

AN ABSTRACT OF THE THESIS OF

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(Name) (Degree)

in VOCATIONAL EDUCATION presented on APRIL 12, 1978
(Major) (Date)

Title: AN ANALYSIS OF TASKS PERFORMED BY LOW-ABILITY
OFFICE EMPLOYEES AS VIEWED BY OFFICE
SUPERVISORY PERSONNEL IN ALBERTA, CANADA

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Abstract approved: Donald Beringson

The Purpose of the Study

The purpose of this study was to identify the tasks performed by low-ability office employees as viewed by office supervisory personnel, and, also, to analyze these tasks. The study was conducted in Alberta, Canada.

To analyze tasks performed by low-ability office employees, it was necessary to identify:

1. Tasks being performed by low-ability office employees
2. Skills required to perform low-ability tasks
3. Equipment and machinery operated by low-ability office employees
4. Tasks low-ability office employees might perform if provided with additional training
5. Skills required to increase the employability of low-ability persons
6. Unattractiveness of low-ability tasks
7. Opportunities for advancement in low-ability office tasks

8. Opportunities for decision making in low-ability tasks
9. Tasks performed more efficiently by low-ability office employees

Procedures

An instrument was designed to obtain the data for this study from office supervisory personnel employed by member firms of the Administrative Management Society. Data were collected in a structured-interview format from thirty different organizations in Edmonton and Calgary each, making a total population of sixty respondents. The data were organized according to frequency distribution. Spearman Rank Order Correlation Coefficient was used to analyze the data.

Conclusions

1. Low-ability office employees perform 60 different tasks in the firms surveyed. These tasks are distinguished by: being mastered in a very short time; involving simple, repetitive manipulations or movements; and, generally being done without cooperation or communication to other employees. The most common task performed by low-ability office employees is operating the photocopier. A greater variety of low-ability tasks exists in larger offices than in smaller offices.
2. Low-ability tasks are performed by both low-ability and higher ability office employees. Seven office

tasks are performed better (in terms of productivity, efficiency, and amount of resistance) by low-ability employees. Employers prefer to hire low-ability persons for these tasks.

3. Low-ability persons have very limited opportunities for advancement. None of the more frequently performed tasks offers the low-ability office employee an opportunity to advance.
4. Low-ability tasks are unattractive to office supervisory personnel. The most unattractive tasks involve simple, repetitive hand motions, such as operating the photocopier, typing from copy, refiling cards, and stamping and sealing envelopes. Employers prefer to hire low-ability persons to perform unattractive low-ability tasks.
5. Low-ability office employees operate 28 different pieces of machinery or equipment. The most common piece of equipment used by low-ability office employees is the electric typewriter, followed by the photocopier. Low-ability employees in larger offices operate more equipment and machinery and are more specialized than low-ability office employees in smaller offices.
6. Office employees require 55 different skills to perform the low-ability tasks in an office. Approximately one half of these skills can be learned or developed in the classroom, while many of the

others relate to physical and personal characteristics. A low-ability person with severe physical handicaps is not employable in the office; however, a high-ability person with similar physical handicaps may be profitably employed in the office.

7. Low-ability persons cannot complete high-ability tasks, nor can they perform a variety of low-ability tasks. This reduces the opportunities for employment of low-ability persons, for they can only be hired by organizations having positions consisting purely of low-ability tasks related to one activity, such as filing, duplicating, or delivering messages.

An Analysis of Tasks Performed by Low-Ability
Office Employees as Viewed by Office
Supervisory Personnel in Alberta, Canada

by

Donald Samuel Rencz

A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

DOCTOR OF EDUCATION

April, 1978

Commencement June 1978

APPROVED:

Redacted for Privacy

Associate Professor of Education
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Date thesis presented April 12, 1978

Keyboarded by Cathy Rencz for Donald Rencz

ACKNOWLEDGEMENTS

The writer would like to acknowledge the persons who have contributed significantly to this study.

Michael Colbert, Anne Keast, Theodore Madden, and Clinton Reeder, doctoral committee members, who supported the writer from start to finish.

Donald Beringson, Committee Chairman, who took a finished copy back to a rough draft.

Bradley Lessley, colleague, who shared the frustrations.

Samuel and Jean Rencz, parents, who financed the study.

Cathy Anne Rencz, wife, who, although not knowing the way, kept pushing.

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AN ANALYSIS OF TASKS PERFORMED BY LOW-ABILITY
OFFICE EMPLOYEES AS VIEWED BY OFFICE
SUPERVISORY PERSONNEL IN ALBERTA, CANADA

I. INTRODUCTION

It is the right of every Canadian student to seek employment upon completion of high school. This right is reflected in a recent Canadian study which determined the number one priority of secondary schools is "preparing students for the world of work and jobs" (Chalmers and McPhie, 1972). For this reason, vocational programs are designed to make students employable.

Employability, according to Cross (1975), is:
the state of being employable, of possessing those qualities which the employer requires. They may be standards of workmanship including neatness, efficiency, creativeness, quality production, and use of accepted procedures. Personal characteristics needed for employability frequently make the difference between job success and failure, even more so than do occupational skills. Personal qualities needed may include personal appearance, promptness, pleasant attitude, cooperativeness with fellow workers, and ability to take criticism and direction.

Employability criteria lists have been formulated that contain a core of desirable qualifications. Representative of an employability criteria list would be one prepared by Mason and Haines (1972), which described the good worker as having the following qualities:

Dependability: able to work with little supervision, prompt, truthful, sincere, consistent, follows instruction

Cultural Refinement: courteous, considerate,
respectful, mannerly

Leadership: aggressive, forceful, shows good
judgement, imaginative, resourceful, able to inspire
others to act

Industriousness: persistent, has good habits of work,
makes wise use of time

Mental Alertness: attentive, interested, observing,
eager to learn, has good memory

Personal Appearance and Grooming: clean, not
offensive, has neat appearance, shows orderliness,
has poise

Ability to Get Along With Others: tactful, friendly,
has sense of humor, cooperative

Not everyone possesses the desirable qualities of employability. Bennett (1972b) noted that low-ability students, whom he described as having I.Q.'s ranging from 70 to 90, lack most of these qualities. He determined that as many as 20 per cent of the high school population fit into this category.

The relationship between scholastic ability and employability has been studied. Karnes (1970) observed that compared with average students, low-ability students: learn at a less rapid rate, have more physical defects, have a shorter attention span, have poorer communication skills, are less mature, have a harder time following directions, and have more limited leadership potentials. Callahan and Robinson (1973) noted that low-ability persons tend to exhibit such characteristics as

nervousness, insecurity, and immaturity, and do not function well under pressure situations.

Few studies have been conducted to determine the employment opportunities that exist for low-ability persons. Wells conducted a study in 1967 to ascertain what opportunities exist for business education students who displayed the following characteristics: short attention span, low self-esteem, lacking in discussion ability, some nervous mannerisms, sometimes forgetful, and below-average intelligence. She concluded that office employment opportunities occur for low-ability persons in at least three areas, notably "duplicating services." In a more exhaustive follow-up study, Wells (1971) reached similar conclusions. The 1971 study probed one step deeper by determining that low-ability persons are employed only when persons of higher ability are not available.

The following year, Bennett (1972a) reported that business organizations employ low-ability persons as file clerks, general clerks, messengers, and mail clerks.

Statement of the Problem

Low-ability students face two disadvantages while seeking office employment. First, employers prefer to hire high-ability personnel, even in those situations

where low-ability employees could satisfactorily perform the assigned duties (Roger, 1968). Second, low-ability students often receive high school training and experiences that are not commensurate with their ability level (Harris, 1974). This is compounded by most low-ability students seeking employment with minimal post-secondary education. In their favor, low-ability office education students are being trained for a field which consists of work tasks ranging from the most simple to perform to the rather complex and difficult to complete.

