INFORMATION TO USERS

This dissertation was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or “target” for pages apparently lacking from the document photographed is “Missing Page(s)”. If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in “sectioning” the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from “photographs” if essential to the understanding of the dissertation. Silver prints of “photographs” may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

University Microfilms
300 North Zebo Road
Ann Arbor, Michigan 48106
A Xerox Education Company
BLOOM, Robert Stephen, 1942-
A CURRICULUM SPECIALIST IN A TASK ANALYSIS CURRICULUM DEVELOPMENT PROCESS IN ALLIED MEDICAL EDUCATION.

The Ohio State University, Ph.D., 1972
Education, curriculum development

University Microfilms, A XEROX Company, Ann Arbor, Michigan

© 1972

ROBERT STEPHEN BLOOM

ALL RIGHTS RESERVED
A CURRICULUM SPECIALIST IN A TASK ANALYSIS CURRICULUM DEVELOPMENT PROCESS IN ALLIED MEDICAL EDUCATION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

Robert S. Bloom, B.A., M.Ed.

The Ohio State University
1972

Approved by

[Signature]
Advisor
Department of Curriculum and Foundations
PLEASE NOTE:

Some pages may have
indistinct print.
Filmed as received.

University Microfilms, A Xerox Education Company
ACKNOWLEDGMENTS

This investigator is deeply indebted to the project staff of the Health, Education, and Welfare, Public Health Service Grant (#1 DO2 AH 00964-1) entitled, "Development of Job Descriptions and Curricula in Occupational Therapy Through Task Analysis." The project directors, Dr. Kathryn Schoen and John Camiscioni, provided direction for this investigator's efforts as a curriculum specialist on the project. The project administrator, Rosa Hartsook, provided understanding, encouragement, and the motivation to accomplish the task of developing curriculum modules in occupational therapy. The project evaluation specialist, G. D. Angus, provided input for the evaluation decisions for both the project and this investigation. The project administrative assistant, Laurie Jones, organized much of the material included in the project and used in this investigation.

Many thanks are also extended to this investigator's advisor, Professor Paul Klohr, and to his committee members, Professors John Hough and Kathryn Schoen, for their continued help.

Much love and appreciation is due my wife, Fern, for her support, encouragement, and love.
VITA

December 26, 1942. Born, Pittsburgh, Pennsylvania
1968-1969. Assistant Principal, Laurel Junior-Senior High School, Laurel, Delaware
1969-1970. Assistant Principal, Mt. Pleasant Junior High School, Wilmington, Delaware
1970-1972. Graduate Research Associate, School of Allied Medical Professions, The Ohio State University, Columbus, Ohio

FIELDS OF STUDY

Major Field: Educational Curriculum and Foundations


Studies in Instructional Development. Professor John B. Hough

Studies in Allied Medical Education. Professor Kathryn Schoen
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ACKNOWLEDGMENTS</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>VITA</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF CHARTS</td>
<td>vii</td>
</tr>
</tbody>
</table>

## CHAPTER

### I. INTRODUCTION AND BACKGROUND .......................... 1

- Statement of the Problem and Objectives .......................... 7
- Procedures .................................................................. 8
- Organization of Dissertation ...................................... 9

### II. REVIEW OF LITERATURE ..................................... 11

### III. A CASE STUDY OF CURRICULUM DEVELOPMENT

#### UTILIZING A TASK ANALYSIS APPROACH ...................... 38

- Task Analysis ................................................................ 39
- Development of Plan .................................................. 44
- Developing Task Analysis Procedures ............................ 48
- Selection of Facilities ............................................. 52
- Selection and Training of Data Collection Personnel ........ 55
- Data Collection ....................................................... 59
- Data Analysis ......................................................... 62
- Job Restructuring .................................................... 71
- Developing Job Descriptions ....................................... 76
- Curriculum Development ............................................. 83
- Plans for Curriculum Development ................................ 85
- A Process for Curriculum Development .......................... 94
- Development of Instructional and Evaluation Strategies ...... 106
- Summary ..................................................................... 110
CONTENTS (continued)

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV. A CONCEPTUAL FRAMEWORK FOR CURRICULUM DEVELOPMENT AND A ROLE ANALYSIS OF THE CURRICULUM SPECIALIST</td>
<td>111</td>
</tr>
<tr>
<td>A Conceptual Framework for Curriculum Development Using Task Analysis</td>
<td>111</td>
</tr>
<tr>
<td>An Explanation of the Conceptual Framework</td>
<td>113</td>
</tr>
<tr>
<td>A Comparison of Two Frameworks</td>
<td>118</td>
</tr>
<tr>
<td>A Job Description and Role Analysis of a Curriculum Specialist</td>
<td>122</td>
</tr>
<tr>
<td>A Structured Interview as a Reality Check of a Role Description of a Curriculum Specialist</td>
<td>130</td>
</tr>
<tr>
<td>V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS</td>
<td>142</td>
</tr>
<tr>
<td>Conclusions</td>
<td>151</td>
</tr>
<tr>
<td>Recommendations</td>
<td>151</td>
</tr>
</tbody>
</table>

APPENDIX

<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. JOB DESCRIPTIONS THROUGH TASK ANALYSIS</td>
<td>153</td>
</tr>
<tr>
<td>B. LEVELS OF COMPLEXITY OF LEARNING</td>
<td>176</td>
</tr>
<tr>
<td>C. PREPARATION FOR OCCUPATIONAL THERAPIST</td>
<td>179</td>
</tr>
<tr>
<td>D. AFFECTIVE OBJECTIVES</td>
<td>183</td>
</tr>
<tr>
<td>E. INTERACTIVE STRATEGIES</td>
<td>185</td>
</tr>
<tr>
<td>F. EVALUATION</td>
<td>193</td>
</tr>
<tr>
<td>G. EVALUATION OF ACTIVITIES PERFORMED BY A CURRICULUM SPECIALIST</td>
<td>205</td>
</tr>
<tr>
<td>H. A LIST OF PARTICIPATING RESPONDENTS</td>
<td>209</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>213</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A Grid to Synthesize Task Analysis Data</td>
<td>73</td>
</tr>
<tr>
<td>2. Titles Assigned to Project Job Descriptions</td>
<td>79</td>
</tr>
<tr>
<td>4. A Model for Instructional Design and Management</td>
<td>119</td>
</tr>
</tbody>
</table>
# LIST OF CHARTS

<table>
<thead>
<tr>
<th>CHART</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Flow Chart of Task Analysis Procedures</td>
<td>40</td>
</tr>
<tr>
<td>2. Flow Chart of Curriculum Development</td>
<td>84</td>
</tr>
<tr>
<td>3. Flow Chart of a Process for Developing Curriculum Modules</td>
<td>95</td>
</tr>
<tr>
<td>4. Responses of Perceptions of What a Curriculum Specialist Has Done</td>
<td>133</td>
</tr>
<tr>
<td>5. Responses of Perceptions of What a Curriculum Specialist Should Do</td>
<td>137</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION AND BACKGROUND

The task analysis approach to curriculum development is not new. In the early decades of the twentieth century, W. W. Charters viewed that analysis as related to an assessment of needs in the curriculum development process:

... as applied to teaching, it has been found necessary to discuss the methods of arousing appropriate needs and conditions under which they are found present and investigate the methods pursued by experience both in satisfying these needs, to the aid of which subject matter is invoked, and in securing the maximum degree of such satisfaction.1

In 1913, Franklin Bobbitt echoed Charters' sentiments when he discussed school administration in the context of surveying needs, asserting that it was crucial to survey a community's needs to determine standards which, in turn, might give direction to curriculum planning.2

In 1924, both Charters and Bobbitt called for an activity analysis of human experience to determine educa-


tional goals. Bobbitt underscored the need to analyze the activities that ought to make up the lives of men and women so that these might be used to formulate educational objectives.  

W. W. Charters specifically discussed the concept of task analysis for curriculum development when he wrote:

"Analysis of activities is not an unfamiliar operation. It has long been used as a method of instruction, but its application has not been wide and the present emphasis upon analysis is an effort to not so much use a new method as to make wide application of a method which has been used for a long time in a few situations. . . .

A somewhat more formal sort of analysis is that which is known as job analysis. . . . While its widest use in the vocations has been in connection with employment, its most valuable use is in connection with training programs."  

Refining further an emerging method of activity and task analysis, Bobbitt saw the need to divide the field under analysis into smaller units in which might be discovered specific activities to be performed.

Charters discussed further the concept of delineating specific job activities or duties:

---


5 Franklin Bobbitt, op. cit., p. 8.
By this second method (task analysis) the interviewer asks the individual on the job to give a list of his duties; after the list has been jotted down by the interviewer and typewritten, it is returned to the worker for correction. Other workers on the same job are also interviewed independently, and later the lists of workers are compared in order to get a composite group. In every case a man in authority who knows the job is asked to check this list and add whatever items have been left out.6

The efforts of Charters and Bobbitt serve as the best examples of a task analysis approach in the early literature of curriculum development. The idea was widely disseminated in both educational literature and also in practice. It created a controversy at the time it was being proposed. Many educational writers reacted against the use of task analysis for curriculum development. A common criticism was that task analysis was too "scientific" and mechanistic and, therefore, quite lacking in human values. For example, William Patty wrote:

Scientific curriculum making, as it has been developed and expounded by Bobbitt and Charters, represents a clear example of that type of scientism in education which consists of an operating faith that the methods and principles of scientific thought and technology can and will some day serve education. . . . Actually, these doctrines of scientism in education would, if put to work, lead to a formalized institutionalism such as goes with all mechanization of social affairs.7

---


7 William Patty, op. cit., p. 3.
Other criticisms of task analysis also were expressed by educators. Some critics said that if a task analysis reports what is at present being done, then it does not differentiate between what is good or bad, effective or ineffective. Another criticism, in terms of curriculum development for the future, asserts that task analysis, by analyzing the present, cannot deal with the future in terms of what should be performed. The critics of task analysis called attention to significant issues. These criticisms also served to advance the state of the field by identifying problems which must be faced by those utilizing task analysis. Task analysis can be used effectively if these problems can be surmounted.

In recent years, the allied medical professions such as Occupational Therapy, Physical Therapy, Medical Technology, and others, have grown extensively. With the growth of these professions, there has also been an increase in concern about the curricula needed to train personnel in these fields at the professional, technical, and aide levels.

Many in the area of allied medical professions have been, and are presently, advocating the use of task analysis for curriculum development in the allied medical professions. One very strong advocate of this approach is Dr. Israel Light, presently Dean of the School of Allied
Medical Professions at the University of Chicago. He writes:

The orderly and coordinated development of new specialty fields or new competency levels or both within an established field (in allied medicine) requires that medical specialty leadership's own forms of job descriptions be examined and reassessed. . . . Task analysis will help to identify what must be learned under formal, organized, institutionalized arrangements, and what may be planned to be acquired on the job. . . . Task analysis will clarify teaching-learning objectives on which curriculum construction must be based.8

The need for task analysis in allied medical professions for curriculum development has also been cogently expressed by others following the logic of Light's position.

Another area of concern in the allied medical professions is the area of career mobility to help alleviate manpower problems. For example, Dr. Warren V. Perry, Dean of the School of Health Related Professions, State University of New York at Buffalo, has said

... some measures such as job analysis and job description to set up educational programs for the different levels of work in the allied medical professions, a statement of the educational objectives of the programs, and provisions for evaluating the programs are

---

some aspects which are important if career mobility in allied medicine is to be a reality.9

Dr. Israel Light also discussed the problem of career mobility. He pointed out:

... there is an obligation which the allied medical professions have to its trainees which includes providing for career mobility in both horizontal and vertical terms, and a task analysis makes it easier to identify and assign competency levels for performance. Task analysis has the potential for effectively determining how many functions and responsibilities can reasonably be assigned to a single individual at a particular level of competency and job performance.10

From this perspective, there is justification for using task analysis to help alleviate manpower problems in terms of providing for career mobility in both horizontal and vertical terms. One can also see the need for an appropriate curriculum to train individuals to fill recognized manpower needs on all levels in the allied health professions.

The use of task analysis procedures has been suggested to meet two pressing needs in allied health education.

---


Statement of the Problem and Objectives

This study describes the use of a task analysis procedure in a curriculum development process in an allied medical field and analyzes the role of a curriculum specialist. From these data will be generated a conceptual framework to guide future curriculum specialists in using task analysis.

Three major objectives give direction to this investigation: (1) to describe the curriculum development procedures used in a research grant entitled, "Development of Occupational Therapy Job Descriptions and Curricula Through Task Analysis," funded by the United States Department of Health, Education, and Welfare, Public Health Service (Grant No. 5 D02 AH 00964 02) and conducted at The Ohio State University, College of Medicine, School of Allied Medical Professions from July, 1970, through June, 1972; (2) to delineate the functions of a curriculum specialist in a task analysis approach to curriculum development in allied health education using data from the descriptive case study and through an analysis of the perceptions of a selected population of relevant others involved in the process; (3) to generate a conceptual framework for curriculum development for allied health education and other professional training programs.

A number of specific questions are central in the inquiry designed to achieve the above objectives:
1. What kind of a project or institutional setting is necessary to give support to the use of task analysis for curriculum development?

2. What array of resources needs to be available for an undertaking as ambitious as developing job descriptions and curriculum for an entire profession?

3. How do personnel with different academic and professional background relate to each other so that their professional competencies are fully utilized?

4. What personal attributes must a curriculum specialist possess to fulfill a role as team member of a curriculum development team?

5. How is a process for curriculum development generated from task analysis?

6. How is a conceptual framework for curriculum development formulated from data generated through task analysis?

7. What are the operations of a curriculum specialist performing his role within this framework?

**Procedures**

This is a descriptive study utilizing a philosophical-logical mode of inquiry. Data are also to be derived from the descriptive case study of the curriculum development process with the investigator serving as a participant observer. A reality check of his observations will be
made by assessing the perceptions of a selected population of relevant others who were involved in the process. These perceptions will be recorded through personal interviews using a Likert-type scale with each of fifteen items drawn from an analysis of the curriculum specialist's operations performed in several critical decision-making phases of the total undertaking.

The conventional limitations of this mode of inquiry will be in effect, but every effort will be made to clarify the procedures used in the project and the conceptual framework developed, and to describe the constraints of each situation. Care will also be taken so that unwarranted extrapolations of the generalized findings are not made.

Organization of Dissertation

The report of the investigation is organized into five chapters.

Chapter I contains an introduction, statement of the problem, objectives of the study, procedures, and organization of the presentation.

Chapter II reviews the literature of task analysis procedures, relevant curriculum development projects in allied medical education, and draws upon selected material in related fields that throws light on curriculum development.
Chapter III presents a case study of a research project funded by the Department of Health, Education, and Welfare, Public Health Service, entitled, "The Development of Occupational Therapy Job Descriptions and Curricula Through the Use of Task Analysis" conducted from July, 1970, through June, 1972, at The Ohio State University. Procedures of the research study are described in detail and an analysis is made of the role of a curriculum specialist in the planning, development, and implementation of both the task analysis procedure and related processes in the development of curriculum.

Chapter IV delineates a role analysis of a curriculum specialist from the perspective of a participant observer in the process and interprets the perceptions of a selected population of relevant others. This chapter also presents a conceptual framework for curriculum development using task analysis procedures.

Chapter V includes a summary of the study, warranted generalizations about the role of the curriculum specialist, and recommendations for further research using task analysis.
CHAPTER II
REVIEW OF LITERATURE

The concept for using task analysis for curriculum development has appeared in the literature since the early twentieth century. The rationale for using task analysis discussed by W. W. Charters (1924) and Franklin Bobbitt (1924) and its accompanying criticisms by Patty (1938) was discussed in the first chapter. Consequently, a review of the literature is divided here into three sections which provide a commentary on the state of the field of task analysis procedures as they might apply to curriculum development processes.

Much of the literature defining and utilizing a task analysis approach to curriculum development is found in vocational education since task analysis has generally been considered an industrial technique. Many types of task analysis procedures have evolved in this area. A discussion of the most relevant of these follows.

Two excellent sources for a review of the literature on the vocational preparation of allied health manpower are Review and Analysis of Curricula for Occupations in Health (Lewis, 1970) and Review and Synthesis of Research in Health Occupations Education (Holloway and Kerr, 1969).
These sources point out a number of both task analysis procedures and developmental projects in which task analysis was used.

One task analysis procedure commonly used is called job analysis. This involves the process of studying the operations, duties, and organizational relationships of jobs to obtain data for reporting the worker's activities and requirements. An exemplar study of this kind was conducted at the University of Florida by Dumas and Muthard (1970). This study reported on a job analysis tool based on significant tasks and modalities identified through a content analysis of selected texts in medicine and physical therapy.

The researchers trained physical therapists to use the tool to record job behavior of all workers in a selected Physical Therapy department in order to obtain data about the nature of the physical therapist and the physical therapy aide's job. The observers used stop watches as an adjunct to the job analysis tool. The resulting study was basically one in which an attempt was made to observe the time and motion of the various workers. Thus a job analysis in this context approached the conventional time and motion study.

An expanded form of job analysis is called occupational analysis. This expanded form enlarges significantly the scope of job analysis. A report by Larson and Blake
(1969) points out that occupational analysis is the application of a systematic method of obtaining information focused on occupations and industries as well as on job, tasks, and positions. Procedures for an occupational analysis are delineated in a publication by the United States Department of Labor entitled *A Handbook for Job Restructuring* (1970).

The methodology described in this handbook is a refinement of the job analysis techniques developed by the U. S. Training and Employment Service. The methodology involves the detailed analysis of each job in terms of (1) the specific tasks performed by the worker; (2) the functioning of the worker in relation to data, people, and things; (3) the minimum general educational development required for satisfactory performance; (4) an estimation of the aptitudes required for satisfactory job performance; and (5) other significant worker trait requirements, such as physical demands, temperaments, and interests.

Lewis (1970) discusses a procedure called task analysis as a process by which a task, a sub-unit of a job, is examined, and its characteristics, in terms of certain attributes, are identified. Mager and Beach (1967) describe a procedure to list and detail tasks which are described as logically related sets of actions required for the completion of a job objective.
One might infer from the above definitions and descriptions of these three task analysis procedures that they are the same. Both Lewis (1970) and Larson, and also Blake (1969), point out that they could not establish a clear difference between the three procedures and that positive distinctions between and among the characteristics of the various systems of analysis are often difficult to establish. It can be documented, however, that the scope of these three procedures is different. Thus, differences among them center on differing definitions of scope.

An analysis system closely related to occupational analysis is a systems approach called functional job analysis. A major contributor to this approach is Sidney A. Fine who wrote a number of articles describing functional job analysis. In one article, Fine (1969) describes a systems approach as focusing on the achievement of a specific purpose or goal simultaneously seeking (a) to organize technology, manpower, and money within a specific time frame and (b) to respond to changes in the environment of the goal, including needs and values that are important to its achievement.

In relating a systems approach to job analysis, Fine (1969) develops six criteria that jobs must fulfill in order to satisfy both the agency system and the human system and these include: (1) Does the job purpose clearly
contribute to achieving the purpose of the agency system and are the tasks, the ultimate units designed to effect the system purpose, so organized in the job that they are consistent with the overall job purpose? (2) Does the job meet the workers' needs for growth and development as a person? (3) Is the job conceived of as a flexible combination of tasks which can be arranged and rearranged in many ways? (4) Are the job descriptions written in explicit standardized language so that (a) comparisons can be made of their similarities and differences; (b) relative difficulty and complexity can be determined; and (c) prescribed and discretionary areas of performance are clearly delineated? (5) Are the jobs tailored to fit local conditions and do the jobs, reflect the nature, size, and structure of the agency as a work organization? (6) Can the requirements of the job be translated into human traits, that is, into qualifications which can be used in recruitment and selection of workers?

These criteria serve as the basis for Functional Job Analysis which Martin (1969) defines as a technique theoretically based on a taxonomy of worker functions which keeps separate what the worker does from what the job gets done. Martin also notes that the structure of the worker functions is assumed to be hierarchical in nature reflecting homogeneous groups of tasks involving
people, data, or things at increasing levels of complexity.

The influence of Fine's system is reflected in the occupational analysis system used by the U. S. Department of Labor, described above (1969), inasmuch as Fine was involved in the development of this system used in the preparation of the Dictionary of Occupational Titles, a catalogue of occupations performed in the United States. The concepts presented both by Fine and in the occupational analysis system served as the basis of the task analysis procedure utilized in the curriculum development project to be described in Chapter III of this investigation.

Another analysis procedure is a job inventory described by Ainsworth and Goldsmith (1971). This procedure involves a listing of all of the tasks performed in a particular job and submitting the list to a representative cross-section of workers in that occupation to be checked in terms of every task that they perform, thereby defining job roles. This approach requires a prior listing of all tasks, jobs, functions, and responsibilities of an occupation. Usually used in conjunction with another analysis procedure, this system is a method to obtain feedback from workers or professionals in an occupation being analyzed.

An early analysis system is called the critical incident approach which Flanagan (1952) describes as the collection of reports of behavior which are critical in
the sense that they make a difference between success and failure in observed work situations and which represents actual observations of on-the-job behavior performed by a supervisor. This system is prescribed primarily for evaluation of worker performance; however, it has been utilized as a procedure to analyze effective salesmen as reported by Kirchner and Dunnette (1957). The critical incident technique requires personal judgment by observers and is not always directed toward what is really happening in a job situation; rather it is directed toward what in the job is thought to be critical. This fact is both a strength and weakness for its use as an analysis technique. The strength of observers relating what should be is evident in this approach; however, the weakness of observers relating what they personally would like to see is also evident.

A final analysis system to be discussed here contains a procedure called a Positional Analysis Questionnaire which was developed by Jeanneret and McCormick (1969). This questionnaire is a result of a series of modifications and revisions of an early analysis system called the Worker Activity Profile, and it consists of 189 items, or job elements, that describe work activities in terms of worker-oriented principles. The majority of the questionnaire items provide for rating on a six-point scale of either the importance, extent of use, or amount of time a particular
work behavior or situation is applicable to any given position. This system translates a stimulus-organism-response paradigm into information-input-mediation process-work output terminology.

This review of the literature on task analysis techniques makes clear that there have been a number of systems developed and that a number of revisions, modifications, and broadening of scope of earlier systems have evolved. The ultimate purpose has been that of developing a procedure to systematically observe the job performance of workers. In many cases, procedures of the various analysis systems are similar, and yet there are observable differences. Thus, when one chooses to use a task analysis procedure, he should have a thorough knowledge of the strengths and weaknesses of the various procedures and also of the possibilities of combining various procedures to create a comprehensive tool to analyze job performance.

Task analysis procedures have recently been utilized in developing educational programs in the health professions. A search of the literature provides five examples of task analysis procedures being used for curriculum development in allied health. This section of a review of the literature will present a description of each curriculum development project, state the objectives of the project, describe how task analysis was used for curriculum development, and analyze the results of each project.
A project entitled, "The Systems Approach to Functional Job Analysis: Task Analysis of the Physician's Assistant," directed by Lee Powers (1970), attempts to develop a training program for the newly-emerging position of physician's assistant. The objectives of this project are to (1) use techniques of task analysis to examine both in the hospital and in practice the duties and tasks of pediatricians and the other major specialties (medicine, surgery, and family or general practice) to develop a basic general working definition of the assistant to the physician; (2) develop job descriptions of "assistants to the physician" in the areas mentioned above; and (3) develop a core educational program suitable for the training of those jobs described in (1) above. The initial work of this project identifies those tasks or activities traditionally carried out by a physician which an assistant can be trained to perform. This is accomplished by an industrial engineering analysis procedure which is basically a job analysis and, as the authors state, a time and motion study of physician activities. This is performed to identify those tasks and activities an assistant could be trained to perform and to determine time-consuming (for the physician) activities.

Once common tasks are identified, the researchers utilize the functional job analysis procedure to analyze the level of general educational development, the level of
complexity of physician's assistants' functions, and the functional and specific knowledge and skills required by a student. Functional Job Analysis is employed also to develop performance standards and provide input for the development of curricular manuals designed to prepare manpower to be physician's assistants.

The result of this project is the production of curriculum guides well-suited to preparing physician's assistants. Task statements are delineated from performance objectives; qualitative and quantitative performance standards are given; and functional and specific content skills are also presented to serve as a training program for prospective physician's assistants. Close examination of the project methodology, however, reveals that content goals and objectives are initially developed using a job analysis technique. Functional Job Analysis serves as a systematic way of ordering levels of task performance and subsequent training suggestions. Thus, there is a combination of two task analysis procedures used to meet the project's objectives.

A project entitled, "Selection of Students for Physical Therapy Educational Programs" (1970), conducted at Case-Western Reserve University in Cleveland, Ohio, uses the critical incident approach to develop critical job requirements and rationales for the selection of students. Critical incidents in the performance of
Physical Therapy are collected by the project staff members using an Incident Collection Form which the project developed. The critical incident interview serves as the basis for data collection, and interviews are conducted over a four-week period from a sample of sixteen hospitals in five geographical areas. Each interview is approximately one hour in length. Incidents in which a physical therapist did something that seemed either effective or ineffective are recorded and a total of 640 incidents are identified.

These incidents are categorized along lines of performance, and three categories, including Patient Relations, Other Professionals, and Supportive Personnel, became the basis for the critical job requirements from which job performance can be evaluated. From these categories, component behaviors are listed and an analysis of the component behaviors related to traits of potential applicants and training requirements are presented to complete the definition of critical job requirements.

The product of this study is a comprehensive description of the job of the physical therapist in terms of important or critical behaviors. It also contains a number of useful tools such as a performance rating scale, an incident collection form, and a biographical information form to be used as a screening device for potential students. The critical incident approach is used in this
project for evaluative purposes, and it does not, nor did the researchers claim, develop a comprehensive job description of physical therapists. However, the critical incident approach did present a basic foundation upon which a job description and future curriculum development in physical therapy can occur.

