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THE DEVELOPMENT OF AN EDUCATIONAL PROGRAM
TO MEET THE NEEDS OF THE ADULT GOVERNMENT
EMPLOYEE AT HILL AIR FORCE BASE, UTAH

by

Dix W. Cloward

A dissertation submitted in partial fulfillment
of the requirements for the degree

of

DOCTOR OF EDUCATION

in

Educational Administration

Approved:

Major Professor

Committee Member

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Dean of Graduate Studies

UTAH STATE UNIVERSITY
Logan, Utah

1970

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Dix W. Cloward

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	v
LIST OF FIGURES	vii
ABSTRACT	viii
Chapter	
I. NATURE AND BACKGROUND OF THE STUDY	1
The Need for the Study	1
The Background Information--Logistics	5
The Background Information--Curriculum	10
The Present Problem	18
II. METHOD OF THE STUDY	19
Objectives	19
Questions to be Answered	20
Procedures	21
Basic Assumptions	25
Q-Sort Reliability	26
Limitations	27
Terms	29
III. ANALYSIS OF DATA	30
The Q-Sort Behavioral Items	31
Method of Scoring the Q-Sort Instrument	32
The Rankings	33
Analysis of the Rankings by the Personnel of the Comptroller (C) Directorate	35
Analysis of the Rankings by the Personnel of the Maintenance (M) Directorate	42

TABLE OF CONTENTS (Continued)

Chapter	Page
Analysis of the Rankings by the Personnel of Materiel Management (N) Directorate	48
Analysis of the Rankings by the Personnel of the Procurement (P) Directorate	54
Analysis of the Rankings by the Personnel of the Supply and Transportation (S) Directorate	60
All Sample Personnel in the Combined Directorates. Summary	66 71
IV. CURRICULUM STRUCTURE	76
Phase I--Major	76
Phase II--General Education	87
V. SUMMARY, CONCLUSIONS, SPECULATIONS, AND RECOMMENDATIONS	98
Summary	98
Conclusions	104
Speculations	105
Recommendations	107
LITERATURE CITED	109
APPENDIXES	112
Appendix A. The Q-Sort Questionnaire	113
Appendix B. Standard Deviations Tables	117
VITA	124

LIST OF TABLES

Table	Page
1. Number of items and assigned value of category for the 33 behavioral items used in the Q-Sort instrument	24
2. Spearman Rank Correlation Coefficients of the individuals sampled for testing the Q-Sort instrument reliability	28
3. Number of percent of personnel in each directorate responding to the behavioral item Q-Sort instrument	31
4. A list of the behavioral statements included in the Q-Sort instrument	34
5. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "C" Directorate	36
6. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "M" Directorate	44
7. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "N" Directorate	49
8. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "P" Directorate	56
9. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "S" Directorate	61

Table	Page
10. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by all sample supervisory and non-supervisory personnel in the five combined directorates	67
11. Rankings by directorate, of the seven most important statements as identified by all sample personnel	72
12. Rankings, by directorate, of the seven least important statements as identified by all sample personnel	75
13. Standard deviations computed from the Q-Sort responses of the sample personnel in the "C" Directorate	118
14. Standard deviations computed from the Q-Sort responses of the sample personnel in the "M" Directorate	119
15. Standard deviations computed from the Q-Sort responses of the sample personnel in the "N" Directorate	120
16. Standard deviations computed from the Q-Sort responses of the sample personnel in the "P" Directorate	121
17. Standard deviations computed from the Q-Sort responses of the sample personnel in the "S" Directorate	122
18. Standard deviations computed from the Q-Sort responses for the combinations of the supervisory, non-supervisory, and all sample personnel in the five directorates	123

LIST OF FIGURES

Figure		Page
1.	The core and specialty areas included in the academic major of the total educational program	79
2.	The organizational structure of the general education phase of the total program	92

ABSTRACT

The Development of an Educational Program to Meet the
Needs of the Adult Government Employee
at Hill Air Force Base, Utah

by

Dix W. Cloward, Doctor of Education

Utah State University, 1970

Major Professor: Dr. Charles O. Ryan
Department: Educational Administration

Purpose

The purpose of this study was two-fold: (1) to determine the educational needs of the personnel of the five directorates at Hill Air Force Base; and, (2) to design an educational program to meet those needs.

Procedure

This study consisted of three phases:

Phase One. This phase consisted of identifying the behavioral items that were used in developing the Q-Sort instrument. This was accomplished by a review of job requirement data, by an examination of Project Hy Production, and by personal interviews of the Air Base educational specialists.

Phase Two. This phase consisted of the development of a Q-Sort instrument to be administered to a random sample of supervisory and non-supervisory personnel from each of the five directorates. The respondents ranked the Q-Sort items into seven categories which had been assigned numerical values by the researcher. Mean scores were computed for each statement. Rank order was then established by using the mean scores.

The Spearman Rank Correlation Coefficient was used to determine the degree of agreement between the categories of respondents.

Phase Three. This phase consisted of the development of the organizational structure of the total program. Included was a specific identification of the areas of knowledge that would best satisfy desired behavior, and an explanation of the general education phase of the total program.

Findings

1. The behavioral items identified from the above indicated sources were many and varied. Each emphasized the need for knowledge in English and mathematic skills. Knowledge of the myriad logistics processes were all mentioned as desired behavior.

2. The rankings by the supervisory and non-supervisory personnel of the vocational statements were also varied but a high

level of agreement concerning the importance of the English and mathematics skills was evident.

3. A high level of agreement was evident between supervisory and non-supervisory personnel concerning their opinions of the importance of the Q-Sort items. The correlation coefficients ranged from .832 to .904 for the five directorates.

4. A core area and five specialty areas were developed from the information derived from the Q-Sort instrument. The combined core and specialty areas constituted the major for the total program.

5. The design of the total program was reversed, requiring the student to complete the major first then the general education requirements. The general education phase was designed to allow the student to complete it by independent-guided study.

Conclusions

1. All personnel consider a knowledge of English skills highly important in the performance of their jobs.

2. Skill in the use of mathematics and statistics was considered to be of intermediate importance.

3. The personnel in each directorate ranked a knowledge of the vocational skills related to the activities they were currently performing as highly important.

4. There was considerable agreement between supervisory

and non-supervisory personnel in their opinions of the importance of the behavioral statements.

5. The educational needs of the government employee could best be satisfied by incorporating the reverse plan and the independent-guided study philosophy into the design.

Recommendations

1. A study similarly designed be made at another air materiel area to determine the level of agreement between the personnel at the base and those of the Ogden Air Materiel Area.

2. A similar study be made at other government entities to determine the educational needs of the employees of those installations.

3. This study be replicated in approximately five years to determine what changes should be made in this program.

4. A study designed to test the effectiveness of this program be made.

(135 pages)

CHAPTER I

NATURE AND BACKGROUND OF THE STUDY

The purpose of this study was two-fold: First, to determine desired behavior or performance requirements (objectives) of the personnel in each of the five logistics areas: materiel management, supply and transportation, maintenance, finance, and procurement at Hill Air Force Base. The behavioral objectives were then used to determine needed content for a "major" in logistics. Second, to design or structure an educational program so that the adult government employee can better accomplish his educational objectives.

The Need for the Study

The college degree is regarded with favor in American society. It is desired and sought by large numbers of people for many reasons--some personal, some social, and many economic. The fact that a degree is important to many millions is clearly a mark of the current times.

This interest lies not only with the young high school graduate, but with millions of adults as well. Their interest is a natural consequence of society's attitude toward the importance of a college degree.

Educational institutions, while responding to many of society's

demands, have made it next to impossible for the adult student to be satisfied. Frequently, the barrier to the completion of a degree is the ordinary class schedule. Very few adults are able to meet classes one hour a day for a ten-week period. The evening school program has partially solved the problem, but it too is lacking if colleges and universities want to serve the degree oriented adult.

A second barrier to adult participation in degree programs is the rigid prescriptive requirements of most institutions. The adult is required to enroll in a course and to attend class each time it meets whether or not he already knows the material. Many adults oppose this philosophy, and few will put up with it. Most institutions do allow credits earned through correspondence courses to be counted toward the degree. Some even allow the student to earn credit by special examination without taking some courses. However, most efforts are minor and do little toward solving the total problem.

A third major barrier is the rigid senior year resident requirement maintained by most colleges and universities. Adults frequently are not in one place long enough to satisfy the requirement. This precludes many from obtaining the degree.

Finally, many adults are not at all interested in the course material as it is traditionally organized and offered. They recognize the need of being exposed to the many fields known as "general education," but they also are quite emphatic about the need for a more

practical education. The researcher was acutely aware of these barriers and consideration was given to each as the particulars of this study were developed.

Weber State College, because of its proximity to Hill Air Force Base, has long recognized its responsibility to provide education and training for the military and civilian personnel employed there. In many areas the College has performed creditably. But in general its programs have been on a "piece-meal" basis, solving only part of the Base's educational problems as they arise.

The degrees presently available to adult government employees are traditional in nature, are taught in the typical way, and offered at traditional times. However, in spite of the barriers, some individuals are taking advantage of the offerings and are steadily progressing toward the completion of the baccalaureate degree. Many more have indicated they would be interested in degree programs if curricula were designed that would better fit their needs and offered to meet their time schedules.

The Air Force and more specifically the personnel at Hill Air Force Base have also recognized the need for an educational program that would satisfy their immediate as well as their long-range needs. In 1967, personnel at Hill Air Force Base made a rather detailed study of their human resources in the project entitled Hy Production. The purpose was:

. . . a study in depth of Ogden Air Materiel Area human resources to ensure a highly competent work force with the skills necessary to accomodate existing and projected workloads through the time frame 1967-1980. (Hy Production, 1967, p. 1)

The study indicated that there would be changes in the Base's mission and in its workload. The study also suggested that there would be personnel losses, human obsolescence, and technological systems changes. Projections indicated that it would require 30,000 new hires to maintain the present work force of 17,000 through the 1967-1980 time period. It also indicated that over 1,500 managers and executives (GS 12-15) would have to be replaced by hiring or promotion by 1980. Hill Air Force Base personnel educational needs are urgent as well as peculiar. Statistics indicate that the educational level is low with only 5.8 percent of the civilian work force having bachelor degrees and only 1.9 percent having advanced degrees.

The Hy Production study suggested that with the expected advances in technology, college degrees will be more in demand, with the projected need in 1975 almost twice that of 1967. This need will be met by new hires and by the education and training of those already employed.

Weber State College was contacted by personnel of Hill Air Force Base primarily because of the Hy Production study. One of the conclusions drawn by the study was that it would be necessary to have "substantial increases in educational programs with state educational institutions." (Hy Production, 1967, p. 4R15)

Existing educational programs of the several institutions in the state apparently do not satisfy the Hill Air Force Base educational needs, specifically in the area of logistics. The researcher, by this study, therefore determined the specific educational needs of the personnel of the base and designed a program that, when successfully completed, would culminate in a baccalaureate degree.

The Background Information--Logistics

The military services, under the Department of Defense, have long recognized that the success of the armed forces is dependent upon many actions that precede, accompany, and follow actual operations. "It is axiomatic that if our military efforts are to succeed at all, they will succeed because of, not in spite of logistics." (Rider, 1967, p. 93) The essential logistics actions include procuring and training personnel; acquiring weapons, clothing, food, and other supplies; transporting people and items to critical locations; maintaining equipment; and feeding, clothing, and sheltering personnel.

The responsible general must know that supplies will be produced in adequate number, and that they will be available when and where they are needed. This important feature of availability has long been known as logistics . . . (Ruppenthal, 1963, p. XIV)

Because military planners recognize the importance of logistics support roles, an institution was created for educating personnel in this area of knowledge. An experimental advanced

logistics course was first created in October, 1955 (Air Force Institute of Technology--Catalog, 1967-1969, p. V6). The Air Force Institute of Technology was given responsibility for the course with budget support from Headquarters U.S.A.F.

The institute, after additional research, eventually established The School of Logistics as a permanent part of its regular educational program. In February, 1963, the name of the school was officially changed to School of Systems and Logistics. The school now is an integral part of the Air Force Institute of Technology. The program is ". . . designed to develop logistics managers who will make significant contributions to the defense effort," (Air Force Institute of Technology Catalog, 1967-1969, p V7) and is fully accredited by the North Central Association of Colleges and Secondary Schools.

The School of Systems and Logistics at Wright-Patterson Air Force Base offers only a graduate degree in this vital area and is designed primarily for military personnel. It has encouraged civilian colleges and universities to investigate the possibility of designing an undergraduate curriculum that would prepare government employees, both military and civilian, to better perform their functions as members of the world-wide logistics team.

The School at Wright-Patterson has been stressing the philosophy that is now being expounded by the Department of Defense. On 1 May 1968, a personal memorandum was sent by the Assistant

Secretary of Defense to the Assistant Secretaries of the Army, Navy, Air Force, and the Director of Defense Supply Agency urging a project to develop long-range logistics manpower plans and objectives. As a result, a Policy Board was established with representation from the Department of Defense and the Departments of the Army, Navy, and Air Force. A full time ad hoc task force was also established to develop facts and prepare proposals for consideration of the Board.

Two of the several basic objectives of this effort were to:

Identify key problems in respect to quantitative and qualitative characteristics of the logistics manpower force today and at projected intervals in the future. . . and based on the findings, develop various solutions to those problems. (Memorandum Headquarters Air Force Logistics Command, May, 1969, p. 1)

After identifying what they felt were the major problems relative to the logistics manpower force, the Task Force made some 47 recommendations. Two are particularly noteworthy concerning the purposes of this study. Number 32 stated:

It is recommended that logistics managers direct their personnel and training staffs to develop organized efforts to encourage all personnel with partial qualifications for college degrees to complete the requirements . . .

Number 33 indicated:

The administrators of organic educational training resources be directed to develop programs of instruction with the objective of achieving such accreditation, at either the graduate or undergraduate levels or both levels where appropriate. (Memorandum-- Headquarters Air Force Logistics Command, May 1969, pp.13-14)

The above memorandum emphasized the need for an educational program to be organized in cooperation with existing educational

institutions to insure a long-term improvement in the capabilities of the logistics work force.

The Federation of Regional Accrediting Commissions of Higher Education has also recognized the need for, as well as the peculiarities of, an educational program at our military bases. Its policy statement on collegiate programs on military bases, adopted in October, 1966, stated:

The military, like other segments of our population is very much aware of the critical shortage of well educated manpower . . .

. . . Many of the colleges and universities involved are departing from the practice of providing courses on military bases which merely repeat the regular day courses of the campus. Courses designed for the young undergraduates, or for the professional preparation in an academic discipline, may not adequately meet the needs or capitalize on the experience of military personnel . . .

. . . Thus, there is a need for adapting campus offerings to a somewhat different clientele . . . (Federation of Regional Accrediting Commissions of Higher Education, 1966, p. 1)

Utah's Master Plan for Higher Education suggests that an adult degree should be especially designed. It states:

The academic and skill content of an institutional degree should be especially designed for adult audiences and adjusted to their available time and location. Provisions should be made to recognize and allow credits for skills and knowledge gained through experience where it can be tested or measured. (Utah's Master Plan for Higher Education, 1968, p. 161)

Although neither the Regional Accrediting Commission nor Utah's Master Plan for Higher Education refers explicitly to logistics, they

do suggest the need for changes in the traditional educational programs to better satisfy the needs and demands of the adult working student.

Another organization highly concerned with this area of education is the Society of Logistics Engineers (SOLE). It was organized in 1966 and is described as:

. . . a non-profit professional association for individual management and technical practitioners in the field of logistics. The primary purpose of SOLE is to engage in educational, scientific, and literary endeavors to advance the art of logistics, technology and management. (Logistics 70, 1968, p. 6)

Robert N. Braswell, Professor and Chairman of the Industrial and Systems Engineering Department, University of Florida is currently serving as national president. Braswell, Robert L. Street of Texas A & M University, Harry M. Smith, Martin Marietta Corporation, and others have worked diligently to encourage colleges and universities to develop educational programs in logistics. In fact, one of the objectives of SOLE is:

. . . To promote the establishment of college degree and graduate level courses based on joint studies with the academic community to define and refine the logistics disciplines into professional career structure. (Logistics 70, 1968, p. 6)

Education, business, as well as military people are aware of the significance of logistics and are attempting to do something about it. Numerous studies have been made relative to this vital area.