Hansen, Weisbrod, and Scanlon (1970) suggested educators determine the potentialities of low-ability students and offer them a curriculum which not only provides job skills, but does so at a level equal to their abilities. A significant conclusion of their study dealing with the relationships among education, ability, and income was "(low-ability students) are unlikely to benefit financially unless an attempt is made to insure that they learn in school rather than merely attend school."

Holt (1976) basically agreed with this idea, but felt it needed more explanation. His concern was that when students learn a skill, they must then find something to do with it. He wanted vocational education to identify those skills that are needed on the job and then provide the students with these skills.

The problem of this research was to determine the skills low-ability office education students could learn and should learn by identifying the tasks low-ability employees perform or could perform in an office environment.

Purpose of the Study

The main purpose of this study was to identify and analyze the work tasks performed by low-ability office employees, as assessed by office supervisory personnel in Edmonton and Calgary, Canada.

More specifically, the study identified:

1. Tasks being performed by low-ability office employees
2. Skills required to perform low-ability tasks
3. Equipment and machinery operated by low-ability office employees
4. Tasks low-ability office employees might perform if provided with additional training
5. Skills required to increase the employability of low-ability persons
6. Unattractiveness of low-ability tasks
7. Opportunities for advancement in low-ability office tasks
8. Opportunities for decision-making in low-ability tasks
9. Tasks performed more efficiently by low-ability office employees

The results of this study may reasonably assist in

developing a more realistic curriculum for low-ability students in business and office education to better enable them to assume their role as productive citizens within the community.

Need for the Study

Many school administrators and counselors believe that "if a student cannot succeed in an academic subject the best place for him is in a vocational course" (Bennett, 1972a). This rationale has resulted in a high proportion of low-ability students being enrolled in vocational education departments. At the same time, vocational education has been challenged by the Policies Commission for Business and Education (1961) to "provide an adequate program of vocational preparation for all boys and girls who will enter business upon completion of high school."

Low-ability students cannot profit from all instruction designed for the average student. Ames (1977) reported that low-ability students do not generally benefit from a slower pace over the same materials taught to normal students, but require specialized instruction related to their needs. Other authorities, studying independently, made observations supporting Ames.

Myklebust (1964), Blake (1969), and Harris (1974) all reported that low-ability students need educational

experiences different from those offered average students. Foy (1970) wanted low-ability students to have "a realistic curriculum that will enable them to ... get a job and keep it." He advocated a program in which job skills and classroom skills can be tied together right in class. Anderson (1974) determined that jobs do exist for low-ability students provided they have received adequate pre-employment training.

Chapter (1954) strongly recommended that business education program designers consult business people. He claimed there is no substitute for the kind of input that they could provide. This point is also emphasized by Tonne (1961), one of the leading authorities in office and business education. He wrote, "When training is given without adequate planning based upon actual occupational needs, it is likely to be ineffective." With good planning in the program, Tonne said, the prospective employee will have an answer when the personnel manager asks "What can you do?"

Another authority who advocated that people from business be allowed to contribute to vocational education was Ristau (1969). He noted that information regarding labor market needs and trends is basic to developing realistic vocational education programs. Ristau's main concern at that time, however, was to devise a system of

occupational analysis, which in turn, he believed, should be used to determine the skills that should be taught.

The most influential support for a task analysis study came from Larson (1969), who while conducting research for the U.S. Department of Health, Education, and Welfare, wrote:

The real thrust of building curriculums for vocational instruction is found in analysis of occupations. Requirements of the employers are essential to identifying content for occupational and vocational education. Interpretation of the employer's needs of today for tomorrow's program of vocational education to meet the requirements of the employer is more complex-- but highly significant in today's changing technological civilization.

Many Canadian businessmen and students, believing a disparity exists between the perspectives of school and those of society, have questioned the credibility of the school and its curriculum (Katz, 1974). Some businessmen, according to Katz, are recommending certain aspects of literature, history, and art be sacrificed for more practical training better suited to the needs of the business world.

A task analysis is especially relevant in developing a curriculum for low-ability office and business education students. Kashuba (1971), Business Education Consultant for Alberta, noted that low-ability students require practical learning experiences designed

around tangible material which, ideally, would be derived from an analysis of tasks done on the job. He emphasized the need for an analysis of tasks performed by low-ability office workers in Alberta.

The information gathered from a tasks analysis has many uses and advantages. Cristal (1970) noted that while such analyses are used mainly to determine the critical tasks that should be taught in a vocational or technical education program, they can serve as counseling aids to help students obtain realistic perceptions of occupations. He endorsed the use of a tasks analysis because it yields information which is both quantifiable and accurate.

In summary, a study to analyze the tasks performed by low-ability office employees is justified on the basis that:

1. Vocational education has an obligation to prepare its students for the world of work (Roberts, 1971)
2. Twenty per cent of the high school student population is low-ability (Bennett, 1972b)
3. Low-ability students require a realistic vocational education curriculum (Ames, 1977)
4. A task analysis is critical in the preparation of a realistic vocational education curriculum (Ristau, 1969)
5. An analysis of tasks performed by low-ability office employees does not exist for Alberta (Kashuba, 1977)

Limitations

This study was limited by the following factors:

1. Office environments are not consistent. They vary in size, equipment, and function. Operations which appear similar may involve different skills. To compensate for this, tasks, rather than jobs, were identified.
2. Respondents may have been influenced differently by their experiences with low-ability employees.
3. The respondents may have been influenced by the line of questioning. The researcher attempted to obtain the best data possible and used discretion in interpreting and eliciting the responses.

Delimitations

This study was delimited in the following ways:

1. No attempt was made to determine the work tasks performed by low-ability persons in any vocation other than clerical office employment.
2. No attempt was made to identify low-ability persons by name.

Definition of Terms

The following terms are defined as they apply to this study.

Average Person: A person with an intelligence quotient score between 95 and 110 and with no mental or physical handicaps. Interchangeable with the term Normal Person. Most people fit into this category.

Business Education: An area of vocational education which equips the student with skills necessary to perform particular functions in an office. Interchangeable with the term Office Education.

Career Ladder: A vertical arrangement of jobs within an occupational area to indicate skill distinction and progression.

Job: A specific grouping of tasks assigned or delegated by competent authority for the accomplishment of an objective. These constitute a position of employment.

Low-Ability High School Graduate: A low-ability student who graduates from high school.

Low-Ability Office Employee: A low-ability person who is a wage-earner. Such an employee would score between 20 and 45 on the Wonderlic Examination for Office Occupations.

Low-Ability Person: A person who has a native intelligence below that of the average person. Such a person

would score between 70 and 95 on an intelligence quotient examination such as the Stanford-Binet, and would display the following characteristics: short attention span, low self-esteem, lacking in discussion ability, some nervous mannerisms, and sometimes forgetful.

Low-Ability Student: A low-ability person who attends school. Such a student would rank in the bottom 20 to 25 per cent of the class academically. This student is also referred to as a Slow Learner.

Low-Ability Task: A task that could be performed by a low-ability person.

Occupational Area: A group of jobs that are related on the basis of required skills and knowledge.

Office Supervisory Personnel: An employee in an organization with particular responsibilities including the supervision of office staff.

Task: An action or action sequence grouped through time, designed to contribute a specified end result to the accomplishment of an objective and for which functional levels and orientation can be reliably assigned.

Task Analysis: The identification of the technical facts of a specific job and the reporting of the workers' activities and requirements.

Underachiever: A student with an average or above-average native intelligence who does not work up to his ability level. Through error, this type of student may be placed within a low-ability group. For the purposes of this study, this term is not interchangeable with the terms Low-Ability Student and Slow Learner.

II. RELATED LITERATURE

The review of related literature is presented in three sections. The first section presents a profile of low-ability persons and slow learners. Section two reviews curricular patterns and instructional techniques for low-ability students. Section three reviews employment considerations and opportunities for low-ability personnel.