This project was reported here to underscore the fact that a task analysis procedure can be used as an evaluative instrument, as well as a descriptive instrument. The critical incident approach particularly can be used to present information about what should be and about the quality of what is or should be. These concerns, as noted previously, are criticisms of task analysis procedures.

Two projects using a task analysis procedure were conducted in the late 1960's at the University of California at Los Angeles. One was the use of task analysis for developing instructional materials in eighteen allied health professions up to the associate degree reported by Henrich and Goldsmith (1971). The other was an occupational analysis of social service in medical care facilities conducted by Ainsworth and Goldsmith (1971).

The stated objectives of the project to develop instructional materials based on task analysis (Henrich and Goldsmith, 1971) include (1) identification of tasks in the functional or general health area; (2) verification
of the tasks through a national field survey; (3) determination of the skills and knowledges required to accomplish the tasks; (4) development of behavioral objectives or performance goals; (5) development of curricula; and (6) development of innovative instructional materials. To develop the task inventory for the first objective, the project staff conducts a search of the literature and obtains job descriptions, existing task inventories, and policy manuals.

The next objective is met by an actual survey to ascertain that people are indeed performing the tasks as presupposed in the basic inventory. Thus, the task analysis is primarily a questionnaire describing tasks and asking for respondents to verify what was sent out. The real delineation of tasks is not done by any of the formal task analysis procedures mentioned previously.

The third objective, the determination of skills and knowledges necessary to perform the tasks, is met by using a survey method and a "task breakdown process" designed by Miles H. Anderson, head of the Clinical Instructor Training Program at U.C.L.A., Allied Health Division. Dr. Anderson's system reduces a task to its elements and determines the key points or skills and knowledge required to perform a task. From this, behavioral objectives are formulated and curriculum development of instructional materials follows.
The result of this project includes task inventories for all allied health occupations which were delineated in the report. Drafts of instructional material have also been completed for some of the allied health professions.

This project attempted to cover much ground in the area of allied health education. It seems that this could be the project's major weakness. A task analysis procedure was developed which used surveys to delineate tasks performed but used on-the-job observation as a verification of tasks rather than to delineate the tasks. This could lead one to conclude that tasks delineated in this project's survey were what "should be" rather than "what is." This task analysis procedure is too general to serve as a basis for curriculum development. Moreover, it tends to be contaminated by too many wishful thinkers. However, the instructional material developed in this project could serve as a helpful supplement in the areas of allied health education, where there is little, if any, materials available.

The concept of using task analysis for curricular and instructional material development, proposed in this project, was sound. However, the procedures used did not really allow for a comprehensive or adequate development of job descriptions, curricular objectives, or instructional material.
The other project at U.C.L.A. is entitled "Occupational Analysis of Social Services in Medical Care Facilities" and is conducted by Ainsworth and Goldsmith (1971). The object of the project is to analyze the activities of those engaged in Social Service occupations in medical settings. The analysis is carried out by means of a questionnaire containing 192 tasks delineated by using a combination of a job factoring approach and a job inventory. The questionnaire is submitted to a representative sample of hospitals in six geographic areas of the United States. Respondents to all questionnaires are categorized into four levels of employees, and all levels are compared and examined on the variables of percentage and frequency of task performance. The analysis deals with a number of social service functions categorized through the use of the two task analysis procedures mentioned above.

The results of the project are a very comprehensive description of the tasks of all job levels in social service, very substantial tools for occupational analysis, and some interesting conclusions about the performance of social service in medical facilities. Some of these conclusions include (1) the community services function is the function least performed by medical social workers at all levels, and (2) many more similarities than differences exist among the various levels of employees in both task performance and frequency of task performance, as there are
no clear-cut role differentiations among aides, social work assistants, and social workers with a master's degree.

The recommendations of the project deal with the educational preparation of future medical social workers and notes that educational attainment is an inadequate discriminator of occupational role. It also points out that intensive training is recommended for M.S.W.'s in supervisory roles of personnel management, performance evaluation, and task delegation.

This study could effectively serve as the basis of future curriculum development of medical social workers. It provides a comprehensive job description of all levels of performance and frequency of performance and verification of these findings. It also delineates realistic job level differentiation and makes certain very responsible recommendations. Finally, it does include an effective task analysis method, that is, the combination of job factoring and job inventoring. Future application in using task analysis for curriculum development might well rest on some such synthesis.

A final project is a recent report of the Health Services Mobility Study under the direction of Elanor Gilpatrick (1972). The report describes three phases of the study which include: (1) the analysis of needs and potentials for upward mobility in the health industry in New York City; (2) the development of a systems-based
methodology to create job and curriculum leaders in the health industry; and (3) a pilot test of the methodology. This report presents a comprehensive discussion of the "how" and "why" of a task analysis and process for curriculum development which has definite implications for future work of this nature in allied medical education. It also deals with the important issues of trainee selection, licensure, and staffing patterns of allied medical personnel, and it contains a very extensive bibliography related to these issues. This report provides very useful information for using a task analysis procedure for curriculum development.

This section of the review of the literature has described five projects using task analysis. Two of the projects were directly related to curriculum development, and three of the projects delineated specific task analysis procedures which can be used for curricular purposes. Some general conclusions are warranted about the use of task analysis in these projects. Task analysis was used primarily as a verification of previously-collected data about job performance in three of these projects. This fact suggests that task analysis procedures were narrowly applied to job or occupational performance. It may also be inferred that to do a task analysis of an occupation is an expensive and time-consuming undertaking. In using task analysis procedures, these projects delineated primarily
what should be done in terms of occupational performance, which, as noted earlier, has both advantages and dis-advantages.

In the search of the literature, only one reference was found where task analysis was used as the primary source of information for curriculum development in allied health education. Task analysis generally was utilized for validating previously collected or existing data concerning job performance. However, references were found in which task analysis was utilized for curriculum development in other vocational areas. A professional paper entitled, "Use of Job and Task Analysis" (1969), published by the Human Resources Research Office of The George Washington University, provides specific examples of the application of job and task analysis in different training situations within the context of the needs of the United States Army. The paper concludes that there is a need to apply an analytic approach like task analysis to determine job-based training requirements vis a vis human factor involvement. The paper is an excellent source for finding appropriate task analysis procedures which can then be translated into human training requirements.

The final section of this review of the literature will discuss a problem characteristic to the field of curriculum today—that is, the fact that the curriculum field encompasses many diverse aspects such as curriculum development
theory, systems theory, learning theory, and the theories of instruction. Individuals working in these realms have developed abstract theoretical positions not readily applicable by practitioners. Joseph Schwab (1969) has pointed out that the curriculum field has reached a moribund state by inveterate and unexamined reliance on theory in an area where theory is partly inappropriate and where the theories extant, even where appropriate, are inadequate to the tasks which the curriculum field sets them.

John Mann (1968) suggests that both scholarly and professional interests would be served by careful, self-conscious attention on the part of the curriculum theorist to the problem of the relations between his work and the work of other theorists, and between his work and the imminent discipline of curriculum theory.

In an attempt to bridge the gap between abstract theorizing and practical application, this section of the review of the literature will examine selected prototypical conceptual frameworks in the areas of curriculum development, learning, instruction, and systems concepts.

The most basic exposition of curriculum development and instruction is that of Ralph Tyler described in his book, Basic Principles of Curriculum and Instruction (1949). Herbert M. Kliebard (1970) has pointed out that the Tyler rationale, for rationally developing a curriculum, has been raised over time, almost to the status of "revealed
Tyler's curriculum development model revolves around four central questions which Tyler feels need answers if the process of curriculum development is to proceed. These questions may be reformulated into the four-step process of: (1) stating objectives; (2) selecting educational experiences; (3) organizing these experiences; and (4) evaluating to see if the objectives have been attained. Tyler's model has created the foundation upon which many theorists have conceptualized their theories.

In an attempt to answer Tyler's questions about objectives and evaluation procedures, Bloom (1956), Krathwohl (1964), and Simpson (1966) have prepared taxonomies to help curriculum developers specify objectives so that it becomes easier to plan learning experiences and prepare education devices. Mager (1962) and Popham (1969) have prepared texts to help educators prepare behavioral objectives.

Another source dealing with instructional objectives is a report by the Human Resources Research Office of The George Washington University entitled "The Derivation, Analysis, and Classification of Instructional Objectives," by Ammerman and Melching (1966). This report clarifies the methods, terms, and criteria associated with the determination of student performance objectives by synthesizing and applying the relatively new developments in
Human Factors research on this subject in the past decade, and it provides information to the instructional specialist about performance objectives and the ways they differ.

These sources present practical suggestions for curriculum and instructional development and are examples of moving theory into practice. However, to be effective, they must be placed in an appropriate context by all who are working on the development of curriculum and instruction.

The issue of curriculum vis a vis instruction is another area which has received much attention from curriculum theorists. Two sources are noteworthy in this area. Mauritz Johnson (1968) discusses curriculum as a structured series of intended learning outcomes and viewed as the output of a "curriculum-development system" and the input of an "instructional system." To Johnson, instruction is a system which has the three components of planning, execution, and evaluation, and in the design of "courses" and "instructional units," appropriate numbers of curriculum items (intended learning outcomes) are selected and organized for instructional purposes.

Hough and Duncan (1970) describe teaching as a four-phased activity including a curriculum-planning phase, an instructing phase, a measuring phase, and an evaluating phase. Instruction involves creating, using, and modifying instructional strategies and tactics in the classroom. In both sources, instruction is not subsumed under curriculum;
rather it is a logical step in the process of curriculum development and is the act of executing appropriate behavior. Thus curriculum development is a very important part of instruction, and conversely, instruction is very important in the process of curriculum development. This relationship is crucial when a model for curriculum is conceptualized.

The systems approach for curriculum development has also appeared in recent educational literature. Two examples of this are in the area of educational evaluation and in efforts to use task analysis as a point of departure for instructional development in any learning area.

The Phi Delta Kappa National Study Committee on Evaluation has defined educational evaluation as the process of delineating, obtaining, and providing useful information for judging decision alternatives (Stufflebeam, 1970). A systematic approach to decision-making is delineated in the C.I.P.P. model for evaluation where such decisions as those involved in planning project objectives, structuring projects to achieve stated objectives, implementing projects in terms of operationalizing and executing a project design, and recycling on the basis of judgment of and reaction to project designs, are systematically evaluated by four kinds of evaluation.

Stufflebeam (1970) points out that context evaluation serves planning decisions by identifying unmet needs,
unused opportunities, and underlying problems which prevent the meeting of needs or the use of opportunities; input evaluation serves structuring decisions by projecting and analyzing alternative procedural designs; process evaluation serves implementing decisions by monitoring project operations; and product evaluation serves recycling decisions by determining the degree to which objectives have been achieved and by determining the cause of obtained results.

This evaluation system is designed for large projects such as a curriculum development project, and it raises and attempts to answer pertinent questions relating to decisions which must be made throughout the entire process of development. Thus, a systems approach has been directed toward evaluative decision-making of large undertakings in education. The C.I.P.P. model for evaluation, however, is not readily applicable to more limited evaluative areas such as measuring student performance in relation to objectives or evaluating instructional effectiveness. However, there are other sources such as Hough and Duncan (1970) which deal with these issues.

Another systems approach has been applied in a model for instructional design and management developed by Tuckman and Edwards (1971). This model asserts that one begins in the design of instruction by specifying the tasks of an occupation as the goals of instruction. It represents
a departure from the typical techniques used for curriculum
development. The model consists of three phases. The
first phase, called analysis, contains the following three
activities in sequence: (1) specification of post-
instructional tasks via task analysis; (2) restatement of
tasks as behavioral objectives; and (3) specification of a
sequence for behavioral objectives (structural analysis
which is the process of delineating prior, subsequent, and
concurrent activities needed in relation to the behavioral
objectives). Following the analysis phase, the synthesis
phase is undertaken. This phase involves two activities,
occuring in parallel: (1) specification of instructional
activities and (2) design of evaluative procedures. The
final phase, operation, includes two simultaneous activi-
ties: (1) carrying out instructional activities and (2)
the collection of evaluative data. Following these three
phases comes a fourth activity, feedback and iteration,
wherein the data collected during the phase of operation are
fed back into the system so that it can be tested, validated
and redesigned based on input data.

This systems model, suggesting use of task analysis
procedures and the concept of structural analysis, pro-
vides an excellent framework for curriculum development.
The process of structuring tasks into prior, concurrent,
and subsequent learnings is difficult to perform,
especially if extensive data collected by the task analysis
are involved. However, once a format for structuring is developed, curriculum development can be facilitated. It is this system which served as a basis for development in the project central to the investigation reported here.

Finally, a prototypical theory of learning is exemplified in the work of Gagne. Gagne (1965) hypothesizes that there are eight kinds of learning, each requiring a different set of conditions for its occurrence, and these are specifically (1) signal learning, (2) stimulus-response learning, (3) chaining, (4) verbal association, (5) multiple discrimination, (6) concept learning, (7) principle learning, and (8) problem solving. These types of learning are placed on a concrete to abstract continuum.

As Tennyson and Merrill (1971) point out, Gagne's hierarchy provides a systematic relationship to previously independent movements in learning research, and it is the first model to bridge basic learning theory and the more applied concerns of instructional psychologists. Gagne's work has provided the theoretical basis for the rationale for curriculum development to be discussed in this investigation. Among other strengths, it emphasizes a continuum of learning from concrete to abstract which is related to the level of complexity of job performance delineated by task analysis. Gagne's theories have also provided the foundation for other theorists to discuss learning theory.
Tennyson and Merrill (1971) present a paradigm of instruction in which types of behavioral outcomes are distinguished in reference to conditions of learning by adding two additional categories to Gagne's original eight and arranging the ten categories into the four levels of emotional behavior, psycho-motor behavior, memorization behavior, and complex cognitive behavior. This paradigm also includes instructional constructs arranged in a hierarchical fashion so that in complex cognitive behaviors such constructs as classification, analysis, and problem solving are included; in memorization, naming, serial memory, and discrete memory constructs appear; in psycho-motor behavior, topographic, chaining, and complex skill constructs are included; and in emotional behaviors, emotional signal learning occurs. The paradigm operationally defines the constructs mentioned above and uses the writing of Gagne plus other data from theorists such as Bloom and Krathwohl to integrate emotional behavior into learning theory.

Emotional behavior, as it is pointed out in this scheme, has a considerably different relationship to the whole than does Krathwohl's affective domain because the four levels are hierarchical in that behavior at a higher level (such as emotional behavior) includes some kind of behavior from each of the lower levels as a prerequisite.
Thus, the paradigm relates all kinds of learning to emotional learning.

In summary, this section of a review of the literature has presented some prototypical theories of curriculum, curriculum development, instruction, learning, and systems. It has discussed these theories in relation to possible applications by curriculum developers and has also shown how these theories provide a theoretical foundation for the curriculum development process underlying this investigation. This section has provided a framework in which a synthesis of theory and practical application can take place.
CHAPTER III
A CASE STUDY OF CURRICULUM DEVELOPMENT
UTILIZING A TASK ANALYSIS APPROACH

This chapter reports, in a descriptive case study form, certain aspects of a major curriculum development project\(^1\) utilizing a task analysis approach. The investigator functioned as a participant-observer in the undertaking. One specific objective of the project was to produce curriculum modules for the training of occupational therapists at four levels. The focus of the investigation reported here is on the curriculum development process and the role of the curriculum specialist undertaken in that process.

This chapter is divided into two parts. Part I contains a flow chart depicting a step-by-step analysis of the processes and procedures utilized in developing job descriptions in occupational therapy through task analysis. Part I includes also a description and rationale of the procedures involved in the task analysis to develop job

\(^1\) Research project funded by the United States Department of Health, Education, and Welfare, Public Health Service (Grant No. 5 D02 AH 00964 02), entitled "The Development of Occupational Therapy Job Descriptions and Curricula Through Task Analysis," School of Allied Medical Professions, The Ohio State University, July, 1970-June 1972.
descriptions. It further includes an explication of the role of the curriculum specialist at each step of this developmental process. Part 2 describes those processes of curriculum development involved in the development of curriculum guides in the project and the role of the curriculum specialist. Both parts constitute the investigator's report as participant-observer in the complex operations that characterized the total undertaking. Note should be made of the fact that his description as participant-observer differs markedly from the report of the project as a whole. He is concerned throughout with fulfilling the major objective of this study--namely, to interpret the role of a curriculum specialist.

Part I. Task Analysis

A flow chart depicting the process and procedures developed in the use of the task analysis approach to develop job descriptions in occupational therapy helps to map out the complex operations. It appears on the following pages.
Chart 1
FLOW CHART

1.0 Formulate and develop a plan for a project proposal to use task analysis for the development of job descriptions and curricula in an allied health profession.

1.1 Survey literature and allied health educators and practitioners to delineate the need for the study and willingness to undertake it.

1.2 Develop project proposal including objectives, tentative procedures, budget and appropriate supporting documents.

2.0 Development of or adaptation of task analysis data collection procedure.

2.1 Define scope of data to be collected.

2.2 Select or adapt task analysis procedure.

2.3 Modify or expand procedures as necessary to obtain additional data.

3.0 Selection of facilities in which task analysis data are to be collected.

3.1 Define tentative criteria for selecting facilities.

3.2 Establish final criteria for selection of facilities.

3.3 Develop tentative listing of facilities which might be used as sources for task analysis.
Recruit staff to fulfill project objectives 1.3

Recruit and meet with a Planning Advisory Committee. 1.4

Test procedures by means of trail runs and modify procedure as necessary to facilitate data collection. 2.4

Prepare procedural and reference handbook 2.5

Establish a final confirmed list of facilities. 3.4

Selection and training of data collection personnel. 4.0

Select data collection personnel using criteria which define needs 4.1

Data Collection 5.0

Arrange for data collectors to visit facilities selected for study 5.1

Data Analysis 6.0

Compile data on the basis of its verbal content to construct a composite activity list 6.1
FLOW CHART (continued)

- Prepare for training conference 4.2
- Conduct task analysis at selected facilities 5.2
- Collect completed task analysis forms 5.3
- Prepare and send out questionnaires to educators and practitioners to evaluate completeness of data 6.2
- Conduct duplicate field audits to collect data on the validity and reliability of task analysis procedure 6.3
- Analyze data by a multivariate discriminate analysis of Worker Function and Worker Traits to provide statistical basis for job restructuring 6.4
- Conduct training conference 4.3
FLOW CHART (continued)

7.0 Development of Job Descriptions

- Consult with professional occupational analyst to order job element and duty statements, to rewrite statements to reflect level of worker performance, and to write job description summaries

7.1 Preliminary sort of composite activity listings into tentative job positions

7.2 Data collection teams participate in job restructuring conference to develop structuring criteria determining job descriptions

8.1 Conduct surveys of health professionals to ascertain suggested position titles for job descriptions, employment feasibility for workers prepared to perform jobs delineated, and areas of job performance overlap with other health professions.

8.2 Have professional occupational analysts re-rate job descriptions and use a multivariate discriminate analysis of re-rated job descriptions to verify job levels and descriptions.

8.4 Survey O.T. educators for level of learning complexity.

8.5 Review of job descriptions by Planning Advisory
Development of Plan

1.0 There follows here a description of the elements which make up the flow chart. The numbers used in the description correspond to the elements depicted in the flow chart. The formulation of a proposal to use task analysis to create job descriptions and curricula in an allied health profession involves an awareness of current manpower and educational issues and knowing appropriate personnel who can provide practical suggestions and ideas.

1.1 In the late 1960's, allied health educators such as Dr. Israel Light and Dr. Warren Perry were discussing the need for task analysis to deal with manpower and educational issues in allied health. A group of health profession educators and researchers at The Ohio State University were also aware of these problems and began discussing the possibility of developing a plan using such methodology. Dr. Kathryn Schoen, Associate Director of the School of Allied Medical Professions at The Ohio State University, Mr. John Camiscioni, a research expert in medical education at The Ohio State University, Miss Mary Francis Heermans, presently Associate Professor in Occupational Therapy at the University of Texas Medical Branch, in consultation with Dr. Ralph Ingersoll, presently Associate Dean, College of Medicine, University of Virginia, and Dr. Robert Atwell, Director, School of Allied Medical
Professions, The Ohio State University, began to formulate a proposal. They envisioned the idea of surveying one allied health profession to establish a method of using task analysis and to use this method as a prototype to apply to other allied health professions. The American Occupational Therapy Association (A.O.T.A.) was also interested in curricular revision and establishing explicit job descriptions for the profession as a whole. Through the American Occupational Therapy Association president, Miss Florence Cromwell, the Association endorsed the idea. The United States Department of Labor and the Ohio State Bureau of Employment Services were also contacted for consultation and approval of planning. Thus, the ingredients necessary for formulating a proposal—appropriate need, appropriate manpower, and appropriate moral support—were in evidence.

The three principal planners sought financial support from the United States Department of Health, Education, and Welfare. The United States Department of Labor was contacted for approval of the plan, and they were not only receptive to the plan but also provided additional input for implementing the idea. Moreover, the Department of Health, Education, and Welfare, Public Health Service, Division of Allied Health Manpower, requested that a formal project proposal be written.
1.2 The development of a project proposal followed the guidelines set down by the United States Department of Health, Education, and Welfare and included a formal statement of need, delineation of project objectives, suggested project procedures to attain the objectives, personnel needed, and budget. This was submitted to the Department of Health, Education, and Welfare, Public Health Service, Division of Allied Health Manpower, where it was reviewed and funded as a two-year developmental project (Grant No. 5 D02 AH 00964 02).

1.3 Immediately following funding, staff was recruited to implement project plans and procedures. At the time the project was being conceptualized, it was felt that it would be extremely difficult finding one person with the particular background needed to function as a director to develop both position descriptions and curriculum guides. Therefore, both a Director and Co-Director, each assuming primary responsibility for one activity, were provided to solve this problem. A decision was also made to employ a project administrator to provide continuous management of the project.

Both the nature and volume of the activities involved in the evaluation of task analysis data and the development of curriculum guides indicated a need for both a curriculum specialist and an evaluation specialist to assist in the completion of these functions. In anticipation of the
volume of typing, material production, preparation for conferences, and the like, two positions—administrative assistant and clerk-typist—were created. It was planned that Occupational Therapist-Occupational Analyst teams would be utilized to collect the data for the position descriptions. These individuals were classified as project consultants as were additional personnel called upon to provide expertise in the writing of curriculum guides. Finally, it was decided that an advisory committee was needed.

The staff positions were filled by individuals with appropriate backgrounds, experience, and training. The staff included an Occupational Therapist who acted as project administrator, two graduate students who acted as Curriculum and Evaluation Specialists, respectively, and an administrative assistant who helped to direct staff and project activities.

1.4 A final step in the planning stage was the recruitment of a Planning Advisory Board whose function was to provide guidance and make decisions concerning various aspects of the project. It was felt that an advisory board should represent a broad spectrum of medical practice and education, so individuals expert in medical research, hospital administration, medical practice (including physicians and practicing occupational therapists) and
occupational therapy education were asked to serve on an advisory board.

The Planning Advisory Committee met near the start of the project to confirm plans, offer advice and expertise, and to provide general direction for the project. Specific functions which the Committee performed will be delineated in appropriate places in the description.

**Developing Task Analysis Procedures**

2.0 In developing, or adapting, task analysis procedures, a number of steps are taken. In the process under study here, the following were identified:

2.1 One of the initial steps is a definition of the scope of the data to be collected. If all of the activities of a profession are to be observed and analyzed, then an analysis procedure capable of describing not only jobs, but responsibilities of workers, must be considered. If performance of a specific worker in a specific facility is to be analyzed, then an analysis procedure capable of observing minute details must be considered. In the project which served as a data base for this study, the scope of activity was defined as "everything currently performed or related to the performance of occupational therapy."
2.2 A next step is to select or adapt a task analysis procedure by (1) reviewing procedures that have been used in similar studies; (2) identifying types of data each task analysis procedure will produce; (3) determining whether task analysis procedures must be modified or augmented, and (4) defining the number of analysis personnel needed and their training needs in the use of task analysis procedures.

After reviewing several task analysis systems (see Chapter II), the project staff selected the occupational analysis procedure developed and used by the U. S. Department of Labor. It was chosen because (1) its usefulness had been demonstrated through prior application in the analysis of a wide variety of occupations including the medical profession; (2) it included techniques for evaluating worker traits involved in the performance of tasks, as well as in describing the job itself; (3) it contained a way of examining differentiated worker performances; (4) it could be used to obtain a description of all activities in occupational therapy with a minimum amount of modification; and (5) there are, nationally, a large number of trained personnel who could use the procedure and who, it was anticipated, would be able to provide valuable assistance by serving as resource persons, trainers, and data collectors.
2.3 The occupational analysis procedure contained a number of items which the staff decided to modify to meet the specific needs of the project objectives.

Terminology had to be specifically defined so that observation could be performed in relation to precise definitions rather than personal judgment. Another modification incorporated into the occupational analysis technique provided suggested functions and duties of occupational therapy practice to help an analyst focus on medical performances.

Other modifications developed by the project staff included (1) providing a format for a comprehensive description of the organizational structure of the facilities from which task analysis data are obtained; (2) developing forms to obtain supplemental types of information to provide a more comprehensive description of qualitative or quantitative aspects of tasks being performed; (3) developing forms to provide descriptions of minimum education or prior job experience standards established by facilities as entry qualifications for the performance of activities; and (4) developing forms to provide identification of activities being performed independently or simultaneously by persons in other allied health professions which might overlap with occupational therapy.
Thus, the U. S. Department of Labor occupational analysis system with specific modifications was prepared to guide the task analysis of occupational therapy.

The role of the curriculum specialist in the process of selecting and modifying a task analysis procedure centered on providing input about curricular and instructional problems which could possibly be observed by an on-the-job observation system. Such factors as general educational development needed by workers to perform specific activities, whether instruction of students or new workers was part of job performance, and whether learning objectives could be extrapolated from observations of job performance, were some of the issues which the curriculum specialist raised at this juncture in the process. Thus, the function of a curriculum specialist in this phase was one of a consultant to raise pertinent educational questions.

