if they are already proficient in a given subject matter, and 2) award credit by examination rather than having the student take the course if on-the-job experience, purposeful reading, adult school or correspondence courses, or television or taped courses may have prepared one to earn college credit. This type of examination is taken by students for credit in subjects they believe they have already mastered.

One of the refreshing aspects of the advanced placement program is its flexibility. Advanced placement courses provide good opportunity for individual progress and accomplishment and are more stimulating than many of the usual courses (Bedford, 1976). However, many educators feel that even if the student knows more about the subject than is taught in the course, he/she must register for and "take" the

course. This is one of the barriers which must be overcome if an unusually competent student is to get ahead in college work. By being allowed to test out of one or more of the courses he/she would have been required to take as a first-year college student, both time and dollars are saved (Jones, 1975).

Many students have reduced their expenditure of time and money by successfully completing Advanced Standing Examinations and College-Level Examination Program (CLEP) examinations. The five CLEP General Examinations are intended to assess the broad-based intellectual experiences usually gained in college. Dole (1951) suggested that examinations may be devised which will adequately identify the competent student and that these students should be able to receive credit for courses by taking an examination rather than by having to go through the normal classroom requirements. The students who already know the course material would then be freed to enroll in more advanced courses. It has long been thought that predictive examinations for credit should become an acceptable educational procedure (Pressey, 1944-45).

## Instruments Developed for Clothing Construction Courses at Other Universities

Predictive examinations have been developed in clothing and textiles at various colleges and universities around the country. Wright and Henkel (1951) endeavored to measure clothing construction achievement and past experience of students at Purdue University. They found that past experiences had a definite effect on achievement and that it was the quantity rather than the quality or type of previous experience

that affected achievement. Arthur (1964) used a pretest and also found a relationship between a student's past experiences and his achievement in clothing construction.

During 1959 a pretest was developed at New Mexico State University by Hoskins. The instrument was developed as an aid in determining the level of understanding of clothing construction principles. The instrument was designed to be used at more than one school and was administered to high school girls, representing five schools, who had completed two or more years of home economics or four or more years of 4-H club work. When the pretests were scored, the results indicated that the participants held relatively high skill levels but frequently lacked understanding of basic principles. The instrument was considered valuable for sectioning, determining emphasis in the amount and kind of coursework, and for exemption from the basic clothing course. However, recommendations indicated that a practical examination needed to accompany the written examination if the instrument were used as an exemption tool.

At South Dakota State College, Semeniuk (1961) developed an objective pretest to assist instructors in tailoring courses to fulfill the needs of the students, to give a preview of the course, and as a possible aid in sectioning students. The instrument, consisting of 116 objective items that were intended to test knowledge of principles and application of facts concerning clothing construction, was administered for two terms. A questionnaire was also developed and utilized to provide information concerning attitudes toward sewing and past clothing construction experience of the participants. By using an evaluative questionnaire at the end of each term it was found that the

pretest helped students to realize their strengths and weaknesses and it helped the instructor to plan experiences to more effectively meet the needs of the students. Findings indicated that the pretest in its present form was inadequate for placement purposes and Semeniuk recommended that the pretest be supplemented with other criteria such as a practical examination and/or an experience inventory if it were to be used for placement.

From Ohio State University Caudill (1968) reported that students enrolled in the first clothing construction course were expected to have previously attained a particular level of skill in sewing. Caudill developed a pretest that focused on factual knowledge concerning basic construction skills, design and selection, alteration and fit of commercial patterns and flat pattern methods. An experience index and data sheet accompanied the paper and pencil examination. Numerical values were assigned to years and types of clothing experiences reported by the students. A correlation coefficient of .71 was found between years of experience and pretest score and a correlation coefficient of .63 was found between types of experience and pretest scores. This indicated that there was a significant degree of relationship between pretest scores and the amount of previous experience in clothing construction as reported by students.

A decision to incorporate the basic clothing construction course with the flat pattern methods course necessitated the examination of three instruments used as placement devices at Iowa State University. Shaw (1971) revised and redesigned these instruments to determine the extent of student knowledge in the area of clothing construction prior to enrollment in a construction course. Garments were constructed

during the course and evaluated and used as the criterion variable to determine validity of the placement examination. The construction detail grade and the quality of garment score were matched and compared with the placement examination score of the student. Shaw found that a direct relationship existed between scores received on the placement examination and quality ratings received on garments constructed in class.

During 1975 Henson conducted a study at the University of Arkansas to determine whether the efficiency of any one or of a combination of instruments could be used as a predictor of success in clothing construction courses. The instruments included an objective, written examination to test factual knowledge; a practical skills examination to evaluate actual construction ability; and an experience index questionnaire to test the worth of a student's own assessment of previous clothing construction experience.

The battery of instruments was administered to 51 participants. The Pearson product-moment correlation coefficient was computed to determine which instrument or combination of instruments was the best predictor of student success. Henson correlated each of the following with final course grade: 1) scores of written tests, 2) scores of practical skills tests, 3) an average of written and practical test scores, and 4) rating of past clothing experiences. Findings indicated that there was a significant correlation ($p<.01$) between scores on each of the three instruments of the examination battery with final course grades. Scores on the practical skills examination were found to have the highest correlation with final course grades. However, the practical skills instrument was the most expensive and took more time

to prepare, administer, and grade than did either the experience index questionnaire or the written examination. Moreover, the practical skills instrument could not be reused as could the written and experience index instruments. Henson concluded that a significant correlation existed between final course grade and 1) scores of written tests, 2) practical skills tests, 3) an average of written and skills tests, and 4) rating of past clothing experiences.

At Utah State University, Starkey (1975) conducted a study to evaluate an existing examination which was used to waive the basic clothing construction course and to allow students with sufficient background in clothing construction to proceed to advanced clothing courses. The examination was administered during the first two weeks of the semester to two groups of students: 46 who had not taken basic clothing construction, and 21 who had taken basic clothing construction but no advanced courses. Those students who had not taken basic clothing construction but who received a score of 75 percent or better on the examination were allowed to waive the course. No significant differences existed between the two sets of scores indicating that the students who waived the course had knowledge similar to those students who had taken the course. Further results indicated that the number of years of clothing construction taken in junior high and high school did not correlate significantly with the examination scores. The explanation offered was that it might be the quality rather than the quantity of clothing construction experience that is important in high school. Another explanation given was that the waiver examination was definition oriented and that many junior high and high school classes do not emphasize definitions. Results of the study also showed that students

who took clothing construction courses in junior high and high school may not have acquired the necessary skills and knowledge from their classes. The researcher recommended that additional research be conducted concerning the relationship between the type of experience in clothing construction and its relationship to achievement.

From the studies reviewed, past clothing construction experience was an important factor in determining achievement in some college clothing courses. In all of the studies, a written instrument was one component used for evaluating student knowledge. Researchers generally agreed that some other type of evaluation instrument was needed to use along with the written component to more effectively assess student knowledge and skill in basic clothing construction.

## Instruments Developed for Use in Individualized Instruction in Basic Clothing Construction

At Pennsylvania State University, Reich (1971) focused on the improvement of instruction. Major goals of the study were to develop a self-instructional program which would teach a skill by directing the student to an understanding of the processes involved in clothing construction and to evaluate the self-instructional program by comparing students at different experience levels using programmed materials. Sixteen programmed units were developed and two garments were designed to incorporate most of the basic clothing construction techniques presented in the units and to resemble a commercial pattern as nearly as possible. A third garment design included more advanced techniques for use as a control measure for transfer of knowledge. Students were placed into groups of low, medium, and high according

to information on the experience index sheet and written pretest scores. The low group was assigned the clothing construction programmed book Sewing Step-by-Step; the other groups used a combination of prepared slides, teacher explanations, and programmed unit manuals. Scores were based on how well students evaluated their work rather than on actual construction skill. It was found that students who entered the course with limited experience achieved as high a level of conceptual learning as that of students with broader experiences. Reich found that the programmed content was of greater importance than the method of presentation and the manner in which students used the programmed materials and their particular experience level had little effect on the way in which garments were evaluated.

Epps (1972) developed a battery of evaluation devices for pretesting and planning for individualized instruction for students in basic clothing construction at Winthrop College. The evaluation devices included an experience inventory for use with both practical and written pretests. The purpose of the study was to investigate the relationship between written pretest scores, practical pretest scores, previous sewing experience levels, written post test scores, and final course grades. The written examination included questions from ten construction areas. The practical examination involved cutting, marking, and constructing a section of a half-scale bodice to be completed during a two-hour laboratory period. Students received a printed pattern and a sketch of the finished garment; they supplied their own fabric, sewing equipment and thread. The study revealed that both the practical pretest scores and experience levels were significantly related ($p<.01$) to scores made on the written pretest. Epps concluded

that the examination was a valid predictive measure which could be used for planning individualized instruction and thereby recommended that 1) the practical examination be omitted because of time involved in organizing, administering, and scoring; 2) the questionnaire be omitted; 3) self-instructional laboratory lessons be assigned to students who scored below the mean on a particular subtest item.