Lester and Evans (1968) indicated that of the American Collegiate Schools of Business included in their study, only two taught logistics

as an academic discipline, but that logistics was influential in approximately one-third of the schools. Tierney and Dawson (1967) made a study concerning the establishing of logistics career development programs. They concluded that the need for a program to develop and qualify civilians as depot-trained logistics managers was acute. They further suggested that a study should be established to determine the nature of the need and to recommend a course of action to satisfy it. In addition, Pennsylvania State University (Pamphlet, Pennsylvania State University, College of Business Administration, 1968), the United States Army Logistics Management Center (Pamphlet, U. S. Army Logistics Management Center, Fort Lee, Virginia, 1969), as well as individuals such as Harry M. Smith of the Martin Marietta Corporation have suggested specific courses that should be included in a logistics degree program. But, little direct research has been conducted to determine exactly what specific education is needed.

The Background Information--Curriculum

Curriculum in American higher education, like that of the much-criticized lower schools, has been a windmill of individual philosophies and conventional fads. Trivium and quadrivium gave way under the pressures of a changing society for preparation in the so-called new subjects. The elective principle; instigated by Charles William Eliot, President of Harvard University, and adopted by

Harvard as well as by other colleges in the late 19th Century, brought with it substantial credits and debits. Frederich Rudolph noted:

Election permitted the professor to indulge his interests and the students to follow theirs. It encouraged the accumulation of knowledge and welcomed into the world of learning subjects that had been forbidden through an ill considered belief that the ancients know everything worth knowing. . . The elective principle moved the individual to the center of the educational universe and boldly asserted that all educated men need not know the same things. The elective system, by giving free play to the great motive power of interest, freed the curriculum from the deadening influence of latent or open disinterest and hostility. . . The elective principle was the instrument by which departments of knowledge were built, by which areas of scholarly interest were enlarged, and therefore it was the instrument that enabled colleges to become universities. . . Of course the ledger had its debits. The elective principle, enemy of one kind of superficiality though it was, could pawn a limitness number of short courses that might not add up to anything very substantial. On occasion it could make for a system that was "haphazard, illogical, postulated or too high an expectation of a young man's will to learn and too low an estimate of the many attractive side-shows outside the main text." (Rudolph, 1962, pp. 305-306)

Eliot's philosophy, for some time, was so successful that by 1931 at the University of Nebraska a student could take courses in "Early Irish, Creative Thinking, American English, First Aid, Advanced Clothing, Ice Cream and Ices, Third Year Czechoslovakian, Football, Sewerage, and A Man's Problem in the Modern Home." (Rudolph, 1962, p. 442)

The elective principle, however, had its opponents. Columbia University, disagreeing with this philosophy, began the general education movement in 1919. This movement continued through the famous

Harvard Report, which was prepared between 1943 and 1945, and on into the 1950s.

A changing society and a changing people, brought about primarily by World War I, contributed to an increased sense of need for higher education to provide educated leadership to a rapidly progressing nation, thus opposing the completely unstructured educational philosophy. New Humanists also took exception to the elective principle. They felt that the undisciplined chaos of the elective curriculum needed to be countered by a philosophy of intelligent control and an interest in what is human about a student.

Colleges began to move away from the elective principle and toward varying schemes of general education. Common, core, or basic courses became the rule rather than the exception. One example was the new curriculum that Amhurst College established in 1947, which required all freshmen and sophomores to take a two-year sequence in science, history, and the humanities within the framework of a four-course program. (Kennedy, 1955)

As time passed and philosophies changed, many prominent educators, in both the secondary schools and in higher education, began to express their views concerning approaches to curriculum development. Philip H. Phenix and Arthur W. Foshay were particularly outspoken in emphasizing the use of the disciplines in determining curriculum content. Phenix stated (quoted by Passow):

My thesis, briefly is that all curriculum content should be drawn from the disciplines or to put it another way, that only knowledge contained in the disciplines is appropriate to the curriculum. (Passow, 1962, p. 57)

This approach was also questioned. Those opposed presented many reasons why this was not the proper approach to curriculum development. Some institutions of higher learning specifically took exception to the above proposal. Faculties seemed to delight in studying and critically scrutinizing any scheme of general education. However, *General Education in a Free Society*, the Harvard Redbook of 1945, was a valiant attempt to put order in the philosophies of curriculum development. For some time it became the bible of general education, particularly in the smaller colleges and universities. The Bruner Report of 1949 and the 1964 Doty Committee Report further reviewed the status and problems of Harvard's general education program. Elsewhere, other colleges and universities were making concerted attempts to solve the curriculum dilemma.

Six major approaches to general education were common (Johnson, 1952). Distribution requirements, which stressed the idea of a limitation on complete elective choice so that the student was required to distribute a flexible portion of his course work among different fields of study, was one specific approach. A second approach suggested comprehensive survey courses organized most often in the humanities, social sciences, and natural sciences. The "functional" course approach to general education was intended to

prepare students for immediate problems of life such as those of personal and community health, social adjustment, marriage and family life, and vocational guidance. This approach has often been referred to as the problem-centered or need-oriented approach. Lamar Johnson also suggested the Great Books approach, which was identified with St. John's College, and required four prescribed years in the study of approximately 100 important books of the western heritage, along with the study of ancient and modern languages, mathematics, and laboratory science. Johnson describes a fifth approach as method-oriented, but which is more explicitly referred to as the individual study and guidance approach. Colleges such as Black Mountain, Sarah Lawrence, and Bennington originally supported this philosophy. After a student had explored various fields for two years he or she would pursue a reading and tutorial program planned around a central individual interest. The sixth approach is merely a composite of two or more of the approaches briefly described. No matter what the approach, general education represented an effort to give a degree of coherence and some commonality to the first years of college for all students.

One may take exception to any or all of the suggested approaches, in fact many educators have, particularly in the planning of adult education programs. The basic philosophy that a single approach to education will satisfy the desires and needs of all is certainly being challenged. Curriculum planners in the 1960s began to stress the

idea of flexibility, sometimes to a point which conservatives regard as formless. But flexibility in curriculum planning is a must if the psychological and educational needs of students are to be satisfied.

Speaking specifically of the adult student relative to this issue,

Murphy commented:

Who are these adults that sit before us in our classes? The self-important answer is that they are individuals: from what we say they find their own meaning. They seem at a given moment to be in concert. Even then, however, delicate observation would show that they digest and recreate what they hear and that as time goes on the processes of recall, thinking, and imagining bring out the individual differences even more dramatically. Not only the creative genius, but the everyday man and woman select from the material presented them and shape it, consciously or unconsciously, to their will. . . . Different contexts, different feeling tones, will give personal meaning to each individual. . . . More specifically, we should provide an array of learning experiences for adults . . . so that each in his own way can gain understanding, can assimilate the meanings of a subject into a personal model of thinking and feeling. (Murphy and Kuhlen, 1955, p. 7)

The two dynamics of changing individuals and the changing world demand flexibilities of curriculum planning that provide not merely for the individual differences among the intended clientele, but for adaptability to change, itself, as it relates both to the student and to the society of which he is a part. This will require a combination of Eliot's elective principle and Princeton's early president, James McCosh's prescriptive curriculum. This combination suggests that the curriculum planner must see the wholeness of the curriculum. The student must be given a program which will develop the common competencies needed by all and that will also develop "special

competencies based upon the recognition of individual differences in interests, aptitudes, and capacities. . ." (Faunce and Bossing, 1958, p. 58)

To accomplish the above, a series of steps should be followed in developing the curriculum. First, values important to society as a whole and to the community in particular must be identified. These values will then determine the objectives of the curriculum. According to John D. McNeil:

The categories of objectives are derived from several principle sources. One source is the learner himself. Not all learners require the same objectives. Objectives can be drawn to close the gap in deficiencies which some learners have and which keep them from being independent. . .

A second source is the local, national, and world society which demands the teaching of customs, habits, and shared values which contribute to communication among peoples. . .

A third source is the disciplines, bodies of knowledge organized for effective inquiry, explanation, and teaching. . .

A fourth source is found in human activities such as government, agriculture, industry, and business whose skills, undertakings, and behaviors are presumed to contribute to the material property of society. . . (McNeil, 1965, p. 49)

Which of these sources is given the greater emphasis is subject to considerable debate. But the fact that one or more must be considered in the planning process is without question.

The second step in developing the curriculum is the translation of the objectives into learning experiences that will enable the students to achieve the stated objectives. Here the curriculum planner is confronted with a number of problems related to scope and sequency of

the curriculum. He must determine which of the previously indicated approaches he is going to employ to accomplish the objectives. He must also identify the type or types of learning situations which will match the cognitive processes sought in the learners. The learning situations may consist of independent study, group discussions, lecture, private conferences, or supervised practice and projects.

The third step to be considered by the curriculum planner is the selection of appropriate categories of knowledge or subject areas so that the institutions learning experiences can be effeciently organized. Such areas as mathematics, science, languages, social science, and vocational specialties may be included.

After the major areas are determined, the organization of learning by courses, units, or areas must be accomplished. This fourth step is highly significant in that the structure and balance of the total program will, in many respects, determine the effectiveness and success of the cirriculum.

If an effective educational program in logistics for the personnel of Hill Air Force Base is to be developed, a thorough evaluation of the logistics requirements must be accomplished. After determining the requirements, the curriculum must be developed and structured so that the student's educational needs can best be satisfied.

The Present Problem

There has not been sufficient research conducted to identify the educational needs and desires of the United States Government employee who is employed in the general area of logistics. Further, an undergraduate curriculum has not been developed that will better enable the adult government employee to meet these needs and desired educational goals.

CHAPTER II

METHOD OF THE STUDY

To identify proper curriculum content, among other things, one must acquire information relative to the desired behavior or task performance of those persons who will be exposed to the developed program. Two sources of data are: (1) the man actually performing the function; and, (2) his immediate supervisor. The task of this study was to learn from these personnel their opinions toward specifically identified behavioral objectives and from these behavioral objectives determine the curriculum for an appropriate educational program.

This chapter details the specifics of the study. It identifies and explains the following: (1) the objectives, (2) questions to be answered, (3) procedures of the study, (4) the subjects of the study and method of selection, (5) basic assumptions, (6) reliability of the instrument, (7) the limitations of the study, and (8) terms.

Objectives

To accomplish the purpose of this study, the research had the following specific objectives:

1. To identify the desired behavior of the personnel of each

of the directorates: materiel management, supply and transportation, maintenance, finance, and procurement at Hill Air Force Base, Utah.

2. To determine which of the behavior items are considered most important by selected supervisory personnel in each of the five directorates.

3. To determine which of the behavior items are considered most important by selected non-supervisory personnel in each of the five directorates.

4. To determine program content for a logistics "major" from the information derived from objectives one, two, and three.

5. To design or structure an educational program that would meet the educational needs of the government employees in the five directorates included in this study.

Questions to be Answered

1. What is the desired behavior of the personnel in each of the five directorates as identified by Air Force job analysis teams, Project Hy Production, and base educational specialists?

2. How do selected supervisory and non-supervisory personnel in each of the five directorates rank the identified behavior items?

3. What are the areas of agreement and disagreement with respect to the importance of the identified behavioral items, by

selected supervisory and non-supervisory personnel in each of the five directorates?

4. Which of the identified behavior items should be included in designing a "major" for a baccalaureate degree?

5. How should the educational program be designed to best satisfy the adult government employees educational needs and goals?

Procedures

The study provided data that was used in developing a baccalaureate degree in the area of logistics for personnel at Hill Air Force Base. Since the personnel at Hill Air Force Base were working in five directorates, it was necessary to develop a program with specialties in the five different areas. Therefore, the study was planned and organized to accomplish the above.

The program was developed in three phases:

Phase I

This phase consisted of identifying educational behavioral items. This was accomplished by personal interviews with the educational specialists in each of the five functional areas, by a review of job requirement data as defined by Air Force job analysis teams, and by a critical examination of project Hy Production which is an indepth study of the Ogden Air Materiel Areas human resources. The

compiled list of educational behavioral items was used in developing the phase two instrument.

Population. For this phase of the procedures the population consisted of educational specialists whose job was to determine and outline educational requirements. They were identified by position rather than by GS rating.

Instrumentation. As indicated previously, the method used was personal interviews of the subjects by the researcher. The respondents were asked to provide a list of behavior items that they identified to be necessary for the personnel in each of their respective areas. These items were compared with those identified by Air Force job analysis teams and with those identified by the researcher's review of project Hy Production. These three sources provided sufficient information to develop the Phase II instrument.

Phase II

This phase consisted of the development of a Q-Sort instrument using the data obtained in Phase I. The instrument was administered to a sample of both supervisory and non-supervisory personnel in each of the five directorates.

Population. Because of the need for information in the five directorates, the population of Hill Air Force personnel, GS5 and above, were divided into two categories: supervisory and non-supervisory. They were then divided into the directorates to which they

were attached. Specifically, 30 supervisory and 30 non-supervisory individuals were randomly selected from each of the areas. The selection process was the stratified random method (Ostle, 1966). A table of random numbers was used incorporating the procedure as outlined by Nelson (1961). Because the personnel were first stratified into the supervisory and non-supervisory categories and then into the five directorates, the researcher was actually working with ten sample groups.

Instrumentation. The Q-Sort method developed by Stephenson (1953) was administered to a random sample of personnel from each of the ten populations. In the Q-Sort method, the respondents were given a set of behavioral items developed by a review of job requirement data, project Hy Production and by personal interviews with the educational specialists of each of the five directorates. The supervisory and non-supervisory personnel included in the sample then arranged or categorized the items according to importance. The Q-Sort method imposed certain technical restraints in that the respondents were required to order the Q-items into a designated number of categories and with an assigned number of items in each category.

The instrument in this study was divided into seven categories as indicated in Table 1. Each category was assigned a numerical value as indicated in Table 1 and a mean score was

Table 1. Number of items and assigned value by category for the 33 behavioral items used in the Q-Sort instrument

Category	Number of Items	Assigned Value
1	1	7
2	3	6
3	7	5
4	11	4
5	7	3
6	3	2
7	1	1

computed for each behavioral item. The items were then ranked by the mean scores. Rank order was established for supervisory personnel in each directorate, for non-supervisory personnel in each directorate, for the combined personnel in each directorate, for supervisory personnel across directorates, for non-supervisory personnel across directorates, and for all sample personnel across directorates. Standard deviations were also computed for the items to determine the degree of variation of the responses. A Q-Sort computer program was developed and used to obtain the above information.

The degree of agreement or disagreement, between supervisory and non-supervisory personnel was determined by using the rank data obtained from the Q-Sort instrument and applying the Spearman Rank

Correlation Coefficient (ρ) to them (Tate, 1957). This statistical method tests whether there is positive, negative, or no correlation between the rankings. The computations can vary from -1 to $+1$. The greater the positive value of the coefficient (ρ) the greater the agreement between the ranks. The greater the negative value of the coefficient the greater the disagreement between the ranks. Zero represents no community of preference.

Phase III

This phase of the study was most difficult as well as a very important one to complete. Identification of desired employee behavior and program content would be of little value if the organizational structure were not designed so that the educational needs and desires of the clientel for whom the study was made could be satisfied. Both the short and long run educational objectives of Hill Air Force Base personnel were taken into consideration. The general education phase of the traditional baccalaureate degree was added to the content and structure of the "major." This, too, was designed in a way that the adult student could best accomplish his desired and needed educational objectives.

Basic Assumptions

It was assumed for the purpose of this study that a dependable way to identify desired employee behavior in each of the five functional

areas was by a review of job requirements, project Hy Production, and by an analysis of data provided by Hill Air Force Base educational specialists concerning desired behavioral objectives or job performance.

It was further assumed that necessary program content could best be determined by the man on the job and that considerable support would be given to the selection of program content by determining the areas of agreement and disagreement, with respect to the importance of the identified behavioral items, by selected supervisory and non-supervisory personnel.

Q-Sort Reliability

The reliability of the Q-Sort was tested using the coefficient of stability (Borg, 1963b). This method is frequently referred to as the "test-retest reliability." Thirty individuals from the 238 respondents were randomly selected and re-administered the Q-Sort instrument approximately one month after the initial administration. The mean rankings of the first administration were correlated with the mean rankings of the follow-up sample using the Spearman Rank Correlation Coefficient (ρ) (Tate, 1957). The obtained correlation coefficient was .894 indicating a high reliability for the Q-Sort instrument.

Correlation coefficients were also computed for the first and

the second administrations of the instrument for each individual. The range of the coefficients was from .34 to .87. Twenty-two of the 30 coefficients were .62 or higher. These factors indicated a relatively high individual reliability for the Q-Sort instrument used in this study. Table 2 indicates the individual correlations in rank order.