2.4 Once the project staff developed the task analysis procedures, the Planning Advisory Committee suggested trial runs as a feasibility check. The task analysis procedures were produced in rough form, and an occupational analyst and occupational therapist team were asked to use these procedures to collect data at a local health care facility. The analyst team suggested alterations to both procedures and forms that would make data collection easier, more accurate, and more complete.
In this phase the curriculum specialist helped to organize the procedural manual to be used in the trial run. Clarity for users was a prime objective. Once modifications were suggested, the curriculum specialist helped to write the modifications in clear and specific terms.

2.5 The preparation of a reference handbook with detailed instructions for use of the task analysis procedure and with appropriate forms to be used was the final step in this phase of the project. The handbook was used as a training manual for a later developmental phase.

The curriculum specialist helped to compile the handbook to facilitate instruction in its use. Thus, objectives of each procedure were specified, explicit directions were included, and a color-coding system was developed to provide for quick and easy reference.

Selection of Facilities

3.0 The selection of facilities in which task analysis data are to be collected include a number of considerations which are discussed next in this participant-observer analysis of the process.

3.1 Tentative criteria for selecting facilities must be developed and include such factors as: (1) geographic location of facilities if performance is different in many locations; (2) type of administrative or staffing organization of each facility if different types produce
differences in the activities of the occupation being analyzed; (3) differences among facility functions and objectives; (4) variation in minimum education and experience qualifications used in screening or hiring of personnel which could have a bearing not only on the level of complexity of activities being performed, but also on the amount of employee training taking place; and (5) cost factors, in that the number and location of facilities may be determined by consideration of analyst's travel costs.

3.2 In this project, the Planning Advisory Committee was utilized to review the tentative selection criteria and suggest final criteria for selecting facilities. Briefly, the primary criteria for selecting occupational therapy facilities to be analyzed were that they had to contain either psychosocial or physical function units in which acute/restorative, prevention, and maintenance types of care were provided. Secondary criteria for facility selection were also established and these include: (1) public or private sources of funding; (2) in-service training programs in progress; (3) consultative functions relating to community practice occurring; (4) all ages of client population are represented, and (5) all geographic areas within the United States are represented.
3.3 In the project, the project administrator, who was an occupational therapist, consulted with occupational therapist members of the Planning Advisory Committee to develop a tentative listing of facilities which met one of the primary criteria and as many of the secondary criteria as possible.

3.4 The objective of establishing a final confirmed list of facilities was met in the following manner: (1) Occupational Therapists on the Planning Advisory Committee, in a group process situation, narrowed the tentative list down to those facilities which met most of the criteria described above and finally selected fifteen facilities located in six geographic areas within the United States; (2) the project administrator communicated with each director and chief occupational therapist of the selected facilities and sent them an explanation of the project and requested, in writing, participation consent. Formal acceptance by each facility was received, and the facility participation list was complete.

The curriculum specialist provided relatively little input into this phase of the project's development. However, he did, in this case, suggest that the facilities where teaching of students was an important function should be included in the final confirmed list. This proved to be a significant criterion in the selection process.
Selection and Training of Data Collection Personnel

4.0 The selection and training of data collection personnel include a number of considerations discussed in this phase of the total operation.

4.1 Data collection personnel should be selected using criteria which define project needs. Consideration might be given to answering the following questions: (1) Are data to be collected by an individual or a team? (2) Is knowledge of task analysis and/or the occupation being analyzed required? (3) Do the number and location of the facilities to be visited suggest an optimum number of analysts that will be needed? and (4) Is the availability of data collection personnel a problem?

Since the project staff decided to use an adaptation of the United States Department of Labor task analysis procedure, the services of experienced occupational analysts from the federal field centers throughout the United States were secured. It was planned that two-member teams would be involved in data collection, and the team would include an experienced analyst who was able to use the task analysis procedure and who could view the occupation objectively, and an occupational therapist suggested by the advisory committee who could guide the analyst to insure completeness of the task analysis data. Each team member provided a valuable service to the project; however,
certain strengths and weaknesses of the team concept manifested themselves. These will be discussed in the explication of the data collection operations in a later phase of the process.

During this phase, the curriculum specialist did research into the profession of occupational therapy and into the occupational analysis procedure. The curriculum specialist participated in informal discussions with professional occupational therapists and occupational therapy aides to ascertain their perceptions of their jobs and to have them provide both a definition of occupational therapy and an informal job description. Informal discussions were also conducted with other allied health personnel to ascertain their perceptions of occupational therapy and where differences exist between their profession and occupational therapy.

The curriculum specialist also did further research on the United States Department of Labor occupational analysis procedure. In effect, he continued to "ground himself" in the conventional wisdom that characterized the field.

4.2 A next step is to prepare for a training conference to orient and train data collectors. The project staff met several times to develop conference objectives, an outline for conference topics, and an evaluation strategy to see if the conference met its objectives. In addition,
teaching strategies and methods were discussed. It was decided that dissemination of information in the training conference would be divided by using a lecture method, supplemented by prepared written material (reference handbooks) and audio-visual aids, such as blackboards and overhead projectors. It was also decided that a method of group involvement would be used, and arrangements were made for all teams to visit selected local health facilities and perform a "mini-analysis." Teams would then reconvene as a large group and discuss problems they had encountered and would propose any further refinements of the analysis procedures.

The curriculum specialist provided input concerning conference objectives and instructional strategies to be used. The conference objective, stated in terms of terminal behavior which the participants would exhibit by the end of the conference, was that all participants would be able to perform a task analysis of a selected occupational therapy facility. Instructional strategies were directed toward organizing learning experiences and executing appropriate teaching behavior. Thus, the professional knowledge, background, and experience of the curriculum specialist were used in a significant and unique way in planning the training conference.

4.3 In the project, the training conference for the data collection teams was scheduled for three days during which
time the following activities took place: (1) a review of the project background and goals; (2) a broad description of the profession of occupational therapy; (3) a description of the rationale of the task analysis procedure to be used in terms of the "why" and "how"; (4) a description of the data collection forms and the procedures for their completion; (5) a practice session where data collection teams performed a "mini-analysis" in local occupational therapy facilities; and (6) a group discussion of data collection problems and solutions.

The curriculum specialist served as an observer of teaching and learning behavior. He thereby provided feedback to other project staff about the effectiveness of the instruction. An informal observation system based on the curriculum specialist's teaching experience served as an evaluation system for this particular operation.

In this study, analysis teams, including professional analysts and occupational therapists, were used to collect data. Selection of individuals for the teams was based on project needs and availability of personnel. The training conference oriented the groups to the task analysis procedure and to the profession being analyzed. Moreover, it identified and posed possible solutions to problems which arose from the specific procedures.
Data Collection

5.0 In the project, data collection, by use of the task analysis procedure, was accomplished over a three-month period, from December, 1970 through February, 1971, at selected facilities throughout six geographical regions of the United States. The following steps are involved in this process:

5.1 A preliminary time schedule for site visits is established by the project staff and the final specific time for analysis is established by the analysis teams. These operations are primarily administrative.

5.2 The task analysis conducted for the occupational therapy project follows four steps listed as follows:
   (1) a description of the facility in the form of its organizational structure and a general description of the occupational therapy department in terms of its staffing pattern; (2) a description of all activities being performed in the department and by specific personnel; (3) evaluations by analysts' rating worker traits and worker characteristics needed for job performance for each position and each cluster of tasks; and (4) a review of the data by the Occupational Therapy Department Head.

   In step one, information pertaining to the organizational structure of the facility and occupational therapy staffing patterns was obtained by the analysis teams in an
interview with the head of each occupational therapy department. This was considered to be an essential first step in the analysis since knowledge of the department's staffing pattern is vital to subsequent collection of complete and accurate data.

In step two, both team members participated in the collection of data concerning all of the activities performed in the department. The Occupational Analyst assumed responsibility for writing all activity statements in the manner prescribed by the task analysis procedure. The Occupational Therapist observed on-going department operations, equipment, supplies, etc., to determine whether there were additional activities not being performed at that time that should be included in the analysis. If it was ascertained that activities were not being performed at the time of analysis, interviews were conducted with appropriate personnel to obtain a description of these activities. Thus, an attempt was made to be as complete as possible in obtaining data concerning activities performed in each department.

In step three, the Occupational Analyst assigned numerical ratings of worker functions and worker traits (according to the U. S. Department of Labor analysis system used) for each activity observed and/or described. Such traits as general educational development, interest,
temperament, aptitude, environmental conditions, manual dexterity, data, people, things involvement, and others, were assigned ratings.

In step four, a review of the collected data was performed by the occupational therapy department head who was asked to suggest changes in the description of department activities if they were not being performed in the facility being surveyed. This is a standard procedure of the task analysis system as is the signature obtained from the department head to indicate that the data collected are accurate.

5.3 The task analysis data were typed by the analysis teams and sent to the project office. In the project, certain problems developed because of the season in which the analysis was conducted (i.e., Christmas) and because of the time needed by the teams to do a complete analysis. Originally, it was thought that three days would be adequate for a complete analysis of an occupational therapy facility. However, the analysis teams found that this amount of time was inadequate, and so it was not until a month after the deadline that all analyses were completed. The Occupational Therapist team member was able, in most cases, to "speed up" the process of task analysis by directing the occupational analyst's efforts. Most of the Occupational Analysts reported that having someone who
knows the profession and positions being analyzed can facilitate the process of analysis. However, they felt that this was not an appropriate substitute for additional time.

The curriculum specialist was able to make suggestions for "crisis" resolution throughout this phase of the task analysis process. This role proved to be significant in that the curriculum specialist had a perspective of many administrative problems which differed from that of other staff members. Often their perspectives were colored by their personal involvement with the problem. While this is not a role of a curriculum specialist per se, it is clearly a part of his role as a team member.

Data Analysis

6.0 Data analysis is a most important part of the whole process of using task analysis. Order must be created from a mass of data so that rational decisions can be made and a functional product can be developed. Validity and reliability of the procedures used must be established. The following procedures were utilized to analyze the collected data.

6.1 The task analysis teams identified 264 duties and 1458 tasks which occurred in the facilities surveyed and were performed by occupational therapy personnel. It was
essential to make order out of these data so that a com-posite activity list could be developed. Two methods of compiling data were suggested by occupational analyst consultants. One was a statistical analysis of the ratings given to each statement so that similar ratings would identify similar statements. The other was a logical analysis based on the verbal content of each statement. Both methods were given a feasibility check, and the logical-verbal sort proved to be more appropriate.

The logical-verbal sort of the data was performed by the project administrator who, as noted, is an occupational therapist. She examined the verbal content of each duty and task statement and grouped duty and task statements which she considered were describing the same or similar activities. She gave careful attention to the context in which these activities were observed while she was making these determinations. The statements were then organized in a logical (either sequential or functional) order of duties with tasks related to the performance of the duty grouped under each duty. Thus, a Composite Activity List was developed.

The professional experience of the project administrator and, therefore, her professional bias was evident at this stage. However, later analyses and validation of the data were performed to correct this bias.
6.2 The Composite Activity List was presented to a representative sample (96 individuals) of occupational therapy educators at both the baccalaureate and technical levels and occupational therapy practitioners at all levels of job performance who had previously agreed to participate in a survey. This group of evaluators was asked to (1) identify duties and tasks on the list not considered to be in the domain or responsibility of an occupational therapy department; (2) identify duties and tasks which they considered as part of the domain of occupational therapy but not listed in the Composite Activity List; and (3) identify listed activities which should be changed to reflect their replacement by different or more effective procedures.

There were 67 responses received from the 96 representatives and the results of the survey are summarized briefly below: (1) deletions of duties and tasks were basically in the clerical and transportation areas of performance; (2) additions of duties and tasks were in the areas of consultation and research; (3) changes in wording were extensive in that 489 changes in the wording of the statements were suggested. These suggested changes were grouped and compared with the duty and element statements in the Composite Activity List.

All of the suggested wording changes were incorporated into the list except in some instances where suggestions
for change were at variance to each other or to originally collected statements. Where variance of statements to each other existed, the suggestions of a simple majority were accepted. In the case of variance with original statements, the number of analysts' duty and element statements was checked; if the number of suggested changes was greater than the number of duty and element statements contributed by the analysts, the statements were then changed to reflect evaluators' suggestions. The wording changes, it was concluded, reflected the evaluators' concern for accuracy rather than an attempt to inflate the importance of the activity statements. It was also concluded that the new statements did, indeed, reflect practices which should be occurring in occupational therapy.

The specific input of the curriculum specialist into this procedure was a proposal to obtain group consensus and to discuss the future. The curriculum specialist, in this instance, suggested the Delphi Technique as an appropriate method to serve both as an evaluation tool and a way to obtain group consensus. The Delphi Technique has been used previously in education as discussed in detail by Weaver (1970). The recommendation was made that it be modified for use in this project. Thus, the curriculum specialist, functioning as a researcher, provided a research tool for use in data analysis and evaluation.
6.3 Duplicate field audits were conducted to collect data on the validity and reliability of the task analysis procedure developed by the project staff. One duplicate audit compared the report of the occupational analyst-occupational therapist team with a report performed for the same facility by a single occupational analyst.

The purpose of this dual analysis was to determine whether an individual occupational analyst would obtain essentially the same data as an occupational analyst-occupational therapist team and, if not, to determine the area or areas where the occupational therapist team member influenced the observation. The evaluation compared the verbal statements of both analyses and the worker trait-worker characteristics ratings in both analyses. That information, however, made it difficult to determine if the differences in the reports were due to the fact that an occupational therapist accompanied the one analyst or to individual differences in the way the two analysts organized data.

Another difficulty encountered in making a determination was the fact that because the facility was surveyed at different times, it was possible that functional changes in the occupational therapy department had occurred in the interim. However, with the available evidence, it was possible to infer the following: (1) on duties deemed comparable, there existed very little disagreement
in the two reports where the occupational therapist may have influenced the ratings; (2) in terms of data obtained, it appeared unnecessary to use a team approach because both analyses yielded substantially the same information.

Thus, a duplicate analysis to determine the influence of the occupational therapist on the data collection made clear that she had not influenced the ratings or the collection of statements.

A second audit took the form of a duplicate task analysis of a facility performed by an occupational analyst-occupational therapist team who had initially worked in a different region. A comparison of the two analyses showed that the second analysis reported ten duties where the initial analysis reported eight. A test indicated that there was a significant difference in the mean scores of data ratings at the .05 level. The "people involvement" rating mean scores showed a slight difference and the "things involvement" rating mean scores remained constant between analysts.

This evidence seemed to indicate that the rating discrepancy was due to personality and training differences of the analysts. The duplicate audit of a previously analyzed facility, however, led the project staff to conclude that the task analysis procedure was relatively complete and generally accurate and that inter-rater reliability was high.
These two kinds of duplicate audits are generally advised as a check on the reliability and validity of the task analysis procedure. Internal and external variables may interact with the treatment and create some discrepancies which must be taken into account when stating results and conclusions of the validation studies.

The project evaluation specialist performed all the analyses of data concerning duplicate audits, and the project administrator made all the necessary arrangements for doing the duplicate audits. The results of the duplicate analyses were of special interest to the curriculum specialist because of their implications for such aspects of curriculum development as the formulation of objectives.

6.4 Analysis of the collected data by a multi-variate discriminate analysis of Worker Function ratings (Data, People, and Things involvement) and Worker Traits ratings (general educational development, specific vocational preparation, interests, temperament, aptitudes, physical demands, and working conditions) was suggested initially, as noted, as a way of sorting and compiling the data into a composite activity list. This analysis was made but the results were not used because it did not provide adequate information to develop a composite list.

The analysis of the Worker Function ratings and Worker Trait ratings did provide some insights into the profession
of occupational therapy which had significant educational implications. For example, by correlating the mean scores of all the ratings given for general educational development (G.E.D.) and specific vocational preparation (S.V.P.), it was concluded that preparation for occupational therapy required educational and vocational preparation beyond a general education program. A relatively high correlation of the mean ratings for intelligence and verbal aptitude showed that performance in occupational therapy required above average ability in these two areas. Intercorrelations of these four areas showed that educational preparation should include a high degree of cognitive learning. An intercorrelation of spatial aptitude, form perception, motor coordination, finger and manual dexterity ratings was also high, and this indicated that perceptual-motor learning was also necessary for preparation in the profession of occupational therapy.

Analysis of the interest ratings indicated that a majority of activities seen represented (1) situations involving a preference for activities concerned with people and communication of ideas versus a preference for activities dealing with things and objects; and (2) situations involving a preference for working with people for their presumed good versus situations involving a preference for activities that are non-social in nature.
Analysis of the temperament ratings indicated that a majority of the activities represented (1) situations involving the necessity of dealing with people in actual job duties beyond giving and receiving instructions; (2) situations involving the direction, control, and planning of an entire activity or the activity of others; and (3) situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against sensory or judgment criteria.

The analysis of the Worker Function ratings (Data, People, Things) revealed that the highest mean ratings for each activity statement were in the data category, next highest in the people category, and lowest in the things category. Intercorrelation of data, people, things revealed that these functions were largely independent of each other.

While findings of interest and temperament ratings indicated that occupational therapy is a "people-oriented profession," the D.P.T. ratings did not reinforce this. It might be said that data involvement is probably data about people and their activity rather than data involved in a concern or interest in cognitive information.

Thus, while the multi-variate discriminate analysis of Worker Function and Worker Trait ratings was not feasible for compiling a composite activity list of duties and
elements in occupational therapy, it did provide useful
cues for certain aspects of curriculum development.
A detailed report of this analysis and its findings are
included in Appendix A.

Computations and correlations were performed by the
project evaluation specialist. However, since this phase
had curricular implications, the curriculum specialist was
required to understand the language of statistics and
evaluation.

In summary, data analysis included (1) sorting and
compiling data on the basis of verbal content using a
logical analysis; (2) evaluation of the data performed by
a representative sample of occupational therapy educators
and practitioners using the Delphi method to gain consen-
sus; (3) duplicate field audits to determine the reliability
and validity of the task analysis procedure; and (4) a
multi-variate discriminate analysis of analysts' ratings,
performed initially as a way of sorting and compiling data,
but rejected for this task.

**Job Restructuring**

7.0 The next step involved restructuring the activity
statements so that job descriptions could be developed.
The restructuring process was based on the United States
The procedures followed in this process are as follows:

7.1 After the Composite Activity List, containing a logical sort of the verbal content of the collected data, was evaluated and modified, it was decided that a further synthesis of the data was necessary in order to provide input for a job restructuring conference. Three procedures were followed to accomplish this synthesis:

1. Tentative determinations of the level of job complexity were made using the mean scores of the general educational development and specific vocational preparation ratings. Four levels were identified starting with level 3 and going to level 6 as the highest level of job complexity.

2. It was observed that there were two primary processes into which all recorded performances in occupational therapy could be categorized. These two processes were: (1) Client Services and (2) Supportive Activities. Collected data were then divided into these two processes.

3. Recorded statements could be further broken down into a number of process stages which closely paralleled the duty statements collected. Thus, such process stages as intake, client evaluation, treatment planning, program planning and coordination, personnel management, and others, were identified.

A grid reflecting the above procedures is shown in Figure 1.
<table>
<thead>
<tr>
<th>Process I</th>
<th>Process II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Services</td>
<td>Supportive Activities</td>
</tr>
<tr>
<td>Level</td>
<td>Process Stage</td>
</tr>
<tr>
<td>Intake</td>
<td>Program Planning</td>
</tr>
<tr>
<td>Client Evaluation</td>
<td>Program Coordination</td>
</tr>
<tr>
<td>Treatment Planning</td>
<td>Program Management</td>
</tr>
<tr>
<td></td>
<td>Personnel Management</td>
</tr>
</tbody>
</table>

Figure 1

Grid to Synthesize Task Analysis Data

Data were then sorted through this grid and summary statements of the analysis data were written and placed appropriately within the grid to serve as input for job restructuring efforts.

The bulk of the data sorting was performed by the project administrator and the evaluation specialist whose professional backgrounds provided them with competencies to perform this process. In this phase, the curriculum specialist gained additional substantive information about the profession and its function, information which served an important function in later phases of the curriculum development process.
7.2 The objective of the job restructuring conference was to develop job descriptions from the Composite Activity List by assigning a level of job complexity rating to each duty and element statement. Primary decision making was the responsibility of the teams who had performed the original data collection, with consultation by experts in occupational analysis, medical education and research, and occupational therapy practice. The group chose to use the general educational development (G.E.D.) scale developed by the United States Department of Labor, Division of Occupational Analysis, to establish the primary criteria for determining the complexity of each activity. G.E.D. criteria included those aspects of education (formal and informal) which contribute to the worker's reasoning development and ability to follow instructions and acquisition of "tool" knowledge such as language and mathematical skills. It is education of a general nature which does not have a specific occupational objective and is obtained not only in public education but also from experience and individual study.

Secondary criteria used in job restructuring were the two sets of combined numerical composited ratings: one in the cognitive-educational dimension, and the second in a perceptual-motor dimension which had been derived from the original analysis ratings (see step 6.4).
The conferees were divided into small heterogeneous groups and were assigned to review duty and element statements, one at a time, in order to determine the appropriate G.E.D. level. In some cases, the conferees broke activity and element statements into component parts and assigned these parts to one or more of four different performance levels. After duties and elements were assigned to G.E.D. levels, the levels were reviewed by the total group for continuity of client care and feasibility of worker activity. The group also made suggestions for organizing the job descriptions and writing activity statements to reflect clearly the level of complexity.

The restructuring process involved some compromise between occupational analysts, who viewed the data from an objective perspective, and occupational therapists, who viewed the data from the perspective of having personally performed many of the activities. Many "professional" disputes were resolved by the teams literally interpreting the G.E.D. criteria statements or through arbitration by expert consultants in occupational analysis and medical education who attended the conference.

The curriculum specialist participated in this conference as one whose primary responsibility was that of clarifying statements and directions and answering questions about the sorting and compiling process. He also
acted as a mediator when groups could not reach decisions and as a coordinator of consultants when their consultation was needed. In this role, the curriculum specialist was primarily an observer of a group process situation. Throughout the conference, he was called upon to utilize both interpersonal skills and his knowledge of the data analysis procedures and the G.E.D. criteria.

**Developing Job Descriptions**

8.0 The job descriptions developed during the job restructuring were not a finished product. Conference participants ordered most of the broad duty statements and made some recommendations about ordering many task statements. Therefore, the project staff continued from this point to develop final job descriptions for all levels of occupational therapy performance.

8.1 Statements in rough draft of the four job descriptions compiled during the job restructuring conference were organized and rephrased by the project staff, an occupational analyst consultant, and a consultant in expository writing. The objective of this process was to define clearly and concisely the parameters of each level of job function according to the guidelines set during the job restructuring conference. This was accomplished by (1) writing a detailed description of each level with its
ordered duty and element statements; (2) delineating a list of major activities performed at each job level; (3) producing a narrative summary of each job description; and (4) developing a chart, using the synthesis grid (Figure 1) indicating the division of responsibilities at each job level.

Also involved in this process was a review of the overall continuity of client services and worker activity. Gaps in continuity were filled by checking original data to determine if an activity was observed and recorded and then writing additional statements which would reflect continuous client care or worker function. The grid was also reviewed for horizontal and vertical continuity to maintain consistency of statements, and completed job descriptions were finally written.

The curriculum specialist added some relevant information to this process, information which he had obtained from reflection of the restructuring conference.

8.2 It was decided to conduct surveys of occupational therapy educators and practitioners to gain input for suggested job titles for the job descriptions, possible employment opportunities for workers prepared to perform the jobs described in the descriptions, and to ascertain areas of job performance which overlap with other allied health professions.
First, employers of occupational therapists were asked to determine the feasibility of the job descriptions and the employability of persons having those skills and abilities. Fifty-seven facility representatives were surveyed, and of twenty-eight respondents, over 80 per cent indicated they would employ individuals trained at all levels except level 6. The respondents felt that an occupational therapist consultant or researcher, as they generally titled this level, should work at a university or in a high-level policy-making position. However, they asserted that it was doubtful that either university programs or major policy-making bureaucracies, such as the federal health agencies, would utilize a person trained at this level for work only in relation to occupational therapy. The majority of the respondents also felt that the job descriptions would be feasible to use within the next five years with a decreased emphasis on the lowest level in terms of employability.

Respondents were also asked to assign titles to the then untitled job descriptions. Responses are listed in Figure 2 below. At a later conference, the advisory committee made final decisions about job titles, which are also indicated.
<table>
<thead>
<tr>
<th>G.E.D. Level</th>
<th>Majority of Employers' Responses</th>
<th>Planning Advisory Committee Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Education and Research Coordinator, Research Occupational Therapist, Occupational Therapy Consultant</td>
<td>Program Development (Occupational Therapy Consultant)</td>
</tr>
<tr>
<td>5</td>
<td>Director or Supervisor of Occupational Therapy, Senior Staff Therapist</td>
<td>Program Supervision (Occupational Therapist)</td>
</tr>
<tr>
<td>4</td>
<td>Staff Occupational Therapist</td>
<td>Program Implementation (Occupational Therapy Technician)</td>
</tr>
<tr>
<td>3</td>
<td>Occupational Therapy Assistant</td>
<td>Program Support (Occupational Therapy Aide)</td>
</tr>
</tbody>
</table>

**Figure 2**

**Titles Assigned to Project Job Descriptions**

A contrast appeared at level 4. The majority of respondents saw level 4 as being the activities performed by the staff therapist, while the advisory committee viewed level 4 as a technician's position.

Unlike the first survey, which was sent to occupational therapists, a second survey was directed to twenty-five medical and allied health professional organizations. The groups were asked to indicate on a five-point scale (1) if they were prepared to perform delineated activities of the
job descriptions, and (2) the nature of desirable coordination between occupational therapy and their profession.