At Marycrest College in Iowa, the beginning course in clothing construction was modified to facilitate individualized instruction and an effective diagnostic evaluation system was needed (Peterson, 1975). This system would identify knowledge and competencies in fitting and altering, flat pattern designing, and clothing construction. The results of the evaluation would be used to place students at the appropriate instructional level within the course. As the student demonstrated sufficient knowledge, skill, and ability, flat pattern methods of designing would be introduced. Peterson proposed, on this basis, to 1) develop a written and a performance examination to measure clothing construction competencies, 2) develop a rating scale for the performance examination, 3) analyze the instruments for validity and reliability, 4) assess the feasibility of the rating scale and examinations in terms of time, cost, and ease of administration, and 5) evaluate the effectiveness of the devices in identifying and differentiating those students with much knowledge and construction skill from those with limited experience. The written and performance examinations were based on 14 identified construction areas with the written part being objective. The four performance problems were designed to measure various skills. Problem I measured skill in marking, stitching, and pressing a dart; applying and securing interfacing; preparing a facing

edge; and marking and making a buttonhole on a half-scale bodice front with a self-faced front closure. Problem II was an A-line skirt front, also in half-scale, designed to measure ability in measuring a hem; controlling fullness on a concave hem edge; applying hem tape and hand stitching the hem. Problem III was designed to assess the student's ability in applying interfacing to a flat collar, controlling fabric bulk and curved edges, and understitching. Problem IV contained one half of a full-scale bodice and sleeve in order to measure skill in applying interfacing; making a continuous bound placket, controlling fabric by grading; applying a straight band; and gathering and setting in a sleeve. The performance portion was to be completed in a 100-minute period while the written portion was planned for a 50-minute period. To insure that the examination could be completed within the allotted time, the performance problems were prepared in advance. All materials were pre-cut, marked and stapled together with a direction sheet and placed in a large manila envelope. Each student supplied his/her own sewing notions.

A total of 69 students participated in the study. Each packet was evaluated by two raters who held master's degrees in clothing and textiles and who had at least five years of current experience teaching advanced clothing construction. Each rater was given a copy of the rating scale which included detailed descriptors. The rater circled the number corresponding to the descriptor which most closely matched the performance of the student. Standard statistical procedures were used to analyze the instruments for reliability. The written and performance instruments had content validity and reliability and, therefore, could be used with confidence. The wide range of scores

indicated that the written examination discriminated between high and low achievers and that the instrument effectively measured student knowledge of clothing construction and application of principles. The high correlation between the total scores assigned by raters and the high correlation values for a majority of items within each component established the reliability of scores on the rating scale. The wide range of total scores made by students showed that the performance instrument could be used to indicate competencies in basic clothing construction skills and would, therefore, discriminate among students. The performance instrument and rating scale were effective in measuring the extent and quality of construction skills of students. Both the written and performance instruments were considered by the researcher to be feasible in terms of time, expense, ease of administration, and evaluation. Since the instruments were based on objectives that are characteristic of most beginning clothing construction courses, they could be adapted for use at other colleges and universities.

## Studies Conducted at Oklahoma State University

At Oklahoma State University there has been some work toward developing, revising and/or testing of instruments for use in the basic clothing construction course since 1959. The work was initiated by Walsh in 1959 by revising an existing departmental pretest to be used along with a questionnaire. The pretest was an attempt to provide an objective evaluation instrument that could be used to differentiate between the experienced and non-experienced beginning student with regard to clothing construction. Walsh's study did not include administering the examination to a pilot group, but she did recognize that

the instrument was not flawless and that there was much room for improvement. She suggested that the most effective way of developing a better examination was to use the one already in existence, study the results, and offer suggestions for revision. The pretest was then used at Oklahoma State University.

Witt (1961) used examinations of 112 freshman clothing students and conducted an item analysis on the pretest which had been revised by Walsh. The items which were discriminating were used as a basis for revision of the pretest. Additional items were used along with the discriminating ones and a new format was developed using grouped matching, multiple choice and true-false items. Witt also developed a station-to-station practical examination in which materials and instructions for a specified problem were provided for the students at each station. During a 50-minute period the students moved to each of the seven stations and performed the assigned tasks. The performance of each student was rated by the instructor and an item analysis was used to ascertain which items were discriminating. Results showed that the station-to-station examination had more discriminating items than did the written examination. Witt concluded that there was a need to evaluate different types of clothing competencies in order to place students most satisfactorily in their clothing courses and recommended that further studies be conducted for refinement of evaluation devices developed in the study.

Berry (1963) and Gould (1963) worked on refining the previously developed instruments. Berry's study focused on revision of and further development of the written portion of the examination. A pilot study was conducted with students enrolled in basic clothing

construction during fall 1962 to obtain information to be used as a basis for revising the original pretest which had been developed by Walsh and revised by Witt. An item analysis was performed and the results were used to ascertain the need for further revision of the examination. Data revealed that many of the items were not within the difficulty and discrimination range considered desirable for an evaluation instrument. The test was examined by staff members who taught the basic clothing construction course and further revision of the pretest was made according to suggestions and criticisms offered. The revised pretest was administered to 76 beginning clothing students during spring 1963. Data obtained were used to correlate rank on the revised instrument with rank on the unrevised instrument and to correlate pretest scores with final course grade. Results indicated that the revised pretest was neither too difficult nor too easy as indicated by the scores; there were no perfect nor no zero scores. The mean scores made on the original pretest and on the revised examination tended to be similar. Although the pretest was not designed to predict success in the basic clothing course, a correlation coefficient of .44 was obtained between pretest scores and final course grade. Berry recommended that the examination be revised before use and that a variety of evaluative instruments be used along with the written examination.

Gould (1963) focused on the revision and further development of a performance examination which was to be used in conjunction with the written examination. Witt's station-to-station examination was pilot tested by Gould with 24 students to determine the revisions to be made. Results of the pilot study revealed that 1) confusion was created by the constant moving of students between stations, 2) traffic congestion

was caused by some problem requiring more time than others, and 3) a shortage of supplies was caused by some students using more supplies than needed. It was also found that students working on the same problem tended to influence the work of others around them. On the basis of these results, the performance examination was revised and five problems were chosen for its use. The method of administration was changed as well because of the reasons previously stated. Equipment, supplies, and instructions for each of the five problems were placed in a large manila envelope for student use. Other sewing equipment was made available for the students to use as needed. At the end of the hour each student handed the envelope back to the instructor for scoring. This procedure reduced the time needed for setting up the room as well as reducing the cost of administering the examination.

The revised performance examination was given to 77 students and an item analysis was performed. A correlation was calculated to determine the relationship between scores on the written and performance examinations. Gould (1963) reported a correlation coefficient of .70 which indicated that scores from the two examinations were related to some degree. However, a high score on one examination did not insure that one would make a high score on the other examination.

Conclusions from Witt (1961), Berry (1963), and Gould (1963) indicated that using the performance examination in conjunction with the written examination was more effective when pretesting students in beginning clothing construction. In the next few years an increasing number of students taking the examination created a problem in which an excessive amount of time was being spent by the instructor in preparing, administering, and scoring the performance section of the

examination. Therefore, in 1968, a part-time instructor made further revisions and the performance examination was omitted. The revised form was used at Oklahoma State University as an exemption test until 1972. Those students who scored 85 percent or better on the written examination were required to sew a dress to be evaluated for construction detail. If it was satisfactory, the student was exempted from the basic clothing course and was allowed to enroll in a more advanced clothing construction course.

Souligny's research (1971) focused on evaluating the existing clothing exemption test by: 1) subjecting it to an item analysis; 2) determining the reliability of the examination; and, 3) comparing scores on the examination given as an exemption test with scores on the same test given as a final examination. The examination was given to 398 students who were divided into two groups. Group I, 267 students, took the examination for exemption. Group II consisted of 131 students who took the examination as a final examination after completion of the beginning clothing construction course. Tests from both groups were scored and statistically compared. Item analysis data of responses of students in Group I and Group II were reviewed. Souligny concluded that the discrimination power of the examination was greater as an exemption test than as a final examination and that based on the item analysis data, the examination was an acceptable measuring device. When given as an exemption test, 31 percent of the items had good discriminating power; 55 percent had satisfactory discriminating power and only 14 percent had poor discriminating power. Results also supported Souligny's hypothesis that the mean score of those taking the examination as a final after completion of the beginning clothing construction

course would be higher than those who took it as an exemption test.

After further analysis and evaluation the practical component was deleted and the written examination was used as an advanced standing examination between 1972 and 1976, inclusive. Students who made 85 or above on the examination received credit for the basic clothing construction course.

Another study conducted at Oklahoma State University focused on how the cathode ray tube terminal could be used successfully for computer-generated testing in the basic clothing construction course. The study was limited to the adaptation of the final examination for computer use. Good (1974) used a control and an experimental group. The 26 students in the control group took the final examination as a regular paper-and-pencil test during the regularly scheduled final examination period. The 24 students in the experimental group took the final examination via the cathode ray tube terminal. Test items were divided into 13 subject matter categories, keypunched and stored on computer discs. The number of questions from each category was specified by the instructor prior to the date of testing. The students in the experimental group signed up for a convenient time to take the examination during finals week. When a student entered the code requesting the examination, the computer selected 100 items which included a specified random number of items from each of the 13 subject matter categories. Upon completion of the examination, the student's score was flashed on the screen and the student filled out a questionnaire to ascertain his/her attitude concerning the advantages and disadvantages of the computer-generated examination.