Limitations

The study was limited to an analysis of the educational needs and desires of the personnel in the five functional areas as previously indicated. Although there are several additional logistics areas that could have been considered, they were, comparatively speaking, of minor importance. In addition, there was a sizeable overlap of desired behavior or job performance requirements of the areas included and the areas excluded from the study.

The study was further limited to the identification of behavioral objectives concerning the logistics "major." No attempt was made to identify the specific content of the phase of the educational program that is traditionally called "general education." However, the structural organization of both the "major" phase and the "general education" phase was included in keeping with the purposes of the study.

Certain restrictions to the study were inherent because of the purpose of creating a program that, when completed, would culminate in a baccalaureate degree. Program content had to coincide, at least

Table 2. Spearman Rank Correlation Coefficients of the individuals sampled for testing the Q-Sort instrument reliability

Individual	Coefficient	Individual	Coefficient
1	.87	16	.65
2	.86	17	.65
3	.84	18	.65
4	.81	19	.64
5	.79	20	.63
6	.79	21	.62
7	.78	22	.62
8	.75	23	.59
9	.74	24	.55
10	.71	25	.54
11	.71	26	.46
12	.69	27	.44
13	.69	28	.39
14	.68	29	.38
15	.67	30	.34

to some degree, with that established by Weber State College for its traditional degrees and with certain requirements created by the State upon the college.

Terms

A brief explanation of the following terms is provided for clarification:

"C" Directorate--The Hill Air Force Base functional area of the comptroller. The primary activities include budgeting, accounting and finance, and data automation.

"M" Directorate--The functional area of maintenance. The primary activities include maintenance, production, and quality control.

"N" Directorate--The functional area of materiel management. The primary activities include the management functions of each of the other directorates included in the study.

"P" Directorate--The functional area of procurement. The primary activities include contracting and purchasing of all base items.

"S" Directorate--The functional area of supply and transportation. The primary activities include the handling and movement of items within and between government installations.

CHAPTER III

ANALYSIS OF DATA

The purpose of this study was two-fold: (1) to determine certain educational needs of the personnel of the five directorates: materiel management (N), supply and transportation (S), maintenance (M), finance (C), and procurement (P) at Hill Air Force Base; and (2) to design an educational program to meet these needs. To best accomplish this purpose it was necessary, as indicated in Chapter II, to determine the opinions relative to the importance of behavioral objectives of both the supervisory and non-supervisory personnel in each of the above listed directorates.

Thirty supervisory and 30 non-supervisory individuals in each directorate were asked to participate in sorting the identified behavioral items of the Q-Sort instrument. Because of the impossibility of personally administering the Q-Sort instrument to each randomly selected individual, a mail out procedure was used. A direction sheet and an answer sheet were constructed and sent, with the individual behavioral statements, to each of the subjects of the study. A copy of the direction and answer sheets is included in Appendix A.

Of the 300 Q-Sort instruments sent, 238 usable responses were returned to the researcher. The return constituted 79.33 percent

of the total sample. Table 3 contains the numbers and percentages of participating supervisory and non-supervisory personnel in each functional area.

Table 3. Number and percent of personnel in each directorate responding to the behavioral item Q-Sort instrument

Directorate	Type Personnel	Number Participating	Percent
Comptroller (C)	Supervisory	25	83.33
	Non-Supervisory	23	76.67
Maintenance (M)	Supervisory	24	80.00
	Non-Supervisory	28	93.33
Materiel Management (N)	Supervisory	24	80.00
	Non-Supervisory	26	86.67
Procurement (P)	Supervisory	23	76.67
	Non-Supervisory	23	76.67
Supply and Transportation (S)	Supervisory	20	66.67
	Non-Supervisory	22	73.33
TOTAL		238	79.33

The Q-Sort Behavioral Items

The behavioral statement or job performance requirements that were received from the educational specialists were, in many cases, too detailed and either inappropriate or impractical to use

verbatim in the Q-Sort instrument. In addition, some of the stated requirements could be more realistically and more practically conducted on the job. To determine which behavioral statements to use was a judgemental procedure. However, Oppenheim's (1966) classification process of first separating the performance requirements into common categories was extremely helpful in identifying usable statements. After classifying the statements it was necessary to refine them into operational terms; that is eliminating the vagueness and stating the objectives in a cognitive form.

Thirty-three items were identified which were applicable to one or more of the five directorates included in the study. An attempt was made to achieve balance in the selected items. Balance in this sense meant the selection of an approximately equal number of questions that would be applicable to each of the five directorates. The 33 items used in this study are shown in numerical order in Table 4.

Method of Scoring the Q-Sort Instrument

Table 1 in Chapter II briefly identified the classification of the 33 behavioral items. It also indicated the numerical value assigned to each category. As previously stated, mean scores were computed for each behavioral statement and the importance of each was determined by the rankings of these scores.

Mean scores were computed for the responses of supervisory and non-supervisory personnel in each of the five directorates, for the combined personnel in each of the directorates, for supervisory personnel across directorates, for non-supervisory personnel across directorates, and for all sample personnel directorates. This procedure provided information that could be analyzed specifically, as well as generally, in determining the educational program.

Standard deviations were also computed for the responses of each of the above indicated combinations. The standard deviations were used to determine the amount of variability between the responses of each behavioral statement. The larger the standard deviation, the greater the variability. Conversely, the smaller the standard deviation, the less the variability of the responses on that statement. As can readily be seen from the tables there was considerable variability in the responses of personnel in ranking the 33 statements.

Appendix B contains the standard deviations for each statement for the supervisory-non-supervisory categories in each of the five directorates and for the combined directorates as indicated below.

The Rankings

Mean scores were computed for each of the 33 behavioral items used in the study. The items were then ranked from highest to lowest for each of the categories, or combinations of categories of individuals.

Table 4. A list of the behavioral statements included in the Q-Sort instrument

Behavioral Statements
1. comprehend program languages as they apply to the use of computers
2. be able to translate data into factors, rates and other usable statistical indicators
3. be skilled in interpreting written directives
4. have knowledge of the legal concepts applicable to the procurement of Federal Government items
5. comprehend basic accounting principles as applies to Federal Government practices and methodology
6. be able to apply Federal Government budgeting procedures to financial plans and buying requirements
7. have an understanding of public administration, including recruitment, classification, rating and promotion
8. be able to write the English language clearly
9. understand the application of the scientific method in problem solving
10. be able to present briefings to other employees on pertinent data
11. comprehend the principles and processes involved in organizing and managing large and complex establishments
12. be skilled in listening and observing
13. have knowledge of logistics planning processes
14. have knowledge of data automation equipment, its usage, limitation, and potential
15. be able to analyze cost price relationships and their effect on item purchases
16. read the English language with understanding
17. have knowledge of necessary supply and transportation functions relative to the physical distribution of government items
18. be able to use quantitative models in the decision making process
19. readily comply with directives
20. have knowledge of the means of measuring organizational efficiency
21. be skilled in the concepts of packaging and the transportation of items
22. have knowledge of the processing and presentation of statistical data
23. have knowledge of problems concerning employer-employee relations, including a knowledge of appropriate labor laws
24. display consistent behavior regardless of whether his job is routine or creative
25. be skilled in the application of mathematics in the solving of appropriate problems
26. be able to recommend and make decisions relative to program changes
27. have knowledge of basic product reliability requirements

Table 4. Continued

Behavioral Statements
28. comprehend proper social behavior in industry, the community, and society
29. analyze his job and suggest new and better methods of performing it
30. be able to speak the English language clearly
31. be able to coordinate activities between individuals
32. be skilled in analyzing and ordering job assignments
33. be able to formulate his own ideas

Faunce and Bossing (1958, p. 58) suggested that an educational program should consist of a curriculum that would develop common as well as special competencies of the individuals for whom the program was designed. By computing mean scores for each statement included in the Q-Sort instrument and by observing and analyzing the opinions relative to the importance of the items, as ranked by both the supervisory and non-supervisory personnel in each of the directorates, the researcher was better prepared to determine what behavior was compatible to the employees in the several directorates and what behavior was distinctive to a particular directorate. This is in keeping with the Faunce-Bossing philosophy which is supported by the researcher.

Analysis of the Rankings by the Personnel of the
Comptroller (C) Directorate

Table 5 indicates the rankings of the behavioral statements by the sample personnel of the Comptroller (C) Directorate.

Table 5. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "C" Directorate

Supervisory		Non-Supervisory		Combined	
Mean Score of Importance	Item Number	Mean Score of Importance	Item Number	Mean Score of Importance	Item Number
4.92	33	5.32	14	5.06	14
4.92	31	5.12	12	4.94	12
4.88	3	4.91	3	4.90	3
4.85	12	4.91	16	4.79	16
4.85	14	4.73	26	4.79	33
4.73	29	4.73	29	4.73	29
4.73	30	4.68	19	4.71	31
4.69	16	4.64	8	4.65	8
4.65	8	4.64	33	4.63	30
4.50	10	4.59	10	4.56	26
4.42	26	4.55	1	4.54	10
4.31	5	4.50	30	4.48	19
4.31	19	4.45	31	4.27	24
4.31	24	4.23	24	4.19	5
4.27	32	4.18	2	4.19	22
4.23	22	4.14	22	4.13	1
4.19	23	4.14	25	4.06	32
4.08	13	4.05	5	3.94	13
4.04	20	3.95	9	3.90	2
4.00	7	3.82	28	3.88	25
3.77	1	3.82	32	3.83	23
3.69	28	3.77	13	3.79	9
3.65	2	3.56	27	3.79	20
3.65	9	3.50	20	3.75	7
3.65	25	3.45	7	3.75	28
3.54	11	3.45	18	3.33	27
3.42	6	3.41	23	3.31	11
3.12	27	3.09	6	3.27	6
3.08	17	3.05	11	3.23	18
3.04	18	3.00	15	3.02	17
2.73	4	2.95	17	2.79	15
2.62	15	2.50	4	2.63	4
2.15	21	2.23	21	2.19	21

Supervisory

There were some differences in the ranking of the behavioral statements by the supervisory and non-supervisory personnel in the "C" Directorate. The supervisory respondents seemed to have ranked the items within the realm of their own needs and desires. They considered statement number 33, "be able to formulate his own ideas," as the most important of all 33 statements.

Second in importance was statement number 31, "be able to coordinate activities between individuals," an important characteristic of a successful supervisor.

Knowledge of data automation equipment was also considered to be relatively important by the supervisory personnel in the "C" Directorate. However, in contrast to the responses of the non-supervisory personnel, they considered this statement fifth rather than first in importance. There seemed to be inconsistencies in the attitudes of the respondents regarding the need for knowledge in this area.

A further examination of the 33 statements revealed two definite patterns. Statements related to skills in the use of the English language were grouped and rated high in importance by the supervisory personnel.

These statements included:

12. be skilled in listening and observing

16. read the English language with understanding
3. be skilled in interpreting written directives
8. be able to write the English language clearly
10. be able to present briefings to other employees on pertinent data
30. be able to speak the English language clearly

These statements should be considered as an important element of the total educational program and included in each phase of the total curriculum.

Mathematics and statistical concepts appeared to be of lesser importance to the supervisory individuals in the "C" Directorate. Ranked in the low intermediate range were the following statements:

2. be able to translate data into factors, rates, and other usable statistical indicators
22. have knowledge of the processing and presentation of statistical data
25. be skilled in the application of mathematics in the solving of appropriate problems

All individuals in the "C" Directorate were relatively consistent in their attitudes toward what was unimportant to them in performing their functions within the organization. Knowledge of the concepts of procurement, packaging, and the transportation of items, and the legal concepts pertaining to this logistics function were considered

quite unimportant, at least when compared to the other 31 statements included in the Q-Sort instrument.

A maximum mean score of 4.92 for all 33 statements indicated that the supervisors were less consistent than non-supervisors regarding the kind of behavior they felt to be most important for their personnel. The maximum mean score for the 33 statements by non-supervisory respondents was 5.32, indicating a relatively high degree of agreement in their opinions toward desired and needed behavior.

Non-Supervisory

In studying the responses concerning the relative importance of the 33 identified behavioral statements, a rather interesting result emerged. The non-supervisory respondents concluded that the most important behavioral item was to have knowledge of data automation equipment, its usage, limitations, and potential (number 14).

Some inconsistencies did emerge from the responses. As an example, behavioral statement number 1, "comprehend program languages as they apply to the use of computers," was considered by the respondents to 11th in importance. One would anticipate that this statement would be ranked much higher as it is closely related to statement number 14, which was considered to be the most important of all the identified statements.

The item which was considered as least important was number 21, "be skilled in the concepts of packaging and the transportation of items."

A second statement, "have knowledge of the legal concepts applicable to the procurement of federal government items," was also considered relatively unimportant. One could conclude then that knowledge of the procurement, packaging, and transportation of government items and the legal concepts concerning this phase of the logistics process is relatively nonessential to the performance of the functions of non-supervisory personnel in the "C" Directorate.

The behavioral statements related to skills in the use of the English language appeared in the upper 33 percent of all statements, also indicating recognition by the non-supervisory personnel of the importance of, and the need for, knowledge in this vital area. A knowledge of mathematics and statistical concepts appeared to be more important to the employee "on the line" than it did to supervisory personnel in the same functional organization.

The attitudes of the non-supervisory respondents toward the relative importance of the Q-Sort items were not unanimous. Had any one statement been considered most important by all responding personnel, the mean score would have been seven. The remaining statements would have means of six, five, four, three, two, and one, depending on the order in which they were ranked.

Combined

In combining the rankings of the 33 statements by the supervisory personnel with those of the non-supervisory personnel, the order

of importance was changed very little. Knowledge of data automation equipment, its usage, limitations, and potential (number 14) was ranked as most important. As previously indicated, it becomes quite evident that all personnel in the "C" Directorate recognized the value of having a knowledge of this vital area. The statements concerning English skills were again ranked high in importance and were grouped in the upper 33 percent of all statements. Mathematics and statistics statements were somewhat scattered and appeared in the intermediate to low range of importance. Other statements, relative to social behavior, labor laws, product reliability, planning and management, etc. were scattered, with no distinguishable pattern.

The mean scores for the most important and least important statements were 5.06 and 2.19, respectively. This reveals that there was relatively strong agreement between the supervisory and non-supervisory personnel regarding their opinions concerning the knowledge required to perform their functions within the "C" Directorate. This comment is supported by the correlation coefficient which was computed from the Q-Sort information.

Correlation Coefficient

The researcher determined that it would be helpful to more effectively design an educational program for the personnel at Hill Air Force Base if information relative to the degree of agreement or disagreement between the "man on the line" and his supervisor,

concerning desired behavior, was obtained. To obtain this information, the Spearman Rank Correlation Coefficient (Rho) was used.

This coefficient was selected because the researcher was working with bivariate data available only in ranks. As stated in Chapter II, the coefficient may vary from -1.00 (perfect inverse relationship) to $+1.00$ (perfect direct relationship). The more that Rho departs from 0 the stronger the relationship. Using the formula $Rho = 1 - \frac{6\sum D^2}{n(n^2-1)}$ the coefficient for the rankings of the behavioral statements by the supervisory and non-supervisory personnel of the "C" Directorate was .854. This score indicated a high degree of agreement between the two sample populations in their attitudes toward the types of knowledge needed to best perform their functions in this directorate (Borg, p. 283). The importance of this relationship can be judged by squaring Rho. In this case Rho^2 is .7293. This suggests that approximately 73 percent of the variation of either variable is explained by its correlation with the other, while 27 percent is unexplained (Tate, 1957).

Analysis of the Rankings by the Personnel of the
Maintenance (M) Directorate

The rankings of the behavioral statements by the sample personnel of the Maintenance (M) Directorate are indicated in Table 6.

Supervisory

Five of the six previously identified statements concerning knowledge of the English skills were ranked in the top six positions by the supervisors in this functional area. They considered number 16, "read the English language with understanding," as the most important behavioral statement. It was surprising that these individuals were so consistent in their ranking of these statements. Supervisory personnel evidently feel rather strongly concerning the need for knowledge in this vital area. A rather large majority indicated this preference as the computed mean score was 5.76. A score of 7.00 would have been unanimous agreement.

Contrary to the opinions of the respondents in the "C" Directorate, these individuals felt that knowledge of data automation equipment is relatively unimportant to the accomplishment of their employment functions. Behavioral statements 14 and 1, concerning knowledge of computers, and computer languages were ranked number 23 and 28, respectively.