Twelve respondents indicated that their professions were not prepared to perform over 40 per cent of the duties at each level, but they were prepared to perform "some aspects" of approximately 30 per cent of the duties. They indicated that they were prepared to perform only about 4 per cent of the duties more appropriately than occupational therapists. In response to item 2, the respondents indicated that approximately half of the client care activities were a team responsibility which should be coordinated with other health care personnel. Half were viewed as independent functions of occupational therapy.

It was concluded from this survey that other health professions view occupational therapy as an important part of client care. Further, it was concluded that a high degree of coordination was needed between occupational therapy and other health professions. Consequently, sizeable overlap in worker activity among the professions is considered desirable.

One of the functions of the curriculum specialist in this task was to help structure the questionnaires using appropriate research methodology. A knowledge of survey research design was necessary to construct the questionnaires. The curriculum specialist, as a researcher, contributed ideas from his background and experience.
8.3 The completed job descriptions had to be re-rated to provide final conclusive ratings for those who would implement the job descriptions in occupational therapy facilities and to provide a basis of comparison with the original data. The new job levels specified by the participants in the restructuring conference were rated independently by five occupational analysts throughout the country. They reacted strictly to the verbal statements contained in the job descriptions. The re-rating was necessary because many of the duties originally delineated had been broken down and classified in more than one level.

A multi-variate discriminate analysis of the analysts' new ratings supported the following generalizations: (1) ratings for the General Educational Development, Specific Vocational Preparation, and all aptitudes corresponded closely with the averages of the original duty ratings assigned to each level; (2) physical demands and environmental conditions were generally rated the same as the original data; and (3) the interests and temperament ratings showed some significant changes in that they became more specific by level. For example, in level 6, the ratings indicated that the duty statements required a person to maintain an interest in activities of a scientific, technical, and abstract nature while maintaining an interest in people. On the other hand, the data for level 3 indicated the need for a high interest in situations involving
people and no interest for situations dealing with abstract
and technical aspects of occupational therapy.

Thus, the analysis of the completed job descriptions
tended to verify the results of the job restructuring con-
ference. Moreover, it established certain directions for
future implementors of the job descriptions.

Although the curriculum specialist had no specialized
involvement in this process, the data had educational and
curricular implications. At this point in the total process
he needed to understand the analysis and synthesis of these
data for his work in developing curriculum later in the
undertaking.

8.4 A final process in the delineation of job descriptions
was a review of the descriptions by the advisory committee.
The criteria for review included feasibility for use,
completeness and accuracy. The advisory committee felt
that the job descriptions were accurate and complete and
that the task analysis procedure used was valid and
appropriate for use in other allied health situations.

The advisory committee, at this point, was also asked
to provide input for curriculum development based on the
data from the job descriptions. This they did, and an
explanation of the committee's suggestions are included in
Part 2 of this chapter.
In summary, this section has presented a flow chart and a description of the processes and procedures involved in using task analysis to determine job descriptions in occupational therapy. The role of the curriculum specialist as a participant observer in this phase of the total curriculum development process was delineated in each of the eight major operations depicted in the flow chart.

Part 2. Curriculum Development

Part 2 of this chapter delineates the next phase in the overall process of curriculum development by presenting a flow chart depicting the procedures followed in developing curriculum guides and descriptions of these procedures. As in Part 1, the role of the curriculum specialist functioning as a participant-observer is explicated.

The flow chart is presented on the following page.
Formulate plans for Curriculum Development 9.0

Survey literature on curriculum development models and theories of curriculum and instruction

Decide format and organization of curricular guides 9.2

Plan procedures to be followed in curriculum development process 9.3

Survey occupational therapy educators and practitioners to ascertain level of learning complexity, best setting for learning and teaching media and methods they presently use. 9.4

Review and critique of plans and input from the advisory committee 9.5

Develop Curriculum Modules' Performance Objectives 10.0

Delineate process flow chart to depict and explain the steps in developing performance modules and create tentative modules 10.1

Develop and explain the process of delineating effective performance objectives and create tentative objectives 10.2

Critique and review of module performance objectives in terms of accuracy and internal and external consistency by consultants in O.T., medical and vocational education 10.3

Develop Instructional media, methods, and strategy evaluation strategy and procedures, and selection specifications 11.0

Develop and attach suggested teaching media, strategies and methods to performance modules by curriculum specialist 11.1

Develop and attach evaluation strategies and procedures and selection specifications to performance statements by evaluation specialist 11.2

Critique and review of modules by advisory committee 11.3
Plans for Curriculum Development

9.0 To formulate plans for curriculum development based on data collected by task analysis, a wide range of specialized operations is required.

9.1 A thorough review of the literature must be undertaken to find appropriate models or paradigms for curriculum development using task analysis or other models of curriculum development that might be adapted. In effect, there must be established a sound conceptual base. Literature on curriculum theories, learning theories, and theories of instruction and evaluation must also be surveyed to provide input for curriculum development decisions. Finally, previous projects in allied health education, vocational education, and teacher education must be consulted for what they might contribute to the necessary conceptual underpinnings.

In the project, this task involved a cooperative team effort between the project staff and the curriculum specialist. Initial surveys of the literature were made by the curriculum specialist. The collection and compilation of sources was facilitated by the project administrative assistant who developed annotated reference files and a "mini" library of the sources based on the survey. The curriculum specialist evaluated and reported on the
literature and presented these findings to other staff members as essential background information required for their participation in curricular decision-making.

Chapter II of this investigation reviews the literature which was surveyed to provide information for decision-making. The review clearly is selective in nature in that many more items were identified through appropriate E.R.I.C. searches. Several categories were used in this search to guarantee that the survey was not constrained by the boundaries of one specific field such as "task analysis" or "curriculum development" or "allied medicine."

In this particular phase of the process, the curriculum specialist provided leadership in presenting information to other project staff members.

As a researcher and a specialist in education, he performed a major role.

9.2 Once the literature has been reviewed and models for curriculum development have been studied, a decision concerning the organization and format of the curriculum guides is essential. An examination of the job descriptions developed by the task analysis supported the proposition that they were excellent sources from which educational objectives could be developed. They contained statements of worker performance from which determinations of student
performance could be made. Thus, a starting point for curriculum development was established. Considerations concerning the organization of the student performance statements indicated that three types of learning modules would be developed and titled (1) clinical application, (2) information-application, and (3) basic information to reflect a sequential continuum of concrete to abstract learning. Clinical application modules would thus be educational performances based on performances delineated in the job descriptions and defined as performances which a student would be able to practice in a clinical experience.

Information-application modules would be based on inferred skills (from the job descriptions) considered necessary to be learned in order to perform in the clinical-application modules and would include specific information which a student needed to recall and comprehend in order to perform a given skill. For example, "communication skills" is considered necessary for a student to enable him to confer with other staff or aid clients in treatment. And, in turn, the identification and comprehension of verbal and non-verbal behavior cues would be information needed by a student to develop communication skills. Thus, both the skill and the specific information needed to perform the skill would be included in the information-application module.
Basic information modules would again be inferred from the job descriptions and would include information considered necessary for a student to recall and comprehend in order to apply to skills delineated in the information-application module. However, this information would not relate to specific skills as does the information delineated in the information-application module. Rather, it would be background information which must later be applied in order to perform a skill. For example, recall and comprehension of facts concerning normal human development would be information needed by a student to instruct a client in the use of a prosthetic device or to confer with a client exhibiting a physical handicap. Thus, later use of information in the basic information-module as it relates to specific clinical performances and skills would be indicated.

Performance objectives inferred from the job descriptions came to be viewed as only one element in the curriculum modules. The modules which evolved included also suggested teaching media and resources, suggested teaching strategies and methods to help the classroom teacher provide educational experiences for students, and suggested strategies and procedures to help monitor a student's attainment of the performance objectives.

It was also decided that the modules should contain a module title and definition to describe the overall
content of the module.

In summary, modules for each level of educational performance based on the job descriptions were to be developed. Each different kind of student performance inferred from the job description would contain a module title, definition, goal and purpose, and suggested teaching and evaluation procedures.

The curriculum specialist provided major leadership and direction in this phase of the process. The model for instructional design formulated by Tuckman and Edwards (1971) provided the rationale and direction for making decisions about the organization of curricular modules. The project staff relied on a group process approach in making organizational decisions. In this approach, the curriculum specialist participated as a group member. As noted in Chapter II of this investigation, curriculum theory suggests many diverse ways to develop curricula, ways which have not yet stood the test of empirical research. The curriculum specialist, as a consequence, had relatively little substantive information to solve the problems which arose as the group worked to reach decisions. Thus, while the curriculum specialist had background and experience in dealing with some kinds of curricular problems, he could not provide ready-made solutions. He was, in a large measure, a participant in a group process in which decisions were literally hammered out in the practical
field setting. In effect, a conceptual framework was being
generated as practical problems were being attacked.

9.3 The plan for procedures to be followed in the curri-
culum development process was a next logical step after
decisions were made concerning curricular organization and
module format. However, the plans which were made were
always thought of as being tentative since no literature
offered assistance by verifying empirically tested proce-
dures to develop curricula by task analysis. Therefore,
plans for curriculum development included examining the
job description in terms of what was process (or means)
and product (or end), making some determination of the type
of learning necessary (i.e., cognitive, affective, or
psychomotor), and developing behavioral objectives. As
time progressed and work underway reached the actual
performance stage, the process generated problems and
possible solutions.

The curriculum specialist again played a role as a
member of a group process in which decisions concerning
procedures were made. His specialized knowledge, however,
served to give significant input in the process.

9.4 Surveys were sent to the same group of educators and
practitioners who reviewed and evaluated the Composite
Activity List. The respondents were asked to review job
description summary statements in terms of (1) the best
setting for learning each activity, and (2) the level of learning complexity of each activity. To provide input for (1) above, each respondent was asked to check one of the following on a five-point continuum: (a) entirely academic, (b) predominantly academic, (c) equally on-the-job and academic, (d) predominantly on-the-job, and (e) entirely on-the-job, in terms of the job descriptions.

An analysis of the responses from thirty-eight respondents revealed that the highest frequency of responses for all job levels was found under the category "equally on-the-job and academic." The responses also indicated that the "entirely academic" category decreased as the job levels decreased from consultant to aide, and conversely, "entirely on-the-job" decreased as the job level increased from the aide to the consultant.

Respondents were given a list of thirty-four cognitive affective and psychomotor skills levels to provide insight concerning the level of learning complexity. They were asked to check appropriate cognitive, affective, and psychomotor skill levels for each activity statement (see Appendix B).

An analysis of the responses indicated that the respondents felt that the lowest level job (aide) required a stronger emphasis on cognitive recall of specifics and affective awareness of behaviors and events than did any
other level. The responses also indicated that generally the cognitive and affective skills needed at each job level followed the hierarchical pattern intended in the Bloom and Krathwohl taxonomies. Thus, as the areas progressed from lower level cognitive skills, such as recall of specifics, to higher level cognitive skills, such as evaluation, the job levels correspondingly rose from the lowest level (aide) to the highest level (consultant). This was also true of the affective domain. However, a reverse pattern was noted in the psychomotor domain. The responses indicated that more psychomotor skills are needed at the lowest job level than the higher levels and all of the delineated psychomotor skills were needed at the lowest job level.

It was concluded from the survey that (1) job training for aide personnel was more on-the-job while succeeding job levels received training equally on-the-job and academic. Consultant level personnel received most of their training predominantly in academic learning situations; (2) more specific and practical cognitive and affective learnings were directed toward lower job performance while learning was more abstract and theoretical as job levels rose; (3) lower job levels received training in the psychomotor domain, more so than did higher levels. The survey results and conclusions served as guidelines in developing performance goals for curricular modules.
Another survey was sent to a random sample of occupational therapy educators to ascertain what media, sources, and teaching methods they used and were willing to recommend. The information received in this survey was compiled and served as a resource for later development of suggested teaching media, strategies, and methods.

The curriculum specialist helped to construct the surveys and analyze the results. He influenced the development of the cognitive and affective skill taxonomies by suggesting a way they could best be utilized. He participated in developing the psychomotor taxonomy which the project staff created. He also helped to determine the educational implications of the survey results.

9.5 A final step in the formulation of plans for curriculum development was a review and critique of the plans and suggestions from the advisory committee. Their suggestions included (1) names of consultants in both occupational therapy and medical education who would provide expert assistance in developing curriculum modules; and (2) the idea that affective behavioral objectives should be specified for each job level as well as cognitive and psychomotor objectives. These suggestions provided additional guidelines for the continuing process of curriculum development.
10.0 The development of curricular modules required the skills of the entire project staff. The cooperative undertaking is explicated next.

10.1 A central phase of the curriculum development process began with the project staff implementing the general plans developed previously and working with various ideas generated from the job descriptions and from information about curriculum development. A process flow chart depicting the procedures and process for curriculum development was created. It is shown on the following page.

21.0 The job descriptions, as noted, serve as the database from which worker performance is translated into expectations of learner performance. The job descriptions also serve as the basis for defining the kinds of learning modules needed (see 9.2 for definitions of learning modules). Thus, the way the job descriptions are written influences the process for curriculum development.

22.0 The job descriptions are analyzed to ascertain a purpose or product in each statement and the steps or process required to accomplish the product. For example, a statement in the job description, "design research products in order to confirm or deny current occupational therapy theories and to develop new treatment techniques,"
Chart 3

A Process for Developing Curricular Modules
contains a process—"design research projects," and a product—"confirm or deny current theories and develop new treatment techniques." Each job description statement at each level of job performance is analyzed to determine process-product. Each statement is then written on 3x5" cards.

23.0 The next step is a "brainstorming" session in which each process-product card is analyzed to determine what knowledges and skills are needed to perform the processes and to produce the products. In the example above, the "needed learnings" include problem-solving skills, knowledge of research design and methodology, occupational therapy theory, and treatment techniques, and others. This analysis is made for each statement and noted on each process-product card.

24.0 The cards are then examined and the "needed learning" topics are compiled on a list for each level of job performance. Thus, a list of "needed learnings" for a consultant level individual might include such items as research methodology and design, health care delivery systems, group and individual communication skills, program planning skills, etc. A compiled list of "needed learnings" for an aide job level might include communication and interpersonal relations skills, media preparation skills, skills in performing recreational activities, body movement, and others.
This compiled list indicates what needs to be learned at each level but does not indicate the scope and depth of learning.

25.0 A next step is to use a list of curriculum essentials developed by a national accrediting organization (in the project, The American Occupational Therapy Association) to clarify the "needed learnings" list into broad curriculum statements such as biological science, behavioral science, occupational therapy theory, etc. Thus, it is possible to classify a "needed learning" like normal human development under the curriculum essential, behavioral science.

26.0 A next step is to classify the above essential learnings listed according to the definitions of types and modules (developed earlier and defined in 9.2). For example, the biological science grouping of "needed learnings" (including such items as anatomy, kinesiology, etc.) is classified into a basic information module because it can be considered as background information related to future performance. The essential learning grouping of "treatment skills" (including such items as recreation, weaving, orthotics, etc.) is classified into information-application modules because it includes skills and knowledge directly related to specific occupational therapy performance. Classification of essential learnings into clinical application modules does not occur because these
modules contain performance skills directly inferred from the job descriptions.

27.0 The classified "essential and needed learnings" list serves as the basis for determining tentative module titles which reflect a level of learning complexity related to student performance. For example, it can be determined that within a grouping of biological science, knowledge of normal body movement is at an appropriate level of learning complexity for the aide level learner, while knowledge of body mechanics is appropriate for the next higher level, the technician level learner. Determinations such as these can be made by an individual who has professional insight into the depth and scope of content and into the nature of the learners at each educational level. These determinations, it must be emphasized, are tentative and subject to review and critique of other educators and practitioners in the field. Thus, in this step, the depth and scope of topics, as related to the performance needed at each educational level, is tentatively determined.

28.0 The tentative module titles are then ordered within the basic information and information-application categories to reflect an appropriate sequence of learning. For example, in the basic information category, topics such as "Normal Human Structure and Function," "Body Mechanics," and "Physical Dysfunction" are ordered as a
learning series using the logic that a student has to know the structure of the human body and how the body moves before he could learn about the disabling conditions of the body. (Again, these determinations are tentative and subject to review and critique by subject area experts.) These determinations help to qualify and quantify the kind of content which will be included for each module.

A code number is assigned to each title based on its order in the module category and the code number contains two digits. The first digit indicates the type of module (i.e., behavioral science, biological science, treatment techniques, etc.). The second digit indicates the order of the title within a module category.

29.0 Each process-product statement is reviewed to determine which module titles are related to that statement. Each statement is then assigned a number of module title codes. For example, the process-product statement "converse with a client" (a process) "to establish rapport" (product) relates to such module topics as Normal Human Development (code 1.1), Communication (code 2.4), and Interpersonal Relations Skills (code 4.1), etc.

30.0 The final step in this phase of the curriculum development process involves the assembly of all process-product cards having the same code number and developing tentative goals and purposes for each module, and tentative performance objectives. For example, a process-product
card which states, "confers with other allied health personnel to formulate treatment goals," indicates that communication skills must be included as necessary skills a learner must have. All other process-product cards coded with the number designated for communication skills are assembled and the product of the process-product statement is summarized to become a purpose for learning. The processes in the process-product statements indicate overall learner behaviors to achieve the purpose. Thus, an overall goal and purpose statement for student learning is delineated and is completed on all process-product cards.

Once the goal and purpose statement is delineated for each module, the next step is to analyze the goals and determine specific objectives that a student needs to learn and also what cognitive level he needs to achieve. For example, "communication skills" include the specific learning of verbal and non-verbal behavior cues, and the cognitive performance becomes "identify" (recall of specifics) and "explain" (comprehension). This is accomplished for every goal statement.

Process-product cards are used many times because many coded numbers are placed on each card. Performance goals and purposes are written to include each "needed learning" and specific objectives are developed to include each determined skill and knowledge. It then becomes possible to
delineate examples of skill or knowledge content for each learner performance objective. In the module on communication, noted above, examples of verbal and non-verbal behavior cues such as facial expression, voice intonation, and emphasis on words become suggested content which the learner has to identify and explain.

Appendix C contains a completed module for the basic information category of communication skills at the therapist level to illustrate the process as it relates to delineating overall goals, purposes, and specific objectives for all levels of learners from the aide level to the consultant level. This is but one of many modules that made up the final curriculum guide. Inasmuch as this investigator is concerned with the process of curriculum development and the role of the curriculum specialist in that process, little reference has been made to the product itself. Individuals interested in the curricular guide may seek further information about it from The United States Department of Health, Education, and Welfare, Public Health Service, Division of Allied Health Manpower, or The School of Allied Medical Professions, The Ohio State University.

The curriculum specialist participated in this phase of the process as a team member. The process of curriculum development clearly involves the cooperative efforts of many. Propositions for ways and means to develop curricula
and define the nature of curriculum modules were presented, discussed, criticized, revised, and then criticized again by the whole project staff. Issues and problems were presented, discussed, and resolved. Drafts and papers were prepared to convey ideas and criticisms. Finally, consensus on the major decisions was reached.

The curriculum specialist, as well as others, created modular performance objectives and specific student learnings with examples of content. He also performed the detail work of writing process-product cards, delineating and then compiling a list of "needed learnings," and writing appropriate code numbers on cards. He helped to assemble the cards to develop performance objectives by using his knowledge of learning theory to provide guidelines indicating learning complexity. He worked with the project administrator who assembled the cards and initially wrote performance objectives, specific learnings and examples of content by refining her efforts and shaping the modules into clear and concise statements of expected learner performance.

The curriculum specialist, in summary, was a member of a team which went through a process of creating and working through curriculum development procedures. This process gave the curriculum specialist experience in both generating a conceptual framework for curriculum development and
also practical application of a process.

10.2 The curriculum module development described above delineated performance objectives for cognitive and psychomotor performance. The development of performance objectives for affective learnings follows these steps:

(1) survey occupational therapy educators and practitioners concerning the most essential affective learnings required for each job performance; (2) analyze the responses using a weighted frequency analysis to determine specific affects required for each job performance; and (3) relate specific affective performance to each performance module.

In step 1, a survey is sent to the same population of occupational therapy educators and practitioners described in 9.4. The survey includes a list of affective performances such as "awareness of behaviors and events," "sensitivity to client behaviors and values," and others developed from the taxonomy of Krathwohl, et al. (1964) (see Appendix B). The respondents are asked to pick from this list the most essential affective learnings which were necessary in performing specific jobs at a specific level delineated in the job descriptions.

In step 2, the responses are analyzed by a weighted frequency analysis because the respondents are also asked about cognitive and psychomotor learnings (see 9.4). The frequency determination is then used to indicate the most
essential affective learnings needed for each job performance.

In step 3, the writing of affective job performance objectives is accomplished for each level of learning by stating a specific affective performance, relating it to a specific job performance, and providing examples of questions which need to be answered to determine if the affective performance was performed. An example of the logic of developing affective performance objectives and a complete example of this kind of objective is included in Appendix D.

The curriculum specialist participated in this phase by helping to (1) develop the list of affective learnings; (2) structure the questionnaires; and (3) write the initial affective performance objectives. The project administrator provided examples of questions to be asked to determine if an affect exists in job performance. The curriculum specialist thus provided his knowledge of learning theory and demonstrated his ability to write performance objectives.

10.3 The cognitive, affective, and psychomotor performances, as noted, are tentative statements developed by the process mentioned in 10.1 and 10.2. Consultants with expertise in occupational therapy practice and education at all levels are asked to critique and review the module performance objectives and examples of content in order to provide input
about the accuracy and consistency of the objectives and content.

Consultants in the project reviewed the suggested content examples and revised some examples and added others at each learning level. The consultants also suggested appropriate sequences for the performances so that they followed each other within each level in a logical fashion to provide for optimum learning. Additional consultants in medical education and vocational education were asked to suggest a sequencing pattern for the modules for (1) external consistency between the learning levels, and (2) suggestions concerning academic and career mobility.

The curriculum specialist participated in this phase as a disseminator of information about the developmental process, a clarifier of consultant questions and responses, and a listener to consultant suggestions in order to make appropriate changes and revisions as directed. The curriculum specialist made changes and revisions specifically in the areas of the level of learning complexity and specific cognitive, affective, and psychomotor performances while the project administrator made changes and revisions in the examples of content for each performance.
Development of Instructional and Evaluation Strategies

11.0 Additional parts of the curricular modules included, as noted, suggested instructional media and resources, instructional strategies and methods, evaluation strategies, and procedures, and selection specifications. Procedures for developing and including these suggestions with performance statements are discussed below.

11.1 The performance statements and examples of content developed by the procedures suggested in 10.1 and 10.2 provide the basis for developing suggested instructional media and resources and teaching strategies and methods.

A survey is conducted (as described in 9.4) to ascertain instructional media and resources used by occupational therapy educators which they were willing to recommend. This provides information which becomes a resource file for further use. Another source of information used as a resource file is a study conducted at The Ohio State University under the direction of Lois Mills, O.T.R., which created an annotated bibliography of films, filmstrips, commercially produced overhead projector transparencies, texts, and other references currently available related to all aspects of occupational therapy education. The performance statements and examples of content are examined and members of the project staff, with help from occupational therapy consultants, compile appropriate instructional
media and resources and relate them to appropriate performance statements.

The same procedure is generally used to develop suggested teaching strategies and methods. A survey is conducted to ascertain teaching methods used by occupational therapy educators which they are willing to recommend. This serves as a data base for suggesting teaching methods. The curriculum specialist extrapolates from the list four teaching strategies as suggested by Hough and Duncan (1970) and classifies and refines the compiled list of methods according to these strategies using his knowledge of instruction and experience as a teacher. The suggested strategies include: (1) direct communication, (2) teacher-student group interactive, (3) student-student group interactive, and (4) student independent strategy. The final list of suggested teaching strategies and methods is included in Appendix E.

The curriculum specialist played a major role in this phase. He had helped to structure the surveys to gain information from occupational therapy educators, and he had been aware of studies which had been conducted in occupational therapy which contained potentially useful information. He had helped in initially making determinations of appropriate resources and media for performance statements and had made changes and revisions based upon the advice of occupational therapy consultants. He had
used his knowledge of instruction and experience as a teacher to develop suggested teaching strategies and methods, and he provided the necessary leadership to complete this phase of the modular development.

11.2 Another aspect of modular development is the creation of (1) evaluation strategies and procedures to monitor student performance in meeting suggested performance standards and (2) selection specifications to suggest to potential users of the curriculum guide the kinds of academic and personal characteristics needed by prospective students. The evaluation strategies and procedures were created by the project evaluation specialist with consultation by the curriculum specialist and project staff. An example of the logic used in this development is shown in Appendix F.

The development of selection specifications involves an analysis of the job descriptions in terms of general educational development, specific vocational preparation, interest, temperament, aptitudes, and other factors needed to perform on-the-job. These factors are translated into selection specifications for student entry into each learning level, and the logic of this process is shown in Appendix A.

The curriculum specialist performed a consultative function in this phase of modular development. When the evaluation specialist explicated evaluation procedures to
monitor and measure student performance, the curriculum specialist offered an assessment of the alternatives from the perspective of a teacher along with their relative advantages and disadvantages.

11.3 The performance statements, examples of content, suggested media and resources, suggested evaluation strategies and procedures, and student selection specifications are combined as are consultant suggestions concerning sequencing and internal and external consistency within and between each educational level (see 10.3). The completed modules are then presented to the advisory committee for its critique and review in terms of feasibility of use and potential for presenting a way for career and academic mobility.

The advisory committee in the project felt that while the guide suggests areas of academic and career mobility, this problem is too complex to make any definitive statements or conclusions concerning the use of the guides to solve a mobility problem. The committee also suggested that a proposal for implementing both the job descriptions and the curricular guides in existing health and educational institutions be developed and submitted for appropriate funding so that a pilot study could be made to implement the project results.