The Library Retrieval Service at Kerr Library at Oregon State University was employed to assist in identifying and locating all the available information published since 1948.

Profile of Slow Learners and Low-Ability Personnel

Authorities defined low-ability persons and slow learners by referring to one of two sets of criteria. Burt (1953), Frain (1956), Bennett (1972a), and Divoky (1974) defined slow learners in terms of percentile ranks. Burt contended that slow learners are students whose educational achievements are less than 80 per cent of the average for their particular age group. Frain described slow learners as being those students ranking in the lowest 15 to 20 per cent in general intelligence. Bennett considered low-ability students as those who place in the bottom 20 per cent of the class. Divoky also referred to the bottom 20 per cent of the public school

population as low-ability students. Her justification was the result of a study by the Chicago Educational Facilities Center which estimated that two out of every ten children are low-ability and possess learning disabilities.

Intelligence quotient score is the other device that has been readily used in an attempt to define low-ability persons or slow learners. The authorities agreed that I.Q. scores for low-ability persons range from 75 to 95 (Beggs, 1960; Herber, 1968; Anderson, 1974; and Johnson, 1975).

Others identified low-ability persons using additional factors along with general intelligence. Ellenbogen (1964) added that slow learners have a reading level that is two years below the average. The consensus was that low-ability students comprise about one-fifth of the high school student population. The degree of commonality in the definitions provided by authorities of low-ability persons indicated there is an understanding as to who is considered low-ability.

Much has been researched and written on the personal characteristics of low-ability persons. A study conducted by the Los Angeles County Schools Research and Guidance Division showed (see Table 1) the assets and liabilities of slow learners as analyzed from responses

identified by Binet in conjunction with his published tests.

TABLE 1
PSYCHOLOGICAL ASSETS AND LIABILITIES OF SLOW LEARNERS*

Psychological Assets	Per Cent Possessing	Psychological Liabilities	Per Cent Possessing
Vocabulary	68	Lack of ingenuity	96
Visual memory	56	Lack of concentration	80
Reasoning	52	Defective auditory memory	64
Coordination	40	Reading disability	64
Notes details well	36	Poor vocabulary	60
Follows sequences	36	Poor coordination	60
Sense of direction	32	Cannot follow sequences	56
Foresight	32	Inferior reasoning	
Auditory memory	8	ability	48
Ingenuity	4	Lack of foresight	44
		Defective visual memory	36

*SOURCE: The Slow Learner in the Secondary School, Los Angeles County, Office of the Superintendent of School Curriculum, Monograph M-70 (Los Angeles, 1949)

In a similar fashion, Wells (1967) identified the personal characteristics of low-ability students as being either "capabilities" or "liabilities." Her breakdown is shown in Table 2.

Shultheis (1968) characterized the slow learner

as:

limited to a maximum mental age of from 12 to 14½ years...learn more slowly than persons of average intelligence...usually have a poor memory, and fewer, less diverse associations than do persons of average intelligence...usually have difficulty reasoning, defining, analyzing, or conducting logical or abstract thinking...tend to have a narrower scope of attention than do persons of average intelligence...do not differ greatly from

TABLE 2
PERSONAL CHARACTERISTICS OF LOW-ABILITY STUDENTS

CAPABILITIES	LIABILITIES
Do not tire quickly of mechanical tasks Generally uncomplaining Can be dependable Eager, within abilities Honest in attitude Exhibit group loyalty Thrive on evidence of progress	Short attention span Low self-esteem Lacking in discussion skills Limited vocabulary Some nervous mannerisms Sometimes forgetful Below-average intelligence

persons of average intelligence in simple visual and auditory perception...tend to have difficulty detecting their own errors...are usually poor at generalizing from experience...seem to respond best to concrete activities with immediate goals.

Specialists agreed that low-ability students share common learning difficulties. These students, although not primarily retarded, emotionally disturbed, or sensorially impaired, are unable to learn from the normal educational experiences. Their behavior is characterized by disorganization, and they do not function well under pressure. Low-ability students seem to anticipate failure and defeat and generally have poor attitudes towards subjects, the school, and individual teachers (Hammill and Bartel, 1971; Vaugh and Hodges, 1973; Callahan and Robinson, 1973; and Bryan, 1974).

Ames (1977) preferred to consider low-ability a concept rather than a category. She claimed these students have learning problems in one or more areas of development or ability, and by dealing with the concept of low-ability it is possible to understand the motives and actions of low-ability persons.

The U.S. Department of Health, Education, and Welfare required a definition which would make it possible to isolate the students who qualify for federal assistance. The Vocational Educational Amendments of 1976 [P.L. 94-482, Sec, 195(16):U.S.C. 2461.] defined an academically disadvantaged person as one who:

1. Lacks reading and writing skills
2. Lacks mathematical skills; or
3. Performs below grade level

A relatively complete description of low-ability students was prepared by Karnes (1970). He reported sixteen characteristics and needs of the slow learner which teachers and employers must consider when dealing with them. A presentation of these characteristics is listed as follows:

1. Learning rate is less rapid than normal, but not as slow as the educable mentally retarded
2. Tendency toward more physical defects than the average child
3. Consistently below grade level in academic progress

4. Reasoning ability is poorer than that of the normal child
5. Short attention span
6. Poor retention
7. Incidental learning is not as prevalent
8. Poor work habits and poor motivation to learn. They find it difficult to persist independently until a task is completed
9. Respond to immediate goals rather than delayed ones
10. Poorly developed language and communication skills
11. Less mature socially and emotionally than their brighter peers
12. Less confident and less adequate than average children
13. Difficult time following directions
14. Lack of curiosity and creativeness
15. A large percentage come from disadvantaged homes
16. Capable of being followers but have limited leadership potentials

The characteristics identified here by Karnes are representative of low-ability descriptions provided by other authorities.

Educators have established a normative frame of reference for expected performance, and any difference between actual and expected achievement is the basis for labeling that student as being a slow learner, normal, or gifted, according to Algozzine and Sutherland (1977). They believed the levels of achievement were established

arbitrarily, and not related to the achievement level of the individual students. This coincides with the thinking of Myklebust (1964), when he said, "Tell me how many (low-ability students) you want to find and I'll write you a description that will find that many."

However, the views of Algozzine and Sutherland, and Myklebust, were outnumbered, for the majority of the authorities accepted the concept of low-ability students and believed that they could be identified. The investigator of this study agreed with this viewpoint.

Curricular Patterns and Instructional Techniques for Low-Ability Students

There is evidence that there has been a long and close association between low-ability students and vocational education. According to Sears (1931), formal vocational education in America received impetus when it served as a way to occupy the time of delinquent and low-ability children. Sears added, however, "It is not always true that this training was given with the altruistic motives which should have been the guiding force".

Vocational education programs continue to offer a unique contribution to the education of low-ability students. These programs provide low-ability students with skills and abilities that will enable them to assume

a producer role within our society. This is due in part to the pragmatic nature of vocational courses which are more directly related to the learning styles of low-ability students than the traditional academic programs (Tonne, 1961).

Some authorities believed that the mental capacity of low-ability students is high enough to justify keeping them in the normal classroom. DeHann and Hough (1956) believed low-ability students could cope with the rigors of the normal classroom, but would find it difficult to maintain typical class achievement. Likewise, Dobbs (1966) suggested that low-ability students can make satisfactory progress in the normal classroom, but only when given periods of time to study and when the variables in the assignments are reduced to an absolute minimum.

Subsequent authorities were not as confident in the scholastic ability of low-ability students. Mango (1967) believed that slow learners lack incentive and confidence in themselves. His study revealed that slow learners have little capacity to concentrate on drills, exercises, and problems. Dupree (1968) agreed with Mango, and added that low-ability students are a perpetual challenge to the educational system.