The area of human relations, working and coordinating activities with others, was indicated to be of considerable importance. Statements relative to this type of behavior were grouped and ranked just below the English skill statements.

Mathematics and statistical concepts, like the "C" Directorate, were considered to be of intermediate importance. They were of lesser

Table 6. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "M" Directorate

Supervisory		Non-Supervisory		Combined	
Mean Score of Importance	Item Number	Mean Score of Importance	Item Number	Mean Score of Importance	Item Number
5.76	16	5.26	33	5.42	16
5.48	12	5.23	3	5.37	3
5.40	3	5.11	16	5.23	12
5.12	8	5.00	12	5.15	33
5.12	19	4.96	26	4.88	26
5.04	30	4.78	29	4.83	8
5.04	33	4.67	31	4.79	31
4.92	31	4.56	8	4.75	29
4.80	26	4.44	9	4.71	19
4.72	29	4.37	30	4.69	30
4.56	32	4.33	19	4.31	9
4.36	10	4.30	25	4.29	10
4.36	24	4.22	10	4.23	24
4.16	9	4.11	24	4.17	32
4.16	20	4.04	2	4.02	20
4.08	13	4.04	14	3.96	25
4.00	27	3.89	20	3.90	27
3.84	23	3.81	27	3.88	13
3.76	28	3.81	32	3.87	2
3.68	2	3.78	18	3.77	28
3.60	25	3.78	28	3.75	14
3.52	22	3.70	13	3.65	23
3.44	14	3.67	22	3.62	18
3.44	18	3.59	11	3.60	22
3.32	7	3.48	23	3.46	11
3.32	11	3.44	15	3.31	15
3.16	15	3.41	4	3.17	7
2.80	1	3.33	17	3.06	17
2.80	5	3.22	1	3.02	1
2.76	17	3.11	5	2.96	4
2.60	6	3.04	6	2.96	5
2.48	4	3.04	7	2.83	6
2.40	21	2.33	21	2.37	21

importance however than a knowledge of the logistics planning process, of the means of measuring organizational efficiency, and of labor-laws as they pertain to problems concerning employer-employee relations.

Of least importance were the statements concerning the concepts of packaging and the transportation of government items and the legal concepts concerning item procurement. This, however, is an important logistics function, but apparently the respondents felt that this function was not important in the performance of the activities within this organization.

Non-Supervisory

This group of individuals also saw the necessity of having a knowledge of the English skills, but were not as consistent in their opinions, nor did they rank the items as high in importance as did the supervisory personnel in the same directorate. The English skill statements were scattered in the upper 33 percent of the rankings. It appears that the "man on the line" did not have the same attitude as his supervisor toward the acute need for English skills.

Non-supervisory personnel in the "M" Directorate felt that a knowledge of mathematics and statistical concepts is important to the successful accomplishment of their work. The responses revealed that non-supervisors felt much more strongly about this than did their immediate supervisors. The statements concerning these skills

were ranked in the intermediate to upper intermediate range by the non-supervisory respondents.

Knowledge of accounting and budgeting concepts appeared to be of lesser importance in the performance of non-supervisory type of employment. Of least importance, however, was statement number 21 concerning the concepts of packaging and the transportation of items. The fact that this statement was consistently ranked last does not mean that it is not an essential function in the logistics process. It does indicate however that the personnel of this directorate considered this behavioral statement least important of the 33 included in the Q-Sort instrument.

Statements concerning the planning and management of large and complex organizations and measuring their efficiency were ranked in the intermediate range. Knowledge of data automation equipment and principles also appeared in this range. This was in agreement with the views of the supervisors in the same directorate.

Non-supervisors were not as consistent in their views as were the supervisors. A high mean score of 5.26, although quite eminent, was somewhat lower than the high mean score of 5.76 computed for the supervisory personnel. A low mean score of 2.33 for statement number 21 did, however, indicate a relatively high degree of consistency in their opinions as to what behavior was least important, particularly if one considers the mean of the next lowest statement which was 3.04.

Combined

The combined rankings of the 33 statements by the supervisory and non-supervisory personnel placed considerable emphasis on the statements concerning the English skills. As was the case with the supervisors responses, number 16, "read the English language with understanding," was ranked number one. Other English skill statements were also ranked high. The responses revealed a rather interesting fact. The people performing a type of work which requires less formal education were suggesting that a knowledge of English skills was highly important to them.

Because of the rather close agreement in opinions of the supervisory and non-supervisory personnel, there was no distinctive variation from either the supervisory or non-supervisory responses when the two were combined. The correlation coefficient substantiates this comment.

Correlation Coefficient

A very high degree of correlation was found between the two ranking groups in this directorate. The Rho score was .902 which indicated that 81.36 percent of the variation of either variable was explained by its correlation with the other, while 18.64 percent was unexplained. (The reader should, however, be fully cognizant of the fact that a strong correlation is not necessarily indicative of a cause-effect relationship). However, the way in which the correlation

coefficient was used in this study suggested that there was a very high degree of agreement in opinion between supervisory and non-supervisory personnel in the same directorate concerning what behavior was and what behavior was not important in efficiently and effectively performing their functions within the organization.

Analysis of the Rankings by the Personnel of
Materiel Management (N) Directorate

The rankings of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the Materiel Management (N) Directorate are designated in Table 7.

Supervisory

The order in which the supervisory personnel of this directorate ranked the behavioral statements becomes more meaningful if one has at least an introductory knowledge of the basic functions of this directorate. Generally, the planning and management procedures of essentially all phases of the logistics processes is the responsibility of the personnel in the "N" Directorate. They are involved either directly or indirectly with the activities performed by each of the other areas of this study. Considering this, it is not surprising that the behavioral statement indicated as being most important by these personnel was number 13, "have knowledge of the logistics planning processes."

In studying the remaining responses, one finds other

Table 7. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "N" Directorate

Supervisory		Non-Supervisory		Combined	
Mean Score of Importance	Item Number	Mean Score of Importance	Item Number	Mean Score of Importance	Item Number
5.38	13	5.42	3	5.26	12
5.33	12	5.35	16	5.24	16
5.29	33	5.19	8	5.16	3
5.13	16	5.19	12	5.16	33
4.92	8	5.04	33	5.06	8
4.88	3	4.96	30	4.90	13
4.88	31	4.81	26	4.84	30
4.83	26	4.46	13	4.82	26
4.71	30	4.42	19	4.62	31
4.42	29	4.38	31	4.36	10
4.38	10	4.35	10	4.36	29
4.17	20	4.31	29	4.28	19
4.13	19	4.23	27	4.12	2
4.08	2	4.19	9	4.06	14
4.08	14	4.19	24	4.02	24
3.96	32	4.15	2	4.00	27
3.83	24	4.15	25	3.88	20
3.79	11	4.04	14	3.88	32
3.79	22	3.81	32	3.86	9
3.75	27	3.73	28	3.80	25
3.58	23	3.62	20	3.66	22
3.54	6	3.54	17	3.58	28
3.54	7	3.54	22	3.48	17
3.50	9	3.38	18	3.38	11
3.42	17	3.35	15	3.36	6
3.42	25	3.27	4	3.34	23
3.42	28	3.23	5	3.26	4
3.25	1	3.19	6	3.24	15
3.25	4	3.12	1	3.22	5
3.21	5	3.12	23	3.22	18
3.13	15	3.00	11	3.18	1
3.04	18	2.73	7	3.12	7
2.00	21	3.54	21	2.28	21

statements ranked high in importance that would also appear to be essential to a successful manager. In addition to the English skill statements, the following statements appear in the upper third of the responses:

33. be able to formulate his own ideas

31. be able to coordinate activities between individuals

26. be able to recommend and make decisions relative to program changes

29. analyze his job and suggest new and better methods of performing it

The statements ranked in the middle third of the responses were rather varied. Statements relative to a knowledge of data automation equipment and basic computer principles are found here, as are the mathematics and statistical concept statements. Knowledge of product reliability requirements was also considered to be of intermediate importance.

Considered to be of least importance, once again was the statement concerning the concepts of packaging and the transportation of items. These respondents felt rather strongly about the unimportance of this item as the mean score was only 2.00. The reader may remember from a statement made in a previous section that a mean score of 1.00 denoted complete agreement among the responding personnel concerning the least important statement. The 2.00 mean score was

particularly significant when one considers that the mean score for the next least important statement was 3.04. It is interesting to note that this group of individuals were more consistent in their attitudes toward what was least important than they were toward what was most important. This can be seen by comparing the maximum mean score of 5.38 with the minimum mean score of 2.00.

Non-Supervisory

The non-supervisory respondents were in considerable disagreement with the supervisory personnel relative to what behavioral statement they felt was most important. Whereas the supervisors considered number 13, "have knowledge of logistics planning processes," to be number one in importance, the non-supervisors placed this same statement in the eighth position.

The non-supervisory personnel of this functional area judged number three, "be skilled in interpreting written directives," to be most important. A basic understanding of the other English skills was necessary if a person was to be skilled in this behavior. With the exception of number 10, the other English skill statements were grouped immediately below number three, indicating a strong and consistent attitude toward the need for knowledge in this vital area. Four of the six statements had mean scores of 5.04 or higher. A fifth statement had a mean of 4.96. The sixth statement, number 10,

concerning the ability to present briefings to other employees was ranked somewhat lower but still appeared in the upper 33 percent.

Non-supervisors in the "N" Directorate considered having a knowledge of mathematics and statistical concepts to be of intermediate importance. However, the behavioral statements related to this area of knowledge were ranked between 13th and 25th in importance.

Knowledge of product reliability requirements was considered relatively important by these respondents. They ranked this statement considerably higher than did the supervisory personnel.

Number 21, "be skilled in the concepts of packaging and the transportation of items," was again considered to be the least important of the 33 Q-Sort statements. The non-supervisory respondents, in total, did not, however, rank this statement as unimportant as did their supervisory colleagues. The mean score was 2.54 compared to a mean of 2.00 for the supervisors.

Combined

The rankings of the behavioral statements, after combining all of the responses into a single category, brought about some variations from both the supervisory and non-supervisory responses. Neither of the statements that were ranked most important by the groups considered separately appeared in the most important category when they were combined. Number 12, "be skilled in listening and observing," was ranked as most important. The other English skill

statements were also ranked high. In addition, general statements pertaining to job analysis and coordinating activities among individuals were ranked in the upper intermediate range.

The mathematics and statistical concept statements appeared somewhat scattered among the 33 statements with no discernable pattern.

The mean scores of the most important and least important statements denoted that these respondents were rather consistent in their opinions as to which statement was most and which least important. Each was approximately 1.27 points from its possible maximum position. However, the least important statement, number 21, appeared very much alone at the bottom of the scale. The next lowest mean score was 3.12, .84 of a point higher than the least important item.

As previously indicated, there were some variations in the statements when compared to rankings by either of the independent groups. However, these variations were not significant when one looks at the total array of behavioral statements used in the instrument.

Correlation Coefficient

Although the coefficient computed for the supervisory and non-supervisory personnel of the "N" Directorate was lower than those computed for the other directorates, the degree of agreement was still relatively high. The correlation coefficient of .832 indicated that 69.12 percent of the variation of either variable was explained by

its correlation with the other. Thus, approximately 30 percent of the variation was unexplained. One would be inclined to conclude, as was the case with the findings of the previous directorates, that the supervisory and non-supervisory respondents were rather consistent in their opinions as to which behavior was most important and which was least important in performing their jobs within this directorate.

Analysis of the Rankings by the Personnel
of the Procurement (P) Directorate

Table 8 indicates the rankings by mean scores of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel of the Procurement (P) Directorate.

Supervisory

The supervisory personnel of the "P" Directorate indicated a rather high degree of agreement in the behavioral statements they considered to be most important in performing their functions within this area. The eight statements ranked highest by these personnel had mean scores of 5.00 or higher. These eight statements were:

12. be skilled in listening and observing
19. readily comply with directives
30. be able to speak the English language clearly
16. read the English language with understanding
33. be able to formulate his own ideas

3. be skilled in interpreting written directives

4. have knowledge of the legal concepts applicable to the procurement of federal government items

8. be able to writ the English language clearly

One again recognizes the strong feelings of the respondents in this directorate regarding the importance of a knowledge of English skills. Of the six statements previously identified as pertaining to the English skills, five have mean scores of 5.00 or higher. Number one in importance was statement number 12, "be skilled in listening and observing." Its mean score was 5.38.

Statement number 4 concerning the procurement of Federal Government items, was ranked rather high with a mean score of 5.05. This was not surprising, since the basic function of the "P" Directorate is the procurement of the base's many items. It is interesting to note however that even though the primary function of the personnel in this area is procurement, they rated this statement as less important than several others. It is also interesting to note that number 21 which had been consistently ranked as least important by the other directorates, appeared somewhat higher on the rating scale with a mean score of 3.33. This suggests that knowledge in the concepts of packaging and the transportation of items is usable information relative to the performance of the necessary functions by the personnel of this directorate.

Two statements which appeared unexpectedly low on the scale

Table 8. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "P" Directorate

Supervisory		Non-Supervisory		Combined	
Mean Score of Importance	Item Number	Mean Score of Importance	Item Number	Mean Score of Importance	Item Number
5.38	12	5.64	16	5.39	16
5.24	19	5.52	3	5.30	3
5.19	30	5.20	8	5.13	30
5.10	16	5.08	30	5.11	8
5.10	33	5.00	4	5.09	12
5.05	3	4.84	12	5.02	4
5.05	4	4.80	19	5.00	19
5.00	8	4.68	15	4.83	33
4.95	31	4.60	33	4.74	15
4.81	15	4.44	31	4.67	31
4.43	24	4.40	24	4.41	24
4.33	10	4.36	29	4.13	29
4.29	28	4.00	25	4.11	10
4.24	27	3.92	5	4.04	28
4.14	26	3.92	10	4.00	26
3.90	20	3.88	6	3.85	27
3.86	29	3.88	23	3.83	5
3.71	5	3.88	26	3.78	25
3.52	25	3.84	13	3.70	23
3.48	17	3.84	28	3.63	13
3.48	22	3.76	2	3.63	20
3.48	23	3.52	9	3.59	2
3.38	2	3.52	22	3.54	6
3.38	13	3.52	27	3.50	22
3.33	11	3.40	20	3.41	9
3.33	21	3.32	11	3.35	17
3.29	9	3.24	17	3.33	11
3.24	14	3.20	21	3.26	21
3.14	6	3.16	18	3.17	14
3.05	7	3.12	14	3.02	18
2.95	32	3.04	32	3.00	32
2.86	18	2.76	1	2.87	7
2.33	1	2.72	7	2.57	1

of rankings were numbers one and 14. The supervisors of this directorate evidently considered knowledge of data automation equipment, and program languages as they apply to the use of this equipment, to be relatively unimportant.

Statements concerning individuals ability to comprehend proper social behavior and to coordinate activities were considered relatively important. In general, one might conclude that the broad area of human relations is quite important to these respondents.

Non-Supervisory

The non-supervisory respondents ranked the 33 statements in a somewhat different order than did the supervisory respondents of the same directorate. Number 16, "read the English language with understanding," with a mean score of 5.64, was ranked as most important. A relatively close second was number three, "be skilled in interpreting written directives," with a mean score of 5.52. Two other statements related to English skills had mean scores of over 5.00.

Also considered highly important, as was the case with the supervisory personnel, was number four, "have knowledge of the legal concepts applicable to the procurement of federal government items."

Some rather profound differences did appear between the degree of importance of the 33 statements as seen by the supervisors and non-supervisors. As an example, number 27 was ranked 14th in importance

by the supervisors whereas the non-supervisors ranked it 24th. Knowledge of basic product reliability requirements was considered to be much less important by the "man on the line" than by his immediate supervisory. Number 17 concerning knowledge of necessary supply and transportation functions was also ranked lower by the non-supervisory respondents. There was also a rather large difference in opinions between the two groups as to the importance of statement number 20. Supervisors ranked it much higher in importance than did the non-supervisory personnel.

The statements concerning a knowledge of data automation equipment and computer languages were considered to be rather unimportant. However, statement number seven, "have an understanding of public administration, included recruitment, classification, rating, and promotion," was ranked as least important of all 33 statements. Again, it should be noted that this group may not consider this function as totally unimportant; only that it is relatively unimportant to them in performing their particular type of employment.