The curriculum specialist again listened to the advisory committee suggestions. He wrote specific
directions for implementing the curriculum guides and made other revisions and changes as suggested. The curriculum specialist also helped to take care of last-minute details concerning the production of the curriculum guides.

**Summary**

In summary, Part 2 has presented a flow chart of the procedures formulated and followed by the project staff in developing curriculum guides from data gathered by a task analysis procedure. It has also described these procedures from the perspective of the curriculum specialist functioning as a participant-observer in the process.

Chapter III as a whole is a case study of a curriculum developmental process using task analysis to develop job descriptions and curricula in occupational therapy. The role of the curriculum specialist as participant-observer has been discussed in detail. From the data presented in this description of the process, a conceptual framework will be generated and a set of generalizations to guide a curriculum specialist in using this approach will be developed. Chapter IV presents the conceptual framework and a role analysis of the curriculum specialist together with the perceptions of a group of relevant others as they viewed him performing certain activities.
CHAPTER IV

A CONCEPTUAL FRAMEWORK FOR CURRICULUM DEVELOPMENT
AND A ROLE ANALYSIS OF THE CURRICULUM SPECIALIST

This chapter is divided into two parts. Part 1 presents and discusses a conceptual framework for curriculum development using task analysis. This framework has been extrapolated from the case study of a specific curriculum development process. The framework is then compared to a systems model for instructional management developed by Tuckman and Edwards (1971).

Part 2 presents a job description and a role analysis of a curriculum specialist. This description and analysis represents a synthesis of the investigator's experience as a participant-observer in the specific curriculum development process described in the case study and an analysis of the perceptions of a selected sample of relevant others as they viewed his operations as a specialist.


The conceptual framework for curriculum development which emerged from an analysis of the processes described in Chapter III is shown on the following page.
Figure 3. — A Conceptual Framework for Curriculum Development
An Explanation of the Conceptual Framework

This framework for curriculum development is based on the proposition that a task analysis procedure is effective as a base to provide initial data upon which to build curriculum. As noted in Chapter II of this investigation, several types of task analysis procedures may be used either to collect and compile original data or to verify existing data concerning job performance. It is the position taken here that any of these procedures can be used if they are accompanied by a complete job description.

The job descriptions of a profession, formulated by a task analysis procedure, should indicate (1) specific worker performances in terms of tasks, duties, and responsibilities, and (2) a differentiated level of job complexity so that distinctions can be made in terms of professional, technical, or if applicable, aide level performances. If these two criteria are met, entry level specifications for both vocational and educational levels can be determined, and expected student performances can be extrapolated. Selection specifications can be determined by using the General Educational Development Scale (see Chapter III) created by the United States Department of Labor. The wording of the job descriptions can be analyzed by the G.E.D. scales to indicate the kinds of language, reasoning, and mathematical ability a student needs before he enters into an educational experience and
abilities he is expected to attain while learning on a given level. The job descriptions also serve as the primary source of data for curriculum development because they are stated in performance or behavioral terms. It then becomes the task of a curriculum team to apply the curriculum development process described in Chapter III to begin to formulate general student performance objectives.

The C.I.P.P. Model for evaluation is used to provide data for judging decision alternatives. In the phase of the conceptual framework proposed here, context and input evaluation are performed. Context evaluation provides data upon which decisions can be made concerning unmet or future educational needs as determined by the task analysis. Input evaluation provides data concerning the alternative procedural designs which might be used to develop curriculum from the information delineated in the job descriptions.

The development of general student performances including knowledges, skills, and affects and the delineation of specific content with levels of learning complexity have been described in Chapter III of this investigation. The process of curriculum development in which three types of modules--clinical application, information-application, and basic information--containing general performance goals, specific performance objectives,
and examples of content is used in this phase. Process evaluation is performed to monitor the curriculum development process and raise pertinent questions about the way curriculum development is occurring.

The development of suggested teaching resources, media, strategies, and methods, and student evaluation strategies and procedures follow from the development of performance goals and objectives. It becomes a matter of creating and/or compiling innovative ways to provide learning experiences for students and monitor student progress through the performance objectives. This is accomplished without philosophical issues about the nature of instruction or evaluation conflicting with the development of curriculum. Thus, curriculum and instructional development relate to each other in a logical fashion, as discussed in Chapter II of this investigation. Process evaluation is also applied in this phase to monitor the development of instructional and evaluation procedures by raising questions concerning the feasibility of the ultimately delineated methods and procedures.

The final phase in this proposal involves the assembling and sequencing of learning modules. In this phase, the performance goals and objectives and the suggested instructional and evaluation techniques are combined to become learning modules. The learning modules are sequenced
internally so that the modules considered to be basic are grouped together to form prior and concurrent learnings. More advanced and difficult modules are considered subsequent learnings and generally include performances which require application and practice of previously learned skills and knowledges. Modules containing affective objectives are also sequenced in terms of their relationship to performance objectives. The internal sequencing follows the concrete to abstract continuum of learning as suggested by Gagne (1965) and others.

External sequencing between educational levels also occurs with the intent being that career and academic mobility is facilitated in this fashion. Student selection specifications, developed earlier, are placed within the context of external sequencing to provide data concerning student abilities needed to enter each level of educational performance.

Both internal and external sequencing should be determined by practicing educators and workers whose positions in the profession provide them with a special vantage point from which they can make these kinds of decisions.

Product evaluation is accomplished in this phase by serving recycling decisions in terms of determining the degree to which the learning modules have met overall project objectives. This phase also provides feedback
data to the general student performance phase to determine if the general knowledges, skills, and affects, as determined by the job descriptions, have been adequately developed.

This conceptual framework does not indicate an implementation phase in terms of field testing to revise or modify formulated objectives because its emphasis is on developing performance goals and objectives through a curriculum development process. However, implementation of the learning modules is a logical step in determining whether the performance objectives were appropriate, or, if they needed to be revised, how they should be changed.

The framework suggests learning objectives which are performance-oriented rather than being behavioral objectives proposed by Mager and others (see Chapter IX). It is not the intent to develop teacher-proof learning modules. The modules are designed to serve as input for teachers to develop specific behavioral objectives indicating the audience, specific behaviors, conditions, and degree of mastery appropriate to their given situation. The instructional and evaluation strategies and techniques are suggested for teacher use and not recipes for them to follow. In this way, teacher flexibility and personal involvement are preserved and encouraged, and this is the direction which curricular guides should take.
The process for curriculum development within this conceptual framework is applicable to any allied health profession and can be applied to other professional or technical training programs if certain conditions can be met. For example, a profession must allow itself to be analyzed, and it must provide accurate estimates of future job and educational performances required. The task analysis procedure which is utilized should be capable of analyzing the whole domain of a profession.

A Comparison of Two Frameworks

As is the case with any conceptual framework, the questions it raises must be answered through empirical testing in field situations. If the propositions in the framework stand up under this kind of testing, the conceptual framework may become theory. As a theory, the propositions give one the power of controlling and predicting outcomes. Clearly, one is justified in referring to the propositions described here as a conceptual structure rather than a theory.

To assess further the conceptual framework it is compared to the systems model for instructional management proposed by Tuckman and Edwards (1971). This model is depicted on the following page.

Both frameworks begin with the concept of using task analysis to specify job performance. Tuckman and Edwards
Figure 4.--A Model for Instructional Design and Management
(Tucker and Edwards, 1971)
state that from the task analysis, tasks are restated as behavioral objectives. The conceptual framework proposed here, on the other hand, develops job descriptions from which a process of curriculum development is applied to develop performance goals and objectives. This is a most important process while in the Tuckman and Edwards model, the establishment of behavioral objectives does not delineate what specific skills, cognitions, and affects are needed by a learner.

The Tuckman and Edwards model provides for operationalizing the objectives into a learning situation to revise or modify objectives on the basis of feedback from this process. The conceptual framework does not, because, as noted, it emphasizes the development of curricular objectives and instructional and evaluative methods as suggestions for teacher use. The process for developing objectives is the most important aspect of the proposed framework. On the other hand, the Tuckman and Edwards model provides for a logical and sound principle of system implementation but relegates the formulation of behavioral objectives to a relatively simple task of "restating tasks as behavioral objectives." It might be noted, however, that Tuckman and Edwards' concept of operationalizing curricular and instructional development would be an appropriate addition to this research model.
The specification of instructional and evaluative procedures in both proposals follow, for the most part, the same approach which is compiling and/or creating innovative procedures from the literature, personal experience or from professionals in the field. However, the proposed model provides for process evaluation in this phase to raise the questions to judge decision alternatives concerning the efficacy of suggested strategies and methods. The Tuckman and Edwards model uses operational feedback to make decisions about the efficacy of instruction. The conceptual framework uses process evaluation to deal with what may happen while the Tuckman and Edwards model uses evaluation to determine what did happen. Both methods are appropriate because evaluation can and should be used in both ways. The case study model does not provide for operationalizing the modular development but relies on evaluation for decision-making rather than for measurement or personal judgment as in the Tuckman and Edwards model.

In summary, the Tuckman and Edwards model is a systems model for instructional design and management using task analysis to provide input for restating tasks as instructional objectives. The case study framework is a model for curriculum development using task analysis to develop job descriptions which provide the basis for determining the skills, affects, and cognitions necessary for formulating performance goals, objectives, and examples of
content. Both models use the concept of structural analysis. However, the approach generated here uses the concept of structural analysis not only to sequence performance objectives within a given subject discipline but also to sequence performances between different educational levels. Herein lies one of the major differences. This proposal can be used to develop curriculum within the various performance levels of a profession, while the Tuckman and Edwards model appears to be limited to curricular development within a specific segment of a profession. Another major difference between the two is the use of an operational phase in the Tuckman and Edwards model to provide feedback about the objectives and instruction and thus a reliance of this phase to provide evaluative information. The research model does not include an operational phase and uses the concept of evaluation as delineating, obtaining, and providing useful information to judge decision alternatives in the process of curriculum development.

This investigation concludes that both efforts should be useful for future curriculum development where task analysis is used to analyze job performance and to develop curriculum.

2. A Job Description and Role Analysis of a Curriculum Specialist

This chapter presents next a job description and a modified role analysis of the curriculum specialist. The
criteria under which a role analysis is conducted are those which were used in the task analysis procedure described in this investigation and found in the Training and Reference Manual for Job Restructuring (1965). The criteria provide a framework in which this investigator will delineate necessary personal and professional requirements. These requirements have been generated out of an analysis of his experience as participant-observer in a specific curriculum development process. They are then given a reality test against the perceptions of a selected population of relevant others who perceived him "at work" as a curriculum specialist.

I. Job Description of a Curriculum Specialist in terms of the identity, purpose, and content of each job performed:

1. Consultant
   a. Consults with specified personnel to suggest specific educational issues and problems which can be dealt with using task analysis procedure by participating as a team member in meetings, conferences, and developmental activities.

2. Researcher
   a. Confers with specified personnel to obtain
1) information concerning the definition of a specific allied health profession
2) data to help solve educational problems considered important, and
3) procedures used to perform a task analysis, by conducting interviews and discussions with appropriate personnel.

b. Surveys literature related to curriculum development, learning theory, instructional theory, systems theory, evaluation theory, and previous developmental projects where a task analysis procedure was used to obtain and provide necessary information for curriculum decision-making by reading and noting pertinent sources and appropriate information.

c. Constructs surveys and questionnaires to obtain group consensus and to obtain information related to curriculum and instructional development by modifying given survey techniques and creating new constructs as needed.

d. Supervises the collection and compilation of specific data concerning instructional media, resources, and teaching methods in order to develop a resource file and library containing pertinent information by initially close supervision of worker performing the activity.
3. Developer

a. Helps to formulate a process of curricular and instructional development to develop curriculum guides from a task analysis; helps to design a model for curriculum development, and helps to develop a set of principles for use by other curriculum personnel in utilizing task analysis for curriculum development by participating as a team member in an activity where a task analysis procedure is used for curriculum development.

b. Defines terms relevant to the organization and format of curriculum modules to provide guidance for curriculum development by participating as a team member in a group process situation in which appropriate decisions are made.

c. Refines the work of a team member who initially uses a formulated developmental process to write general performance objectives, specific performance statements reflecting specific cognitive and psychomotor knowledge and skill, and examples of content by rewriting the formulated statements to reflect clear and concise levels of student performance.

e. Initially develops instructional media, resources, strategies and methods to
attach to performance statements by using
data collected through surveys and previous
research and by providing information gained
from personal experience to organize and
compile suggested instructional behavior for
use by curriculum guide implementors.

4. Evaluator

a. Consults with an evaluation specialist in a
curriculum development activity where a task
analysis procedure has been used in order to
suggest appropriate evaluation strategies,
procedures, and student selection specifications
to monitor student performance through and
entry into suggested curriculum modules.

b. Provides feedback to instructors in a training
conference concerning their instructional
behavior related to participants attaining
specified behavioral objectives by informally
observing conference interaction.

II. Qualifications of Worker in Terms of Experience and
Training that a Worker Must Have:

1. Experience:

The curriculum specialist should have prior experi-
ence as a classroom or clinical teacher in either medical
or public education. He should also have some administra-
tive and supervisory experience as it relates to an educational situation and should have some experience in working on a team or group developmental situation. He should have recent experience as a learner in the discipline of education and/or allied health education.

2. Training Data:

The curriculum specialist who has no experiential or academic background concerning the issues and problems of allied health education or performance in a specific allied health profession should have opportunities on the job to gain information about these aforementioned areas by discussing, interviewing, and generally listening to knowledgeable personnel in the field, and by attending meetings where curricular issues are being discussed by allied health educators. Opportunities for obtaining additional information about the educational process should be provided while the curriculum specialist is on-the-job.

It is not necessary for the curriculum specialist to have any specific vocational or technical preparation in developing curriculum although it might be advantageous for a curriculum specialist to have participated in curriculum development activities prior to his coming on-the-job.

The general educational development of a curriculum specialist should be such that prior to his assignment he is
able to (1) apply principles of logical or scientific thinking to define problems, collect data, establish facts, and draw valid conclusions; (2) interpret an extensive variety of technical instructions, in books, manuals, and mathematical or diagramic form; (3) deal with several abstract and concrete variables; (4) perform ordinary arithmetical, algebraic, and geometric procedures in standard, practical applications; (5) comprehend and express himself at a level to interview professional personnel. He should also display the potential of being able to (1) apply principles of logical and scientific thinking to a wide range of intellectual and practical problems; (2) deal with non-verbal symbolism in its most abstract phases; (3) comprehend the most abstract classes of concepts; (4) apply knowledge of advanced statistical techniques such as factor analysis and probability determination; and (5) comprehend and express himself on a level to report, write, or edit articles for such publications as magazines or professional journals, or to prepare and deliver lectures on education or curricular issues.

3. Responsibility:

The curriculum specialist should coordinate and supervise the efforts of those whose job responsibilities are directly related to the performance of his tasks and should be directly accountable for progress, quality, and costs of work. He should seek contacts with outsiders or
others in the organization not in the line of authority to both gain and impart appropriate information, and must produce work which can and should be verified, replicated, or implemented by others. Finally, he should be responsible for providing leadership and making decisions as it relates to the process of curriculum development.

4. Job Knowledge:

The curriculum specialist should have a thorough knowledge of the many procedures and processes used in curriculum development but be willing to search for additional and more definitive sources of information in this area. He must possess a thorough knowledge of research design and methodology and an ability to compute elementary research statistics. He should know the concepts and uses of advanced research statistics so that he can communicate with statisticians when necessary, and he should have a rudimentary knowledge of the theories and concepts of evaluation so that he can understand the results and implications of evaluative questions and data. He should have an above average knowledge of systems theory so that he can create and interpret flow charts and other systems data. Finally, he should acquire a thorough knowledge of the many kinds of task analysis systems and acquaint himself with many of the procedures used in each system.
5. Personal Characteristics

The curriculum specialist should show a high degree of initiative in facing or solving new problems by using his mental ability, analytical ability, ability to make decisions, and ability to take independent action, should the need arise. He should be adaptable and versatile in order to handle adequately quick change in assignment or to carry on several tasks simultaneously and must exercise a high degree of judgment in terms of the amount of decision-making he must perform.

A Structured Interview as a Reality Check of a Role Description of a Curriculum Specialist

In order to provide a reality check of the job description of a curriculum specialist using task analysis in curriculum development presented above, a structured interview was conducted by this investigator with selected personnel who were in some way involved in the Occupational Therapy Curriculum Development project. The personnel included five people from the project staff who were highly involved with the project and highly informed about the role which this investigator played; ten people from the project Planning Advisory Committee who were involved with the project as advisory personnel and who had the opportunity to perceive the activities of this investigator as he fulfilled his responsibilities; and five people in the occupational Therapy
Division of The Ohio State University, School of Allied Medical Professions, who observed this investigator at work because of the proximity of their offices to that of the project staff and who were called upon from time to time to provide input for the project. These three groups had different perceptions of the role of the curriculum specialist because of the different involvement they had in the project, and it was felt that they could present a broad "reality check" on the role of the curriculum specialist.

The structured interview, a copy of which is found in Appendix G, was presented either personally or by mail to each respondent prior to the interview. Each respondent was asked to check the degree to which he perceived the activities of the curriculum specialist in the project and also to delineate his perceptions of what he thought a curriculum specialist using task analysis should do. Each respondent was then personally interviewed by this investigator either in person or by phone during which time the responses to the structured questions were recorded as were additional comments each had.

Chart 4 depicts the respondents' views of the degree to which they perceived this investigator as a curriculum specialist at work. The chart is arranged in the following fashion:
1. The numbers at the top of the chart correspond to the list of respondents found in Appendix H. The list is arranged alphabetically by groups with Group I being members of the Occupational Therapy Project Staff; Group II being members of the Project Planning Advisory Committee; and Group III being members of the Occupational Therapy Division at The Ohio State University.

2. A mean score and a standard deviation is computed for each group and for the overall responses to depict the relative scores of the respondents to each activity.

3. Respondents' answers are given a numerical value corresponding to the following Likert-type ratings:

   5 = Very often  
   4 = Often       
   3 = Sometimes  
   2 = Infrequently
   1 = Never

4. At the bottom of each column is a computed mean and standard deviation score to depict the relative discrimination of each respondent in answering the structured questions.

It can be generally concluded from the data depicted in Chart 4 that this investigator as a curriculum specialist did, in reality, perform all of the activities as described. In eleven of fifteen activities, the respondent's perception of the degree of performance was at least "sometimes" or "often." In four of fifteen activities, the degree of
Chart 4 - Responses of Perceptions of What A Curriculum Specialist Has Done

<table>
<thead>
<tr>
<th>Response</th>
<th>Group I</th>
<th>Group II</th>
<th>Mean for Group</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Providing consultation to staff and other personnel involved with the project</td>
<td>3 5 5 4 4</td>
<td>3 5 5 4 4</td>
<td>.42 .44 5 4 4</td>
<td>.44 .44 5 4 4</td>
</tr>
<tr>
<td>2. Suggesting specific educational issues to be dealt with by task analysis</td>
<td>3 4 3 4 3</td>
<td>4 3 4 3 3</td>
<td>.55 .55 5 4 3</td>
<td>.55 .55 5 4 3</td>
</tr>
<tr>
<td>3. Conferring with O.T. educators about nature of their profession and educational problems.</td>
<td>4 3 5 4 3</td>
<td>4 3 5 4 3</td>
<td>.84 .84 4 2 3</td>
<td>.84 .84 4 2 3</td>
</tr>
<tr>
<td>4. Conferring with professional analysts about how task analysis is performed.</td>
<td>2 3 3 3 2</td>
<td>3 3 3 3 2</td>
<td>.55 .55 3 4 2</td>
<td>.55 .55 3 4 2</td>
</tr>
<tr>
<td>5. Surveying the literature relating to curriculum development, instruction, evaluation, and systems theories</td>
<td>3 5 5 4 4</td>
<td>4 4 4 2 5</td>
<td>.84 .84 5 4 3</td>
<td>.84 .84 5 4 3</td>
</tr>
<tr>
<td>6. Constructing surveys and questionnaires to obtain information related to curriculum and media in O.T.</td>
<td>2 3 3 3 3</td>
<td>2 3 3 3 3</td>
<td>.45 .45 3 3 2</td>
<td>.45 .45 3 3 2</td>
</tr>
<tr>
<td>7. Supervising the collection and compilation of data concerning media and teaching methods used in O.T.</td>
<td>3 3 3 2 3</td>
<td>3 3 3 2 3</td>
<td>.45 .45 3 3 2</td>
<td>.45 .45 3 3 2</td>
</tr>
<tr>
<td>8. Helping to formulate a process for developing curriculum modules for O.T. students</td>
<td>3 5 4 4 4</td>
<td>4 4 4 3 4</td>
<td>.40 .40 3 4 5</td>
<td>.40 .40 3 4 5</td>
</tr>
<tr>
<td>9. Helping to write overall performance objectives and specific performance statements</td>
<td>5 5 4 4 5</td>
<td>4 4 4 3 4</td>
<td>.55 .55 4 4 3</td>
<td>.55 .55 4 4 3</td>
</tr>
<tr>
<td>10. Helping to write affective objective statements</td>
<td>3 5 4 4 4</td>
<td>4 4 4 3 4</td>
<td>.71 .71 4 5 4</td>
<td>.71 .71 4 5 4</td>
</tr>
<tr>
<td>11. Developing a list of instructional strategies</td>
<td>4 5 5 5 5</td>
<td>4 5 5 5 5</td>
<td>.45 .45 3 5 3</td>
<td>.45 .45 3 5 3</td>
</tr>
<tr>
<td>12. Helping to write instructions and directions for use of curriculum guide</td>
<td>3 4 4 3 3</td>
<td>3 4 4 3 3</td>
<td>.55 .55 3 3 2</td>
<td>.55 .55 3 3 2</td>
</tr>
<tr>
<td>13. Revising content and level of learning statements</td>
<td>3 4 4 4 3</td>
<td>3 4 4 4 3</td>
<td>.36 .36 3 5 3</td>
<td>.36 .36 3 5 3</td>
</tr>
<tr>
<td>14. Conferring with project evaluation specialist about evaluation strategies to be used in guides</td>
<td>3 4 4 3 3</td>
<td>3 4 4 3 3</td>
<td>.55 .55 4 5 4</td>
<td>.55 .55 4 5 4</td>
</tr>
<tr>
<td>15. Providing feedback to staff about their instructional behavior in training conferences held during project</td>
<td>2 3 3 1 3</td>
<td>2 3 3 1 3</td>
<td>.97 .97 4 1 3</td>
<td>.97 .97 4 1 3</td>
</tr>
</tbody>
</table>

Mean for each respondent: 3.1 4.1 3.9 3.3 3.5
Standard Deviation for each Respondent: .80 .88 .80 1.00 .84
<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>Mean for Group I</th>
<th>Mean for Group II</th>
<th>Mean for Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 ± 2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0 ± 3.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 ± 3.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.6 ± 4.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9 ± 4.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 ± 5.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5 ± 5.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.8 ± 6.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Standard Deviation

Group I: 1.5 ± 2.0
Group II: 2.0 ± 2.5
Group III: 2.5 ± 3.0
performance was at least "infrequent." The overall score for activities #7 and #14 are high enough in the "infrequent" category to indicate that the respondents perceived them being performed generally. Activities #4 and #15 were the most difficult to perceive, but the individual responses do, in fact, indicate that they were perceived. Thus, all of the activities were perceived as being performed by the curriculum specialist from the perspective of three different groups of people with varying degrees of involvement with the project and this investigator.

An analysis of the mean scores of each group shows a consistency of perception between Group I and Group II. In eleven of fifteen activities, mean scores indicate a very close degree of perception between the two groups. However, in three of four activities in which there is a difference of perception between the two groups, Group II perceived the performance of these activities higher than Group I which is different from what was expected to occur. An explanation of this which can be inferred from the verbal responses of each respondent is that members of Group II were making inferences from the products which were produced in the project while Group I respondents, reacting from personal involvement, were providing some indication of the quality of performance by the curriculum specialist. However, it is a warranted conclusion that both groups
perceived that the curriculum specialist performed generally the same activities.

The mean scores for Group III indicate a difficulty of perception of the role of the curriculum specialist by many members of this group. They did not clearly perceive the performance of the curriculum specialist even though they were in close proximity to the project. However, they did perceive him performing about 60 per cent of the activities at least "infrequently." Verbal responses from this group indicated that all of the respondents felt that they had insufficient data upon which to make judgments. In activities in which individual members of Group III were personally involved with the project, scores indicated a high degree of perception of the role of the curriculum specialist. The mean scores from this group tended to lower the overall mean score for each activity. However, the scores were not so low as to affect the overall degree of perception by all of the groups.

In summary, Chart 4 depicted the degree of perception respondents had of the performance of this investigator as a curriculum specialist. Three groups of people, each with varying degrees of involvement with the Occupational Therapy Curriculum Development Project and with this investigator as a curriculum specialist, participated in a structured interview which provided a "reality check" to the activities which this investigator as a participant-observer had
delineated. It is a warranted conclusion that the role
description presented above has a high degree of reality.

A second chart is a report of the respondents' per-
ceptions of what they thought a curriculum specialist
using task analysis should do. Chart 5 is arranged in
the following fashion:

1. The numbers at the top of the chart correspond
to the list of respondents found in Appendix G.
The numbers do not run consecutively because
some respondents indicated that they did not
feel they had the professional knowledge to
venture judgments on what a curriculum specialist
should do.

2. An overall mean and standard deviation is com-
puted for the total responses because no distinc-
tion was made concerning the background of the
respondents. An overall mean and standard devia-
tion is also computed for each column again to
show that the respondents were discriminatory in
their answers.