The literature emphasized the importance of employing basic teaching techniques to the learning process when working with low-ability students. Teske (1972) viewed instruction humanistically and cautioned that "instructional activities must be appropriate to the interests, needs, and abilities of the individual student." Explaining this more fully, Anderson (1974) said "regardless of the teaching method used, keep in mind that below-average learners have a slower reaction time, a shorter attention span, and a shorter memory span than the average learner." She offered the following fifteen teaching concepts or methods as aids in teaching the slow learner.

1. Thoroughly explain and illustrate a topic before making an assignment
2. Let the student know exactly what he is expected to do at the end of the lesson, unit, or grading period
3. Have patience and understanding
4. Show sincere interest, care, warmth, and firmness at the right time
5. Teach one thing at a time at a pace the learner can master
6. Re-explain and re-illustrate a lesson when necessary
7. Provide ample repetitive practice
8. Reinforce immediately through materials with correct answers
9. Vary teacher demonstrations, visual aids, etc.

10. Make maximum use of films, field trips, and peer tutoring
11. Give ample assistance
12. Modify the standards so that each learner can have some success
13. Give short, but frequent, tests at learner's level
14. Use relevant daily activities which actively involve the student
15. Replace formal book sessions with rap sessions

Harris (1974) wanted educators to use the terminology "student with instructional disabilities" rather than "low-ability student." He believed the academic performance of these students could be improved most by providing them with an individualized instructional program which contains simple but specific assignments.

Other authorities also did not appreciate the terms "slow learner" and "low-ability student." Meyer (1976) said that these terms "trigger prejudice" and do not permit these children to have an equal opportunity to grow and learn. Meyer preferred the emphasis to be shifted from the word "slow" to the word "learner."

To find more about business and office education's role regarding low-ability students, Bennett (1973) surveyed 148 business education department chairpersons. Seventy-seven per cent of the respondents in Bennett's survey believed that the high school business department

should be responsible for vocational training of low-achieving students. Bennett also asked the chairpersons to report any specialized practices and/or programs in their schools for low-achieving students. Table 3 presents the responses to this question.

TABLE 3
PRACTICES AND/OR PROGRAMS FOR LOW-ACHIEVING STUDENTS

PRACTICE AND/OR PROGRAM	PERCENTAGE
Remedial course in other departments	58.1
Specialized counseling	48.7
Individualized instruction by another student	46.0
Individualized instruction by a teacher	38.5
Special courses	32.4
Work study program	31.8
Ability grouping	30.4
Office simulation techniques	27.0
Remedial courses in business education department	27.0
Special job placement	23.0
Laboratory periods	18.9
Flexible graduation requirements	14.2
Flexible or modular scheduling	4.1

Blake (1969) conducted a study which indicated that low-ability students cannot learn as fast nor as much as average students. Later authorities also made reference to this and attempted to determine where and how to best channel the efforts and abilities of low-ability students.

Most of the later attempts to train low-ability students have centered on the teaching of basic job

skills. Foy (1970) advocated a program in which job skills and classroom skills can be linked together within the classroom. He believed that a job experience program in which young people can earn while learning would greatly increase the slow learners' self-confidence.

Isabelle and Lokan (1973) collected follow-up information on 1,500 students who graduated from a two-year occupational high school in Ontario in 1969. Their findings revealed that 40 per cent of those students now hold jobs unrelated to that training. Isabelle and Lokan concluded that if a job experience is to be used, it must be in an occupational area where employment statistics indicate a need for workers.

Support for Isabelle and Lokan's conclusion was provided in a study by Hansen, Weisbrod, and Scanlon (1970), which reported that low-ability students who obtained a marketable job skill in high school are earning more money than those who did not.

Another consideration was provided by Allen (1974). He said to make students more employable, the vocational instruction should concentrate on student learning attainments. As the students gain in skills and knowledges, the instruction should gradually involve the conditions found within an occupation. Ristau (1969)

advocated that this can be done if curriculum designers develop tasks analyses of occupations for use in the classroom.

This sentiment was supported by many other curriculum designers. Wright (1975) stated "vocational educators should find out what the hiring criteria in their occupational areas are and do all they can to help students cope with them."

Arnold and Ferguson (1973) claimed that a vocational curriculum should depend upon:

1. Local and national manpower needs
2. Student needs as perceived by school staff
3. Student occupational aspirations
4. Parental occupational preferences for their children

A unique characteristic relative to this study was that it involved responses from parents as well as educators.

Martin (1965) postulated that the problem underlying the present under-utilization of manpower is the result of ill-defined and haphazard classification and grouping of jobs according to skills and abilities.

From research conducted on the occupational aspiration-expectation discrepancies among high school seniors, Bogie (1976) determined that low-ability students have wider discrepancies between occupations they would like to achieve and the ones they actually

expect to enter, contrasted with higher ability students. He explained that low-ability students feel they are being pushed into existing programs that do not allow for their interests and abilities. They have little opportunity to select a career path independent of outside influence.

Hamdani (1977) made reference to the occupational aspiration-expectation discrepancy research by claiming that a major deficiency in the educational process is the failure of schools to help low-ability students select and prepare for meaningful careers. He advocated that the career education model of career awareness, exploration, and skill preparation is important for the average-ability and high-ability students, and especially important for low-ability students.

A study by Cristal (1970) revealed that a task analysis can be especially beneficial to educators and business people alike. He listed that a task analysis can be used to determine:

1. The different jobs that exist, along with their relation to one another and the requirements of the incumbent of each job
2. Job differences and relationships to be used in identifying and structuring specific jobs into career fields and career field ladders
3. Training that can be reduced or eliminated. Obsolete subject matter can be identified and removed from existing curricula

4. The critical tasks that should be taught in a vocational or technical education program
5. The critical tasks that should be included in occupational competency and certification tests
6. Appropriate counseling aids to help students receive realistic perceptions of occupations

Several advantages have been claimed for the task analysis technique. Cristal (1970) appreciated its use in designing curricula because it yields information that is accurate. Melching and Borchert (1973) like the technique because it can collect data easily from many sources.

Two recent writings stressed the need for business people to contribute to the vocational high school curriculum. Katz (1974), in his book Education in Canada, claimed that members of the business community in Canada want to be consulted regarding the secondary school curriculum. Niss and Pledge (1977), believing that employers are in the best position to make suggestions for course content in vocational programs, wanted employers to determine the vocational training of employees for entry-level occupations.

Employment Considerations and Opportunities for Low-Ability Personnel

Limited research has been conducted regarding the employment opportunities and conditions for low-ability

persons. In general, the reviews considered a person with a low intelligence quotient at a disadvantage in the labor market. A study by Jurist (1967) indicated that a person's success in business was dependent upon many factors. These included personality, social graces, training, and mental ability. A low rating in one of these areas would not necessarily prevent a person from succeeding in the employment market.

Featherstone (1951) conducted a study to determine the reasons why low-ability persons lose their jobs. His findings indicated that persons lose their jobs primarily because of their inability to work with other people. The slow learner, according to Featherstone, is often unrealistic in his outlook on the world of work. It was not unusual for slow learners to often overestimate their capacities and set goals which are much higher than can be expected to achieve.

Beggs (1960) indicated that job prospects for the slow learner are not good. He added that "this is hardly a surprise to either school guidance counselors or the industrial personnel managers; but the starkness of the situation can only be felt by the chronically unemployed." In that same year, Flood (1960) conducted a similar survey on job opportunities. Her findings were somewhat

different, and revealed office job opportunities do exist for someone having less-than-average capacity.

In certain circumstances, it is advantageous to hire low-ability persons. Andrews (1961) noted that low-ability persons are generally hired for a specific task and are capable of immediate production rather than long run potential.

More recent studies have attempted to determine the occupational areas in which low-ability office workers are employed. Hansen (1961) mailed questionnaires to low-ability graduates from a California high school. Her findings indicated that very few are hired in the stenographic, secretarial, or bookkeeping areas although they received high school training in these areas. She determined that preparation of low-ability students for low-level clerical positions is much more realistic.