Combined

The results of combining the two previously discussed categories was to find the first seven important statements the same as in each of the individual categories, but with a slight variation in the order of importance. The variation, however, did not substantially effect the use of the information in accomplishing the purpose of this

study. The English skill statements were ranked high in importance, again suggesting the need for these skills and the importance of including courses in this area of knowledge in the developing of an educational curriculum for the subjects of this study.

Two statements which were not considered to be important to the personnel in the previously discussed directorates were ranked as relatively important by the personnel of the "P" Directorate. Numbers four and 15 were ranked 6th and 9th, respectively. They were both concerned with the procurement of government items.

The respondents from this directorate were rather inconsistent in their rankings of the statements relative to skills in mathematics and statistical concepts. It is possible, however, they did not associate the statements in the same manner or to the same degree as did the researcher, therefore accounting for the somewhat scattered rankings of these items.

Numbers one, seven, 18, and 32 were ranked at or near the bottom of the scale by both the supervisory and non-supervisory personnel. The two groups were very much in agreement as to what behavior was least important as well as what was most important in performing their functions within this organization.

Correlation Coefficient

The researcher did not expect the correlation coefficient for the ranking of the Q-Sort statements by these two groups of respondents

to be so high. The computed coefficient was .884, which indicated a very high degree of agreement in the rankings. The square of this number was .7815 which suggested that 78.15 percent of the variation of either variable was explained by its correlation with the other. With the attitudes between the two groups toward the importance of some of the statements being so different, it was natural to assume that the correlation coefficient would be considerably lower than it was. Obviously, the correlation of the rankings in total can be high, even with considerable differences in the rankings of some of the individual statements. It is interesting to note that both the supervisory and non-supervisory respondents disagreed to some extent with the personnel of the other directorates as to what types of behavior they considered relatively unimportant. They were, however, very much in agreement with one another as is reflected by the computed correlation coefficient.

Analysis of the Rankings by the Personnel of the
Supply and Transportation (S) Directorate

The rankings, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the Supply and Transportation (S) Directorate are included in Table 9.

Supervisory

Statement number 17, "have knowledge of necessary supply and

Table 9. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by the sample personnel in the "S" Directorate

Supervisory		Non-Supervisory		Combined	
Mean Score of Importance	Item Number	Mean Score of Importance	Item Number	Mean Score of Importance	Item Number
5.10	17	5.23	33	5.07	33
5.05	12	5.05	12	5.05	12
5.00	29	4.91	16	4.93	16
4.95	16	4.77	3	4.83	3
4.90	3	4.77	26	4.76	29
4.90	33	4.55	29	4.74	17
4.70	19	4.50	19	4.60	19
4.70	31	4.45	8	4.52	26
4.55	30	4.45	13	4.52	31
4.50	8	4.41	17	4.48	8
4.40	10	4.41	30	4.48	30
4.40	13	4.36	31	4.43	13
4.40	14	4.23	10	4.31	10
4.40	24	4.18	22	4.26	14
4.40	32	4.14	14	4.10	20
4.25	26	4.14	20	3.98	22
4.05	20	4.00	21	3.90	24
4.05	23	3.91	9	3.90	32
3.95	28	3.86	2	3.88	9
3.85	9	3.82	25	3.79	2
3.75	22	3.68	27	3.79	28
3.70	2	3.64	28	3.74	23
3.65	27	3.59	18	3.67	25
3.50	25	3.45	11	3.67	27
3.45	1	3.45	23	3.57	21
3.10	11	3.45	24	3.38	1
3.10	21	3.45	32	3.29	11
3.05	5	3.41	15	3.21	18
2.95	4	3.36	4	3.17	4
2.90	15	3.32	1	3.17	15
2.85	7	3.05	6	2.95	7
2.80	18	3.05	7	2.93	5
2.70	6	2.82	5	2.88	6

transportation functions relative to the physical distribution of government items," was ranked as most important by the supervisory personnel in this directorate. This is not unexpected since this directorate is directly concerned with the supply and distribution of all items at Hill Air Force Base. It was surprising, however, that number 21, "be skilled in the concepts of packaging and the transportation of items," was not considered more important by these respondents. It was ranked 27th in importance. The non-supervisory personnel in the same directorate did not agree with their supervisory counterparts. They ranked this statement 10 positions higher, 17th in importance.

The English skill statements were not as consistently grouped as they were in some of the other directorates. However, they ranked high in importance, thus lending additional support to the value of having a knowledge of these concepts and giving evidence of the need for including English skill subjects in the educational program designed for the subjects of this study.

Several statements concerning general types of behavior were ranked in the intermediate to upper intermediate range. Number 13, "have knowledge of logistics planning processes," number 24, "display consistent behavior regardless of whether his job is routine or creative," number 20, "have knowledge of the means of measuring organizational efficiency," and number 23, "have knowledge of problems concerning

employer-employee relations, including a knowledge of appropriate labor laws," all appeared within this range.

Accounting and budgeting principles were considered relatively unimportant by these respondents, in the performance of their specific duties. Number six, which was ranked least important, had a mean score of 2.70. This score was considerably higher than the low mean score of the supervisory personnel of the other directorates. The high mean score for this group was also lower than the high mean score for the supervisory personnel of the other directorates. This suggests that, in total, these respondents were not as consistent in their attitudes toward what types of behavior they considered to be most and least important.

Non-Supervisory

It is interesting to note that number 33, "be able to formulate his own ideas," was ranked by these non-supervisory respondents as most important of all the 33 statements. This ranking is particularly noteworthy considering the fact that the educational level of the non-supervisory personnel in this directorate, generally speaking, is relatively low compared to the educational level of the personnel of the other functional areas of the Air Base (Hy Production, p. 56).

This group ranked the statement concerning knowledge of data automation equipment higher than did their supervisor counterparts. Also, these respondents grouped and ranked the mathematics and

statistical concept statements above those of the supervisory respondents in the same directorate. With few exceptions, the rankings of the individual statements were not extremely different between the two ranking groups. However, there were only two that were considered to be of equal importance, number 12, "be skilled in listening and observing," and number four, "have knowledge of the legal concepts applicable to the procurement of federal government items.

These respondents, like those of the other directorates, ranked the previously identified statements related to a knowledge of English skills, in the upper one third of the rankings. They also felt, according to the responses, that a knowledge of logistics planning processes, transportation functions, and the planning and coordinating of activities between individuals within the organization, was of considerable importance.

Of least importance was statement number five concerning basic accounting principles. Ranked only slightly higher was statement number six which was also concerned with accounting and budgeting procedures. The respondents evidently felt that this area of knowledge was relatively non-essential to the performance of their jobs.

Combined

The combined mean scores of the supervisory and non-supervisory personnel was obviously the mean of the rankings of each

of the 33 statements by these two groups. The mean for the most important statement was decreased and the mean for the least important statement was increased, relative to the mean scores of the individual groups. This lessened the dispersion or variability and made the distribution of scores appear more leptokurtic than they did when considered separately. The weights of the rankings of the individual groups kept the four most important statements in the same order as they appeared in the non-supervisory rankings.

The rankings of the behavioral statements by all of the sample personnel in this directorate revealed some general patterns that should be adhered to in designing this part of the educational program.

1. English skill statements were of major importance.
2. Positive behavior in working with other individuals was relatively important.
3. Mathematics and statistical concepts were also relatively important for the people employed in this functional area.
4. Accounting and budgeting principles were least important and should be weighted lightly in the designing of that part of the educational program for these personnel.

Correlation Coefficient

The correlation coefficient computed for the supervisory and non-supervisory personnel of the "S" Directorate was identical to that of the "N" Directorate, .832. The square of this number was

.6912, which indicated that 69.12 percent of the variation of either variable was explained by its correlation with the other.

One would therefore conclude that the respondents in the "S" Directorate were also rather consistent in their opinions as to which behavior was most important and which behavior was least important in performing the necessary activities within this organization.

All Sample Personnel in the Combined Directorates

Table 10 reveals the rankings, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by all supervisory and non-supervisory personnel in the five combined directorates. It also indicates the rankings of the statements when the rankings of all personnel in all directorates were combined.

Supervisory

The supervisors in the combined directorates concluded that statement number 12, "be skilled in listening and observing," was the most important behavioral statement of the 33 from which they had to choose. Also, considered highly important, with mean scores of 5.00 or higher, were the following statements:

- 16. read the English language with understanding
- 33. be able to formulate his own ideas
- 3. be skilled in interpreting written directives

Numbers 16 and three are English skill related statements

Table 10. Rankings of importance, by mean scores, of the 33 behavioral statements included in the Q-Sort instrument by all sample supervisory and non-supervisory personnel in the five combined directorates

Supervisory		Non-Supervisory		Combined	
Mean Score of Importance	Item Number	Mean Score of Importance	Item Number	Mean Score of Importance	Item Number
5.22	12	5.21	3	5.16	16
5.13	16	5.20	16	5.12	3
5.05	33	5.02	12	5.12	12
5.03	3	4.96	33	5.00	33
4.88	31	4.82	8	4.83	8
4.84	8	4.67	30	4.76	30
4.84	30	4.63	26	4.67	31
4.68	19	4.54	19	4.61	19
4.55	29	4.54	29	4.57	26
4.51	26	4.47	31	4.55	29
4.40	10	4.25	10	4.32	10
4.28	13	4.10	14	4.17	24
4.26	24	4.09	24	4.16	13
4.07	20	4.09	25	4.06	14
4.05	32	4.04	13	3.88	20
4.02	14	4.02	9	3.86	2
3.84	23	4.00	2	3.86	9
3.80	28	3.79	22	3.82	25
3.77	22	3.78	27	3.82	32
3.73	27	3.76	28	3.78	22
3.71	2	3.70	20	3.78	28
3.70	9	3.59	15	3.76	27
3.54	25	3.59	32	3.65	23
3.50	17	3.53	4	3.49	17
3.43	5	3.48	17	3.44	15
3.43	11	3.48	18	3.42	5
3.39	7	3.47	23	3.39	4
3.28	15	3.42	5	3.36	11
3.24	4	3.36	1	3.27	18
3.14	1	3.29	11	3.25	1
3.09	6	3.25	6	3.18	6
3.05	18	2.98	7	3.18	7
2.55	21	2.84	21	2.70	21

whereas number 33 indicated a type of behavior that is extremely valuable to all individuals in all positions of employment.

Ranked immediately below these four statements were those that appeared to be of general importance to most individuals. The remaining statements concerning English skills were also ranked in this range. A knowledge of logistics planning processes and the means of measuring organizational efficiency were also considered to be relatively important by these respondents. Proper and consistent social behavior was important to supervisory personnel at the Air Base, as is a knowledge of data automation equipment, its usage, limitations, and potential.

Of intermediate importance were the statements concerning the understanding and use of mathematics and statistical concepts.

The combined supervisory personnel from all the functional areas considered a knowledge of budgeting procedures and packaging and the transportation of items to be relatively unimportant when compared to the other statements used in the Q-Sort instrument.

The mean scores of the rankings ranged from a high of 5.22, number 12, to a low of 2.55, number 21. This indicated, of course, that the statement concerning skills in listening and observing was consistently ranked at or near the most important position by the supervisors in each of the five directorates of the study and that the statement relative to skills in the concepts of packaging and the transportation of items was consistently ranked at or near the least important position.

Non-Supervisory

Statement number three, "be skilled in interpreting written directives," was ranked most important by the combined non-supervisory personnel of the five directorates included in the study. Numbers 16, 12, and 33 were also ranked high in importance, but in slightly different order than they were ranked by the supervisory personnel.

Like the supervisors, the statements concerning the English skills were considered to be high in importance. However, the behavioral statements that were previously referred to as being general in nature, were ranked lower by these respondents than they were by their supervisory colleagues.

Contrary to the expectations of the researcher, the combined non-supervisory respondents ranked that statements concerning the mathematics and statistical skills higher than did the combined supervisors.

This group considered a knowledge of data automation equipment and its usage to be more important to them in the performance of their activities than did their supervisory counterparts.

The non-supervisors were consistent with the supervisors in ranking number 21, "be skilled in the concepts of packaging and the transportation of items," as least important of the 33 statements used in the Q-Sort instrument.

Combined

The behavioral statement that was ranked highest by the 238 individuals included in the study was number 16, "read the English language with understanding." This, of course, suggested that both supervisory and non-supervisory personnel recognize the need for, and the importance of a basic knowledge of the English skills. Particularly interesting was the fact that the statements concerning general knowledge and the English skill statements, with few exceptions, were ranked above the more specific or vocational skill statements.

Immediately following the "general" statements were the mathematics and statistical concept statements interspersed with the statements concerning the logistics planning processes, data automation equipment, measuring organizational efficiency, and analyzing and ordering job assignments.

Of lesser importance to the combined group were the statements regarding packaging and transportation of government items, understanding public administration, accounting and budgeting principles, legal concepts applicable to the procurement of government items, computer languages, and principles and processes involved in organizing and managing large and complex establishments.

The mean scores for the 33 behavioral statements ranged from a high of 5.16 to a low of 2.70, indicating that no single statement was ranked extremely and consistently high in importance nor

was any one statement consistently ranked extremely low by all respondents.

Correlation Coefficient

The correlation coefficient computed for all supervisory and all non-supervisory respondents was .832. This coefficient indicated that 69.12 percent of the variation of either variable was explained by its correlation with the other. Approximately 30 percent of the variation was unexplained. The importance of the indicated relationship was judged by squaring the computed correlation coefficient. As with the individual directorates, one finds a rather high degree of agreement between the attitudes of the supervisors and their subordinates toward the importance and unimportance of certain types of behavior in the performance of the many and varied logistics functions at Hill Air Force Base.

Summary

The researcher intended that this section of Chapter III serve as a capsule summary of the pertinent findings of the study. The seven behavioral statements considered most important by all sample personnel were as follows:

16. read the English language with understanding
3. be skilled in interpreting written directives
12. be skilled in listening and observing

33. be able to formulate his own ideas
8. be able to write the English language clearly
30. be able to speak the English language clearly
31. be able to coordinate activities between individuals

A summary of the rankings of these seven statements by the combined supervisory and non-supervisory personnel of each directorate is included in Table 11.

Table 11. Rankings, by directorate, of the seven most important statements as identified by all sample personnel

Directorate	Item Number						
	16	3	12	33	8	30	31
Comptroller (C)	4	3	2	5	8	9	7
Maintenance (M)	1	2	3	4	6	10	7
Materiel Management (N)	2	3	1	4	5	7	9
Procurement (P)	1	2	5	8	4	3	10
Supply & Transportation (S)	3	4	2	1	10	11	9

Of the seven most important statements, five were related to English skill concepts. The remaining two, numbers 31 and 33, were concerned with the ability to formulate one's own ideas and coordinating activities between individuals.

There appeared to be a high degree of consistency of the personnel across directorates in ranking these seven statements.

The range of rankings of the seven statements was from 1st to 11th. Academic subjects concerned with the teaching and application of these skills was therefore considered to be highly important by the researcher in designing the educational program for the personnel in the five directorates. This concept is more specifically identified in Chapter IV.

The seven behavioral statements considered least important by all sample personnel were as follows:

21. be skilled in the concepts of packaging and the transportation of items.

7. have an understanding of public administration, including recruitment, classification, rating and promotion

6. be able to apply federal government budgeting procedures to financial plans and buying requirements

1. comprehend program languages as they apply to the use of computers

18. be able to use quantitative models in the decision making process

11. comprehend the principles and processes involved in organizing and managing large and complex establishments

4. have knowledge of the legal concepts applicable to the procurement of federal government items.

A summary of the rankings of these seven statements by the

combined supervisory and non-supervisory personnel of each directorate is included in Table 12.

No particular pattern emerged from the summation of the least important statement. However, the statements were generally concerned with specific vocations.

With two exceptions, the personnel of the five directorates were also rather consistent in their opinions as to the least important types of skills necessary in performing their various jobs. The personnel of the "C" Directorate considered statement number one concerning the comprehension of program languages as 16th in importance. The personnel of the "P" Directorate ranked statement number four concerning a knowledge of the legal concepts applicable to the procurement of items as 6th in importance. The next highest ranking of this statement was 27th in importance by the personnel of the "N" Directorate.

The seven statements identified in Table 12, are considered to be of lesser importance by the researcher in designing the educational program discussed in Chapter IV. Courses pertaining to these specific skills might be included for the personnel of the appropriate directorate but probably should not be compulsory for all personnel in all directorates.