A majority of students preferred the computer-generated examination to the paper-and-pencil test because it was easy to read and the student's score was immediately available upon completion of the examination. Many of the students also indicated that the computer-generated examination was faster to take than the paper-and-pencil test. On the other hand, there were a few students who were disturbed by noise in the computer terminal area and some thought that they were at a disadvantage by not having a copy of all test items in front of them.

The t-test was used to analyze differences between the control and experimental groups. Means, standard deviations, and variances were very similar, therefore, the t-statistic was not significant. Good concluded that computer-generated testing was at least as effective as paper-and-pencil testing and may have additional advantages.

> Computerized testing is particularly desirable in college and university courses designed for individualized instruction. . . . With the computer, tests are available in a matter of seconds, and no student must take the same form of test twice. Cheating can be kept to a minimum since a different test can be generated for each student (Wilkins and Sisler, 1971, p. 677).

Through the years the clothing exemption test had been used in various ways including combinations of written and/or practical/performance items. Those students who passed the examination were allowed to enroll in a more advanced clothing construction course. Because of a need for revision, the clothing exemption test was discontinued in 1976. There is a need for concentrated review and revision and for the development of a large item pool from which advanced standing examinations can be compiled for use in basic clothing construction.

# CHAPTER III

## PROCEDURES AND ANALYSIS OF DATA

The purpose of the study was to develop an item pool from which selected advanced standing examinations can be compiled for use in basic clothing construction. Data used in the development of the item pool included results of 1) a comparison of experience checklist scores and advanced standing examination scores and 2) a comparison of scores made by students in the basic clothing construction course on written examinations and practical assignments. Item analysis data from the written examinations currently used in the basic clothing construction course were used to identify items which might be acceptable for inclusion in the item pool.

### Description of Data

Two sets of data were examined in the study. The first set of data included advanced standing examination scores and experience checklist scores of the students who completed the advanced standing examination between fall 1972 and fall 1975, inclusive. During the time the exmination was offered for advanced standing credit, 47 students took the examination and completed the experience checklist. The advanced standing examination was discontinued during 1976 because of a need for concentrated review and revision. The second set of data consisted of scores obtained from written and practical assignments of the

285 students who were enrolled in basic clothing construction between fall 1975 and fall 1977, inclusive.

## Collection and Analysis of Data

Advanced standing examination scores and experience checklist scores for each student were paired. The pairs of scores were coded from 1 to 47. The Pearson product-moment correlation coefficient was calculated to determine the degree of relationship between the scores from the experience checklist and from the advanced standing examination. The results from this analysis were used as an indication of whether the experience checklist was a good predictor of student knowledge in the area of clothing construction.

A second correlation coefficient was computed using scores made by students enrolled in the basic clothing construction course on written examinations and practical assignments between fall 1975 and fall 1977, inclusive, to determine the degree of relationship between the practical scores and the written examination scores. A written score was calculated for each of the 285 students by averaging the scores made on the three written examinations given in the course (CTM 1103). A practical score was calculated for each of the 285 students by averaging scores made on the three practical assignments in the course (CTM 1103): 1) sample bodice, 2) dress, and 3) notebook containing samples of specified construction techniques. The results of this analysis were used as an indication of whether skill in clothing construction could be measured by a written examination or whether a practical component needed to be included as a part of an advanced standing examination.

A list of topic areas included in the basic clothing construction course was obtained from the instructor of the course. Based on the item analysis data from the written examinations currently being used in the basic clothing course, items with a difficulty range of 40 to 70 and a discrimination index of 40 or greater were identified and included in the appropriate topic area when developing the item pool. Additional items were then developed for each topic and a table of specifications was compiled to indicate the level of learning measured by each of the 571 items.

# CHAPTER IV

# FINDINGS

The purpose of the study was to develop an item pool from which selected advanced standing examinations can be compiled for use in basic clothing construction. The study included an analysis of two sets of data. The first set of data included advanced standing examination scores and experience checklist scores of the 47 students who took the examination for advanced standing credit between fall 1972 and fall 1975, inclusive. The second set of data consisted of scores obtained from written examinations and practical assignments of 285 students enrolled in basic clothing construction between fall 1975 and fall 1977, inclusive.

The study was conducted in three phases. The first phase included the examination and testing of hypotheses and the determination of correlation coefficients for the two sets of data. The second phase included the review of item analysis data from the current basic clothing construction written examinations and phase three consisted of the development of an item pool from which selected advanced standing examinations can be compiled.

## Phase I - Examination of Hypotheses

The Pearson product-moment correlation coefficient was used to test the two hypotheses. The first set of data consisted of scores of

the 47 students who completed the advanced standing examination between fall 1972 and fall 1975, inclusive. Scores from the experience checklist and the advanced standing examination were paired and coded from 1 to 47 (Appendix A, p. 44). The Pearson product-moment correlation coefficient was calculated to test the first hypothesis which was that there would be no significant correlation between the scores from the advanced standing examination and the experience checklist scores of students who took the clothing examination for advanced standing credit from fall 1972 to fall 1975, inclusive. Tabulation of data revealed that 85 percent of the students scored higher on the advanced standing examination than on the experience checklist, while five percent scored higher on the experience checklist than on the advanced standing examination. Four percent scored the same on both instruments.

Results of the correlation (Table I) supported the null hypothesis and indicated a very low, insignificant degree of relationship between the two scores ($r = .15$; $p < .32$). This would tend to indicate that the score on the experience checklist exhibited relatively little indication as to how the student performed on the advanced standing examination. Scores on the two instruments were not significantly related and a high score on one instrument did not insure a high score on the other instrument.

The second set of data consisted of scores of 285 students enrolled in basic clothing construction between fall 1975 and fall 1977, inclusive. Scores from the practical assignments and written examinations completed in the class were paired and coded from 1 to 285 (Appendix B, p. 46). The Pearson product-moment correlation coefficient was calculated to test the second hypothesis which was that there

would be no significant correlation between written examination scores and practical assignment scores of students enrolled in basic clothing construction from fall 1975 to fall 1977, inclusive. The correlation was calculated to determine the degree of relationship between the scores from the practical assignments and the written examinations. The resulting information was used to determine whether to include a practical examination as a part of the advanced standing examination.

TABLE I

PEARSON PRODUCT-MOMENT CORRELATION OF EXPERIENCE CHECKLIST SCORES WITH ADVANCED STANDING EXAMINATION SCORES OF STUDENTS BETWEEN 1972 AND 1975 (N=47)

| Variables | Mean | Standard Deviation | Pearson r | Significance Level |
|---|---|---|---|---|
| Experience checklist | 68.30 | 9.21 | .15 | N.S. |
| Advanced standing examination | 80.55 | 7.80 | | |

Tabulation of data revealed that 95 percent of the students scored higher on the practical assignments than on the written examinations while four percent scored higher on the written examinations than on the practical assignments. One percent scored the same on both

practical and written. A significant correlation (r= .58; p<.0001) existed between the practical assignment scores and the written examination scores of the 285 students enrolled in basic clothing construction from fall 1975 to fall 1977, inclusive. (See Table II.) This would tend to indicate that student performance on the practical assignments was significantly related to student performance on the written examinations.

TABLE II

PEARSON PRODUCT-MOMENT CORRELATION OF PRACTICAL ASSIGNMENT SCORES WITH WRITTEN EXAMINATION SCORES OF STUDENTS BETWEEN 1975 AND 1977 (N=285)

| Variables | Mean | Standard Deviation | Pearson r | Significance Level |
|---|---|---|---|---|
| Practical assignment scores | 87.16 | 8.03 | .58 | .0001 |
| Written examination scores | 73.45 | 9.54 | | |

Phase II - Item Analysis of Written Examinations

The second phase of the study consisted of item analysis of the written examinations currently being used in basic clothing

construction. Computer answer cards which had been used by students during the fall 1977 and spring 1978 semesters were obtained for forms A, B, and C of each of three written examinations. They were then processed through the university computer to ascertain the difficulty level and discrimination index for each of the 50 test items on each form on the three examinations (a total of 450 questions). (See Appendix D, p. 53.) After consulting several sources (Ahmann and Glock, 1975; Cross, 1973; and Sax, 1974) a difficulty range of 40-70 and a discrimination index of 40 or greater was established for acceptance of the item as a discriminating item of medium difficulty. The 51 items which fell into this category were identified for future use in the development of the item pool.

## Phase III - Development of the Item Pool

The third phase of the study consisted of the actual development of the item pool. Based on results of data obtained from Phase I, it was concluded that the experience checklist and practical examination components were non-essential parts of an advanced standing examination. A list of topic areas to be included in basic clothing construction was obtained from the instructor of the course. The 24 topic areas included were basic fabric facts; fabric preparation; fabric layout and cutting; marking the fabric; sewing machine parts and their function; basic pressing equipment and principles; small equipment; hand basting; machine stitching; darts; seams; seam finishes; removing bulk; extended facings; bias bindings; buttonholes; buttons; fasteners; zipper application; plackets; hems; pattern selection; selection, application, and purpose of interfacing, facings, and lining; and

fabric selection.