A similar questionnaire was sent out by Carlson (1966) to businessmen in order to determine the office employment opportunities for the average and below-average student. Over 80 per cent of his results indicated that the average or below-average student could handle the positions of addressing machine operator, file clerk, folding machine operator, general typist (forms), mail clerk, mimeograph operator, and spirit

duplicator operator. Seventy per cent mentioned that these persons could operate the adding machine, while 50 per cent indicated that they were capable of switch-board operation, verifier operation, and work of a receptionist.

Wells (1971) conducted research on office employment opportunities for low-ability persons. Her research determined that more office managers are dissatisfied with low-ability personnel than are satisfied with such persons. To rectify this situation, the office managers surveyed by her suggested a curriculum for low-ability students which includes an emphasis on basic knowledges, on social business knowledges, and a marketable skill with a reliance in cooperative education.

The findings of Bennett's (1972a) survey on job opportunities were not favorable to the low-achiever. He reported that while job opportunities of an office-clerical nature do exist for low-achieving students, these opportunities do not occur in all companies. In those companies in which jobs occur for low-achievers, they are limited in both variety and number.

Huffman and others (1971) noticed that even though there had been an increase in the number of jobs available in office occupations, there had not been a corresponding increase in the number of low-ability

people filling these positions. They referred to these people as the "untapped manpower in our society."

Several studies provided more optimism for the low-ability student. Anderson (1974) noted that "major employment opportunities for these youth (low-ability) are in the business field, provided they receive adequate pre-employment training in schools and on-the-job training." Another study reported on the type of work activity assigned to low-ability office workers as being routine in nature and that they were good employment candidates for these positions (Work, 1961).

A study by Strauss (1975) revealed that workers place "interesting work" as the most significant characteristic relative to their respective position. Six of the eight top ranking work aspects were related to job content. He suggested that low-ability office workers are often assigned those tasks that are not challenging or interesting to higher ability office workers.

Another significant observation was made in a study by Mann and Edsforth (1975). They reported that low-ability office employees could only function if the inputs, outputs, tools, equipment, and procedures were all specified in advance. The assignment or job description needed to specify the amount of work or the standard number of units per hour that was to be

produced. This suggests that low-ability persons performed activities that involved limited or non-existing decision-making skills.

Summary of the Review of Literature

Low-ability persons score between 70 and 95 on intelligence quotient examinations. There was a consensus that low-ability persons share one or more of the following characteristics:

1. Learn at a slower rate than the normal
2. Have more physical defects than the average
3. Are consistently below grade level in academic progress
4. Have poorer reasoning ability than the normal child
5. Respond to immediate goals rather than delayed ones
6. Have a shorter attention span and memory than the average child
7. Have poorly developed language and communication skills

Studies relating to curriculum patterns and instructional techniques indicated that although low-ability students might survive in the regular classroom, they will suffer many hardships and will receive the minimal benefits from those experiences. They suggested a better approach to teaching low-ability students is to determine the job skills which are required of low-ability persons in the labor market then provide the low-ability

students with these skills. Hamdani and Bogie suggested that the vocational aspirations of the low-ability students should also be considered, which is consistent with the career education concept.

In assessing the job opportunities for low-ability personnel, it became apparent that there was little agreement regarding job opportunities for low-ability persons. Even though opportunities existed in the office occupation areas for low-ability persons, there were discrepancies in the number of such jobs available, the quality of those jobs, and the entry-skill requirements. This could in part be due to the different geographic regions of the writers, different time periods, or to a lack of standardization in terms and subjective measures. In general, the research reviewed indicated few employment opportunities existed for low-ability office employees. The opportunities that did exist were primarily in the areas of duplicating, filing, and mailing. It was determined that jobs assigned to low-ability persons generally were unattractive to higher ability employees. The literature also revealed the tasks performed by low-ability employees require few decision-making skills and are closely supervised.

Overall, the literature indicated that low-ability persons do exist, they are identifiable, and

they have unique capabilities and liabilities. Low-ability persons have the ability to perform many tasks in an office setting, but often lack the education and experiences to perform these tasks. By referring to a task analysis, educators can provide vocational education students with job entry skills.

III. PROCEDURES

Course content must be determined by task analysis and be closely aligned with the skill and knowledges that are necessary for meeting the job requirements in order to prepare students for gainful employment in that occupation (Drawbaugh, 1966; Gray, 1967). The purpose of this research was to conduct an analysis of tasks performed by low-ability office employees as viewed by office supervisory personnel in Alberta.

A manual by Melching and Borchert (1973), outlining methods used for making task inventories, was a primary reference for developing the procedures and instrumentation for conducting this study. A NOBELS (New Office Business Education Learning System, 1972) study pertaining to office activities also provided guidance in developing this study.

Sample

Melching and Borchert suggested that a study population be obtained from an organization whose membership included the desired sample and would give its endorsement. Accordingly, the sample for this study was chosen from the rosters of the Edmonton and Calgary chapters of the Administrative Management Society (AMS). Sixty organizations were randomly chosen from the four groups

as indicated in Table 4. Study participants were office supervisory personnel employed by the organizations.

TABLE 4
STUDY PARTICIPANTS BY LOCATION AND NUMBER OF OFFICE EMPLOYEES

LOCATION	SIZE OF OFFICE	
	Smaller Offices (1-10 Employees)	Larger Offices (11+ Employees)
Edmonton	15	15
Calgary	15	15

The following guidelines were observed in recruiting the sample:

1. A list of members from the Edmonton and Calgary chapters of the AMS was obtained from the Assistant Director, Region 13 (Oregon, Washington, Alberta, and British Columbia). The AMS membership, consisting generally of persons working in an office environment, has as one of its purposes "to assist institutions in the educational field to interpret the needs of commerce and industry in developing training programs and courses of study" (AMS, 1977).
2. Random numbers were assigned to each of the 183 organizations listed on the rosters from Edmonton and Calgary. The Edmonton and Calgary rosters were

treated equally but separately. A table of random numbers (Kendall and Smith, 1954) was referred to for ranking the organizations to determine the interview sequence.

3. Initial interviews were conducted to identify business organizations willing to participate in the study. These interviews were made in the sequence determined from the assignment of random numbers. The interviews in Edmonton were held from November 14 to December 3. The Calgary interviews were made from December 5 to December 23, 1977.
4. The researcher met with office supervisory personnel in the initial interview to outline the study, describe low-ability persons, and obtain a commitment from them regarding participation in the study. The information presented during the initial interview included an information sheet, a description of low-ability persons, and a sample questionnaire (see Appendices I, II, and III). If there was agreement to participate, a follow-up interview was scheduled. To secure the proper distribution in the sample, it was also necessary to determine the number of office employees at each participating organization. The initial interview consumed approximately twenty minutes.

5. The initial interviews were conducted until a commitment had been reached from sixty business organizations to participate in the study.
6. A follow-up interview was conducted with those organizations agreeing to participate in the study. No attempt was made to sequence the interviews once the population had been established. The follow-up interview, generally lasting between 45 and 60 minutes, was used to secure the data needed for the study.

Instrumentation

The instrument was designed in the structured-interview format, whereby each respondent was asked the same sequence of questions. Support for this method came from Courtney and Sedgwick (1974) who claimed that data for descriptive research obtained through a direct personal interview method have the advantage of being quite valid. Cristal (1970) also approved of the structured-interview approach, adding that the information collected is both accurate and quantifiable.