Table 12. Rankings, by directorate, of the seven least important statements as identified by all sample personnel

Directorate	Item Number						
	21	7	6	1	18	11	4
Comptroller (C)	33	24	28	16	29	27	32
Maintenance (M)	33	27	32	29	23	25	30
Materiel Management (N)	33	32	25	31	30	24	27
Procurement (P)	28	32	23	33	30	27	6
Supply & Transportation (S)	25	31	33	26	28	27	29

CHAPTER IV

CURRICULUM STRUCTURE

Phase I--Major

Because we are inevitably, creatures of the past, our tendency is to use each additional year of schooling as a more quantitative extension of previous years, and to fit our schools into existing and familiar patterns. That habit was not unjustified in the nineteenth century but the justification for it has disappeared. We are confronted, in planning for the next generation with a demand for more radical reforms. We are required to reconsider the functioning of our whole educational enterprise, . . . to look at it not so much in historical context as in the context of present and future requirements. (Patterson and Longworth, 1966, p. 33.)

As suggested by Commager, the researcher considered the present and future requirements of the personnel of Hill Air Force Base in designing the educational program of this study. The information obtained and reported in Chapter III concerning desired employee behavior and program content is of little value if the organizational structure is not designed so that the needs and desires of the clientel for whom the study is made can be satisfied.

It is determined, by interviews with key personnel of each of the directorates and base educational specialists that the general educational needs of base personnel were two-fold: (1) immediate satisfaction of the previously identified behavioral objectives; and

(2) a long-range educational program that would culminate in a baccalaureate degree.

To satisfy the above indicated needs, the researcher concluded that it would be necessary to radically depart from the traditional method of offering academic subjects. Therefore, the traditional sequence of completing the general education requirements and then the major subject area was dispensed with. This approach was reversed as indicated in Figure 1. The student would be required to complete the major or specialty area first. This procedure would allow the students to receive specific education and training in each directorate and immediately become better qualified to perform their various functions in their specific professions. It also would allow them to continue until a baccalaureate degree has been earned. This approach incorporates three of Lamar Johnson's suggested curriculum development approaches as briefly stated in Chapter I, the "functional," the "comprehensive survey," and the "method-oriented" approaches. Johnson would more explicitly refer to the curriculum design in this program as the "composite" approach.

It should be noted that in designing this educational program, the researcher made one basic assumption. The assumption is that the clientel for whom this program is designed have competencies that the average entering college freshman does not have. Admittedly, there would be exceptions to this supposition; but, in general, it is

felt that the theorem is valid, and that the values derived from a curriculum designed from this assumption far outweigh the exceptions that are certain to exist.

An analysis of the information reported in Chapter III gives a relatively good indication of the types of behavior needed and desired by the personnel in each of the directorates.

The Q-Sort responses revealed that there were certain kinds of knowledge or types of behavior that were important to all individuals in all directorates. In addition, there appeared to be other kinds of knowledge that were relatively important but of a general nature not requiring a specific knowledge or skill. It was determined from this information that the major phase of the total educational program should be divided into two segments--the core and the specialty areas. Figure 1 portrays this arrangement and suggests a specialty for each of the key functional areas of the Ogden Air Materiel Area.

The core

Both the supervisory and non-supervisory respondents from each directorate indicated a definite need for a knowledge of the English skills. Therefore, one highly important behavioral objective to be included in the "core" would be a means of preparing the adult student to better read, write and understand the English language. The student should also be afforded the opportunity to become skilled in listening and observing.

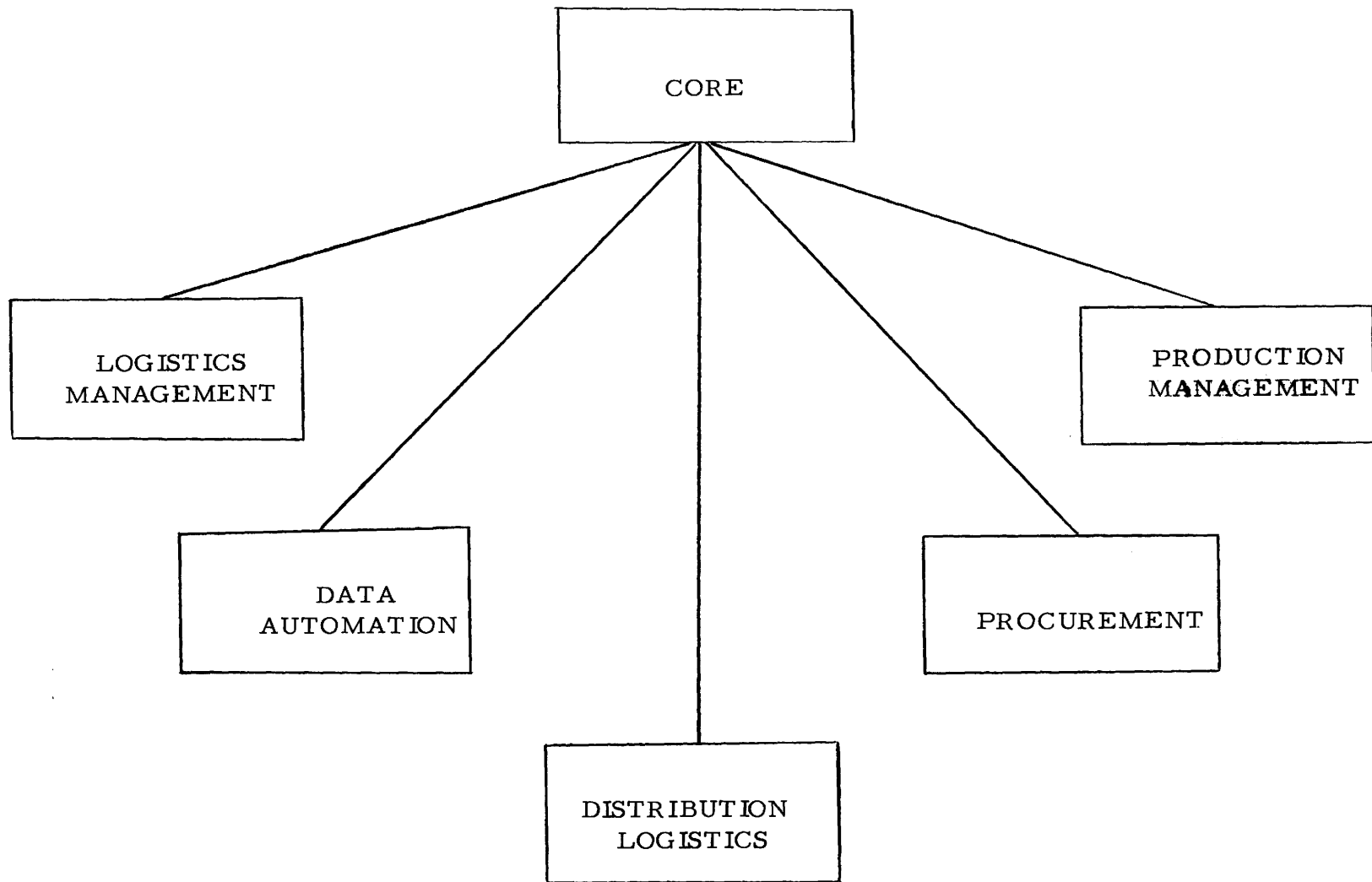


Figure 1. The core and specialty areas included in the academic major of the total educational program

Additional behavioral statements included in the Q-Sort instrument that were ranked as being relatively important by most of the respondents were the mathematics and statistical concept statements. It would appear that the ability to use these concepts appropriate, to the individual need, is an important objective for the "core." Basic courses in mathematics and statistics which would provide the student a knowledge of sampling methods, statistical surveys, data processing, and data presentation should therefore be included in this segment.

The Q-Sort respondents revealed that proper social behavior and the ability to coordinate activities between individuals was an important behavioral objective. Therefore, subjects in human relations should also be included in the designed program. The responses also revealed that the individuals employed in the five directorates of the study should be able to plan, evaluate and analyze systems as they relate to operational organizations and processes. In other words, an introductory course in all logistics processes should be included.

Behavior considered relatively important by both supervisory and non-supervisory personnel is the ability to understand basic concepts concerning data automation equipment. Knowledge of computer languages was considered to be of lesser importance and therefore, the assumption is made that advanced knowledge in this area is

not necessary for the general population. It would, of course, be important to the appropriate specialty area.

Behavior statements that were considered of lesser importance, but that should probably be included in the "core" segment of the program are those related to labor-management relations and public personnel administration. Introductory courses in these areas would probably be sufficient for all enrollees.

In summary, the courses in the "core" area should be designed to provide the student with a solid understanding of the basic skills in English, mathematics and statistics. In addition, introductory or general courses in the previously indicated specific areas should be included. These courses should be designed to give all enrollees necessary background information for the learning of the more specialized logistics areas.

The courses in the core will probably not prepare the student sufficiently to perform expected and necessary behavior. He must now select a specialty area that is appropriate to his particular type of employment. The Q-Sort responses clearly indicated that the individuals in the several directorates differed in their opinions as to the importance of the vocational skills necessary to best perform their specific duties.

Specialty areas

Data automation. The "C" Directorate's primary function is

in the area of finance. Structurally, its composition consists of the Base Comptroller and the subdivisions of Budget, Management Analysis, Accounting and Finance, Data Automation, and Cost Analysis. The desired and needed knowledge for the personnel in this directorate should be directly or indirectly related to these areas. The respondents to the Q-Sort from this directorate indicated that those behavioral statements related to these functions were indeed important.

This specialty area of the major should include the subjects of data automation, budgeting, and accounting with particular emphasis on all phases of computer principles. Included should be courses in computer program languages, systems analysis and design, data communications, and programing systems analysis and design, data communications, and programing systems. By completing the core subjects as well as additional study in the above indicated areas, the "C" Directorate employee should be much better prepared to perform the specific activities of this directorate.

Production management. The major function of the "M" Directorate is in the performance of the many facets of maintenance. Its structure consists of the Director of Maintenance, the Production Control Division, The Quality Control Division, The Industrial Engineering Division, The Shops Division, and The Management Services Division.

Logistics planning processes, emphasis in production control, and quality assurance or product reliability were considered to be relatively important by the Q-Sort respondents of this directorate. Several courses in quality assurance such as Procurement Quality Control, Quality Control Engineering Principles and Techniques, Quality Control Management, and Product Reliability should be included in this specialty area.

Another area of knowledge that the respondents indicated to be of importance to the personnel of this directorate is mathematics and statistics. Production control and planning requires considerable knowledge of these concepts and could be the reason for the emphasis in this area. Additional courses that should be included are: Materiel Control, Production Planning, Inventory Control, and Production Management.

An "M" Directorate employee's desired and expected behavior should be enhanced by the successful completion of the above suggested areas of knowledge.

Logistics management. The primary function of the "N" Directorate was briefly described in the previous chapter. However, to briefly restate, the personnel of this function area are involved in the management-planning phase of essentially all the activities performed in the other directorates. Structurally, this directorate consists of the following divisions: Director of Materiel Management, Logistics Management, Service Engineering, F-4 Systems Management,

Materiel Services, Aircraft Missile, Landing Gear Transportation Equipment, Data Products, and Aerospace Reconnaissance and Photo Equipment. From the organizational structure one can see the overlap between the functions of this directorate and the other directorates.

The responses of the personnel in this directorate indicated the importance of the planning and management processes. They ranked the behavioral statements concerning logistics planning processes and knowledge of the means of measuring organizational efficiency relatively high in importance.

Courses included in this specialty area should be Inventory and System Manager Concepts, Requirements Computation and Provisioning, Configuration Control and Management, Quantitative methods in Decision Making, as well as courses from each of the other specialty areas. By completing these subject areas, the individuals should become better able to perform their functions relative to the other directorates.

Procurement. The primary function of the "P" Directorate is in the area of procurement. The structural organization consists of the following divisions: Director of Procurement and Production, Commodity Procurement, Base Procurement, Management Services, Weapon System and Major Equipment Procurement, Production Plans and Management, Small Business and Contract Relations Office,

Procurement Committee, and Pricing Office. The division titles suggest the importance of a knowledge of the principles and problems of procurement for the personnel of this directorate. This statement is supported by the fact that statement number four, "have knowledge of the legal concepts applicable to the procurement of federal government items," was ranked high in importance by both supervisor and non-supervisory personnel. The behavioral statement relative to the ability to analyze cost/price relationships and their effect on item purchases was also considered to be relatively important.

Specific courses that should be included in this specialty area are: Defense Procurement Management, Contract Law, Price/Cost Analysis, Contractor Performance Evaluation, Value Engineering, and Contract Administration. Taken in conjunction with those courses specified in the core segment of the major, these courses should provide sufficient knowledge for the personnel from this directorate to perform more effectively within the organization.

Distribution logistics. The "S" Directorate is concerned with the myriad functions in supply and transportation. The organization consists of the following divisions: Director of Supply and Transportation, Quality Control, Management Service, Base Support, Transportation Support, Installation Equipment Management, Transportation Operations, Materiel Facilities, and Redistribution and Marketing. From the division titles, one can see the areas of knowledge that

would be of importance to the personnel of this directorate. The Q-Sort respondents indicated that a "knowledge of necessary supply and transportation functions relative to the physical distribution of Government items" was of primary importance. Courses that are related to the above behavioral objective and that should be included in this specialty area are: Property Accounting, Principles and Techniques of Production Control, Supply Management, Physical Distribution and Traffic Management, Transportation Systems Management, Requirements Computations, and Redistribution Marketing. These courses, in addition to those included in the core, should provide the employees in the several divisions of the "S" Directorate additional knowledge to better perform their required activities.

In summary, students planning to earn a baccalaureate degree should, in addition to completing the core courses, select and complete the courses in one of the five specialty areas. A number of elective courses selected from the other four specialty areas is also recommended. The students who successfully complete this sequence of courses should be given a "Certificate of Completion" and their student records should indicate that they are now prepared to continue into the second or general education phase of the program.

The designed program should satisfy the immediate educational needs of the personnel of the Ogden Air Materiel Area. If all students

do not achieve success in all courses necessary for the completion of the major, they should nevertheless be better prepared to perform their functions at the base and certainly be more valuable government employees.

The long range educational needs may also be satisfied in that the students who successfully complete the major are now qualified to continue study in the general education phase of the program. They may therefore eventually earn a baccalaureate degree which, according to the Hy Production report, is essential to the future manager and executive needs of Hill Air Force Base.

Phase II--General Education

As stated in Chapter II, no attempt was made to identify specific content for the second or general education phase of the program. However, the organizational structure and a basic educational philosophy will be stressed in this section of Chapter IV in compliance with the second of the two-fold purpose of this study.

de Toqueville wrote that men may "refuse to move altogether for fear of being moved too far," that they may not make, "when it is necessary, a strong and sudden effort to a higher purpose."

(Patterson and Longworth, 1966, p. xi).

The educational needs of a dynamic and changing society must be recognized and necessary adjustments made to better

satisfy these demands. Educators must also recognize that there are numerous methods to educate students. The traditional method of attending class 50 minutes per day, five days per week, 30 weeks per year, until the final accumulation of the necessary number of credit hours, is not the only way in which the student may gain knowledge. In fact, it is generally agreed that the best learning is that in which the student progressively acquires the ability to teach himself. The philosophy of independent study stressed in this phase of the total curriculum emphasizes this type of learning. Indeed, if the student successfully completes this phase of the program he will become an independent learner. Too often our traditional educational programs reward the student for not thinking independently. The conforming student receives the "A" grade. If he completes his assignments as reasonable facsimiles of textbook excerpts or transcriptions of the professor's lectures, the student is rewarded. If he does exactly as he is told--no more, no less--he generally does well; is considered a competent student and will probably graduate with honors. It is then expected that the same student will take his place in society as an independent thinker with the ability to analyze problems and make correct decisions concerning them. It is anticipated that this differently designed educational program will better prepare the student to do what society wants and expects of him.

The suggested curriculum is programmed as a multiple sequence in which several learning situations are available concurrently.

Their use by a given student would depend on his own educational needs, prior learning, time available for study, and academic capability. The curriculum is also designed so that the adult student may continue to work and earn his livelihood while independently expanding his knowledge.