Data from Phase II were used to determine which items from the written examinations currently being used in basic clothing construction were acceptable items for use in the item pool. Items with a difficulty range of 40-70 and a discrimination index of 40 or greater were used in the appropriate section. These items are marked with an (*) on the item analysis data (Appendix D, p. 53). Only 51 items on the three forms of the three examinations qualified for use in the item pool. Additional test items were developed for each of the 24 topic areas using a variety of resources (Appendix C, p. 51) including textbooks, workbooks, and the item analysis data from the written examinations currently being used in basic clothing construction.

Upon completion of the first draft of the item pool, it was critiqued by a professor of clothing and textiles and by a class of eight graduate students who were enrolled in a graduate level evaluation course. The nine people evaluated the items for sentence structure, clarity, understandability, and agreement of answer with the item, and made suggestions for revision of items. When copies of the item pool were returned to the researcher, suggestions from the evaluators were considered and appropriate corrections were made on the basis of their comments. The number and type of items developed per section are shown in Table III. The number of items developed per section varied from a minimum of 6 to a maximum of 46 depending on the amount of factual information included in the corresponding topic area. All items were objective, either multiple choice, true-false, or matching. There were a total of 311 multiple choice items, 223 matching items and 37 true-false items which made a pool of 571 items

TABLE III

NUMBER AND TYPE OF ITEMS INCLUDED IN THE ITEM POOL FOR EACH TOPIC AREA

| Topic Area | Type of Items | | | Total |
|---|---|---|---|---|
| | Multiple Choice | Matching | True False | |
| Basic fabric facts | 12 | 9 | 1 | 22 |
| Fabric preparation | 12 | 9 | 3 | 24 |
| Fabric layout and cutting | 15 | 21 | 11 | 47 |
| Marking the fabric | 12 | 7 | 1 | 20 |
| Sewing machine parts and their function | 32 | 12 | 2 | 46 |
| Basic pressing equipment and principles | 6 | 13 | 4 | 23 |
| Small equipment | 3 | 12 | - | 15 |
| Hand basting | 10 | - | 2 | 12 |
| Machine stitching | 22 | 13 | 1 | 36 |
| Darts | 7 | 13 | 1 | 21 |
| Seams | 7 | 16 | - | 23 |
| Seam finishes | 8 | 22 | 2 | 32 |
| Removing bulk | 16 | 17 | - | 33 |
| Extended facings | 6 | - | - | 6 |
| Bias bindings | 8 | 3 | - | 11 |
| Buttonholes | 15 | 25 | - | 40 |
| Buttons | 16 | - | 3 | 19 |
| Fasteners | 12 | - | - | 12 |
| Zipper application | 14 | 3 | 1 | 18 |
| Plackets | 6 | - | 1 | 7 |
| Hems | 16 | 13 | 1 | 30 |
| Pattern selection | 15 | - | - | 15 |
| Selection, application, and purpose of interfacing, facing and lining | 23 | 15 | 2 | 40 |
| Fabric selection | 18 | - | 1 | 19 |
| Total items | 311 | 223 | 37 | 571 |

from which a specified number of items for an advanced standing examination could be selected. Many of the test items included diagrams or drawings which were adapted from the various sources listed in Appendix C.

A table of specifications was compiled to indicate the level of learning measured by each of the 571 items. A total of 280 items (49.0%) measured learning at the knowledge level, 189 items (33.0%) measured learning at the application level, 77 items (13.4%) measured learning at the analysis level and 25 items (4.4%) measured learning at the evaluation or synthesis level. (See Table IV.)

TABLE IV

TABLE OF SPECIFICATIONS FOR POOL OF ITEMS

| Topic Area | Knowledge | Application | Analysis | Evaluation or Synthesis | Total N | Total % |
|---|---|---|---|---|---|---|
| Basic fabric facts | 15 | 7 | - | - | 22 | 3.8 |
| Fabric preparation | 11 | 12 | 1 | - | 24 | 4.2 |
| Fabric layout and cutting | 9 | 11 | 9 | 18 | 47 | 8.2 |
| Marking the fabric | 18 | 2 | - | - | 20 | 3.5 |
| Sewing machine parts and their function | 33 | 8 | 11 | - | 52 | 9.1 |
| Basic pressing equipment and principles | 16 | 5 | 2 | - | 23 | 4.0 |
| Small equipment | 15 | - | - | - | 15 | 2.6 |
| Hand basting | 7 | 4 | 1 | - | 12 | 2.1 |
| Machine stitching | 25 | 3 | 3 | - | 31 | 5.4 |
| Darts | 11 | 10 | - | - | 21 | 3.7 |
| Seams | 1 | 16 | 6 | - | 23 | 4.0 |
| Seam finishes | 6 | 21 | 5 | - | 32 | 5.6 |
| Removing bulk | 13 | 17 | 3 | - | 33 | 5.8 |
| Extended facings | 1 | 3 | - | 3 | 7 | 1.2 |
| Bias bindings | 2 | 7 | - | 2 | 11 | 1.9 |
| Buttonholes | 34 | 2 | 3 | 1 | 40 | 7.0 |
| Buttons | 10 | 5 | 2 | 1 | 18 | 3.2 |
| Fasteners | 3 | 9 | - | - | 12 | 2.1 |
| Zipper application | 9 | 4 | 5 | - | 18 | 3.2 |
| Plackets | 5 | 2 | - | - | 7 | 1.2 |
| Hems | 11 | 17 | 1 | - | 29 | 5.1 |
| Pattern selection | 4 | 1 | 10 | - | 15 | 2.6 |
| Selection, application, and purpose of interfacing, facings and lining | 17 | 17 | 6 | - | 40 | 7.0 |
| Fabric selection | 4 | 6 | 9 | - | 19 | 3.3 |
| Total | 280 | 189 | 77 | 25 | 571 | |
| Percentage | 49.0 | 33.0 | 13.4 | 4.4 | | 99.8[a] |

[a]Total does not equal 100 percent because of rounding.

# CHAPTER V

## SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of the study was to develop an item pool from which selected advanced standing examinations can be compiled for use in basic clothing construction. Data used in the development of the item pool included results of a comparison of experience checklist scores and advanced standing scores of students who took the examination for advanced standing credit between fall 1972 and fall 1975, inclusive, and a comparison of written examination scores and practical assignment scores of students enrolled in the basic clothing construction course between fall 1975 and fall 1977, inclusive. Data were also obtained from an item analysis of written examinations currently being used in basic clothing construction to determine items which would be acceptable for inclusion in the item pool.

Scores from the experience checklists and advanced standing examinations and from the practical assignments and written examinations were paired. The Pearson product-moment correlation coefficient was calculated for each set of scores to determine the degree of relationship. Results of the analysis were used as an indication of whether the experience checklist was a good predictor of student knowledge and of whether a practical component needed to be included as a part of an advanced standing examination.

A list of topic areas which were included in the basic clothing construction course was obtained and a table of specifications was developed. Objectives for each of the 24 topic areas were written and the item analysis data from the written examinations currently being used in basic clothing construction were reviewed in order to select items for possible use in the item pool. Items within a specified range were identified for use in the appropriate topic section. The item pool was then developed.

Upon completion of the first draft of the item pool, it was critiqued by a professor of clothing and textiles and by a class of eight graduate students who were completing a graduate level course in evaluation. Suggestions were considered and appropriate corrections were made on the basis of their comments.

No significant correlation was found between the scores from the advanced standing examination and the experience checklist scores. This would tend to indicate that the score on the experience checklist exhibited relatively little indication as to how the student performed on the advanced standing examination and that a high score on one instrument did not insure a high score on the other.

A significant correlation was found between the practical assignment scores and written examination scores. This would tend to indicate that performance on the practical assignments was significantly related to performance on the written examinations.

## Discussion and Conclusions

Past research has indicated that a practical examination was a necessary component of a pre-assessment instrument when used to

evaluate student performance in basic clothing construction. Researchers generally agreed that the accuracy of measurement was enhanced by the inclusion of a practical examination and/or an experience checklist.

Results of the study revealed that having a student enumerate his/her clothing construction experiences gave no significant indication as to how well he/she would perform on a written examination in basic clothing construction. Further results indicated that scores made by students on practical assignments were significantly related to student performance on written examinations. Therefore a practical examination may not be a necessary component of an advanced standing examination when being used to assess knowledge and skill of students in basic clothing construction.

## Recommendations for Further Development and Use of the Item Pool

The study consisted of the development of an item pool from which selected advanced standing examinations can be compiled for use in basic clothing construction. Recommendations for further development and use of the item pool include the following:

1. To assess the validity and reliability, the pool of items should be critiqued by a panel of persons knowledgeable in the field of clothing and textiles before being administered to students as an advanced standing examination.
2. More items should be developed, particularly for those topic areas having relatively few items, so that items may be used on a rotating basis.

3. Items from the item pool should be used in the basic clothing construction course so that item analysis data will be available for further revision of individual items.
4. Investigate the feasibility of administering the advanced standing examination as a computer-generated examination. A predetermined number of items from each of the 24 topic areas could be randomly selected from the item pool by the computer, making each examination different. The computer could generate a test at any time, allowing a student to take the examination at any time during the semester.
5. Determine competencies expected of students at the end of the basic clothing construction course and evaluate the item pool to determine whether the competencies are being measured.