The following procedures indicate the steps that were used to develop and administer the instrument:

1. Questions were designed to align with the objectives outlined in Chapter I.

2. The first draft of the questions was previewed by a jury of graduate students in vocational education at Oregon State University (see Appendix V). Recommended changes were incorporated into the instrument.
3. The Affirmative Action Office and the Survey Research Center at Oregon State University were consulted to determine the appropriateness of the questions for the patterned interview procedure.
4. The instrument was pilot-tested in two business organizations (see Appendix VI) in Corvallis, Oregon. Necessary modifications were again made on the instrument and the instrument was finalized.
5. An interview procedure was established. The interview procedures were the same for all sixty sites. The researcher asked each question according to the prepared instrument format. Each response was recorded on the instrument by the researcher. The interview instrument is included in Appendix III.
6. The questions used in the interview were:
 - ...What tasks do low-ability office employees perform in your organization
 - ...What skills are required to perform the low-ability tasks in your organization
 - ...What machinery and equipment do low-ability office employees operate in your organization
 - ...What tasks could low-ability persons perform if provided with additional training

- ...What skills are required to increase the employability of low-ability persons
- ...What are the three most unattractive low-ability tasks in your office
- ...What are the opportunities for advancement in low-ability tasks
- ...What are the opportunities for decision-making in low-ability tasks
- ...What low-ability tasks are performed more efficiently by low-ability office employees
- ...What observations have you made regarding low-ability office employees

Treatment of the Data

The data were tabulated from responses to questions on a structured interview form.

Response to question one provided a listing of all the tasks performed by low-ability office employees in the participating organizations. Response to questions two and three provided listings of the skills and machinery necessary to perform low-ability tasks. The data obtained from questions one to three were organized according to combined frequency of smaller and larger offices. Within each category, the respective ranking was included for the task, skill, or machinery.

Response to questions four and five provided a listing of the tasks and skills needed to enable low-ability persons be more employable in the office.

Within each category, the data were organized according to frequency.

Response to questions six through nine provided rankings of the low-ability tasks in terms of four characteristics--unattractiveness, opportunity for advancement, opportunity for decision-making, and performance.

Spearman Rank Order Correlation Coefficient was used to describe the relationship that existed between the rankings of the following three characteristics--unattractiveness, opportunities for decision-making, and performance. The formula used to compute these relationships was:

$$s_r = 1 - \frac{6 \sum (r_a - r_b)^2}{N(N^2 - 1)}$$

The observations of office supervisory personnel pertaining to low-ability office employees were listed.

IV. ANALYSIS OF THE DATA

The data for this study were provided by sixty respondents representing office supervisory personnel in Alberta, Canada. They responded to questions asked during a structured interview which dealt with various aspects of work performed in the office by low-ability employees. The purpose of the study was to identify the tasks performed by low-ability office employees as viewed by office supervisory personnel in Alberta, and, also, to analyze these tasks. Scores were obtained from respondents' listings of the tasks and skills under the various sections of the instrument. The instrument, or structured interview, is displayed in Appendix III.

Tasks Performed by Low-Ability Office Employees

A listing of tasks performed by low-ability office employees was developed by tallying the respondents' listing of all the tasks performed by low-ability office workers employed in their organizations. The tasks were displayed according to the frequency being performed in the offices. Sixty different low-ability tasks were identified. Twenty different tasks were mentioned by at least 20 per cent of the respondents. The other 40 tasks were mentioned less

frequently. The complete listing is displayed in Table 5. Operating the photocopier is the most frequently performed low-ability task in the office.

Basic Skills Required by Low-Ability Office Employees

A listing designed to identify those basic skills required by office employees to perform the tasks listed in Table 5 was developed by tallying the different responses to question two. Fifty-five different skills were listed as being used in the performance of the tasks. These skills were ranked according to the number of tasks they are required for, as determined by the office supervisory personnel. The performance level of many of these skills were criteria in the selection procedure. These tasks are listed in Table 6.

Machinery or Equipment Operated by Low-Ability Office Employees

The listing of machinery or equipment operated by low-ability office employees was determined by tallying the responses to question three. Twenty-eight different pieces of machinery or equipment were identified. (Low-ability office employees in smaller offices operated 15 different machines; in larger offices they operated 26 different machines.) The machinery or equipment is listed in Table 7 according to the number

TABLE 5

TASKS PERFORMED BY LOW-ABILITY OFFICE EMPLOYEES
IN ORDER OF THE FREQUENCY PERFORMED

NO.	TASK	FREQUENCY					
		Smaller Offices		Larger Offices		All Offices	
		Tally	Rank	Tally	Rank	Tally	Rank
1	Operating the photocopier	17	2	22	1	39	1
2	Answering the telephone	18	1	7	14	25	2.5
3	Typing miscellaneous jobs	9	9	16	2	25	2.5
4	Refiling cards, records, etc.	9	9	14	3	23	4
5	Distributing mail within office	10	6.5	12	5.5	22	5
6	Pulling files	8	12	13	4	21	6.5
7	Running bank errands	11	5	10	8	21	6.5
8	Stamping & sealing envelopes	9	9	11	5.5	20	8.5
9	Typing letters from copy	13	3	7	14	20	8.5
10	Taking & forwarding messages	12	4	6	18	18	10.5
11	Dealing with customers/clients	8	12	10	8	18	10.5
12	Collating of reports, etc.	7	16	9	10	16	12.5
13	Placing names on envelopes (labeller/addressograph)	6	18	10	8	16	12.5
14	Making entries on cards, etc.	8	12	6	13	14	14
15	Making coffee	8	12	5	23	13	16
16	Maintaining typewriter	7	16	6	18	13	16
17	Sorting incoming mail	5	20	8	11.5	13	16
18	Running post office errands	7	16	5	23	12	19
19	Straightening-up reception area/office	8	12	4	28	12	19
20	Running odd jobs	10	6.5	2	41	12	19
21	Recording incoming mail	4	25	6	13	10	21.5
22	Delivering messages in office	2	37	8	11.5	10	21.5
23	Operating duplicating machines gestetner, offset	3	31.5	6	13	9	23.5
24	Recording photocopies made	4	25	5	23	9	23.5

Table 5 (continued) TASKS PERFORMED BY LOW-ABILITY OFFICE EMPLOYEES

25	Wrapping parcels	5	20	3	33.5	8	25.5
26	Finding misplaced files	4	25	4	28	8	25.5
27	Signing for mail	4	25	3	33.5	7	28.5
28	Managing stock room	2	37	5	23	7	29.5
29	Recording outgoing mail	4	25	3	33.5	7	29.5
30	Operating microfilm camera	0	--	7	14	7	28.5
31	Writing orders	5	20	1	50.5	6	31.5
32	Straightening-up staff room	3	31.5	3	33.5	6	31.5
33	Maintaining photocopier	3	31.5	2	41.5	5	37
34	Recording deliveries made	3	31.5	2	41.5	5	37
35	Making route calls	4	25	1	50.5	5	37
36	Typing lists	2	37	3	33.5	5	37
37	Cleaning office machines	1	43.5	4	28	5	37
38	Assisting in taking inventory	3	31.5	2	41.5	5	37
39	Weighing mail	1	43.5	4	28	5	37
40	Operating switchboard	0	--	5	23	5	37
41	Matching invoices	4	25	1	50.5	5	37
42	Operating envelope stuffer	0	--	4	28	4	42.5
43	Displaying bulletin boards	2	37	2	41.5	4	42.5
44	Recording weights	1	43.5	2	41.5	3	45.5
45	Making phone inquiries	3	31.5	0	--	3	45.5
46	Wrapping & bagging coins	1	43.5	2	41.5	3	45.5
47	Operating envelope sealer	0	--	3	33.5	3	45.5
48	Operating microfilm viewer	0	--	2	41.5	2	49.5
49	Preparing visual aids	0	--	2	41.5	2	49.5
50	Sorting & counting coins	0	--	2	41.5	2	49.5
51	Shelving merchandise	2	37	0	--	2	49.5
52	Making microfilm copies	0	--	1	50.5	1	56
53	Placing cards in computer	0	--	1	50.5	1	56
54	Making phone connections	1	43.5	0	--	1	56
55	Operating tape recorder	0	--	1	50.5	1	56
56	Being left in charge	1	43.5	0	--	1	56
57	Marking boxes	0	--	1	50.5	1	56
58	Recording supplies	1	43.5	0	--	1	56
59	Managing film library	1	43.5	0	--	1	56
60	Changing date on calendar	0	--	1	50.5	1	56