3. The numerical values, again, correspond to the
Likert-type rating as follows:

5 = Very often
4 = Often
3 = Sometimes
2 = Infrequently
1 = Never
<table>
<thead>
<tr>
<th>Response of Perceptions of What a Curriculum Specialist Should Do</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Providing consultation to staff and other personnel involved with the project</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2. Suggesting specific educational issues to be dealt with by task analysis</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3. Confering with O.T. educators about nature of their profession and educational problems</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>4. Conferring with professional analysts about how task analysis is performed.</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5. Surveying the literature relating to curriculum development, instruction, evaluation, and system theories</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6. Constructing surveys and questionnaires to obtain information related to curriculum and media in O.T.</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>7. Supervising the collection and compilation of data concerning media and teaching methods used in O.T.</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8. Helping to formulate a process for developing curriculum modules for O.T. students</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>9. Helping to write overall performance objectives and specific performance statements</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10. Helping to write affective objective statements</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>11. Developing a list of instructional strategies</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>12. Helping to write instructions and directions for use of curriculum guide</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>13. Revising content and level of learning statements</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>14. Confering with project evaluation specialist about evaluation strategies to be used in guides.</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>15. Providing feedback to staff about their instructional behavior in training conferences held during project</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Mean for each respondent: 3.2 4.7 4.2 3.7 3.9 4.9 4.3 4.3 3.8 3.3

Standard Deviation for Each Respondent: .80 .46 .77 1.15 .88 .27 .61 1.03 .68 1.5
<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>4.4</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5.4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2.9</td>
<td>1.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>4.2</td>
<td>1.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3.3</td>
<td>1.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>4.4</td>
<td>4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>4.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.7</td>
<td>3.9</td>
<td>4.9</td>
<td>4.3</td>
<td>4.3</td>
<td>3.2</td>
<td>3.3</td>
<td>4.7</td>
<td>3.8</td>
<td>4.1</td>
<td>2.5</td>
<td>3.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean for Group III</th>
<th>Standard Deviation</th>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4</td>
<td>1.67</td>
<td>4.1</td>
<td>.97</td>
</tr>
<tr>
<td>1.4</td>
<td>.55</td>
<td>3.0</td>
<td>1.3</td>
</tr>
<tr>
<td>2.8</td>
<td>.45</td>
<td>3.6</td>
<td>.82</td>
</tr>
<tr>
<td>1.4</td>
<td>.55</td>
<td>2.3</td>
<td>.97</td>
</tr>
<tr>
<td>2.4</td>
<td>1.24</td>
<td>3.8</td>
<td>1.24</td>
</tr>
<tr>
<td>2.2</td>
<td>.41</td>
<td>3.0</td>
<td>.86</td>
</tr>
<tr>
<td>2.0</td>
<td>1.73</td>
<td>2.8</td>
<td>1.20</td>
</tr>
<tr>
<td>2.4</td>
<td>1.67</td>
<td>3.1</td>
<td>1.97</td>
</tr>
<tr>
<td>3.6</td>
<td>1.12</td>
<td>4.3</td>
<td>.72</td>
</tr>
<tr>
<td>1.6</td>
<td>.60</td>
<td>3.5</td>
<td>1.36</td>
</tr>
<tr>
<td>2.2</td>
<td>1.64</td>
<td>3.9</td>
<td>1.42</td>
</tr>
<tr>
<td>1.8</td>
<td>1.10</td>
<td>3.4</td>
<td>1.17</td>
</tr>
<tr>
<td>2.2</td>
<td>1.79</td>
<td>3.3</td>
<td>1.13</td>
</tr>
<tr>
<td>1.8</td>
<td>1.10</td>
<td>2.9</td>
<td>1.35</td>
</tr>
<tr>
<td>1.0</td>
<td>0.60</td>
<td>2.3</td>
<td>1.23</td>
</tr>
</tbody>
</table>

1.15 .83 .27 .61 1.03 .62 1.51 1.25 1.38 1.59 1.64 .93
An analysis of the overall mean scores shows that the respondents perceived almost all of the activities listed as necessary to be performed by a curriculum specialist at least "sometimes" or "often." The only exception to this is activity #4.

A comparison of the overall mean for this chart and Chart 4 shows that, in general, the mean scores for what should be done are higher than what was done. This apparent discrepancy suggests that what is done in reality does not measure up to the ideal. However, a close analysis of both sets of mean scores shows that the related scores are generally within one standard deviation of the mean which suggests that there is some consistency in what was done with what should be done.

Respondents were also asked to add additional functions to the list of activities, and the responses emphasized that a curriculum specialist must be flexible and be able to communicate with other members of a curriculum development team. These responses tend to provide some reality to the qualifications of a curriculum specialist contained in the role description. Some of the verbal responses presented the following salient points:

1. A curriculum specialist should provide an "educational" perspective to a curriculum team which includes subject area specialists or professionals in fields such as health care.
2. A curriculum specialist should assume the role of a task force leader in determining the ultimate product to be produced in a curriculum development situation.

3. A curriculum specialist should perform differently than an instructional specialist in that he should be involved in developing or organizing broad goals for curriculum development. An instructional specialist should be concerned primarily with helping instructors in the execution of instructional behavior or ways to use instructional media. It was pointed out that a curriculum specialist should have knowledge and experience in instruction so that when the product of curriculum development is implemented, the curriculum specialist can provide guidance for instruction.

4. A curriculum specialist should assume major responsibility for communication and publication of results of the project in which he is involved so that persons outside of the specialized area in which a project is conducted will be appraised of a new or modified curriculum developmental process.

5. A curriculum specialist should work in concert with an evaluation specialist before, during, and when the project results are implemented. The curriculum specialist should evaluate the clarity of content and how instruction is facilitating learning by students while an evaluation specialist should present questions to judge decision
alternatives and develop instruments to monitor student achievement.

6. A curriculum specialist should be responsible for searching, evaluating, and making educational literature available to project staff members who are not educators, and to teaching personnel with whom he comes into contact. He should provide literature in a collaborative sense rather than by being coercive.

7. A curriculum specialist should relate the product of a project (i.e., curriculum modules, guides, units, etc.) to macro-curricular questions of a larger institutional design. For example, an issue such as developing student performance objectives should be related to developing institutional or societal goals.

8. A curriculum specialist should act as a change agent vis a vis administrators and teaching faculty by acting as a consultant in implementing a project's results.

The above verbal responses were emphasized by many of the respondents. These responses provide a richness of experience from people who have extensive knowledge and background in curriculum development. The verbal responses serve as useful additions to the role of a curriculum specialist described in this investigation.

In summary, Chart 5 presented respondents' perceptions of what a curriculum specialist should do. It pointed out that there was some discrepancy between what was done
and what should be done by a curriculum specialist, but it did reinforce the fact that the activities listed in the role description contained in this investigation has some degree of reality. Verbal responses from respondents were also presented to add other functions which a curriculum specialist should perform.

This chapter has presented a conceptual framework for curriculum development using task analysis by depicting a specific curriculum development process. It has presented a job description and a role analysis which explicated pertinent data concerning how a curriculum specialist performs his role and personal and professional competencies which he must display. It has also presented a reality check of the job description and role analysis by a structured interview with persons who were in some way involved with the project and with this investigator. It is a warranted conclusion that the job performance of a curriculum specialist requires a high level of general educational development and an ability to relate to other people and work as a team member. A curriculum specialist must be a person who can make decisions when called upon to do so and provide leadership to help direct the completion of an overall curriculum development task.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter is to present a brief summary of this investigation, state generalizations and present conclusions and recommendations concerning the future use of the task analysis procedures and the process and model for curriculum development growing out of this investigation.

This investigation discussed the rationale for using task analysis as described by W. W. Charters and Franklin Bobbitt and the criticisms of this procedure by William Patty and others. It reviewed the current literature on the kinds of task analysis procedures in current use, recently completed curriculum projects in allied medical education in which task analysis procedures have been used, and educational literature on curriculum theory, instructional theory, and systems theory. A case study of a curriculum development project entitled "The Development of Job Descriptions and Curricula in Occupational Therapy Through Task Analysis," conducted at the School of Allied Medical Professions at The Ohio State University from 1970-1972, in which this researcher served as a curriculum specialist, was presented. In the case study, the process
and procedures of the development of job descriptions and curriculum in occupational therapy were delineated and analyzed, and the specific role which the curriculum specialist performed was clarified in detail.

From the data derived from these sources, a conceptual framework for curriculum development was generated.

A job description and a role analysis of a curriculum specialist were formulated and subjected to a reality check by relevant others who had participated in the project.

Conclusions about the role of the curriculum specialist derived from the data contained in this investigation can be made. These conclusions are descriptive rather than empirical and reflect the point of view which this investigator holds concerning the process of curriculum development. This investigator asserts that curriculum development must give top priority to the processes in which curriculum personnel are involved rather than what is the product of the curriculum development. The product created is not discounted; rather the most important result of curriculum development is the changes in people who are involved in the process. The empirical testing of this value-based hypothesis is beyond the scope of this study. However, the hypothesis itself serves as a basis for a fuller understanding of the generalizations to be presented. It is the task of future curriculum specialists to make the following conclusions into empirical principles:
1. The curriculum specialist who uses task analysis must search the literature concerning the use of task analysis to acquire a background concerning the advantages and disadvantages of using task analysis and to ascertain what prior studies have been conducted where task analysis has been used for curriculum development.

The rationale for using task analysis in curriculum development, as noted, is not a new concept in the literature of curriculum development nor in the literature of vocational education. Many contemporary experts in fields such as allied medical education have suggested the use of task analysis to deal with such issues as manpower training and career mobility. Therefore, a search of the literature on task analysis is imperative.

2. The curriculum specialist must be aware of the various types of task analysis procedures which can be used so that he can relate an appropriate procedure to the objectives of a curriculum development project with which he will work. He must know the inherent strengths and weaknesses of the many task analysis procedures in terms of its effect on curriculum development so that he may participate in a group process situation where decisions concerning the scope and depth of curriculum objectives are made.

It is not necessary that a curriculum specialist know the operational intricacies of every task analysis procedure. Rather, he must know what kind of data is generated in each system so that he can relate the data to curriculum development.
3. The curriculum specialist who uses task analysis and who does not have an academic or professional background in a profession or area for which curriculum development is to occur must have the opportunity as part of his job performance to interview and discuss with practicing educators or professionals the educational issues and problems related to the area being studied.

The curriculum specialist should attend professional conferences and travel beyond the immediate environs of the institution with which he is associated as a way to accomplish this. He must informally observe the practitioners of a profession performing both the routine and non-routine responsibilities of their job. It is not necessary that a curriculum specialist be or become a subject area specialist or a professional in the profession being analyzed. He must, however, be aware of professional issues and concerns.

4. A curriculum specialist must have communication skills such as interpersonal skills, group process skills, and other skills and abilities which he can use either in working with people from a profession or from which appropriate learning objectives and learning experiences may be developed.

It is desirable that a curriculum specialist not threaten the personal or professional security of the individuals with whom he is working nor to challenge their professional or academic competence through his own personality or his use of task analysis to develop curricula. Staff personnel must be involved in deliberations and
decisions concerning curriculum and the advice of those whose breadth and depth of experience give them many insights into the issues and problems of the profession must be a part of the concern of the curriculum specialist.

5. The curriculum specialist must have the aptitude and ability to participate in a curriculum development situation primarily as a team member, and he should provide leadership when the situation demands it.

The use of task analysis procedures requires specialists in this area to implement them. The profession being analyzed contains personnel who have been involved in practice and teaching who can be used as primary sources to suggest necessary and essential student learnings and other components of curriculum content. The curriculum specialist must recognize this and work within these realities if he is to be of service. Aggressive behavior on the part of the curriculum specialist which upsets the balance of the team personalities is disastrous in terms of his ultimate function and the final product which is produced.

6. The curriculum specialist must know and be able to use the educational taxonomies of Bloom, Krathwohl, and others. He must know and be able to provide appropriate vocabulary words which reflect the cognitive, motor, and affective level of learning complexity suggested by these taxonomies. Other important knowledges needed by a curriculum specialist include curriculum theory, models for curriculum development, systems theory,
learning theory, instructional theory, theory and procedures of evaluation, and theories concerning the kinds and use of instructional media, and the practical application of these theories.

The knowledges of educational theories and practices which a curriculum specialist can provide allows him to provide leadership in many aspects of curriculum development. This helps him in writing and/or refining performance goals and objectives which are the key to developing curriculum using task analysis. This helps him to create and/or compile suggestions for instruction and evaluation which are essential parts of any curriculum development project. Therefore, the most important contribution a curriculum specialist can make is his knowledge of and his ability to use skills related to general curriculum development.

Questions raised in Chapter I of this investigation have been discussed and answered thusly:

1. A full-time curriculum development project conducted at an educational institution is necessary to provide the kind of support needed for task analysis for curriculum. Experts in the theory of curriculum and curriculum development are readily available in an educational institution, and a pool of personnel who can devote their full time to curriculum development efforts are also readily available.
2. The financial resources necessary to undertake a large-scale project using task analysis to develop job descriptions and curriculum need to come from an organization such as the federal government which has both the interest and resources to finance it. Task analysis is an expensive undertaking in terms of the personnel needed to perform it, the travel needed to assure a broad and complete analysis, and the personnel needed to validate analysis findings. Curriculum development requires personnel to formulate and execute plans, provide appropriate educational material, and provide expert advice and consultation.

Resources other than personnel include a task analysis procedure which can be easily modified and adapted, computer facilities which can be used to analyze the data produced, equipment and supplies to both produce and copy written material, and facilities which can be used for staff and conference meetings. These resources must be efficiently and effectively organized so that they facilitate project work rather than to create barriers.

3. Personnel who have different academic and professional background must relate to each other so that there is a mutual respect of each other as people and as professionals doing their jobs. Respect for each other as people means that there is recognition that each person is an individual who has likes and dislikes, joys and
sorrows, personality strengths and weaknesses, and that each person needs security and guidance from each other. Professional competencies must be recognized and must not be subject to unwarranted attack. People working as a team must be willing to cooperate with each other and also be willing to criticize and be criticized. Thus, rules of common courtesy and treatment of people as individuals characterize the relationships of people working on a curriculum development team.

4. The personal attributes which a curriculum specialist must possess are specifically discussed in a role analysis presented in this investigation. Briefly, it is pointed out that a person fulfilling the role of a curriculum specialist must be capable of working as a team member and providing leadership when situations arise which demand that he do so. He must be willing and able to perform high level abstract decision-making as well as to perform necessary detail work. He must not threaten the security or professional competency of others on the team, and his behavior must be such that he is not considered to be overly aggressive or domineering.

5. A process for curriculum development follows from an analysis of job descriptions developed through task analysis to ascertain specific cognitions, skills, and affects which students need to learn in order to perform on-the-job. This fact has been described in detail in the
investigation. It must be pointed out that verification of this process must rely on future projects which utilize this process.

6. A model for curriculum development is formulated after a long and difficult process occurs. This process includes searching the literature for curriculum development models, presenting one's own ideas, listening to the criticism of other team members, revising one's thinking, proposing new plans, and finally making a decision. This process is frustrating, threatening, and difficult. However, when it is over, and a model for developing curriculum is formulated, it can be a most satisfying accomplishment.

7. The description and analysis of the role of a curriculum specialist using task analysis provides a foundation upon which future curriculum specialists may fulfill their professional responsibility. It delineates an example of a practical application which provides a direction for the work of future curriculum specialists in their efforts to develop programs in many aspects of professional and vocational education. Finally, it provides the information upon which empirical testing can occur to explicitly describe the role of a curriculum specialist.
Conclusions

This investigation supports the following warranted conclusions:

1. Task analysis procedures, and especially the occupational analysis procedure developed by the United States Department of Labor, are a viable way of developing job descriptions and curricula in an allied medical profession, such as occupational therapy, and other professional or technical preparation programs of a similar nature.

2. The model and process for curriculum development generated in this investigation can be used effectively as a guide for future curriculum development in allied medical, professional, technical, and vocational education.

3. A curriculum specialist who has both the required personal and professional competencies can define and fulfill his specialized role as a member of a curriculum development team by drawing upon the principles derived from the investigation.

Recommendations

The following recommendations grow out of this investigation:

1. That the findings of this investigation be disseminated widely throughout the allied medical field.
2. Further research and field testing be undertaken using the curriculum development model and also using the job description and principles delineated in this investigation to empirically validate them.

3. Professional training of curriculum specialists include components that give the theoretical and practical base for development of competencies required to fulfill specialized roles delineated in this investigation.

4. In-service education of individuals involved in curriculum development projects include skill development in certain of the competencies identified as critical in the task analysis approach to curriculum development, and

5. More adequate exchange of curriculum development information be instituted between allied medical fields and more general fields of curriculum and instruction in university settings.
APPENDIX A

INTRODUCTION

For many decades educators have been perplexed by the problems of selection criteria and selection procedures. Fishman and Pasanella studied 580 predictive studies which were conducted between 1948 and 1958. The vast majority of these studies related high school grades to college freshman grade point average. The most obvious deficiency in these studies was their failure to identify the necessary ingredients for successful on-the-job performance. This is frequently referred to as the criterion problem in research studies. Rather than develop a reliable and valid measure of successful job performance, researchers have been content to validate predictors against any available measure such as grades or standardized achievement tests.

In 1943 Crider summed up the problems in a nursing setting as follows:

We could eliminate almost all losses except those due to marriage and illness. All that is necessary is minimum critical scores in intelligence, arithmetic and reading, and refuse to take all those who give evidence of personality problems. This is one-sided where the nursing school merely assures its own success and neglects a large number who could have succeeded.

In the discussion of twenty years of research in medical

154
education, Taylor concluded that "little or no relationship has been found between scores of performance in medical education and later criterion scores of physician performance."³

A study to determine the predictors of successful clinical affiliation of occupational therapy students was conducted by Amy Lind. The criteria in this study were students' clinical affiliation grades, and predictors were generated by the Allport-Vernan-Lindzey Study of Values, the Edwards Personal Preference Schedule, and the Strong Vocational Interest Blank. Although the multiple regression equations were statistically significant, she concluded that: "As the correlations were low they could be of limited value in predicting performance in the clinical experience of students." A primary recommendation of this study was that "Definition of the role and function of occupational therapy in the treatment and rehabilitation program needs to be more clearly defined."⁴

A logical question in response to the above considerations is, "How do we resolve these issues in view of the shortage of trained occupational therapy personnel?"⁵ Task analysis was a technique proposed to provide the following:

1. an effective division of worker function and responsibilities within a discipline,
2. clearly defined criteria for the development of educational programs, and
3. realistic specifications of qualifications needed by individuals selected for these programs.
Through a Health, Education, and Welfare Grant (PHS #5 DO 2 AH0096402), "Development of Occupational Therapy Job Descriptions and Curricula through Task Analysis," a team of researchers at The Ohio State University, School of Allied Medical Professions, applied a task analysis procedure to occupational therapy. The task analysis was conducted by teams, each composed of an Occupational Therapist, Registered, and an Occupational Analyst from the Department of Labor. The analyses occurred at fifteen facilities which were recommended by a Planning Advisory Committee and which fulfilled preestablished criteria related to type of treatment, client group, etc.

The teams identified 264 duties and 1458 tasks which occurred in the facilities and were performed by occupational therapy personnel. This list was reviewed by sixty-seven people associated with occupational therapy education and practice. Based on a significant (.05 one-tailed test) number of the sixty-seven responses, duties were added and deleted. Deletions were basically in the clerical and transportation areas, and additions were in consultation and research. These results maintained 246 of the original duties, and added four duties related to consultation and research, for a total of 250 duties.

With each of the initial 264 duties, a rating was given to the following:
(1) **Training Time:**

General Educational Development (GED)

Specific Vocational Preparation (SVP)

(2) **Aptitudes**

(3) **Interests**

(4) **Temperaments**

(5) **Physical Demands**

(6) **Working Conditions**

These ratings are based on Appendix B of the Dictionary of Occupational Titles (DOT). The subject performing each duty was identified as an Occupational Therapist, Registered, Certified Occupational Therapy Assistant, and Occupational Therapy Aide.

**INITIAL RESULTS**

Table A summarizes the results of the task analysis data for all observed duties in the fifteen occupational therapy facilities. The scales for GED and SVP are explicited in the Appendix of the DOT, and all other ratings are based on the following scale: 5 - bottom 10 per cent of the population; 4 - lower third of the population other than lower 10 per cent; 3 - middle third of the population; 2 - upper third of the population other than top 10 per cent; and 1 - top 10 per cent of the population.
### Table A

**ORIGINAL DUTY RATINGS**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Scale Low-High</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>GED</td>
<td>1 - 6</td>
<td>4.5</td>
<td>0.9</td>
<td>1-6</td>
</tr>
<tr>
<td>SVP</td>
<td>1 - 8</td>
<td>6.0</td>
<td>1.7</td>
<td>1-8</td>
</tr>
<tr>
<td>Intelligence (G)</td>
<td>5 - 1</td>
<td>2.1</td>
<td>0.7</td>
<td>1-4</td>
</tr>
<tr>
<td>Verbal (V)</td>
<td>5 - 1</td>
<td>2.2</td>
<td>0.7</td>
<td>1-4</td>
</tr>
<tr>
<td>Numerical (N)</td>
<td>5 - 1</td>
<td>3.3</td>
<td>0.7</td>
<td>2-5</td>
</tr>
<tr>
<td>Spatial (S)</td>
<td>5 - 1</td>
<td>3.6</td>
<td>0.6</td>
<td>2-5</td>
</tr>
<tr>
<td>Form Perception (P)</td>
<td>5 - 1</td>
<td>3.7</td>
<td>0.6</td>
<td>2-5</td>
</tr>
<tr>
<td>Clerical Perception (Q)</td>
<td>5 - 1</td>
<td>3.3</td>
<td>0.7</td>
<td>2-5</td>
</tr>
<tr>
<td>Motor Coordination (K)</td>
<td>5 - 1</td>
<td>3.7</td>
<td>0.7</td>
<td>2-5</td>
</tr>
<tr>
<td>Finger Dexterity (F)</td>
<td>5 - 1</td>
<td>3.6</td>
<td>0.7</td>
<td>2-5</td>
</tr>
<tr>
<td>Manual Dexterity (M)</td>
<td>5 - 1</td>
<td>3.6</td>
<td>0.7</td>
<td>2-5</td>
</tr>
<tr>
<td>Eye-Hand-Foot Coord. (E)</td>
<td>5 - 1</td>
<td>4.6</td>
<td>0.5</td>
<td>3-5</td>
</tr>
<tr>
<td>Color Discrimination (C)</td>
<td>5 - 1</td>
<td>4.6</td>
<td>0.6</td>
<td>3-5</td>
</tr>
</tbody>
</table>

The mean GED and SVP levels appeared relatively high. Among the aptitudes, the mean ratings for Intelligence and Verbal were relatively high, while those for Eye-Hand-Foot Coordination and Color Discrimination tended to be low.

Intercorrelations among these variables presented two interesting patterns. The intercorrelations among GED, SVP, G, and V tended to be high (.665 to .887) as were the ones among S, P, K, F, and M (.408 to .883). These intercorrelations seemed to indicate that the task analysis identified a cognitive-educational dimension depicted by the first group of variables, and a psychomotor dimension in the second set of variables.

The DOT provides five pairs of work activities or experiences, and the selection of one member of a pair
implies the rejection of the other member. However, members of more than one pair can be selected for each duty. The percentage of the 264 duties which related to each of these experiences is presented in Table B.

**TABLE B**

**INTERESTS**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Situations involving a preference for activities dealing with things and objects.</th>
<th>vs.</th>
<th>Situations involving a preference for activities concerned with people and the communication of ideas.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.2%</td>
<td>Situations involving a preference for activities involving business contact with people.</td>
<td>vs.</td>
<td>Situations involving a preference for activities concerned with people and the communication of ideas.</td>
</tr>
<tr>
<td>31.1%</td>
<td>Situations involving a preference for activities of a routine, concrete organized nature.</td>
<td>vs.</td>
<td>Situations involving a preference of an abstract and creative nature.</td>
</tr>
<tr>
<td>12.5%</td>
<td>Situations involving a preference for working for people for their presumed good, as in the social welfare sense, or for dealing with people and language in social situations.</td>
<td>vs.</td>
<td>Situations involving a preference for activities that are non-social in nature, and are carried on in relation to processes, machines, and techniques.</td>
</tr>
<tr>
<td>57.6%</td>
<td>Situations involving a preference for working for people for their presumed good, as in the social welfare sense, or for dealing with people and language in social situations.</td>
<td>vs.</td>
<td>Situations involving a preference for activities that are non-social in nature, and are carried on in relation to processes, machines, and techniques.</td>
</tr>
</tbody>
</table>
TABLE B (continued)

19.3% Situations involving a preference vs. 2.3% Situations involving a preference for activities resulting in prestige or the esteem of others.

The interests indicate that the duties were seen by the analysts as heavily related with people and their "prestige and presumed good." Notice that the interest which was seen in the largest number of duties (61%) indicates a "preference for activities concerned with people and the communication of ideas."

The temperaments related to the 264 duties are listed below with the percentage of duties in which each temperament was apparent. Temperaments listed in the DOT are abstracted from "different types of occupational situations to which workers must adjust."

TABLE C
TEMPERAMENTS

37.1% Situations involving a variety of duties often characterized by frequent change.

7.2% Situations involving repetitive or short cycle operations carried out according to set procedures or sequences.