## Recommendations for Further Research

Additional investigations could be made to determine the competencies which are being tested in basic clothing construction courses at other universities. Various types of instruments used for placement and for advanced standing should be studied to determine whether they include a performance component as well as a written component. A survey could be made to ascertain how many colleges and universities use an advanced standing examination to award credit to students who attain a specified level of achievement in clothing construction and to determine whether advanced standing examinations are different from placement examinations. Investigations could be made to ascertain the relationship between the types of past experience in clothing construction and achievement in clothing construction.

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# APPENDIX A

## SCORES OF STUDENTS ON EXPERIENCE CHECKLIST AND ADVANCED STANDING EXAMINATION

TABLE V

SCORES OF STUDENTS ON EXPERIENCE CHECKLIST
AND ADVANCED STANDING EXAMINATION

| Student Number | Experience Checklist | Advanced Standing Examination | Student Number | Experience Checklist | Advanced Standing Examination |
|---|---|---|---|---|---|
| 1 | 63 | 89 | 25 | 62 | 91 |
| 2 | 71 | 91 | 26 | 67 | 84 |
| 3 | 77 | 73 | 27 | 56 | 79 |
| 4 | 48 | 84 | 28 | 70 | 77 |
| 5 | 60 | 70 | 29 | 65 | 79 |
| 6 | 58 | 81 | 30 | 71 | 77 |
| 7 | 55 | 70 | 31 | 79 | 76 |
| 8 | 66 | 81 | 32 | 80 | 86 |
| 9 | 79 | 82 | 33 | 61 | 82 |
| 10 | 85 | 84 | 34 | 80 | 80 |
| 11 | 87 | 88 | 35 | 63 | 80 |
| 12 | 63 | 64 | 36 | 63 | 73 |
| 13 | 82 | 86 | 37 | 59 | 66 |
| 14 | 74 | 80 | 38 | 63 | 94 |
| 15 | 67 | 66 | 39 | 69 | 88 |
| 16 | 74 | 91 | 40 | 74 | 87 |
| 17 | 55 | 89 | 41 | 81 | 82 |
| 18 | 69 | 89 | 42 | 81 | 81 |
| 19 | 59 | 90 | 43 | 65 | 79 |
| 20 | 78 | 92 | 44 | 60 | 75 |
| 21 | 69 | 82 | 45 | 69 | 72 |
| 22 | 75 | 80 | 46 | 62 | 71 |
| 23 | 53 | 82 | 47 | 76 | 63 |
| 24 | 67 | 80 | | | |

85% of the students scored higher on Advanced Standing Examination.
11% of the students scored higher on Experience Checklist.
4% of the students scored the same on both.

# APPENDIX B

## SCORES OF STUDENTS ON PRACTICAL ASSIGNMENTS AND WRITTEN EXAMINATIONS

TABLE VI

SCORES OF STUDENTS ON PRACTICAL ASSIGNMENTS AND WRITTEN EXAMINATIONS

| Student Number | Written Examination Scores | Practical Assignment Scores | Student Number | Written Examination Scores | Practical Assignment Scores |
|---|---|---|---|---|---|
| 1 | 78 | 90 | 43 | 60 | 70 |
| 2 | 54 | 94 | 44 | 61 | 77 |
| 3 | 84 | 88 | 45 | 63 | 88 |
| 4 | 47 | 48 | 46 | 79 | 79 |
| 5 | 73 | 90 | 47 | 73 | 75 |
| 6 | 75 | 76 | 48 | 70 | 75 |
| 7 | 77 | 92 | 49 | 73 | 82 |
| 8 | 65 | 85 | 50 | 54 | 72 |
| 9 | 82 | 92 | 51 | 59 | 69 |
| 10 | 68 | 86 | 52 | 75 | 88 |
| 11 | 68 | 89 | 53 | 62 | 62 |
| 12 | 77 | 94 | 54 | 80 | 96 |
| 13 | 76 | 91 | 55 | 72 | 96 |
| 14 | 57 | 73 | 56 | 66 | 83 |
| 15 | 73 | 85 | 57 | 58 | 79 |
| 16 | 69 | 80 | 58 | 65 | 69 |
| 17 | 60 | 91 | 59 | 70 | 86 |
| 18 | 72 | 84 | 60 | 73 | 89 |
| 19 | 69 | 84 | 61 | 79 | 88 |
| 20 | 61 | 68 | 62 | 75 | 99 |
| 21 | 71 | 80 | 63 | 85 | 94 |
| 22 | 76 | 96 | 64 | 88 | 97 |
| 23 | 70 | 93 | 65 | 80 | 89 |
| 24 | 82 | 92 | 66 | 77 | 80 |
| 25 | 83 | 95 | 67 | 78 | 78 |
| 26 | 61 | 83 | 68 | 83 | 90 |
| 27 | 71 | 91 | 69 | 63 | 77 |
| 28 | 69 | 81 | 70 | 70 | 82 |
| 29 | 66 | 74 | 71 | 76 | 94 |
| 30 | 85 | 93 | 72 | 69 | 88 |
| 31 | 74 | 94 | 73 | 87 | 96 |
| 32 | 66 | 78 | 74 | 77 | 92 |
| 33 | 73 | 94 | 75 | 83 | 88 |
| 34 | 64 | 88 | 76 | 75 | 92 |
| 35 | 72 | 87 | 77 | 77 | 89 |
| 36 | 61 | 93 | 78 | 66 | 82 |
| 37 | 77 | 73 | 79 | 67 | 85 |
| 38 | 65 | 95 | 80 | 79 | 86 |
| 39 | 78 | 91 | 81 | 82 | 98 |
| 40 | 74 | 84 | 82 | 67 | 85 |
| 41 | 51 | 75 | 83 | 77 | 80 |
| 42 | 55 | 77 | 84 | 67 | 79 |

TABLE VI (Continued)

| Student Number | Written Examination Scores | Practical Assignment Scores | Student Number | Written Examination Scores | Practical Assignment Scores |
|---|---|---|---|---|---|
| 85 | 84 | 90 | 130 | 75 | 88 |
| 86 | 80 | 93 | 131 | 64 | 88 |
| 87 | 62 | 88 | 132 | 80 | 98 |
| 88 | 85 | 96 | 133 | 69 | 76 |
| 89 | 84 | 99 | 134 | 76 | 95 |
| 90 | 76 | 91 | 135 | 61 | 76 |
| 91 | 72 | 89 | 136 | 56 | 87 |
| 92 | 82 | 89 | 137 | 84 | 94 |
| 93 | 67 | 87 | 138 | 81 | 90 |
| 94 | 77 | 95 | 139 | 76 | 94 |
| 95 | 60 | 77 | 140 | 67 | 86 |
| 96 | 84 | 98 | 141 | 80 | 93 |
| 97 | 77 | 87 | 142 | 83 | 95 |
| 98 | 36 | 64 | 143 | 79 | 95 |
| 99 | 48 | 73 | 144 | 80 | 94 |
| 100 | 86 | 93 | 145 | 76 | 88 |
| 101 | 77 | 91 | 146 | 81 | 97 |
| 102 | 75 | 83 | 147 | 48 | 71 |
| 103 | 70 | 89 | 148 | 75 | 80 |
| 104 | 65 | 86 | 149 | 76 | 93 |
| 105 | 73 | 92 | 150 | 69 | 91 |
| 106 | 89 | 93 | 151 | 63 | 88 |
| 107 | 71 | 81 | 152 | 64 | 84 |
| 108 | 83 | 94 | 153 | 85 | 89 |
| 109 | 72 | 85 | 154 | 71 | 89 |
| 110 | 90 | 94 | 155 | 83 | 96 |
| 111 | 69 | 87 | 156 | 78 | 97 |
| 112 | 74 | 85 | 157 | 55 | 79 |
| 113 | 89 | 91 | 158 | 76 | 92 |
| 114 | 80 | 86 | 159 | 78 | 98 |
| 114 | 81 | 94 | 160 | 86 | 98 |
| 116 | 67 | 84 | 161 | 72 | 98 |
| 117 | 64 | 90 | 162 | 75 | 94 |
| 118 | 63 | 90 | 163 | 86 | 97 |
| 119 | 75 | 96 | 164 | 64 | 76 |
| 120 | 53 | 77 | 165 | 74 | 95 |
| 121 | 84 | 95 | 166 | 74 | 85 |
| 122 | 68 | 69 | 167 | 71 | 89 |
| 123 | 72 | 95 | 168 | 82 | 91 |
| 124 | 77 | 93 | 169 | 83 | 94 |
| 125 | 84 | 95 | 170 | 76 | 94 |
| 126 | 82 | 97 | 171 | 71 | 94 |
| 127 | 78 | 88 | 172 | 81 | 97 |
| 128 | 74 | 88 | 173 | 73 | 83 |
| 129 | 85 | 93 | 174 | 70 | 86 |