TABLE 6

REQUISITE SKILLS RANKED ACCORDING TO THE NUMBER
OF LOW-ABILITY TASKS FOR WHICH THEY ARE USED

NO.	BASIC SKILL OR ATTRIBUTE	RANK, ACCORDING TO USAGE		
		Smaller Offices	Larger Offices	All Offices
1	Reading	1	1	1
2	Manual dexterity, mobility	3	3	2
3	Writing	2	6	3
4	Finger dexterity, work	6	2	4
5	Typing (40+ w.p.m.)	4	6	5
6	Communicate verbally	5	15.5	6
7	Elementary computation skills	8	6	7.5
8	Neatness	7	9	7.5
9	Physically fit, healthy	10.5	8	9
10	Friendly, personable	9	11	10
11	Understanding the alphabet	10.5	11	11.5
12	Eye-hand coordination	10.5	4	11.5
13	Understanding a filing system	16.5	11	13
14	Responsible, diligent	16.5	13.5	14
15	Following orders and instructions	16.5	18	15
16	Driver's license	13	29.5	17.5
17	Knowing the city (routes)	13	29.5	17.5
18	Lifting	13	29.5	17.5
19	Good vision	13	29.5	17.5
20	Knowing the organization	22	22	20.5
21	Outgoing	22	22	20.5
22	Common sense	22	29.5	24
23	Phone etiquette	22	29.5	24
24	Learning a routine	46	15.5	24
25	Setting-up a letter	28	22	24

Table 6 (continued) SKILLS REQUIRED TO PERFORM LCW-ABILITY TASKS

26	Working at a repetitive task, perseverance	35.5	18	24
27	Working with others	16.5	49.5	27.5
28	Attractive	35.5	22	27.5
29	Understanding a coding system	28	38	32.5
30	Energetic	22	49.5	32.5
31	Good vocabulary	35.5	29.5	32.5
32	Good hearing	22	49.5	32.5
33	Positive attitude	28	38	32.5
34	Mechanically inclined	46	22	32.5
35	Deliberate, slow but sure	28	38	32.5
36	Sense of organization	--	18	32.5
37	Under cross-referencing	35.5	38	39.5
38	Quiet	35.5	38	39.5
39	Spatial judgement	46	29.5	39.5
40	Good memory	35.5	38	39.5
41	Spelling	22	--	39.5
42	Annunciation	28	49.5	39.5
43	Bondable	35.5	49.5	44.5
44	Proofread	35.5	49.5	44.5
45	Working alone	--	29.5	44.5
46	Knowing the building	46	38	44.5
47	Feminine voice	--	38	44.5
48	Elbow grease	46	49.5	48.5
49	Correcting typing errors	46	49.5	48.5
50	Well dressed, groomed.	--	38	48.5
51	Distinguish colors	--	49.5	53
52	Course in graphic arts	--	49.5	53
53	Taking messages	46	--	53
54	Good vision	46	--	53
55	Own transportation	46	--	53

TABLE 7
MACHINERY AND SPECIALIZED EQUIPMENT
OPERATED BY LOW-ABILITY PERSONNEL

NO.	MACHINERY OR EQUIPMENT	FREQUENCY BY SIZE OF OFFICE					
		Smaller Offices		Larger Offices		All Offices	
		tally	rank	tally	rank	tally	rank
1	Electric typewriter	21	1	23	1	44	1
2	Photocopier	18	2	19	2	37	2
3	Telephone	6	4	10	3	16	3
4	Postage meter	7	3	6	6.5	13	4
5	Scale	4	5.5	4	11	8	5
6	Addressograph	3	8	4	11	7	7
7	Gestetner	3	8	4	11	7	7
8	Microfilm camera	0	-	7	4	7	7
9	Car	4	5.5	2	17	6	10.5
10	Stuffer	0	-	6	6.5	6	10.5
11	Switchboard	0	-	6	6.5	6	10.5
12	Collater	0	-	6	6.5	6	10.5
13	Stapler	3	8	2	17	5	14
14	Microfilm viewer	0	-	5	9.5	5	14
15	Microfilm copier	0	-	5	9.5	5	14
16	Wrapper	1	12.5	3	13	4	16
17	Labelling machine	1	12.5	2	17	3	18
18	Card catalogue	0	-	3	13	3	18
19	Time stamp	0	-	3	13	3	18
20	Address labelling machine	0	-	2	19	2	21.5
21	Strapper	0	-	2	19	2	21.5
22	Coin sorter	1	12.5	1	22	2	21.5
23	Offset duplicator	1	12.5	1	22	2	21.5
24	Wagon tray	0	-	1	22	1	26
25	Programmable typewriter	0	-	1	22	1	26
26	Stamp machine	1	12.5	0	-	1	26
27	Card index	1	12.5	0	-	1	26
28	Cassette recorder	0	-	1	22	1	26

of offices in which they are being operated by low-ability office employees.

Tasks Low-Ability Office Employees Could Perform if Provided with Additional Training

Table 8 presents a listing of tasks that low-ability office employees could perform, but did not because they lacked the training. Office supervisory personnel identified 13 such tasks that low-ability office employees have the ability to perform. These tasks were listed according to the number of times they were suggested by the office supervisory personnel.

Skills Required to Increase the Employability of Low-Ability Office Workers

In order to perform more tasks in the office, low-ability employees require additional skills and training. The office supervisory personnel participating in this study made recommendations regarding ways to make low-ability persons more employable. These skills are listed in Table 9 according to the number of times they were recommended.

The Unattractiveness of Low-Ability Tasks

A review of the literature indicated that low-ability tasks are generally unattractive. To

TABLE 8

TASKS THAT COULD BE PERFORMED BY LOW-ABILITY OFFICE
EMPLOYEES WITH ADDITIONAL EDUCATIONAL EXPERIENCES

Task	No. Office Supervisory Personnel Reporting (of 60 total)
Typing letters from rough copy	8
Taking messages over the phone	7
Operating the dictaphone	6
Making appointments over the telephone	6
Operating a programmable typewriter	5
Operating a switchboard	3
Operating a communicating typewriter	2
Operating microfilm equipment (camera, viewer)	2
Proofreading	2
Checking invoices	1
Receiving customers/clients	1
Operating a cash register	1
Handling money	1

TABLE 9

BASIC SKILLS REQUIRED TO INCREASE THE
EMPLOYABILITY OF LOW-ABILITY PERSONS

Skill	No. of Times Recommended
Sense of responsibility	17
Deal with people	13
Communication	10
Reading, writing, arithmetic	8
Reasonable salary expectations	8
Telephone etiquette	6
Office politics class	2
Penmanship	2
Work experience program	1

determine a listing of the most unattractive office tasks, office supervisory personnel were asked to rank the three most unattractive low-ability tasks in their offices. Scores were determined describing the unattractiveness of each task, permitting the tasks to be ranked in terms of their unattractiveness to the office supervisory personnel. This ranking is displayed in Table 10, with the most unattractive task listed first. It should be noted that all the tasks in Table 10 are considered unattractive.

Opportunities for Advancement in Low-Ability Tasks

Respondents were asked to consider the low-ability tasks (from Table 5) in terms of opportunities for advancement. A task was considered leading to advancement if the successful performance of it allowed the incumbent to gain added responsibilities in that task ladder.

The results of this study indicated there are very few opportunities for advancement for low-ability office employees. None of the twenty most common office tasks provided a low-ability office employee an opportunity to advance.