6.4% Situations involving doing things only under specific instruction, allowing little or no room for independent action or judgment in working out job problems.
**TABLE C (continued)**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.2%</td>
<td>Situations involving the direction, control, and planning of an entire activity or the activities of others.</td>
</tr>
<tr>
<td>70.1%</td>
<td>Situations involving the necessity of dealing with people in actual job duties beyond giving and receiving instructions.</td>
</tr>
<tr>
<td>1.0%</td>
<td>Situations involving working alone and apart in physical isolation from others, although the activity may be integrated with that of others.</td>
</tr>
<tr>
<td>22.7%</td>
<td>Situations involving influencing people in their opinions, attitudes, and judgments about ideas or things.</td>
</tr>
<tr>
<td>1.5%</td>
<td>Situations involving performing adequately under stress when confronted with the critical or unexpected, or when taking risks.</td>
</tr>
<tr>
<td>55.7%</td>
<td>Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against sensory or judgmental criteria.</td>
</tr>
<tr>
<td>25.0%</td>
<td>Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against measurable or verifiable criteria.</td>
</tr>
<tr>
<td>1.9%</td>
<td>Situations involving the interpretation of feelings, ideas, or facts in terms of personal viewpoint.</td>
</tr>
<tr>
<td>5.7%</td>
<td>Situations involving the precise attainment of set limits, tolerances, or standards.</td>
</tr>
</tbody>
</table>

Surveying the temperaments which were seen by the analysts in more than a third of the duties seemed to indicate that duties performed by occupational therapy personnel were characterized by the following:

1. Frequent change,
2. Direction, control and planning of activities,
3. Involvement with people in actual job duties,

and

Although the above may be frequently encountered in occupational therapy, many of the other temperaments were also represented (e.g., 5% indicates 13 of the 264 duties).

In terms of physical demands, 92 per cent of the duties were viewed as being sedentary or light, six per cent as medium, and only two per cent as heavy or very heavy.

Virtually all of the activities in occupational therapy were seen as being performed inside; only one and one-half per cent of the duties involved working both inside and outside.

Each analysis team listed the tasks accompanying each duty and assigned worker function ratings to each task based on the degree to which it required the worker to function in relation to Data, People, and Things. A total of 1458 tasks were reported. The mean, standard deviation, and range for each worker function are given in Table D.

**TABLE D**

**DATA, PEOPLE, THINGS**

<table>
<thead>
<tr>
<th>Worker Function</th>
<th>Scale Low - High</th>
<th>Mean</th>
<th>Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>8 - 0</td>
<td>2.5</td>
<td>1.5</td>
<td>0-8</td>
</tr>
<tr>
<td>People</td>
<td>8 - 0</td>
<td>5.1</td>
<td>2.7</td>
<td>0-8</td>
</tr>
<tr>
<td>Things</td>
<td>8 - 0</td>
<td>6.6</td>
<td>1.5</td>
<td>0-8</td>
</tr>
</tbody>
</table>

The scales utilized for the above ratings are hierarchical, and the means seemed to indicate the tasks had a higher involvement with data than they did with things.
and people. However, a correlation revealed a low, but significant (.05 level) relationship between data and people which may indicate that the data in the 1458 tasks were derived from or directed to client activities.

**O.T.R.'s, C.O.T.A.'s, AIDE**

The individual performing each of the 264 duties was identified by title. Analysis of the data indicated no significant difference between O.T.R., C.O.T.A., and Aide in the following areas (for all practical purposes, all groups follow the pattern of the initial results): Interests, Temperaments, Physical Demands, and Working Conditions.

Significant differences were seen in the areas of GED, SVP, and Aptitudes. A summary of the results for these areas is presented below for each classification. Table E summarizes the results of the 264 duties substantiated by sixty-seven occupational therapy practitioners and educators.

Multivariate discriminate analysis of the original data for these three classes derived a generalized Mahalanobis D-square of 136.5 which, as a Chi-square with 26 degrees of freedom, indicated that these classes were significantly different at the .001 level. Analyses and comparison of the functions for each class indicated that the most variability occurred in the GED, SVP, Verbal, and Numerical ratings.
<table>
<thead>
<tr>
<th>#</th>
<th>Aptitude</th>
<th>Scale</th>
<th>OTR (N=163) mean/s.d.</th>
<th>COTA (N=62) mean/s.d.</th>
<th>AIDE (N=21) mean/s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GED</td>
<td>1-6</td>
<td>4.6/0.8</td>
<td>3.8/0.8</td>
<td>3.0/0.6</td>
</tr>
<tr>
<td>2</td>
<td>SVP</td>
<td>1-8</td>
<td>6.4/1.4</td>
<td>4.3/1.6</td>
<td>3.0/1.1</td>
</tr>
<tr>
<td>3</td>
<td>Intelligence</td>
<td>5-1</td>
<td>2.0/0.6</td>
<td>2.9/0.6</td>
<td>3.3/0.5</td>
</tr>
<tr>
<td>4</td>
<td>Verbal</td>
<td>5-1</td>
<td>2.1/0.6</td>
<td>3.0/0.8</td>
<td>4.0/0.4</td>
</tr>
<tr>
<td>5</td>
<td>Numerical</td>
<td>5-1</td>
<td>3.2/0.7</td>
<td>3.8/0.5</td>
<td>4.3/0.5</td>
</tr>
<tr>
<td>6</td>
<td>Spatial</td>
<td>5-1</td>
<td>3.5/0.7</td>
<td>3.7/0.5</td>
<td>4.0/0.5</td>
</tr>
<tr>
<td>7</td>
<td>Form Perception</td>
<td>5-1</td>
<td>3.2/0.6</td>
<td>3.7/0.5</td>
<td>3.3/1.1</td>
</tr>
<tr>
<td>8</td>
<td>Clerical Perception</td>
<td>5-1</td>
<td>3.2/0.7</td>
<td>3.9/0.6</td>
<td>3.5/0.8</td>
</tr>
<tr>
<td>9</td>
<td>Motor Coordination</td>
<td>5-1</td>
<td>3.7/0.6</td>
<td>3.6/0.5</td>
<td>3.6/0.5</td>
</tr>
<tr>
<td>10</td>
<td>Finger Dexterity</td>
<td>5-1</td>
<td>3.5/0.7</td>
<td>3.4/0.6</td>
<td>3.7/0.5</td>
</tr>
<tr>
<td>11</td>
<td>Manual Dexterity</td>
<td>5-1</td>
<td>3.6/0.7</td>
<td>3.3/0.6</td>
<td>3.5/0.5</td>
</tr>
<tr>
<td>12</td>
<td>Eye-Hand-Foot Coord.</td>
<td>5-1</td>
<td>4.7/0.5</td>
<td>4.3/0.6</td>
<td>4.1/0.4</td>
</tr>
<tr>
<td>13</td>
<td>Color Discrimination</td>
<td>5-1</td>
<td>4.6/0.6</td>
<td>4.3/0.7</td>
<td>4.7/0.5</td>
</tr>
</tbody>
</table>
Because the Verbal and Numerical indices are included in the GED scale, and the fact that the individuals attending a conference to restructure the duties into two or more occupational levels felt that they understood GED, it became the primary tool used to reclassify the 250 duties into levels. For this reason, a brief discussion of the General Educational Development Tests (GED) is included in this paper.

GED tests were originally developed and standardized in 1942 and 1943 by the United States Armed Forces Institute under the direction of E. F. Lindquist and Ralph W. Tyler. The original purpose of the battery was to help returning servicemen demonstrate the extent to which they had secured the equivalent of a general (non-technical) high school education. The tests, to serve this purpose, were designed especially to measure general educational development which results from informal education.

As a result of this testing program, many servicemen who would otherwise have been educationally or vocationally handicapped without a high school diploma were able to demonstrate competence equivalent to that of a typical high school graduate, and consequently were given diplomas.

Including the original test, thirteen forms have been developed and distributed (the last in 1955), although
classified versions have been developed since 1955. The tests have served and continue to serve the following uses:

1. Issuance of secondary school credentials,
2. Determining admission to college,
3. Use within the Armed Forces (qualifying for military assignments, training, and promotion)
4. Qualification for employment.
5. Self-satisfaction for adults not possessing a high school credential.

Though the tests continue to serve all these uses, the first two are the most important ones today in terms of frequency. For a more detailed description of these uses, see the Examiner's Manual for the Tests of General Educational Development and a 1944 article by E. F. Lindquist entitled "The Use of Tests in the Accreditation of Military Experience and in the Educational Placement of War Veterans."

The conference established four levels based primarily on the GED scale although a cognitive-educational index, and a psychomotor index were also available. The levels and titles suggested are listed below:

Level 3: Program Support (Occupational Therapy Aide)
Level 4: Program Implementation (Occupational Therapy Technician)
Level 5: Program Supervision (Occupational Therapist)
Level 6: Program Development (Occupational Therapy Consultant)
The original duties were classified by the participants of the restructuring conference into the above GED levels. However, duties were identified which contained components or tasks related to two or more of the new levels. Analysis of the data accompanying the duties which appeared in only one level produced the information displayed in Table F.

These new levels reflected the same Interests, Temperaments, Environment, and Physical Activities of the original duties. It may be noted that the GED for levels 6 and 5 differed only by .3, and no difference was evident between levels 4 and 3. However, the SVP and other aptitude scales showed a great difference between levels 3 and 4, and seemed to dispel any notion of establishing only two levels. Specific Vocational Preparation seemed to indicate level 5 required more training time than level 6. The mean SVP for level 3 seemed low when compared to the other levels.

RATINGS FOR NEW LEVELS

The four new levels developed by the participants in the restructuring conference were rated by occupational analysts. This was necessary because many of the original duties were divided and classified in more than one level. Five analysts rated all duties in each level, and Table G summarizes the results.
### TABLE F
APTITUDES FOR RESTRUCTURED LEVELS

<table>
<thead>
<tr>
<th>Scale low-high</th>
<th>Level 6 (N=4) mean/s.d.</th>
<th>Level 5 (N=79) mean/s.d.</th>
<th>Level 5 (N=12) mean/s.d.</th>
<th>Level 3 (N=18) mean/s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GED</td>
<td>1 - 6</td>
<td>5.3/1.0</td>
<td>5.0/0.5</td>
<td>3.8/0.6</td>
</tr>
<tr>
<td>2. SVP</td>
<td>1 - 8</td>
<td>6.5/2.4</td>
<td>6.9/1.0</td>
<td>5.5/1.6</td>
</tr>
<tr>
<td>3. Intelligence</td>
<td>5 - 1</td>
<td>1.8/1.0</td>
<td>1.8/0.5</td>
<td>2.3/0.7</td>
</tr>
<tr>
<td>4. Verbal</td>
<td>5 - 1</td>
<td>1.8/0.5</td>
<td>1.8/0.5</td>
<td>2.4/0.5</td>
</tr>
<tr>
<td>5. Numerical</td>
<td>5 - 1</td>
<td>3.5/0.6</td>
<td>3.1/0.7</td>
<td>3.5/0.8</td>
</tr>
<tr>
<td>6. Spatial</td>
<td>5 - 1</td>
<td>3.5/0.6</td>
<td>3.5/0.6</td>
<td>3.5/0.5</td>
</tr>
<tr>
<td>7. Form Perception</td>
<td>5 - 1</td>
<td>3.5/0.6</td>
<td>3.6/0.5</td>
<td>3.7/0.5</td>
</tr>
<tr>
<td>8. Clerical Perception</td>
<td>5 - 1</td>
<td>3.3/1.3</td>
<td>3.1/0.6</td>
<td>3.3/0.8</td>
</tr>
<tr>
<td>9. Motor Coordination</td>
<td>5 - 1</td>
<td>3.5/0.6</td>
<td>3.8/0.5</td>
<td>3.4/0.5</td>
</tr>
<tr>
<td>10. Finger Dexterity</td>
<td>5 - 1</td>
<td>3.5/0.6</td>
<td>3.7/0.6</td>
<td>3.4/0.5</td>
</tr>
<tr>
<td>11. Manual Dexterity</td>
<td>5 - 1</td>
<td>3.8/1.0</td>
<td>3.7/0.6</td>
<td>3.4/0.5</td>
</tr>
<tr>
<td>12. Eye-Hand-Foot Coord.</td>
<td>5 - 1</td>
<td>4.8/0.5</td>
<td>4.8/0.4</td>
<td>4.4/0.7</td>
</tr>
<tr>
<td>13. Color Discrimination</td>
<td>5 - 1</td>
<td>4.5/0.6</td>
<td>4.8/0.4</td>
<td>4.2/0.8</td>
</tr>
</tbody>
</table>
### TABLE G
NEW APTITUDE RATINGS BY LEVELS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GED</td>
<td>1 - 6</td>
<td>5.3/0.6</td>
<td>4.9/0.6</td>
<td>3.9/0.5</td>
</tr>
<tr>
<td>2. SVP</td>
<td>1 - 6</td>
<td>6.4/1.8</td>
<td>*5.7/1.8</td>
<td>*4.2/1.2</td>
</tr>
<tr>
<td>3. Intelligence</td>
<td>5 - 1</td>
<td>1.7/0.5</td>
<td>2.0/0.5</td>
<td>*2.7/0.4</td>
</tr>
<tr>
<td>4. Verbal</td>
<td>5 - 1</td>
<td>1.8/0.5</td>
<td>2.0/0.5</td>
<td>2.7/0.4</td>
</tr>
<tr>
<td>5. Numerical</td>
<td>5 - 1</td>
<td>*2.4/0.6</td>
<td>3.2/0.8</td>
<td>3.6/0.6</td>
</tr>
<tr>
<td>6. Spatial</td>
<td>5 - 1</td>
<td>3.5/1.0</td>
<td>3.8/0.8</td>
<td>3.9/0.8</td>
</tr>
<tr>
<td>7. Form Perception</td>
<td>5 - 1</td>
<td>3.7/1.0</td>
<td>3.9/0.8</td>
<td>4.0/0.7</td>
</tr>
<tr>
<td>8. Clerical Perception</td>
<td>5 - 1</td>
<td>3.9/0.6</td>
<td>3.3/0.6</td>
<td>3.3/0.7</td>
</tr>
<tr>
<td>9. Motor Coordination</td>
<td>5 - 1</td>
<td>3.9/0.7</td>
<td>3.8/0.5</td>
<td>3.8/0.5</td>
</tr>
<tr>
<td>10. Finger Dexterity</td>
<td>5 - 1</td>
<td>4.1/0.8</td>
<td>4.0/0.7</td>
<td>4.0/0.8</td>
</tr>
<tr>
<td>11. Manual Dexterity</td>
<td>5 - 1</td>
<td>3.9/0.7</td>
<td>3.7/0.5</td>
<td>3.7/0.6</td>
</tr>
<tr>
<td>12. Eye-Hand-Foot Coord.</td>
<td>5 - 1</td>
<td>4.6/0.6</td>
<td>4.9/0.3</td>
<td>4.9/0.4</td>
</tr>
<tr>
<td>13. Color Discrimination</td>
<td>5 - 1</td>
<td>4.6/0.6</td>
<td>4.9/0.3</td>
<td>*4.9/0.3</td>
</tr>
</tbody>
</table>
The averages of the analysts' new ratings for GED, SVP, and Aptitudes corresponded closely with the averages of the original duty ratings assigned to each level. On level 6, the only significant difference occurred in the Numerical area where the analysts raised the requirements. The only significant change in level 5 was a lowering of the time requirements in Specific Vocational Preparation. Although the analysts lowered all the ratings in level 4, the only ones which were significant were SVP, Intelligence, and Color Discrimination. The analysts ratings for level 3 differed from the original ratings in that they showed the following significant changes: (1) lowered the GED, (2) raised the SVP, (3) lowered the Intelligence, (4) lowered the Verbal ability, and (5) raised the Motor Coordination.

The physical demands and environmental conditions were seen by the analysts to be sedentary or light and indoors, respectively. However, the interests and temperaments ratings became more specific by level. Level 6, while maintaining an interest in people, indicated an interest in activities of a scientific, technical, and abstract nature. The data for level 3 indicated a high interest in situations involving people, and no desire for situations dealing with abstract and technical aspects of occupational therapy. The differences between levels, and the trend as one progresses from level 3 to level 5 is evident in the following discussion.
SELECTION SPECIFICATIONS FOR EACH LEVEL

The following suggestions are based entirely on a detailed investigation of the information cited previously. In addition to the statistical assumptions that the GED, SVP, and Aptitude scales are interval, these suggestions assume that the individual is being selected for occupational therapy related training.

Level 6
The individual should:

1. Have level 5 GED in language, mathematics, and reasoning development.
2. Be in the top 20 per cent of the population in Intelligence.
3. Be in the top 25 per cent of the population in Verbal ability.
4. Be in the top 50% of the population in Numerical ability.
5. Desire activities involving business contact with people.
6. Desire activities involving work with people for their presumed good and prestige.
7. Desire activities involving scientific, technical, and abstract work.
8. Be capable of adjusting to frequent change.
9. Be capable of adjusting to deal with people beyond giving and receiving instruction.
10. Be able to influence the opinions, attitudes, and judgments of others.
11. Be able to evaluate information against sensory or judgmental criteria.
12. Desire indoor employment.
13. Desire a job with very little physical activity.
14. Be able to devote 1 to 2 years to training.

**Level 5**

The individual should:

1. Have language development at level 5 GED.
2. Have mathematics development at level 4 GED.
3. Have reasoning development at level 5 GED.
4. Be in the top third of the population in Intelligence.
5. Desire situations dealing with people and working for their presumed good and prestige.
6. Desire situations concerning the communication of ideas to people.
7. Desire situations involving the direction, control, and planning of activities.
8. Desire to work with people beyond giving and receiving instructions.
9. Desire situations involving the evaluation of information against judgmental criteria.
10. Desire indoor employment with very few outside activities.
11. Desire a job with light or sedentary physical activities.
12. Be able to devote 1 to 2 years to training.

**Level 4**

The individual should:

1. Have a GED level of 4.
2. Be in the top 50 per cent of the population in Intelligence.
3. Be in the top 50 per cent of the population in Verbal ability.
4. Desire to work with people for their presumed good.
5. Desire activities resulting in prestige or the esteem of others.
6. Desire activities involving people and the communication of ideas.
7. Desire to deal with people beyond giving and receiving instruction.
8. Desire to influence people and their opinions, attitudes, or judgments.
10. Desire work with mostly light or sedentary physical activity.
11. Be able to devote 6 months to a year to training.

Level 3

The individual should:

1. Have a GED level of 3.
2. Have a preference for working with people, as in the social welfare sense.
3. Desire situations involving people and the communication of ideas.
4. Desire activities of a routine, concrete, organized nature.
5. Desire activities dealing with things and objects.
6. Be able to adjust to duties characterized by frequent change.
7. Desire to deal with people beyond giving and receiving instruction.
8. Desire activities involving the evaluation of information against judgmental criteria.


10. Desire a job involving light or sedentary physical activities.

11. Be able to devote up to 3 months to training.

**SUMMARY**

This paper presented the data and its various revisions related to the activities in an occupational therapy facility. Based on this data, a restructuring conference established four levels of complexity of an activity in occupational therapy. The duties and tasks in each of the four levels were rated again by occupational analysts, and from these ratings, baseline selection specifications were developed.
REFERENCES


APPENDIX B

LEVELS OF COMPLEXITY OF LEARNING
APPENDIX B

LEVELS OF COMPLEXITY OF LEARNING

(Please choose three items from any of the headings below in any combination and write the numbers in the spaces provided for each of the activity statements on the questionnaire. The items chosen should reflect the level of complexity of learning for each of the activity statements.)

*Cognitive Learnings
1. Recall of specifics
2. Recall of ways and means of dealing with specifics
3. Recall of theories and patterns of therapeutic principles
4. Comprehension of facts
5. Interpretation of relationships of facts
6. Extension of interpretation beyond given facts
7. Abstraction from concrete situations
8. Analysis of elements, relationships and organizational principles
9. Derivation of a plan, or proposed operations
10. Development of judgments from internal evidence or external criteria

*Affective Learnings
11. Awareness of behaviors and events
12. Acceptance of client values and behaviors
13. Sensitivity to client values and behaviors
14. Expression of feelings, emotions and attitudes
15. Appreciation of aesthetic beauty
16. Compliance in performing tasks
17. Willingness to provide service
18. Derivation of satisfaction in providing service
19. Acceptance of the values of providing services
20. Examination and selection of values of therapeutic activities
21. Commitment to values of therapeutic activities
22. Formation of judgments concerning personal responsibilities
23. Organization of a value system concerning personal responsibilities and therapeutic principles
24. Readiness to revise judgments and change behavior in light of evidence

25. Development of ethical code of behavior consistent with principles of therapy

**Psychomotor Skill Learnings**

26. Ability to discriminate quality and kind of sensory information
27. Ability to perceive and recognize forms in space and relationships of plane and solid objects
28. Ability to perceive pertinent detail in objects, pictorial or graphic material
29. Ability to make sensory comparisons and discriminations and sense slight differences in sensory information
30. Ability to remember and recognize pertinent details of sensory information
31. Ability to perform large muscle activity requiring strength or endurance, or both
32. Ability to move the extremities coordinately with each other according to sensory stimuli
33. Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed
34. Ability to move the hands easily and skillfully in placing, turning, pushing, pulling motions

---

**Adapted from: Dictionary of Occupational Titles, Appendix B-4, U. S. Department of Labor**
APPENDIX C

PREPARATION FOR OCCUPATIONAL THERAPIST
APPENDIX C
PREPARATION FOR OCCUPATIONAL THERAPIST

Basic Information Module: Communication: Overview of communication theory and methods, with applications in person-to-person verbal communication.

Overall Goal: (1) To identify and describe theories of communication; (2) list, explain formal and informal methods of verbal and non-verbal communication; and (3) identify and apply person-to-person communication techniques.

Purpose: To observe and analyze client's communication skills, formulate treatment objectives for improving communication skills, be able to apply instructional methods, confer with and counsel clients, their families, and staff, compose records, reports, and correspondence, supervise staff, and coordinate client and staff activities, consult with other health care workers and receive instruction to maintain and upgrade personal skills.

Suggested Objectives

The Learner Should:

1a. Define the term "communication."

Examples: Giving a part or share of something.

1b. Discuss the need for and purpose of communication.

Examples: Impart, receive, share information and feeling.

2. Recognize and describe given specific theories of communication.

Examples: Input - Feedback Systems: Message, messenger systems, etc.

3. Identify methods of formal and informal communication commonly used in the health care system, and give examples of each.

Examples: Formal--structured
Written--Memos, letters, policy, client records
Verbal--Lectures, interviewing and examinations
Informal
Written--Notes, schedules, etc.
Verbal--Team conferences, staff meetings.
Non-verbal--Facial expressions, body postures, gestures
4a. Describe and compare the importance of the functions and purposes of given types of formal written communication commonly used in health care systems.

4b. Describe, compare the importance of the functions and purposes of given types of formal verbal communication.

5. Identify non-verbal behavior cues usually given by individuals involved in communication and suggest the meaning of each as it relates to human feelings.

6a. Identify and describe the dynamics of a conversation between two individuals.

6b. Identify and describe behaviors involved in listening and receiving information and apply this to a given situation.

6c. Demonstrate the ability to listen and extrapolate information in a given situation.

6d. Given a verbal or written list of directions, identify and organize the steps and perform or report the steps in order.

7. Identify a method for giving directions and apply this method in a given situation.
8. Identify behaviors apparent in non-verbal and verbal reinforcement and apply these to a given situation.

Verbal encouragement—"good," "right," "almost right," etc.
Non-verbal—smiles, head nods, attentive leaning towards, etc.

9. Define the term "persuasion," state some techniques which may be used to persuade and apply these to a given situation.

Persuade—to induce to believe, convince. Techniques: reinforcement, pointing out positive benefits, being personally enthusiastic.

10. Define the term "negotiation," identify some methods of negotiating, and apply these to a given situation.

Negotiation—mutual discussion or arrangement of the terms of a transaction or agreement. Techniques: Identifying items to be negotiated through discussion, determining alternatives, making mutual concessions, and settlement.

11. Identify and describe the techniques of interviewing to obtain information and demonstrate an acceptable skill in applying this technique to a given situation.

Listening, repeating statements, showing interest, silent waiting.

12. Identify and describe methods of giving a talk or lecture. Apply them to speak about a subject before a given group.

Knowing the audience's interests and needs, organizing the material, using language and manner which makes the audience comfortable, speaking clearly and slowly, asking for feedback.
Level 6  **Affective Objectives**

1. The learner will organize a value system concerning personal responsibilities and therapeutic principles to be demonstrated in formulating, integrating, and coordinating occupational therapy policies, procedures, and programs and in making required organizational changes.

2. The learner will develop an ethical code of behavior consistent with principles of therapy to be demonstrated in formulating, integrating, and coordinating occupational therapy policies, procedures, and programs, and in making required organizational changes.

3. The learner will demonstrate a readiness to revise judgments and change behavior in light of evidence when planning, arranging, and conducting research in occupational therapy to confirm or refute current occupational therapy theory or to develop new treatment techniques.

**Examples:**

1a. Does he identify his value system in identifying program needs?

1b. What values are displayed in planning for space, personnel, and materials?

2a. What ethics are displayed in his use of consultation and feedback?

2b. Does he support funding requests with appropriate, reliable data?

3a. Is his research design unbiased, or are biases and assumptions stated?

3b. Is interpretation of results unbiased and based on findings?
APPENDIX E

INTERACTIVE STRATEGIES
APPENDIX E

INTERACTIVE STRATEGIES

In the literature of education, the teaching process has been defined in different ways. For the purpose of this guide, a definition of teaching delineated by Dr. John B. Hough is used. "Teaching is the act of instruction which involves creating, using and modifying instructional strategies in a classroom or clinical situation to achieve specified performance objectives." Teaching is, therefore, an interactive process where the teacher or student use a pattern of behavior involving a reciprocal communication process between two or more people at a time. The key behaviors in the interactive process are defined below:

1. Initiation of Substantive Information - All instances in which substantive information is given at the initiation of either teacher or students.

2. Solicitation of Information - Verbal behaviors which typically take the form of a question, direction, or command or non-verbal behaviors such as gestures, voice modulation, etc.

3. Responses to Solicitation - A direct answer to a question or a response to a direction or command and may involve knowledge, skills, or feelings states.

4. Clarification - The Process of (1) helping a person who emitted a response or question become more aware of his own behavior or (2) helping a person responding to a behavior understand the meaning or implication of the behavior.