TABLE VI (Continued)

| Student Number | Written Examination Scores | Practical Assignment Scores | Student Number | Written Examination Scores | Practical Assignment Scores |
|---|---|---|---|---|---|
| 175 | 89 | 81 | 220 | 82 | 91 |
| 176 | 77 | 84 | 221 | 76 | 81 |
| 177 | 57 | 79 | 222 | 68 | 88 |
| 178 | 81 | 93 | 223 | 78 | 93 |
| 179 | 67 | 79 | 224 | 78 | 82 |
| 180 | 81 | 97 | 225 | 83 | 92 |
| 181 | 80 | 95 | 226 | 76 | 91 |
| 182 | 83 | 98 | 227 | 79 | 85 |
| 183 | 79 | 89 | 228 | 58 | 87 |
| 184 | 75 | 85 | 229 | 74 | 84 |
| 185 | 67 | 84 | 230 | 87 | 96 |
| 186 | 60 | 94 | 231 | 82 | 86 |
| 187 | 69 | 73 | 232 | 57 | 80 |
| 188 | 72 | 85 | 233 | 68 | 67 |
| 189 | 76 | 90 | 234 | 75 | 88 |
| 190 | 86 | 90 | 235 | 80 | 88 |
| 191 | 75 | 98 | 236 | 78 | 92 |
| 192 | 85 | 91 | 237 | 62 | 82 |
| 193 | 57 | 90 | 238 | 84 | 80 |
| 194 | 64 | 86 | 239 | 82 | 90 |
| 195 | 73 | 77 | 240 | 86 | 90 |
| 196 | 91 | 89 | 241 | 86 | 71 |
| 197 | 57 | 88 | 242 | 73 | 92 |
| 198 | 67 | 66 | 243 | 79 | 81 |
| 199 | 82 | 96 | 244 | 82 | 93 |
| 200 | 71 | 79 | 245 | 61 | 87 |
| 201 | 79 | 88 | 246 | 77 | 80 |
| 202 | 69 | 90 | 247 | 77 | 91 |
| 203 | 76 | 86 | 248 | 87 | 86 |
| 204 | 77 | 91 | 249 | 86 | 85 |
| 205 | 70 | 88 | 250 | 73 | 89 |
| 206 | 80 | 96 | 251 | 76 | 92 |
| 207 | 61 | 95 | 252 | 69 | 86 |
| 208 | 69 | 84 | 253 | 58 | 71 |
| 209 | 81 | 93 | 254 | 85 | 81 |
| 210 | 69 | 81 | 255 | 83 | 89 |
| 211 | 59 | 62 | 256 | 71 | 93 |
| 212 | 79 | 97 | 257 | 79 | 89 |
| 213 | 82 | 95 | 258 | 79 | 87 |
| 214 | 85 | 96 | 259 | 89 | 93 |
| 215 | 64 | 87 | 260 | 90 | 96 |
| 216 | 74 | 73 | 261 | 72 | 85 |
| 217 | 90 | 98 | 262 | 72 | 87 |
| 218 | 85 | 90 | 263 | 73 | 89 |
| 219 | 60 | 64 | 264 | 39 | 85 |

TABLE VI (Continued)

| Student Number | Written Examination Scores | Practical Assignment Scores | Student Number | Written Examination Scores | Practical Assignment Scores |
|---|---|---|---|---|---|
| 265 | 74 | 82 | 276 | 63 | 86 |
| 266 | 61 | 83 | 277 | 65 | 92 |
| 267 | 70 | 80 | 278 | 78 | 91 |
| 268 | 68 | 84 | 279 | 75 | 89 |
| 269 | 82 | 97 | 280 | 72 | 91 |
| 270 | 66 | 92 | 281 | 68 | 85 |
| 271 | 91 | 94 | 282 | 88 | 100 |
| 272 | 86 | 95 | 283 | 70 | 89 |
| 273 | 68 | 83 | 284 | 77 | 87 |
| 274 | 75 | 83 | 285 | 83 | 91 |
| 275 | 84 | 94 | | | |

95% of the students scored higher on Practical Assignments.
4% of the students scored higher on Written Examinations.
1% of the students scored the same on both.

# APPENDIX C

## REFERENCES USED IN DEVELOPING THE ITEM POOL

## SELECTED REFERENCES

Bancroft, V.S. It's So, Sew Easy. Minneapolis: Burgess Publishing Company, 1970.

Erwin, M.D. and Kinchen, L.A. Clothing for Moderns. London: The Macmillan Company, 1969.

Hutton, J. and Cunningham, G. Singer Sewing Book, Revised Edition. The Singer Company, 1972.

Lewis, V.S. Comparative Clothing Construction Techniques. Minneapolis: Burgess Publishing Company, 1976.

Let Yourself Sew. New York: Simplicity Pattern Co. Inc., 1972.

Reader's Digest Complete Guide to Sewing. New York: The Reader's Digest Association, Inc., 1976.

Simplicity Sewing Book (Updated). New York: Simplicity Pattern Co. Inc., 1975.

The A B C's of Shortcut Sewing. New York: Simplicity Pattern Co. Inc., 1976.

The Vogue Sewing Book, Revised Edition. New York: Vogue Patterns, 1975.

Written Examinations from the basic clothing construction course at Oklahoma State University.

# APPENDIX D

## ITEM ANALYSIS DATA FROM CTM 1103

## WRITTEN EXAMINATIONS

TABLE VII

ITEM ANALYSIS DATA
CTM 1103 TEST IA
(N=80)

| Test 1A Question Number | Difficulty | Discrimination Index | Test 1A Question Number | Difficulty | Discrimination Index |
|---|---|---|---|---|---|
| | % | | | % | |
| 1 | 80.00 | 0.46 | 26 | 87.50 | 0.24 |
| *2 | 62.50 | 0.48 | 27 | 100.00 | 0.00 |
| 3 | 83.75 | 0.40 | 28 | 93.75 | 0.27 |
| 4 | 21.25 | 0.07 | 29 | 75.00 | 0.22 |
| 5 | 95.00 | 0.30 | 30 | 98.75 | 0.19 |
| 6 | 85.00 | 0.35 | 31 | 97.50 | 0.10 |
| 7 | 83.75 | 0.37 | 32 | 87.50 | 0.24 |
| 8 | 88.75 | 0.40 | 33 | 100.00 | 0.00 |
| 9 | 82.50 | 0.15 | 34 | 83.75 | 0.13 |
| *10 | 56.25 | 0.58 | 35 | 66.25 | 0.20 |
| 11 | 91.25 | 0.17 | 36 | 87.50 | 0.36 |
| 12 | 86.25 | 0.58 | *37 | 51.25 | 0.41 |
| 13 | 80.00 | 0.39 | 38 | 73.75 | 0.63 |
| 14 | 92.50 | 0.15 | 39 | 46.25 | 0.29 |
| 15 | 83.75 | 0.33 | 40 | 86.25 | 0.22 |
| 16 | 97.50 | 0.04 | *41 | 52.50 | 0.52 |
| 17 | 86.25 | 0.26 | 42 | 55.00 | 0.38 |
| 18 | 87.50 | 0.55 | 43 | 96.25 | 0.06 |
| 19 | 82.50 | 0.45 | *44 | 68.75 | 0.60 |
| 20 | 93.75 | 0.44 | 45 | 92.50 | 0.25 |
| 21 | 87.50 | 0.38 | *46 | 63.75 | 0.41 |
| 22 | 77.50 | 0.40 | 47 | 76.25 | 0.61 |
| 23 | 80.00 | 0.16 | 48 | 72.50 | 0.33 |
| 24 | 80.00 | 0.43 | 49 | 92.50 | 0.36 |
| 25 | 92.50 | 0.25 | 50 | 72.50 | 0.41 |

*Asterisk indicates items selected for inclusion in item pool.

TABLE VIII

ITEM ANALYSIS DATA
CTM 1103 TEST 1B
(N=48)

| Test 1B Question Number | Difficulty | Discrimination Index | Test 1B Question Number | Difficulty | Discrimination Index |
|---|---|---|---|---|---|
| | % | | | % | |
| 1 | 75.00 | 0.19 | 26 | 93.75 | 0.10 |
| 2 | 72.92 | 0.09 | 27 | 93.75 | 0.30 |
| 3 | 50.00 | 0.31 | 28 | 75.00 | 0.37 |
| 4 | 66.67 | 0.24 | 29 | 85.42 | 0.38 |
| 5 | 95.83 | 0.33 | 30 | 95.83 | 0.22 |
| 6 | 22.92 | -0.03 | 31 | 77.08 | 0.10 |
| 7 | 68.75 | 0.39 | 32 | 79.17 | 0.49 |
| *8 | 52.08 | 0.51 | 33 | 100.00 | 0.00 |
| 9 | 72.92 | 0.53 | 34 | 91.67 | 0.22 |
| 10 | 77.08 | 0.55 | 35 | 18.75 | -0.03 |
| 11 | 97.92 | 0.03 | 36 | 45.83 | 0.36 |
| 12 | 27.08 | 0.52 | 37 | 68.75 | 0.11 |
| 13 | 50.00 | 0.17 | 38 | 93.75 | 0.30 |
| 14 | 83.33 | 0.44 | 39 | 97.92 | 0.20 |
| 15 | 58.33 | 0.38 | 40 | 81.25 | 0.47 |
| 16 | 75.00 | 0.45 | 41 | 95.83 | 0.22 |
| 17 | 95.83 | 0.26 | 42 | 97.92 | 0.20 |
| 18 | 100.00 | 0.00 | 43 | 87.50 | 0.32 |
| 19 | 79.17 | 0.47 | 44 | 95.83 | 0.08 |
| 20 | 79.17 | 0.32 | 45 | 60.42 | 0.02 |
| 21 | 72.92 | 0.26 | *46 | 47.92 | 0.53 |
| 22 | 93.75 | 0.20 | 47 | 85.42 | 0.54 |
| 23 | 58.33 | 0.22 | 48 | 62.50 | 0.11 |
| 24 | 83.33 | 0.42 | 49 | 72.92 | -0.04 |
| 25 | 87.50 | 0.49 | 50 | 97.92 | -0.09 |

*Asterisk indicates items selected for inclusion in item pool.