Each adult student should be able to enter the general education phase of the program at his own level of prior learning and proceed to completion at his own pace. Learned and Wood stress this philosophy by stating:

Each individual has some level peculiar to himself at which his education in any given subject must begin. Average levels, like the "average man" do not exist for practical education. There exists only different starting points from which alone progress is possible. This suggests that instead of expecting the members of a college class to conform to an average, we might better arrange circumstances so that each student could make full use of what he has learned and could advance from the point where he really stands. His permanent gains derived from schooling would thus be substantially increased. (Learned and Wood, 1938, p. 55)

The curriculum for this phase of the program is rooted firmly within the liberal arts tradition, but adapted to the special circumstances of a population whose attendance in regular formal classes is most difficult. Most of the people for whom this program is designed, have made vocational choices. Their specialized training and education has been accomplished by on-the-job training and by the completion of Phase I of this program. They now need to broaden their knowledge in the social sciences, the humanities, and the

natural sciences, and also strengthen their personal values. The specific aim of the general education phase of the program is to develop awareness, sympathetic appreciation, informed understanding, and the ability to discover sources of relevant information and assemble it in such a way as to permit critical judgement on important general issues.

Structurally, this phase of the program is divided into three components (proposal, University of South Florida, no date): the humanities, the social sciences, and the natural sciences. The humanities area should concern itself with art, literature, music, and religion. It should concentrate on the subjects that will help the student better understand man's values, his aspirations, and his inspirations.

The natural sciences should involve a study of the inorganic and organic environment of man and a study of man himself. It should deal with such concepts as natural law and the use of scientific method.

The social sciences should bring together the study of man and society. This relationship should be studied from the historical, economic, sociological, psychological, philosophical, and political point of view. In general, it should examine the manners in which societies operate.

Each of the three area studies is divided into two parts:

independent-guided study followed by intensive resident study in the area seminar. Figure 2 identifies this arrangement. The idea stressed by this approach is to achieve both depth and breadth in the area of study. Independent study is aimed primarily at achieving breadth, while the area seminars should focus in depth on problems and themes. During independent study the student must gain a broad knowledge throughout the subject-matter areas. The seminar should allow the student to make a rather exhaustive study of a limited subject. Treated in proper perspective and kept in balance, these two approaches should complement each other in the general education phase of the program.

The student, expecting to earn a baccalaureate degree, must successfully complete all three areas of study in this phase of the program. He should, however, be allowed considerable flexibility as to the sequence of subject matter he follows, and the time he requires to complete his studies. His enrollment for the area study should be for an indeterminate period of time. The student may complete the area study in a minimal period if his prior formal and informal learning and his own ability permit him to do so. On the other hand, if his educational background and the time he can spend on necessary study is rather limited he should be allowed to extend the period he needs to complete independent study for the area. Of utmost importance, of course, is that the student demonstrate

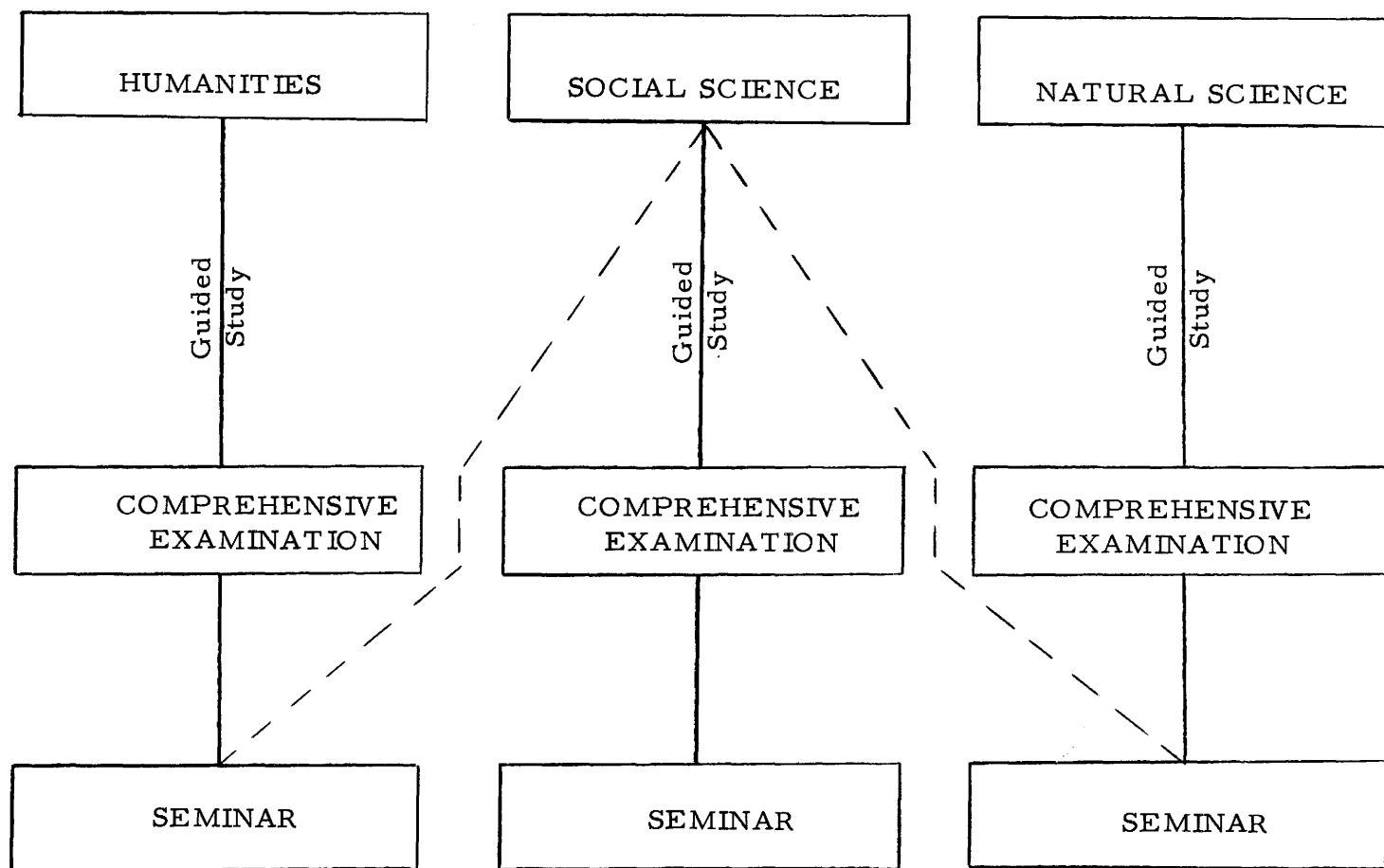


Figure 2. The organizational structure of the general education phase of the total program

continuous progress in his educational program. This should be accomplished by a close working relationship with a faculty advisor to whom the student is assigned upon entering the general education phase of the program. Written papers, oral interviews, and periodic written examinations, required by the advisor, may be used to determine student progress.

Independent study--Specific suggestions

Upon entering Phase II the college level School and College Aptitude Tests (SCAT) and the Sequential Tests of Educational Progress (STEP) should be administered to the student. These tests should not be used to determine acceptance or rejection, but should be used for counseling and placement as well as for advisement as the student continues through his educational experience.

As previously suggested, the student should immediately be assigned an advisor. The number of advisees per advisor should be restricted to enhance the working relationship between the two. The advisor and student, in their initial meeting, should review the results of the SCAT and STEP examinations and contemplate the student's strengths and weaknesses. They should also make a preliminary assessment of the amount of work necessary for completion of requirements for independent study in the student's initially selected area. The advisor may be helpful in encouraging the student to select his first area of study as the one in which his ability and

interest is greatest. Because independent study requires maximum self-discipline, selecting the primary area of interest will probably help the student until he adjusts to this non-traditional approach to educating himself. A basic reading list should be established by members of the faculty of the disciplines. Each degree candidate should read the complete list. In addition, the faculty advisor should make specific assignments to better prepare the student in the subject matter areas in which there is an indicated deficiency. The advisor may recommend that the student take a course or a number of courses in the traditional educational program, if it appears that this may help to correct known deficiencies. Educational television or sponsored lecture series and workshops may also be used as additional sources of information. In effect, the advisor should be concerned with two aspects of the advisee's learning; namely, confirmation of the learning the student has already achieved, and guidance of the student for achievement of appropriate additional learning.

Completion of area independent study should require satisfactory performance on an area comprehensive examination. This examination should be administered to the student when he and his advisor feel that sufficient knowledge has been acquired to successfully pass it. The examination should be prepared by the faculties of the appropriate subject-matter areas and should be both subjective

and objective in nature. If, upon taking the examination, the student still demonstrates deficiencies in one or more specific subject-matter area, he should be given additional assignments in these areas and be allowed to take an alternate form of the examination at some later date, again determined by consultation with his advisor. The student should probably be restricted to one retake.

Area seminar--Specific suggestions

Upon successful completion of independent study with a satisfactory score on the comprehensive examination the student is eligible to proceed to the area seminar. The area seminar should be concerned with critical thinking, inter-relatedness of knowledge, and with the organization of knowledge around central problems, themes or topics. The seminar provides the student, who has been studying independently, the opportunity to interact with other students and with the seminar faculty. It further permits him to more fully utilize the college faculties such as the library, laboratories, etc.

The faculty for each seminar should consist of a teaching team consisting of two or more faculty members who should attend all sessions of the seminar. They should also be available for individual counseling when the seminar is not in session. Resource speakers may also be scheduled when their participation would add to the competencies of the teaching team.

As is the case in other seminars, the faculty leaders should

use some of the time for presentations of their own, perhaps raising questions of contrast and comparison relative to the theme or topic being considered. The introduction of data that will stimulate discussion as well as analysis by the students would be appropriate. They should, however, avoid "giving the answers" as this will tend to curtail individual participation. A student oriented seminar is imperative. It should be designed so that the student may orally present and defend a topic of his own choosing within the confines of the general area of study.

The key to the success or failure of the seminar is the quality and preparation of the faculty teaching team. This preparation should include an intensive schedule that will require a maximum effort by each student for the entire seminar. In addition to the required paper, library assignments, and committee reports should be required.

Although the seminars of the three area studies will vary in both content and method, each will be of substantial benefit to the student because he will learn to organize and project information learned through his independent study into the seminar topic or theme.

Since independent study would usually be finished before the seminar, the student normally would complete the area study with the seminar. A letter from the college noting the area of study completed and also the amount of work remaining for completion of

the degree should be sent to the student. As previously indicated, this sequence, independent study, comprehensive examinations, area seminar, is repeated for each of the three areas: humanities, social science, and natural science.

The organizational structure of the program as outlined in this chapter should satisfy the general educational needs of the personnel at the Ogden Air Materiel Area which were previously identified as: (1) immediate educational training that will satisfy the identified behavioral objectives and (2) an extended program that will eventually culminate in a baccalaureate degree. While satisfying these needs the designed program also emphasizes a philosophy that has been expounded by many educators and is strongly subscribed to by this researcher. This academic program avoids a system of forced spoon-feeding or a non-system in which the only direction given to studies is what is sometimes referred to as natural interest. The structure of this program is likely to please neither those who feel education should follow a strictly prescribed set of lines and cover everything important within such lines, nor those who feel education is good only when its lines are wholly set by the student according to his felt needs and present interests.

This program, as designed, is one that has long been sorely needed and will be located where it for long has sorely needed to be.

CHAPTER V
SUMMARY, CONCLUSIONS, SPECULATIONS,
AND RECOMMENDATIONS

Summary

The purpose of this study was two-fold: (1) to determine the educational needs of the personnel of the five directorates--materiel management, supply and transportation, maintenance, finance, and procurement at Hill Air Force Base: and (2) to design or structure an educational program for these personnel to meet these needs.

Objectives

The specific objectives of this study were:

1. To identify desired behavior of the personnel of each of the five directorates by a review of job requirement data; by a critical examination of Project Hy Production which is an in depth study of the Ogden Air Materiel area's human resources; and, by personal interviews of educational specialists of each of the five directorates.

2. To determine which of the behavioral items were considered most important by selected supervisory personnel from each of the five directorates.

3. To determine which of the behavioral items were considered

most important by selected non-supervisory personnel in each of the five directorates.

4. To determine program content for a college major in logistics from the information derived from objectives one, two, and three.

5. To design an educational program to better meet the educational needs of the adult workers at Hill Air Force Base employed in the five directorates included in the study.

Procedures

This study consisted of three phases:

Phase One. This phase consisted of identifying the educational behavioral items that were used in developing a Q-Sort instrument. This was accomplished by a review of job requirement data; by a critical examination of Project Hy Production and by personal interviews with the education specialists of each of the five directorates. The educational specialists provided a list of behavioral items which they identified to be necessary for the personnel of each of their respective areas if they were to best accomplish their functions within the organization.

Phase Two. The Q-Sort instrument was developed employing the data obtained in phase one. The compiled list of items supplied by the educational specialists was classified and defined in operational terms, i. e., as behavioral statements. A stratified sample of 30

supervisory and 30 non-supervisory individuals from each of the five directorates for a total of 300 personnel, were sent the 33 statement instrument. Of the 300 persons asked to participate, 238 or 79.33 percent completed the instrument.

The Q-Sort process required the respondents to arrange or categorize the 33 items according to their importance. The researcher grouped the items into seven categories and a value was assigned to each category as indicated in Table 1. Mean scores were computed for each of the 33 statements for the supervisory, the non-supervisory, and the combined personnel in each of the five directorates; for all supervisory personnel across directorates; for all non-supervisory personnel across directorates, and for all personnel across directorates. These mean scores were used to determine the rank order of the 33 statements for each of the indicated categories.

The degree of agreement or disagreement, with respect to the importance of the identified behavioral statements, by the selected supervisory and non-supervisory personnel was tested using the Spearman Rank Correlation Coefficient.

The reliability of the Q-Sort instrument was checked using the Coefficient of Stability, a test-retest procedure. The instrument was re-administered to a random sample of 30 of the 238 persons that initially completed it. The rankings of the statements between the first and the second administration was tested using the Spearman Rank Correlation Coefficient.

Phase Three. This phase consisted of the development of the organizational structure of the total program. Included, was an identification of areas of knowledge that would best satisfy the desired behavior and an explanation of the general education phase of the total program. A departure from the traditional method of offering academic subjects was necessary to best satisfy the educational needs of the clientel for whom the program was designed.

The findings

The questions the researcher sought to answer and a brief summary of the findings related to each question are as follows:

1. What is the desired behavior of the personnel in each of the five directorates as identified by Air Force job analysis teams, Project Hy Production, and base educational specialists?

The behavioral items identified from these three sources were many and varied. All three sources reported a need for skills in English and mathematics. Knowledge of the myriad logistics processes, i. e., procurement, transportation, management, planning, and maintenance were all mentioned as desired behavior. In addition, proper behavior in working with one's peers was indicated as necessary behavior. The behavioral items initially identified from the three sources were classified and defined in operational terms to be used in the Q-Sort instrument.

2. How do selected supervisory personnel in each of the five

directorates rank the identified behavioral items?

This question was treated by administering the Q-Sort instrument to sample supervisory personnel from each area. The rankings of the vocational statements were varied but a high consensus of agreement was found with the statements concerning the English and mathematics skills. All supervisory respondents were unanimous in their opinions as to the least important behavioral items, "be skilled in the concepts of packaging and the transportation of items."

3. How do selected non-supervisory personnel in each of the five directorates rank the identified behavioral items?

Non-supervisory personnel, like their supervisory counterparts, ranked the English skill statements high in importance. Mathematics skill statements were considered of intermediate importance and the vocational skill statements varied in importance between the respondents of the several functional areas. Of least importance was the statement concerning the packaging and transportation of items.

4. What are the areas of agreement and disagreement, with respect to the importance of the identified behavioral items, by selected supervisory and non-supervisory personnel in each of the five directorates.

This question was answered by using the Spearman Rank

Correlation Coefficient to measure the degree of correlation between the responses of the supervisory and non-supervisory personnel in each directorate and by all supervisory and all non-supervisory personnel in the combined directorates. The correlation coefficient for the "C" Directorate was .854, for the "M" Directorate .904, for the "N" Directorate .832, for the "P" Directorate .884, and for the "S" Directorate .832. Comparing all supervisory responses with all non-supervisory responses, the correlation coefficient was computed as .903. All coefficients indicated a high degree of agreement between the two groups concerning their attitudes toward the importance of the behavioral items used in the Q-Sort instrument.

5. Which of the identified behavioral items should be used in designing a major for a baccalaureate degree?

A core area in the major was developed from the statements that were ranked consistently high in importance by the respondents in all directorates. Specialty areas were developed for the five directorates incorporating the areas of knowledge that were ranked high in importance by the personnel in the appropriate area. The combined core and specialty area constituted the major for the total educational program.