5. Corrective Feedback - Student or teacher responses to statements that can be considered incorrect or inappropriate by commonly accepted definition, custom, convention, or some form of empirical verification.

6. Confirmation - An indication of teacher or students of the correctness or appropriateness of behaviors by commonly accepted customs, convention, or empirical verification.
7. Acceptance - A response by either teacher or student which portrays an unconditional regard for another person or for what another person said.

8. Positive Personal Judgment - Behaviors with a positive value connotation which praise, reward, or encourage.

9. Negative Personal Judgment - Behaviors with negative value connotations which criticize or reject ideas or feelings.

### Four instructional or interactive strategies that are:

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Direct communication strategy</td>
</tr>
<tr>
<td>2.</td>
<td>Teacher-student interactive strategy</td>
</tr>
<tr>
<td>3.</td>
<td>Student group activity strategy</td>
</tr>
<tr>
<td>4.</td>
<td>Independent strategy</td>
</tr>
</tbody>
</table>

Key:  
- **T** = teacher  
- **S** = student  
- **A** = artifact

The direct communication strategy suggests a teaching method in which the primary activity is the dissemination of information. In a situation which is a true exposition of information certain kinds of behaviors on the part of both teachers and students should appear. Teacher behaviors include: Initiation of substantive information and silence (behavior #1) and student behaviors include such covert student responses as confirmation (behavior #6), acceptance (behavior #7), positive or negative personal judgment (behavior #8 and 9) and other non-verbal feedback.

The teacher-student interactive strategy suggests a teaching method where the teacher plays the role of or is perceived as the leader. The behaviors in this strategy which are usually displayed by the teacher include: initiation of substantive information, solicitation of information, clarification of responses, confirmation, acceptance or positive and negative personal judgment. Student behaviors might include: response to solicitation, initiation of information, solicitation of a response, clarification, corrective feedback, acceptance, positive or negative personal judgment. The teacher can solicit responses which are either convergent or divergent. Convergent responses are those in
which only one answer is acceptable, and divergent responses are those in which creativity, personal perceptions, and many answers are acceptable.

The student-group activity interaction suggests a teaching method in which the teacher is not the acknowledged leader and may or may not be present. Students, in this strategy, assume the responsibility of directing or carrying on learning. Student behaviors might include: initiation of information, solicitation, response to solicitation, clarification, corrective feedback, confirmation, acceptance, or positive or negative personal judgment. If the teacher is part of the group, then teacher's behaviors might be any of the previously mentioned student behaviors with an emphasis on clarification.

The independent strategy suggests a method in which the student works with some kind of artifact (such as a book, a film, a patient, a model, or anything which is judged to be an instructional value). The teacher serves as a guide or mentor of the student. Student behaviors in this strategy might be heavily oriented to: initiation of information, solicitation of response, and clarification. The teacher may behave in the manner mentioned in the student-group activity strategy.

These strategies and behaviors have been identified for the purpose of teachers using observational systems to analyze their own behavior. Formal observational systems such as those developed by Ned Flanders, John Hough, and others, can help a teacher analyze his teaching behavior as it relates to his daily learning objective and thus improve his instruction. A number of observational systems are found in the reference, Mirrors from Behavior, edited by Simon and Boyer, which can be applied to any instructional situation from the classroom to the clinic. 3

Suggested teaching methods which relate to specific instructional strategies will be listed. In the context of each module will appear a system in which specific instructional strategies will be delineated and coded references to the list presented below will also be presented. Therefore, to use this guide, it will be necessary to refer to the list below for suggested teaching methods for each module.

1. Direct Communication a. Teacher lecture disseminating information not readily available in any other way using appropriate audio-visual media such as blackboard, overhead
189

projectors, opaque projectors, charts, and others.

b. Teacher demonstration of a process or use of some material or equipment.

c. Teacher presentation of a film, filmstrip, 8mm., loop film, video or audio tape, or training film.

d. Lecture or demonstration by selected resource personnel defining, explaining, or clarifying beliefs, ways to perform, or other special interest subjects.

2. Teacher-Student Group Interactive

a. Teacher-led discussion used to clarify student given definitions and perceptions; directing students to relate personal beliefs and perceptions; directing convergent responses from students about what is correct or acceptable; or directing students to present divergent responses on issues, problems, and/or definitions.

b. Teacher-directed simulated task group with teacher as leader and students role playing group participants.

c. Teacher-led simulations of clinical situations with teacher playing the role of health professional and students playing the role of clients.

d. Teacher-directed observation of a clinical situation with a follow-up discussion of pertinent things seen or an exchange of student perceptions of what they have seen.
e. Teacher-assigned problems to be solved with teacher-made directions given.

f. Teacher-led discussion of a hypothetical situation where student responses are directed toward giving either convergent or divergent answers.

g. Teacher-led follow-up discussion evaluating either an individual student or a student group performance or presentation.

h. Teacher-prepared forms given to students to be filled out and discussion of the "do" and "don't" procedure used.

3. Student-Student Group Activity

a. Student group discussion of each student's others perceptions, definitions, beliefs, or independent study findings.

b. Students using each other to practice techniques or to point out specified information.

c. Simulation with students role playing specified roles or performing specified tasks.

d. Student task groups with students acting as observers and evaluators of group proceedings or role playing specified roles.

e. Student small group discussion of relevant medical, political, sociological issues with follow-up presentation to larger student group about what was discussed or conclusions which were reached.
f. Student buzz sessions or brainstorming sessions to create, plan, organize, or solve specified activities.

g. Students group performance of a specified activity with students helping each other to complete a project or activity.

h. Student participation as a group in specified activities to either enhance their skills in performing a specified task or to have students get the feeling of being a group member.

i. Student group-on-group observation to ascertain or evaluate group process or group product.

j. Student group formulation of word games or crossword puzzles.

k. Students playing either commercially prepared games (such as scrabble, etc.), teacher-prepared games, or student-prepared games limited to using only medical terminology.

l. Student to student quizzing of each other on correct definitions or spelling.

4. Student independent

a. Student reading or research of given sources such as books, charts, journals, reference sources, and others.

b. Individual student manipulation of and practice with specified artifacts including tools, equipment, material or commercial items.
c. Student interview of specified personnel or resource personnel to find out about themselves or an important process or activity.

d. Student viewing of film, filmstrip, 8mm. loop films, video or audio tape, etc.

e. Student writing of reports, autobiographies, diaries, or creative material as directed.

f. Student observation of specified groups or activities to evaluate group or individual process or product.

g. Student participation in performing a specified task or activity.

h. Student filling out forms or using checklists or other prepared forms.

i. Student reports on specified topics.

j. Student independently creating an artifact or plan.

k. Student role playing a specified role without group interaction.

Footnotes

1. The information contained in this section was adapted from, Teaching: A Description and Analysis, by John B. Hough and James K. Duncan, Reading, Massachusetts: Addison-Wesley Publishing Company, 1970.

2. Hough and Duncan, ibid., p. 6.

3. Simon, Anita and Boyer, Gil E., eds., Mirrors from Behavior, Philadelphia: Research for Better Schools, 1968. This reference is a series of 14 volumes containing over 90 observational systems.
APPENDIX F

EVALUATION
APPENDIX F

Evaluation

To provide a basis upon which educators may employ evaluation in relation to these curriculum guides, it is necessary to explicate a perception of the nature of evaluation and the evaluation function. Although surveys, tests, and measurements, professional judgment, and the establishment of objectives are frequently involved in evaluation, the complex process of evaluation extends beyond these specific tasks.

What, then, is evaluation? The Phi Delta Kappa Study Commission on Evaluation defines evaluation as "the process of delineating, obtaining, and providing useful information to judge decision alternatives." The important implications in this definition which distinguish it from traditional research are that:

1. The evaluator is serving a specific decision audience, and

2. The purpose of evaluation is to provide information to facilitate decision-making.

The decision audience being served by the educator in terms of these curriculum guides are: (1) the instructor and (2) the student. The instructor must determine the answers to various questions throughout the instructional process. Some of these questions relate to the speed at which the curriculum is offered, the sequence of the various modules, and which teaching strategies and media accomplish the objectives with the most effectiveness and efficiency. The student will constantly have to be informed of his progress in relation to the expectations of the course to enable him to make decisions regarding studying time, effort, references, and work load for the immediate future. A helpful tool for many instructors has been to identify the questions he/she will need to answer before, during, and after each module. Once the questions are known, the information which is necessary to answer each question can be determined.

To facilitate an understanding of evaluation, the Phi Delta Kappa study commission has identified four types of evaluation and the decisions they serve. These four types are explicated below:
Context evaluation (What do we have?) Serves planning decisions and relates to a typical needs assessment. However, context evaluation also identifies opportunities and provides the information necessary for the establishment of objectives. This project has performed context evaluation on the field of occupational therapy and from this we have developed these curriculum guides. In terms of classroom performance, the instructor will need context information on the student's entering behaviors or level of performance in order to adapt curriculum modules to each student's specific needs and to establish a baseline needed to determine if the student has grown through the duration of the course.

Input evaluation (What can we do about it?) Serves structuring decisions and provides information necessary to assess the various alternatives which may be applied within these modules. Input evaluation would aid in determining which of the various types of teaching strategies may be most effective as well as what type of media presentation should be employed.

Process evaluation (Are we doing it?) Serves implementing decisions. This evaluation provides information to answer questions such as: What problems may be anticipated in this module? Is the module consistent with what is needed? and, Is it possible to modify or improve the program by re-sequencing the various modules? Evaluations throughout the module will provide the instructor with information necessary to decide whether to proceed to the next module or reemphasize the present lesson.

Product evaluation (How well was it done?) Serves recycling decisions and provides information on whether to modify, discontinue, or proceed with the present program. Product evaluation is the most common type of evaluation and is employed to determine whether or not the student has fulfilled the pre-established expectations of the module.

The curriculum guides provide performance objectives which define a form of student behavior; it is important that either the behavior itself, or the product of the behavior be measurable in some way in order to evaluate appropriately. These objectives are unique in that they all state the student's behavior in terms of "to identify," "to define," "to list," "to state," etc. These performance objectives are in contrast with typical goals which use such verbs as "to know," "to realize," "to appreciate."
In attempting to make these curriculum guides generalizable, specific methods of assessment and required degrees of accuracy were not stated. This should be specified by the instructor prior to implementing any of these modules. In addition to specifying the degree of knowledge required, the instructor should indicate what type of assessment will be used, when the assessment occurs, and what is required of the student during each assessment. The chart on the following page relates the degree of knowledge with various assessment procedures for each level of the curriculum.

Once the required degree of knowledge is established on the continuum of Awareness to Mastery, the appropriate assessment procedure(s) can be identified for each level. Although mastery of a concept may be required in a Basic Information module, the concept of mastery is more appropriate when related to skill acquisition.

The following discussion will elaborate on each of the instruments in the table and provide examples of each. A more detailed discussion of each evaluation technique may be found in the appropriate reference article listed in the bibliography.

**Questionnaires**

Some of the important considerations regarding questionnaires relate to the type, purpose, and procedures under which the questionnaires are implemented. Questionnaires can be developed to assess achievement, affect, ability, and other aspects of an individual. They can also assess the cognitive aspects of certain psychomotor activities. Depending on the specific questions involved, most teacher-made tests assess a combination of these aspects. Indicated below are some of the more common examples of various classes of questionnaires.

<table>
<thead>
<tr>
<th>Achievement</th>
<th>Affective</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Standardized</td>
<td>(1) Semantic Differential</td>
</tr>
<tr>
<td>(2) Teacher-Made</td>
<td>(2) Q methodology</td>
</tr>
<tr>
<td></td>
<td>(3) Attitude Scales</td>
</tr>
<tr>
<td></td>
<td>(4) Interest Inventories</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) American College Tests (ACT)</td>
</tr>
<tr>
<td>(2) Specific Aptitudes</td>
</tr>
<tr>
<td>(3) IQ Tests</td>
</tr>
<tr>
<td>Preparation for:</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>AIDE</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>TECHNICIAN</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>THERAPIST</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>CONSULTANT</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Also, one should ask about the actions a questionnaire requires the student to perform. In the case of a multiple choice question, the action would be "to select" the correct answer; for a matching test item, "to match" would be the most appropriate verb form; and for an open-ended question, "to complete." Under what conditions will the student be asked to perform any of these actions cited previously? Typically, students are either given materials with which to answer a test question, or they use unaided recall. In one class, an objective might read, "Given a skeleton, the student will be able to...." Another important consideration is what the student is going to write, match, so forth. This (what) represents the content of the action. In one of these modules, for example, it might be a definition of the various muscles in the finger. The fourth area of consideration is how accurate the student must be on this specific test question. Each objective must contain an explicit standard of accuracy. For instance, if a student must be able to list six of ten possible items, the standard is sixty per cent and this should be specified in the objective.

If no degree of performance accuracy is stated, the implied standard is 100 per cent, and the student may not make any mistakes or he will have to recycle on this objective. With each of these curricular modules, it is the responsibility of the instructor to assign an acceptable minimum performance level.

There are several advantages of questionnaires. They are relatively inexpensive when compared to the other types of assessment. They are thought to be the most objective method of assessing students, although frequently teacher bias is apparent. Questionnaires lend themselves to various statistical analyses to assess their validity and reliability. It is also possible to provide rather specific feedback to the students in terms of areas in which they have not fulfilled a pre-established level of competence.

1. True-False

The true-false test is the most simple type of objective measure. Its construction involves statements or brief sentences to which the subject must respond. The response is a choice between true or false, plus or minus, yes or no, or any other pairs which would indicate his agreement or disagreement with the statement.
This type of test is designed so that a great number of items may be presented within a given time period in order to yield the widest possible range of scores.

The major disadvantage of the true-false test is the individual chance element, resulting in the possibility that the expected minimum score could be high in comparison to the maximum score. Simply by chance an individual could be expected to get fifty per cent of the items correct, and research has found the percentage to be nearer to sixty.

Examples:

1. All cows are brown.

   T   F

   ___ ___

2. Indicate, by making True or False, if the following are parts of a wheelchair:

   Headlight
   Swivel wheels
   Armrests
   Horn

   ___ ___
   ___ ___
   ___ ___

2. Multiple Choice

The multiple choice test is the most generally used type of pencil and paper measure. The items consist of a statement of a problem (stem) or some verbal or visual material to which the subject must respond. The response includes a set of two or more statements, or visual or verbal material. One of these alternatives is usually considered correct, while the others are intended as decoys or misleads. The number of alternatives varies between two and seven, the most common being five.

The chance element in the multiple choice test is greatly reduced if the number of decoys is more than two, a major advantage over the true-false test. In addition, the multiple choice test is thought to measure a wider range of knowledge, skills, and aptitudes.

The greatest disadvantage is the difficulty in constructing enough plausible decoys for each stem, especially when four or more decoys are used.
Example:

1. On a multiple choice exam item, the examinee will usually be less likely to find the correct answer by chance (compared with a true-false question) because:
   
   a. True-false tests tend to be longer.
   b. A true-false question can be stated more precisely.
   c. True-false tests tend to measure a wider range of talent.
   d. A multiple-choice question uses misleads.

3. Matching

The matching test is one that has been used commonly by classroom instructors and in commercially published tests, but now seems to be decreasing in its used. It consists of two sets of elements constructed so that for every element in the first set there is a related element in the second set. It is not necessary to have the same number of elements in each set; there may be excess elements, or decoys, in the second set.

In the matching type test it is difficult to control the element of chance in both theoretical and practical work. The test may be constructed so that there is only one correct answer in the second set for each item in the first set. Or, it may be that each element in the second set may serve as a possible answer to more than one element in the first set.

One advantage of the matching test is its variety and resulting appeal to the subjects, although this appeal may not be as important as an extensive measurement of capabilities.

Example:

At the left are listed materials commonly found in occupational therapy. At the right are listed kinds of storage. For each kind of material write the number for the most appropriate kind of storage.

<table>
<thead>
<tr>
<th>Dead mice</th>
<th>1. Open shelves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used Occupational Therapists</td>
<td>2. Open cardboard boxes</td>
</tr>
<tr>
<td>Elephants</td>
<td>3. Open metal cans</td>
</tr>
</tbody>
</table>
4. **Completion**

The completion test is used extensively to measure achievement. The items consist of a sentence with one or more words missing which the subject is to supply from memory. It may be compared to the multiple choice item in which the number of alternatives is very great, although the correct answer must be recalled (rather than recognized) from an unlimited (rather than limited) number of alternatives.

The greatest advantage of the completion test is its ease of construction, especially for classroom instructors who may lift sentences from textbooks and simply omit certain words. In addition, the chance factor in this type of test is relatively small.

Two obvious disadvantages to this type of item are that specification of acceptable answers is difficult, and these tests cannot be scored by machine.

**Example:**

1. Two advantages of the completion type test are

   _______________________________________________________

   and ___________________________________________________.

5. **Essay**

Essay questions are designed to assess many of the same traits as the completion test. As such, many of the same advantages and disadvantages are involved in both kinds of assessment.

The primary advantages is that the essay test requires not simply a memory response, but many interrelated responses. The student must integrate various concepts into a logical sequence. This process involves deductive and inductive reasoning combined with synthesis of ideas.

Most disadvantages are related to the grading procedures of the final essay. Although coding and other tactics may be used, the assessment still is confounded with teacher bias. A procedure to decrease this bias would be the development of lists of essential elements necessary for each question. Each essential
would receive a pre-established number of points, any additional concepts (other than essentials) could receive a lesser number of points. The obvious disadvantage in this is the amount of teacher's time required, both in developing these lists and in the grading itself.

Example:

1. Describe the advantages and disadvantages of an essay type exam question.

6. List

In this type of question, the student is asked to recall, from unaided memory, a series of facts, categories, or concepts. The order in which items are listed may or may not be involved in establishing the correctness of a response.

A major advantage of this type of question is that it has a clearly definable "right" answer. This both reduces teacher bias and the amount of time required for scoring. A test of this type cannot be readily machine scored, however.

Example:

1. List ten human behaviors that can be used as means of non-verbal communication.

7. Observational Techniques

In general, observational techniques are employed when one individual views and appraises the behavior of another. In some cases, this observation simply specified whether or not a defined activity has taken place; in others, an effort is made to quantify the behavior being observed.

All observational systems can be classified into one or two categories. Interventionist techniques are those in which the observer interacts with the individual being observed. Unobtrusive techniques, on the other hand, are ones in which the observer has little or no interaction with or influence on the behavior of the person being viewed.
A basic interventionist technique is the interview or oral examination. These tend to be quite time-consuming, e.g., a great deal of preparation time may be needed if valid and reliable information is to be obtained. Moreover, an extensive amount of training may be necessary to produce a capable interviewer or examiner. On the positive side, however, it can be stated that a well-conducted interview or oral exam will provide comprehensive responses to specific questions and will also allow the student to express in-depth or wide range knowledge of a topic. A major drawback of the interview is the difficulty in equating or comparing the performance of two different students. Most often, completely different questions have been asked in the two sessions. One way of overcoming this problem is to use a structured interview. Here a common core of questions are asked of all students. As an option, sets of equivalent questions or problem-solving situations can be developed and used with the students. Overall, the kinds of questions asked in an interview parallel the kinds discussed previously under Questionnaire.

Quite often unobtrusive observation is accomplished with the assistance of contrived situations and/or concealed hardware. Hidden microphones and cameras can be used to relay or record the performance. The person being observed can be in a natural situation or one that has been purposely designed to provide desired stimuli. In the later instance, an instructor, another student, or an actor could be playing a role for the student being observed. The value of elaborate unobtrusive observational techniques seem somewhat questionable in light of research which shows that after a period of time a visible observer becomes nonthreatening and gains essentially the same information as a hidden one. In addition, legal and ethical considerations must often be taken into account with this type of observation.

Observational techniques are useful in evaluating student performance in activities such as role playing or demonstrating a psychomotor skill. They seem essential for the task of assessing student effectiveness in clinical situations.

Finding valid and reliable ways of scoring or rating observed behaviors requires a great deal of ingenuity and judgment, to say the least. At one extreme a critical incident approach can be taken. A listing of
essential (critical) behaviors is established and the observer tallies the frequency each has been seen. At the opposite extreme, a very careful analysis can be made not only of frequency but also of quality of behavior. For example, key words, phrases, or physical actions can be established as criteria that are used to determine if a specified behavior has taken place. These criteria can be very elaborate and allow for rating of behaviors on a numerical continuum.

The material included in this appendix is coded to SUGGESTED EVALUATION in each module. For example, Code #2 in the module refers to the use of multiple choice tests to assess student performance. Code #7 refers to the use of either observational technique discussed in this appendix. Please refer to this appendix when ascertaining suggested evaluation procedures.
APPENDIX G

EVALUATION OF ACTIVITIES PERFORMED
BY A CURRICULUM SPECIALIST
APPENDIX G

The Ohio State University
School of Allied Medical Professions
HEW, PHS Grant No. 5 D02 AH 00964 02
"Development of Occupational Therapy Job Descriptions and Curriculum Guides Through Task Analysis"

Directions

You have been asked to provide input for this survey because of your involvement with the project and because of your background and work in curriculum development. As a participant in the project, you had the opportunity to observe this curriculum specialist at work. Please read the descriptions and indicate the degree to which you perceived these activities being performed by placing the letter "A" in the appropriate column.

The following activities were performed by the curriculum specialist. Which activities did you see the curriculum specialist perform and to what degree?

<table>
<thead>
<tr>
<th></th>
<th>Very Often</th>
<th>Often</th>
<th>Sometimes</th>
<th>Infrequently</th>
<th>Never</th>
</tr>
</thead>
</table>

1. Providing consultation to staff and other personnel involved with the project.

2. Suggesting specific educational issues to be dealt with by task analysis.

3. Conferring with occupational therapy educators to obtain information about the nature of their profession and educational problems they perceive.

4. Conferring with professional analysts to obtain information about how the task analysis is performed.

5. Surveying the literature related to curriculum development, learning
theory, systems theory, instructional theory, and evaluation theory

6. Constructing surveys and questionnaires to obtain information related to curriculum, instruction, and instructional media in occupational therapy.

7. Supervising the collection and compilation of data concerning instructional media and teaching methods used in occupational therapy.

8. Helping to formulate a process for developing curriculum modules for occupational therapy students.

9. Helping to write overall performance objectives and specific performance statements indicating appropriate cognitive and psychomotor learning needed by occupational therapy students.

10. Helping to write affective objective statements for prospective occupational therapy students.

11. Developing a list of instructional strategies and methods to provide direction for user implementation of curriculum modules.

12. Helping to write instructions and directions for use of curriculum guide
13. Revising the content and level of learning statements in a preliminary draft of curriculum modules after examining input from occupational therapy educational consultants.

14. Conferring with project staff specialist to formulate appropriate evaluation strategies and procedures to be included with curriculum modules.

15. Providing feedback to project staff concerning their instructional behavior in training conferences held during the project.

Note:

Please re-read this list and mark the letter "B" in the column indicating the activities and the degree to which a curriculum specialist using task analysis should perform.

If there are functions which should be performed but are not listed, please add them on the back of this form.
APPENDIX H

A LIST OF PARTICIPATING RESPONDENTS
APPENDIX H

A LIST OF PARTICIPATING RESPONDENTS

A list of respondents who participated in a structured interview to provide a reality check of the role of this investigator as a curriculum specialist include:

**Project Staff**

1. G. D. Angus, Ph.D.
   Project Evaluation Specialist

2. John Camiscioni, M.A.
   Project Co-Director

3. Rosa Hartsook, O.T.R.
   Project Administrator

4. Laurie Jones, B.A.
   Project Administrative Assistant

5. Kathryn Schoen, Ph.D.
   Project Co-Director

**Planning Advisory Committee**

6. Robert Atwell, M.D.
   Director
   School of Allied Medical Professions
   The Ohio State University
   Columbus, Ohio

7. Clyde Buty, M.D., O.T.R.
   Director
   Division of Functional Programming
   Department of Mental Hygiene of the State of New York
   Albany, New York

   President
   American Occupational Therapy Association
   New York, New York
9. Charles W. Dohner, Ph.D.
   Director
   Office of Research in Medical Education
   School of Medicine
   The University of Washington
   Seattle, Washington

10. Nedra Gillette, M.A., O.T.R.
    Consultant
    Occupational Therapy Division
    Columbia University
    New York, New York

11. H. Kay Grant, M.S., O.T.R.
    Director
    Occupational Therapy Division
    School of Allied Medical Profession
    The Ohio State University
    Columbus, Ohio

12. Elizabeth Gurney
    Consultant
    Health Occupations Trade and Industrial Education
    Ohio Department of Education
    Columbus, Ohio

13. Paul Klohr, Ph.D.
    Professor of Education
    The Ohio State University
    Columbus, Ohio

    Director
    School of Occupational Therapy
    Virginia Commonwealth University
    Richmond, Virginia

15. W. Loren Williams, Jr., Ph.D.
    Director of Medical Education Research
    Medical College of Georgia
    Augusta, Georgia

Members of The Occupational Therapy Division,
The Ohio State University

16. Margaret Adamson, M.S., O.T.R.
    Assistant Professor
17. Jan Johnson, M.A., O.T.R.
   Assistant Professor

18. Barbara Locher, M.A., O.T.R.
   Associate Professor

19. Sharon Henne
   Secretary

20. Jean Penucci, M.A., O.T.R.
   Assistant Professor
BIBLIOGRAPHY


214

Holloway, Lewis D., and Kerr, Elizabeth E. Review and Synthesis of Research in Health Occupations Education. Columbus, Ohio: The Eric Clearinghouse at The Ohio State University.


Larson, Milton E., and Blake, Duane L. Institute on Occupational Analysis as a Basis for Curriculum Development. Columbus, Ohio: The Eric Clearinghouse at The Ohio State University, 1969.


Weaver, Timothy. The Delphi Method: Background and Critique. Syracuse, New York, 1970. (Mimeographed.)