TABLE IX

ITEM ANALYSIS DATA
CTM 1103 TEST 1C
(N=54)

| Test 1C Question Number | Difficulty | Discrimination Index | Test 1C Question Number | Difficulty | Discrimination Index |
|---|---|---|---|---|---|
| | % | | | % | |
| 1 | 85.19 | 0.21 | 26 | 94.44 | 0.07 |
| 2 | 25.93 | 0.18 | 27 | 50.00 | 0.12 |
| 3 | 77.78 | 0.30 | 28 | 81.48 | -0.02 |
| 4 | 90.74 | 0.27 | 29 | 37.04 | 0.39 |
| 5 | 33.33 | 0.36 | 30 | 98.15 | 0.23 |
| *6 | 61.11 | 0.45 | 31 | 88.89 | 0.25 |
| 7 | 87.04 | 0.03 | 32 | 90.74 | 0.45 |
| 8 | 90.74 | 0.27 | *33 | 66.67 | 0.61 |
| 9 | 62.96 | 0.37 | 34 | 100.00 | 0.00 |
| *10 | 59.26 | 0.51 | 35 | 81.48 | 0.46 |
| 11 | 0.00 | 0.00 | 36 | 87.04 | 0.36 |
| 12 | 90.74 | 0.32 | 37 | 88.89 | 0.10 |
| 13 | 79.63 | 0.17 | 38 | 51.85 | 0.30 |
| 14 | 96.30 | 0.46 | 39 | 46.30 | 0.37 |
| *15 | 59.26 | 0.45 | 40 | 35.19 | 0.19 |
| 16 | 94.44 | 0.32 | 41 | 31.48 | 0.30 |
| 17 | 92.59 | 0.25 | 42 | 83.33 | 0.24 |
| 18 | 72.22 | 0.39 | 43 | 57.41 | 0.26 |
| 19 | 61.11 | 0.39 | *44 | 68.52 | 0.71 |
| 20 | 66.67 | 0.35 | 45 | 72.22 | 0.33 |
| 21 | 92.59 | 0.31 | 46 | 85.19 | 0.25 |
| 22 | 98.15 | 0.27 | 47 | 90.74 | 0.56 |
| 23 | 94.44 | 0.25 | 48 | 87.04 | 0.36 |
| *24 | 57.41 | 0.43 | 49 | 81.48 | 0.36 |
| 25 | 87.04 | 0.21 | 50 | 90.74 | 0.23 |

*Asterisk indicates items selected for inclusion in item pool.

TABLE X

ITEM ANALYSIS DATA
CTM 1103 TEST 2A
(N=57)

| Test 2A Question Number | Difficulty | Discrimination Index | Test 2A Question Number | Difficulty | Discrimination Index |
|---|---|---|---|---|---|
| | % | | | % | |
| 1 | 59.65 | 0.01 | 26 | 84.21 | 0.35 |
| 2 | 84.21 | 0.11 | 27 | 77.19 | 0.37 |
| 3 | 96.49 | 0.36 | 28 | 94.74 | 0.16 |
| *4 | 61.40 | 0.51 | 29 | 92.98 | 0.35 |
| 5 | 80.70 | 0.30 | 30 | 91.23 | 0.40 |
| 6 | 94.74 | 0.21 | 31 | 73.68 | 0.46 |
| 7 | 96.49 | -0.05 | 32 | 52.63 | 0.31 |
| 8 | 71.93 | 0.09 | 33 | 33.33 | -0.08 |
| 9 | 43.86 | 0.14 | 34 | 77.19 | 0.53 |
| 10 | 59.65 | 0.30 | 35 | 91.23 | -0.01 |
| 11 | 89.47 | 0.39 | 36 | 89.47 | 0.51 |
| 12 | 75.44 | 0.69 | 37 | 68.42 | 0.24 |
| 13 | 31.58 | 0.18 | 38 | 63.16 | 0.30 |
| 14 | 57.89 | 0.08 | 39 | 92.98 | 0.38 |
| 15 | 75.44 | 0.45 | 40 | 84.21 | 0.36 |
| 16 | 82.46 | 0.56 | 41 | 85.96 | 0.48 |
| 17 | 78.95 | 0.50 | 42 | 98.25 | 0.36 |
| 18 | 92.98 | 0.43 | 43 | 26.32 | -0.26 |
| 19 | 82.46 | 0.36 | 44 | 84.21 | 0.23 |
| 20 | 89.47 | 0.42 | 45 | 66.67 | 0.18 |
| *21 | 52.63 | 0.40 | 46 | 87.72 | 0.19 |
| 22 | 92.98 | 0.39 | 47 | 80.70 | 0.43 |
| 23 | 96.49 | -0.05 | 48 | 92.98 | 0.05 |
| 24 | 64.91 | 0.39 | *49 | 63.16 | 0.44 |
| *25 | 54.39 | 0.40 | 50 | 84.21 | 0.53 |

*Asterisk indicates items selected for inclusion in item pool.

TABLE XI

ITEM ANALYSIS DATA
CTM 1103 TEST 2B
(N=59)

| Test 2B Question Number | Difficulty | Discrimination Index | Test 2B Question Number | Difficulty | Discrimination Index |
|---|---|---|---|---|---|
| | % | | | % | |
| 1 | 55.93 | 0.25 | 26 | 83.05 | 0.25 |
| 2 | 94.92 | 0.10 | 27 | 77.97 | 0.35 |
| 3 | 84.75 | 0.53 | 28 | 81.36 | 0.25 |
| 4 | 98.31 | 0.14 | 29 | 83.05 | 0.25 |
| 5 | 64.41 | 0.04 | 30 | 89.83 | 0.51 |
| 6 | 96.61 | 0.06 | 31 | 69.49 | 0.33 |
| 7 | 81.36 | 0.16 | 32 | 86.44 | 0.43 |
| *8 | 67.80 | 0.50 | 33 | 72.88 | 0.50 |
| 9 | 23.73 | 0.33 | 34 | 94.92 | 0.33 |
| 10 | 100.00 | 0.00 | 35 | 22.03 | 0.36 |
| 11 | 71.19 | 0.43 | 36 | 81.36 | 0.11 |
| 12 | 98.31 | 0.30 | 37 | 91.53 | 0.16 |
| 13 | 93.22 | 0.36 | 38 | 100.00 | 0.00 |
| 14 | 45.76 | 0.32 | 39 | 91.53 | 0.29 |
| *15 | 59.32 | 0.41 | *40 | 64.41 | 0.53 |
| *16 | 69.49 | 0.47 | 41 | 72.88 | 0.34 |
| 17 | 44.07 | 0.29 | 42 | 74.58 | 0.29 |
| *18 | 55.93 | 0.45 | 43 | 84.75 | 0.33 |
| *19 | 59.32 | 0.42 | 44 | 81.36 | 0.19 |
| *20 | 67.80 | 0.48 | 45 | 86.44 | 0.40 |
| 21 | 55.93 | 0.31 | 46 | 71.19 | 0.37 |
| 22 | 13.56 | 0.04 | 47 | 84.75 | 0.29 |
| 23 | 100.00 | 0.00 | 48 | 88.14 | 0.12 |
| 24 | 66.10 | 0.19 | *49 | 67.80 | 0.44 |
| 25 | 93.22 | 0.19 | 50 | 66.10 | 0.30 |

*Asterisk indicates items selected for inclusion in item pool.