6. How should the educational program be designed to best satisfy the adult government employee's educational objectives?

It was determined that a departure from the traditional

method of offering academic subjects was necessary. The program was designed so that the student would complete first the major then the general education requirements. In addition, the general education phase of the total program was divided into three broad areas: humanities, social sciences, and natural sciences. These areas would be completed by an independent-guided study approach.

Conclusions

The findings of the study elicits the following conclusions:

1. All personnel, supervisory and non-supervisory, consider a knowledge of English skills to be highly important in the performance of their numerous jobs. This conclusion is supported not only by the initial input of desired behavioral statements from the three sources-- defined job requirements, Project Hy Production, and Air Base educational specialists, but also by the fact that they were consistently ranked high in importance by all sample personnel.

2. Skill in the use of mathematics and statistical concepts was considered to be of intermediate importance, but certainly important enough to warrant inclusion in the total educational program.

3. The personnel in each directorate ranked a knowledge of the vocational skills related to the type of activities they were currently performing as highly important.

4. Supervisory and non-supervisory personnel in each

directorates indicated considerable agreement in their attitudes toward the importance of the behavioral statements included in the Q-Sort instrument.

5. Some behavioral items are applicable to all personnel in all directorates and some are applicable to only specific areas. This conclusion instigated the designing of the major phase of the total educational program as described on pages 78 through 87 of this study.

6. The educational needs and desires of the adult government employee could not be sufficiently satisfied if the program were traditionally structured. Thus the reverse plan and the independent-guided study philosophy was incorporated into the design.

Speculations

The researcher included this brief section in the study for the purpose of expressing his ideas as to why the personnel may have ranked some of the Q-Sort statements as they did.

1. Statement number 33 was consistently ranked high because the ability to formulate one's own ideas is highly important for one to be successful in a supervisory position.

2. Statement number 31, "be skilled in interpreting written directives was also considered to be highly important. Skill in this area would be especially important because of the numerous directives

to which government employees are constantly exposed.

3. Statement number 14 was consistently ranked considerably higher than was statement number one. The large difference in the rankings of the two data automation statements was because the Air Base has specialists in computer languages whose function is to translate given programs into the appropriate language. Therefore, a knowledge of computer languages is not nearly as important to the respondents as is a knowledge of the use and potential of data automation equipment.

4. All personnel ranked the statements concerning a knowledge of the English skills high in importance. This was not unexpected because a basic understanding of the English language, with few exceptions, is highly important to the successful accomplishment of most types of employment.

5. Working with, and coordinating activities between individuals was ranked high in importance by the personnel in the Maintenance Directorate because of the large number of employees in that directorate. Positive behavior in working with others is highly essential for functional efficiency in that large organization.

6. Statement number 21 was consistently ranked low in importance. This was not because it is an unimportant logistics function, but because the personnel included in this study felt that this function should be performed by some other organization.

7. Statement number 13, "have knowledge of the logistics planning processes," was ranked especially high by the supervisory personnel of the Materiel Management Directorate. This was because this is their primary function. The individuals that already possess this knowledge are currently employed in key positions.

8. Personnel of the Procurement Directorate ranked the two statements related to data automation much lower than did the personnel of the other directorates. One might speculate that these personnel responded in this manner because they were rather far removed from the actual usage of computer equipment.

9. Supervisory personnel ranked statement number 20 concerning knowledge of the means of measuring organizational efficiency to be more important than did non-supervisory personnel. This was not unexpected because knowledge in this area would be much more important to a person occupying a supervisory position than it would be to a person in a non-supervisory position.

Recommendations

The following appear to be areas in which future research may be profitably directed:

1. A study similarly designed be made at another air materiel area to determine the degree of agreement between the personnel of that base and those of the Ogden Air Materiel Area with respect to the

importance of the indicated behavioral statements.

2. A similar study might be replicated at other government entities (Internal Revenue Service, U. S. Forest Service, etc.) to determine the educational needs of those employees.

3. Flexibility is important in any educational program. It is recommended therefore, that this study be replicated in approximately five years to determine what changes should be made in this educational program.

4. A study designed to test the effectiveness of this program should be made. The University of Oklahoma used the Graduate Record Examination to test the independent study phase of the program. The major phase of the program should be tested by evaluating job performance of the individuals successfully completing the program.

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APPENDIXES

APPENDIX A
THE Q-SORT QUESTIONNAIRE

MANAGEMENT-LOGISTICS SURVEY

Name _____ Organization _____ Supervisory _____
Nonsupervisory _____

Directions for Sorting Behavioral Statements

You have been selected to participate in this survey to help obtain more precise information for program content for the Management-Logistics Degree Program.

Enclosed are 33 statements which should describe desirable behavior of an individual in your area of employment if he is best to accomplish his job. Each statement is presented on a separate slip of paper. Some of the statements are rather specific and some general in nature. You are asked to read through the statements and arrange them according to your attitude towards their importance. You will better understand the statement if you precede it with the phrase: TO BEST PERFORM HIS FUNCTION IN THIS ORGANIZATION, THE EMPLOYEE SHOULD.

You are asked to sort the statements into seven (7) categories from most important to least important. To help you sort the most important from the least important, you should read each statement and first sort them into three piles as follows:

- A. Include in the first pile the statements you feel are most important.
- B. Include in the second pile the statements you feel are of medium importance.
- C. Include in the third pile the statements you feel are least important.

From the three piles you are now asked to sort out each pile as follows:

- A. Attached is a sheet with blank spaces provided for the appropriate number of statements.
- B. From the pile of "Most Important Statements," select the one most important and place its number in the blank space provided under "Most important behavioral statement (One statement).

- C. Now select from the same pile the next three most important statements and place the numbers of these statements in the blank spaces provided under "Next most important statements (Three statements)."
- D. Continue this procedure until only one statement of least importance is left. Place the number of this statement in the blank provided at the bottom of the page under "Least important behavioral statement (One statement)."
- E. Please place only the requested number of statements in each category even if you determine that a larger number than requested are of equal importance.

Please complete and return to _____
_____ no later than _____

Most important behavioral statement (One statement)

Next most important statements (Three statements)

Next most important statements (Seven statements)

Next most important statements (Eleven statements)

Next most important statements (Seven statements)

Next most important statements (Three statements)

Least important behavioral statement (One statement)

APPENDIX B
STANDARD DEVIATIONS TABLES

Table 13. Standard deviations computed from the Q-Sort responses of the sample personnel in the "C" Directorate.

Supervisory		Non-Supervisory		Combined	
Statement No.	S. D.	Statement No.	S. D.	Statement No.	S. D.
1	1.45	1	1.44	1	1.49
2	1.00	2	0.94	2	1.00
3	0.85	3	0.90	3	0.87
4	1.02	4	1.03	4	1.03
5	1.51	5	1.64	5	1.58
6	1.57	6	1.12	6	1.40
7	0.96	7	0.84	7	0.95
8	0.78	8	0.98	8	0.88
9	1.14	9	0.77	9	1.00
10	0.84	10	0.58	10	0.73
11	1.84	11	1.26	11	1.62
12	0.95	12	0.93	12	0.94
13	0.96	13	1.17	13	1.07
14	1.38	14	1.26	14	1.34
15	0.62	15	0.80	15	0.73
16	1.14	16	1.08	16	1.12
17	1.17	17	1.11	17	1.15
18	1.16	18	1.12	18	1.16
19	1.14	19	1.26	19	1.21
20	0.81	20	0.72	20	0.82
21	1.10	21	1.13	21	1.11
22	0.93	22	0.69	22	0.83
23	0.88	23	1.07	23	1.05
24	1.03	24	1.00	24	1.02
25	1.07	25	1.14	25	1.13
26	1.01	26	0.96	26	1.00
27	0.85	27	1.11	27	1.01
28	1.03	28	1.07	28	1.05
29	0.81	29	1.14	29	0.97
30	0.94	30	0.99	30	0.97
31	0.92	31	0.94	31	0.96
32	1.06	32	0.98	32	1.05
33	0.83	33	1.23	33	1.04

Table 14. Standard deviations computed from the Q-Sort responses of the sample personnel in the "M" Directorate.

Supervisory		Non-Supervisory		Combined	
Statement No.	S. D.	Statement No.	S. D.	Statement No.	S. D.
1	1.06	1	1.07	1	1.08
2	0.68	2	1.20	2	1.00
3	0.69	3	0.94	3	0.83
4	1.27	4	1.23	4	1.33
5	1.10	5	1.37	5	1.26
6	1.02	6	1.14	6	1.10
7	1.05	7	1.07	7	1.07
8	0.65	8	0.83	8	0.80
9	1.12	9	1.17	9	1.15
10	0.56	10	0.87	10	0.74
11	1.19	11	1.34	11	1.28
12	0.85	12	1.09	12	1.01
13	0.74	13	1.41	13	1.15
14	0.80	14	1.23	14	1.09
15	1.05	15	1.20	15	1.14
16	0.99	16	0.57	16	0.86
17	0.76	17	0.86	17	0.86
18	0.50	18	0.99	18	0.81
19	0.91	19	1.25	19	1.17
20	0.97	20	1.07	20	1.03
21	0.89	21	1.19	21	1.06
22	0.64	22	0.94	22	0.81
23	0.78	23	0.96	23	0.90
24	0.93	24	1.10	24	1.03
25	0.85	25	1.12	25	1.06
26	0.75	26	0.74	26	0.75
27	0.85	27	1.02	27	0.95
28	1.30	28	1.52	28	1.42
29	0.72	29	0.96	29	0.85
30	1.15	30	0.87	30	1.07
31	0.84	31	1.05	31	0.97
32	1.02	32	0.90	32	1.03
33	0.60	33	1.38	33	1.08

Table 15. Standard deviations computed from the Q-Sort responses of the sample personnel in the "N" Directorate.

Supervisory		Non-Supervisory		Combined	
Statement No.	S. D.	Statement No.	S. D.	Statement No.	S. D.
1	1.01	1	1.01	1	1.01
2	0.95	2	0.95	2	0.95
3	0.88	3	0.37	3	0.61
4	0.83	4	1.13	4	1.00
5	0.87	5	1.05	5	0.97
6	1.38	6	0.92	6	1.18
7	1.08	7	0.86	7	1.05
8	0.76	8	0.73	8	0.76
9	0.91	9	1.36	9	1.22
10	0.75	10	0.73	10	0.74
11	1.50	11	1.49	11	1.55
12	1.03	12	1.11	12	1.07
13	1.28	13	1.28	13	1.36
14	0.91	14	0.59	14	0.76
15	0.97	15	0.92	15	0.95
16	0.88	16	1.00	16	0.95
17	1.08	17	1.25	17	1.17
18	1.21	18	0.92	18	1.08
19	1.48	19	1.12	19	1.31
20	0.80	20	0.79	20	0.84
21	1.04	21	1.25	21	1.18
22	0.76	22	0.80	22	0.79
23	1.19	23	1.01	23	1.12
24	1.43	24	1.33	24	1.39
25	1.00	25	0.66	25	0.92
26	1.28	26	1.14	26	1.21
27	0.66	27	1.12	27	0.96
28	1.08	28	1.02	28	1.06
29	1.19	29	1.26	29	1.23
30	0.93	30	0.71	30	0.83
31	0.83	31	0.88	31	0.89
32	0.93	32	1.04	32	0.99
33	0.79	33	1.72	33	1.36

Table 16. Standard deviations computed from the Q-Sort responses of the sample personnel in the "P" Directorate.

Supervisory		Non-Supervisory		Combined	
Statement No.	S. D.	Statement No.	S. D.	Statement No.	S. D.
1	1.21	1	1.11	1	1.17
2	1.25	2	0.91	2	1.09
3	0.95	3	0.75	3	0.88
4	1.09	4	0.94	4	1.01
5	1.24	5	1.02	5	1.13
6	0.77	6	0.99	6	0.97
7	0.72	7	0.96	7	0.87
8	0.31	8	0.75	8	0.52
9	1.20	9	0.75	9	0.99
10	0.56	10	0.98	10	0.84
11	0.84	11	1.41	11	1.18
12	0.85	12	1.01	12	0.54
13	0.65	13	1.12	13	0.96
14	1.23	14	1.45	14	1.36
15	1.10	15	1.16	15	1.13
16	0.97	16	1.16	16	1.11
17	0.96	17	1.07	17	1.03
18	0.71	18	0.78	18	0.77
19	1.23	19	1.02	19	1.14
20	0.75	20	1.20	20	1.05
21	1.08	21	1.06	21	1.07
22	1.30	22	0.85	22	1.08
23	0.66	23	0.91	23	0.83
24	1.68	24	1.39	24	1.53
25	0.91	25	1.20	25	1.10
26	0.83	26	0.71	26	0.78
27	1.15	27	1.14	27	1.20
28	1.08	28	1.35	28	1.25
29	1.25	29	0.79	29	1.06
30	1.05	30	0.98	30	1.01
31	0.79	31	1.02	31	0.96
32	1.29	32	1.37	32	1.34
33	0.87	33	0.57	33	0.76

Table 17. Standard deviations computed from the Q-Sort responses of the sample personnel in the "S" Directorate.

Supervisory		Non-Supervisory		Combined	
Statement No.	S. D.	Statement No.	S. D.	Statement No.	S. D.
1	1.02	1	1.06	1	1.05
2	1.42	2	0.68	2	1.15
3	0.70	3	0.69	3	0.81
4	0.86	4	1.27	4	0.97
5	0.74	5	1.10	5	0.88
6	1.00	6	1.02	6	1.03
7	1.01	7	1.05	7	1.25
8	1.20	8	0.65	8	1.12
9	1.01	9	1.12	9	1.03
10	0.80	10	0.56	10	0.83
11	1.70	11	1.19	11	1.56
12	1.02	12	0.85	12	1.00
13	1.02	13	0.74	13	0.90
14	1.07	14	0.80	14	1.02
15	1.09	15	1.05	15	1.21
16	1.02	16	0.99	16	1.03
17	1.37	17	0.76	17	1.35
18	1.17	18	0.50	18	1.21
19	1.10	19	0.91	19	1.35
20	1.28	20	0.97	20	1.25
21	1.26	21	0.89	21	1.50
22	1.26	22	0.64	22	1.16
23	0.97	23	0.78	23	1.09
24	1.43	24	0.93	24	1.59
25	0.87	25	0.85	25	1.11
26	0.99	26	0.75	26	0.96
27	1.11	27	0.85	27	1.19
28	1.32	28	1.30	28	1.64
29	1.14	29	0.72	29	0.37
30	0.97	30	1.15	30	0.93
31	0.90	31	0.84	31	1.10
32	1.16	32	1.02	32	1.15
33	0.70	33	0.60	33	0.91

Table 18. Standard deviations computed from the Q-Sort responses for the combinations of the Supervisory, Non-Supervisory, and all sample personnel in the five directorates.

Combined Supervisory		Combined Non-Supervisory		All Sample Personnel	
Statement No.	S. D.	Statement No.	S. D.	Statement No.	S. D.
1	1.27	1	1.28	1	1.28
2	1.09	2	0.99	2	1.05
3	0.85	3	0.81	3	0.83
4	1.36	4	1.35	4	1.36
5	1.27	5	1.32	5	1.29
6	1.27	6	1.09	6	1.18
7	1.06	7	1.08	7	1.09
8	0.79	8	0.92	8	0.86
9	1.12	9	1.10	9	1.12
10	0.72	10	0.85	10	0.79
11	1.49	11	1.41	11	1.45
12	0.83	12	1.04	12	0.95
13	1.16	13	1.23	13	1.20
14	1.25	14	1.33	14	1.29
15	1.22	15	1.23	15	1.23
16	1.07	16	1.02	16	1.05
17	1.33	17	1.20	17	1.27
18	1.02	18	1.01	18	1.03
19	1.26	19	1.25	19	1.26
20	0.94	20	1.05	20	1.01
21	1.19	21	1.40	21	1.31
22	1.03	22	0.92	22	0.97
23	0.96	23	1.04	23	1.02
24	1.33	24	1.33	24	1.33
25	0.95	25	1.10	25	1.07
26	1.03	26	0.98	26	1.00
27	1.00	27	1.16	27	1.08
28	1.20	28	1.40	28	1.30
29	0.86	29	1.09	29	0.99
30	1.04	30	0.94	30	0.99
31	0.86	31	1.03	31	0.98
32	1.22	32	1.11	32	1.19
33	0.78	33	1.29	33	1.07

VITA

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Candidate for the Degree of

Doctor of Education

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