TABLE XII

ITEM ANALYSIS DATA
CTM 1103 TEST 2C
(N=51)

| Test 2C Question Number | Difficulty | Discrimination Index | Test 2C Question Number | Difficulty | Discrimination Index |
|---|---|---|---|---|---|
| | % | | | % | |
| 1 | 56.86 | 0.15 | 26 | 66.67 | 0.38 |
| 2 | 62.75 | -0.29 | 27 | 60.78 | 0.19 |
| 3 | 92.16 | 0.55 | 28 | 39.22 | 0.22 |
| 4 | 84.31 | 0.16 | 29 | 88.24 | 0.45 |
| 5 | 98.04 | 0.06 | 30 | 92.16 | 0.55 |
| 6 | 72.55 | 0.32 | 31 | 80.39 | 0.08 |
| 7 | 82.35 | 0.24 | 32 | 74.51 | 0.49 |
| 8 | 90.20 | 0.23 | 33 | 80.39 | 0.33 |
| *9 | 70.59 | 0.40 | 34 | 39.22 | 0.11 |
| 10 | 70.59 | 0.33 | 35 | 62.75 | 0.11 |
| 11 | 60.78 | 0.15 | 36 | 60.78 | 0.28 |
| 12 | 21.57 | -0.10 | 37 | 62.75 | 0.42 |
| 13 | 98.04 | -0.03 | 38 | 74.51 | 0.20 |
| *14 | 62.75 | 0.47 | 39 | 88.24 | 0.22 |
| 15 | 29.41 | 0.24 | *40 | 68.63 | 0.48 |
| 16 | 96.08 | 0.13 | 41 | 94.12 | 0.24 |
| 17 | 80.39 | 0.11 | 42 | 90.20 | 0.18 |
| 18 | 90.20 | 0.36 | 43 | 88.24 | 0.10 |
| 19 | 84.31 | 0.25 | 44 | 92.16 | 0.18 |
| 20 | 100.00 | 0.00 | 45 | 76.47 | 0.43 |
| 21 | 86.27 | 0.41 | 46 | 98.04 | 0.48 |
| 22 | 76.47 | 0.51 | 47 | 60.78 | 0.29 |
| 23 | 98.04 | -0.08 | *48 | 70.59 | 0.61 |
| 24 | 80.39 | 0.42 | 49 | 98.04 | -0.14 |
| 25 | 78.43 | 0.18 | 50 | 84.31 | 0.15 |

*Asterisk indicates items selected for inclusion in item pool.

TABLE XIII

ITEM ANALYSIS DATA
CTM 1103 TEST 3A
(N=76)

| Test 3A Question Number | Difficulty | Discrimination Index | Test 3A Question Number | Difficulty | Discrimination Index |
|---|---|---|---|---|---|
| | % | | | % | |
| 1 | 46.05 | 0.34 | 26 | 76.32 | 0.35 |
| 2 | 35.53 | 0.44 | 27 | 36.84 | 0.27 |
| 3 | 82.89 | 0.31 | 28 | 63.16 | 0.22 |
| 4 | 59.21 | 0.11 | *29 | 53.95 | 0.49 |
| 5 | 98.68 | -0.00 | 30 | 15.79 | 0.02 |
| 6 | 56.58 | 0.15 | 31 | 81.58 | 0.33 |
| 7 | 64.47 | 0.03 | 32 | 82.89 | 0.36 |
| 8 | 21.05 | 0.06 | 33 | 89.47 | 0.05 |
| *9 | 60.53 | 0.50 | *34 | 60.53 | 0.44 |
| 10 | 31.58 | 0.07 | 35 | 96.05 | 0.09 |
| 11 | 42.11 | 0.26 | 36 | 38.16 | 0.31 |
| 12 | 88.16 | 0.20 | 37 | 98.68 | 0.09 |
| 13 | 31.58 | 0.26 | *38 | 50.00 | 0.50 |
| 14 | 97.37 | -0.14 | 39 | 88.16 | 0.10 |
| *15 | 50.00 | 0.44 | 40 | 40.79 | 0.22 |
| 16 | 55.26 | 0.35 | 41 | 69.74 | 0.13 |
| 17 | 97.37 | 0.21 | 42 | 80.26 | 0.34 |
| *18 | 56.58 | 0.51 | 43 | 39.47 | 0.34 |
| 19 | 65.79 | 0.12 | 44 | 64.47 | 0.33 |
| 20 | 64.47 | 0.05 | 45 | 89.47 | 0.34 |
| 21 | 71.05 | 0.19 | 46 | 96.05 | 0.18 |
| 22 | 77.63 | 0.10 | 47 | 89.47 | 0.24 |
| 23 | 78.95 | 0.20 | 48 | 56.58 | 0.37 |
| 24 | 75.00 | 0.35 | 49 | 67.11 | 0.30 |
| 25 | 80.26 | 0.38 | 50 | 84.21 | 0.23 |

*Asterisk indicates items selected for inclusion in item pool.

TABLE XIV

ITEM ANALYSIS DATA
CTM 1103 TEST 3B
(N=61)

| Test 3B Question Number | Difficulty | Discrimination Index | Test 3B Question Number | Difficulty | Discrimination Index |
|---|---|---|---|---|---|
| | % | | | % | |
| 1 | 49.18 | 0.30 | *26 | 67.21 | 0.45 |
| 2 | 47.54 | 0.38 | 27 | 22.95 | 0.22 |
| 3 | 31.15 | 0.51 | 28 | 80.33 | 0.07 |
| *4 | 54.10 | 0.46 | 29 | 78.69 | 0.45 |
| 5 | 13.11 | -0.03 | 30 | 90.16 | -0.06 |
| 6 | 93.44 | 0.20 | 31 | 85.25 | 0.30 |
| 7 | 75.41 | 0.26 | 32 | 34.43 | 0.26 |
| 8 | 34.43 | -0.01 | 33 | 90.16 | 0.32 |
| *9 | 67.21 | 0.41 | 34 | 67.21 | 0.31 |
| 10 | 68.85 | 0.39 | 35 | 31.15 | 0.17 |
| 11 | 83.61 | -0.02 | 36 | 59.02 | 0.12 |
| 12 | 72.13 | 0.29 | *37 | 49.18 | 0.42 |
| *13 | 52.46 | 0.50 | 38 | 62.30 | 0.31 |
| *14 | 54.10 | 0.41 | 39 | 72.13 | 0.48 |
| *15 | 59.02 | 0.50 | 40 | 77.05 | 0.25 |
| 16 | 78.69 | 0.52 | 41 | 67.21 | 0.24 |
| 17 | 91.80 | 0.13 | 42 | 72.13 | 0.13 |
| 18 | 77.05 | 0.42 | *43 | 44.26 | 0.48 |
| 19 | 52.46 | 0.20 | 44 | 91.80 | 0.13 |
| 20 | 4.92 | 0.04 | 45 | 100.00 | 0.00 |
| *21 | 63.93 | 0.43 | 46 | 73.77 | 0.34 |
| 22 | 80.33 | 0.50 | *47 | 63.93 | 0.48 |
| 23 | 32.79 | 0.42 | 48 | 93.44 | 0.26 |
| 24 | 98.36 | 0.15 | *49 | 70.49 | 0.42 |
| 25 | 98.36 | -0.15 | *50 | 67.21 | 0.40 |

*Asterisk indicates items selected for inclusion in item pool.

TABLE XV

ITEM ANALYSIS DATA
CTM 1103 TEST 3C
(N=43)

| Test 3C Question Number | Difficulty | Discrimination Index | Test 3C Question Number | Difficulty | Discrimination Index |
|---|---|---|---|---|---|
| | % | | | % | |
| 1 | 74.42 | 0.34 | 26 | 83.72 | 0.51 |
| 2 | 9.30 | -0.20 | 27 | 79.07 | 0.33 |
| 3 | 0.00 | 0.00 | 28 | 88.37 | 0.41 |
| *4 | 51.16 | 0.43 | 29 | 76.74 | 0.42 |
| 5 | 30.23 | 0.02 | 30 | 44.19 | -0.11 |
| 6 | 41.86 | 0.31 | 31 | 90.70 | 0.46 |
| 7 | 79.07 | 0.40 | 32 | 41.86 | 0.37 |
| 8 | 62.79 | 0.26 | 33 | 55.81 | 0.33 |
| 9 | 69.77 | 0.02 | 34 | 97.67 | 0.59 |
| 10 | 69.77 | 0.29 | 35 | 67.44 | 0.25 |
| 11 | 93.02 | 0.01 | 36 | 46.51 | 0.23 |
| *12 | 44.19 | 0.51 | 37 | 83.72 | 0.40 |
| 13 | 58.14 | 0.29 | 38 | 93.02 | 0.57 |
| *14 | 58.14 | 0.46 | 39 | 95.35 | 0.50 |
| 15 | 74.42 | 0.14 | 40 | 88.37 | 0.30 |
| 16 | 83.72 | 0.25 | 41 | 60.47 | 0.30 |
| 17 | 95.35 | 0.12 | 42 | 97.67 | 0.59 |
| 18 | 79.07 | 0.41 | 43 | 93.02 | 0.38 |
| 19 | 37.21 | 0.12 | 44 | 44.19 | 0.11 |
| 20 | 76.74 | 0.54 | 45 | 74.42 | 0.39 |
| 21 | 51.16 | 0.11 | 46 | 97.67 | 0.59 |
| 22 | 74.42 | 0.12 | 47 | 58.14 | 0.26 |
| 23 | 86.05 | 0.28 | 48 | 69.77 | 0.16 |
| 24 | 97.67 | 0.11 | 49 | 90.70 | 0.48 |
| 25 | 74.42 | 0.24 | 50 | 97.67 | 0.59 |

*Asterisk indicates items selected for inclusion in item pool.

VITA[2]

Dortha Sherrié Lisenby

Candidate for the Degree of

Master of Science

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Major Field: Clothing, Textiles and Merchandising

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Honorary Organizations: Omicron Nu, Phi Upsilon Omicron, Kappa Omicron Phi.