The office supervisory personnel were asked to explain why low-ability office employees cannot advance

TABLE 10
 THE MOST UNATTRACTIVE LOW-ABILITY TASKS
 FOR OFFICE SUPERVISORY PERSONNEL TO PERFORM

NO.	TASK*	MEASURE OF UNATTRACTIVENESS					
		Smaller Offices		Larger Offices		All Offices	
		Score	Rank	Score	Rank	Score	Rank
1	Operating the photocopier	12	5.5	21	1	33	1
2	Typing letters from copy	23	1	9	8.5	32	2
3	Typing miscellaneous jobs	13	3	18	3	31	3.5
4	Refiling cards, records, etc.	12	5.5	19	2	31	3.5
5	Placing names on envelopes	8	9	16	4	24	5.5
6	Stamping & sealing envelopes	13	3	11	7	24	5.5
7	Pulling files	9	8	14	5	23	7
8	Collating of reports, etc.	10	7	12	6	22	8
9	Running bank errands	13	3	3	11.5	16	9
10	Sorting incoming mail	3	15.5	9	8.5	12	10
11	Running post office errands	4	12	5	10	9	11
12	Straightening-up office	7	10	0	18	7	12.5
13	Making entries on cards, etc.	4	12	3	11.5	7	12.5
14	Answering telephone	3	15.5	2	13.5	5	14.5
15	Distributing mail in office	3	15.5	2	13.5	5	14.5
16	Running odd jobs	3	15.5	1	15	4	16.5
17	Taking & forwarding messages	4	12	0	18	4	16.5
18	Maintaining the typewriter	0	19	0	18	0	19
19	Making coffee	0	19	0	18	0	19
20	Dealing with customers/clients	0	19	0	18	0	19

*must be mentioned as a task by at least 20 per cent of the respondents

within their organizations. The most common replies were:

1. Low-ability employees are hired for a specific task
2. Tasks performed by low-ability office employees are not part of a task ladder
3. Low-ability office employees lack the ability to perform higher ability tasks

Higher ability office employees performing low-ability tasks have opportunities for advancement.

Tasks That Have Specific Policies Describing Performance

Respondents were asked to indicate the low-ability tasks in their offices which have specific policies regarding performance. The policies, covering the inputs, outputs, and procedures for the tasks, did not allow the incumbent to make decisions.

Table 11 displays the tasks ranked according to the per cent of tasks with specific policies. Most of the participating organizations had established policies regarding the performance of the low-ability tasks.

Performance of Low-Ability Office Employees Compared to Performance of Higher Ability Office Employees

The findings of this study revealed that none of the low-ability tasks were performed exclusively by

TABLE 11

LOW-ABILITY TASKS RANKED ACCORDING TO THE PER CENT
HAVING SPECIFIC POLICIES REGARDING PERFORMANCE*

NO.	TASK**	PERCENTAGE OF ORGANIZATIONS					
		Smaller Offices		Larger Offices		All Offices	
		%	Rank	%	Rank	%	Rank
1	Refiling cards, records, etc.	100	1	100	2	100	1
2	Making entries on cards, etc.	96	4	100	2	98	3
3	Pulling files	95	5	100	2	98	3
4	Collating of reports, etc.	98	2	98	4	98	3
5	Typing miscellaneous jobs	97	3	91	11	94	5.5
6	Taking & forwarding messages	93	7	96	6	94	5.5
7	Running bank errands	90	10	96	6	93	8
8	Operating photocopier	91	9	94	8	93	8
9	Sorting incoming mail	94	6	92	9	93	8
10	Typing letters from copy	89	11	96	6	92	10
11	Placing names on envelopes	92	8	90	12	91	11
12	Running post office errands	84	13.5	92	10	87	12.5
13	Stamping & sealing envelopes	85	12	89	13.5	87	12.5
14	Distributing mail in office	81	15	89	13.5	86	14.5
15	Dealing with customers/clients	84	13.5	88	15	86	14.5
16	Maintaining typewriter	69	16	73	17	71	16.5
17	Answering the telephone	66	17	81	16	71	16.5
18	Running odd jobs	58	18	63	18	60	18
19	Straightening-up office	43	19	30	20	38	19
20	Making coffee	11	20	38	19	23	20

*tasks which do not allow for decision-making

**must be mentioned as a task by at least 20 per cent of the respondents

low-ability office employees. That is, low-ability tasks were also performed by higher ability employees.

The office supervisory personnel were asked to rate each task as being either performed as well as or better (in terms of productivity, efficiency, and resistance to work) by a low-ability office employee or by a higher ability office employee after a period of time (six to twelve months). The tasks were listed in Table 12 according to the percentage of tasks performed as well as or better by low-ability employees. Over all, this study determined that seven tasks were performed as well as or better by low-ability office employees than by higher ability employees. These tasks included: collating, running odd jobs, placing names on envelopes, sorting incoming mail, running post office errands, pulling files, and stamping and sealing envelopes.

Relationships Between Various Task Characteristics

The Spearman Rank Order Correlation Coefficient was employed to determine if relationships exist between the various characteristics of low-ability tasks. Three sets of relationships, involving the unattractiveness of low-ability tasks, tasks with specific policies outlining their procedures, and the performance level

TABLE 12

LOW-ABILITY TASKS RANKED ACCORDING TO PERCENTAGE BEING
PERFORMED AS WELL AS OR BETTER BY LOW-ABILITY OFFICE
EMPLOYEES COMPARED TO HIGHER ABILITY EMPLOYEES

NO.	TASK*	PERCENTAGE OF ORGANIZATIONS					
		Smaller Offices		Larger Offices		All Offices	
		%	Rank	%	Rank	%	Rank
1	Collating of reports, etc.	57	2.5	78	3	69	1
2	Running odd jobs	60	1	100	1	67	2**
3	Placing names on envelopes	50	4	70	6	63	3
4	Sorting incoming mail	40	5	75	4.5	62	4.5
5	Running post office errands	57	2.5	75	4.5	62	4.5
6	Pulling files	25	8.5	69	7	52	6
7	Stamping & sealing envelopes	22	10.5	79	2	50	7
8	Distributing mail in office	30	7	58	8	45	8
9	Running bank errands	36	6	50	12	43	9.5
10	Refiling cards, records, etc.	22	10.5	57	9	43	9.5
11	Typing miscellaneous jobs	11	14	50	12	35	11
12	Making coffee	25	8.5	40	16	31	12.5
13	Operating photocopier	6	16	50	12	31	12.5
14	Making entries on cards, etc.	13	12.5	50	12	29	14.5
15	Straightening-up office	13	12.5	50	12	29	14.5
16	Typing letters from copy	8	11	43	15	20	16
17	Answering the telephone	0	18.5	0	18.5	0	18.5
18	Taking & forwarding messages	0	18.5	0	18.5	0	18.5
19	Dealing with customers/clients	0	18.5	0	18.5	0	18.5
20	Maintaining typewriter	0	18.5	0	18.5	0	18.5

*must be mentioned as a task by at least 20 per cent of the respondents

**"running odd jobs" individually was ranked number one and number one, but was number two when totalled. This was due to a low percentage of runners in larger offices, which brought the total score nearer the smaller office score

of the tasks, were established and are displayed in Tables 13, 14, and 15.

Also, relationships were determined between smaller offices and larger offices for each of the three task characteristics. These relationships are displayed in Tables 16, 17, and 18.

Observations Made by Office Supervisory Personnel
Regarding Low-Ability Employees

The office supervisory personnel participating in this study commented on low-ability office employees. Their observations are reported below in the order of frequency mentioned.

- ...Low-ability persons are hired for a specific job or task. They must have the skills at that time--prefer not to train low-ability persons. (mentioned 8 times)
- ...Low-ability employees generally cannot work unsupervised (7)
- ...Low-ability employees are good at what they do (7)
- ...Employers will hire a person who is physically impaired or mentally handicapped, but not both (7)
- ...Low-ability employees do not function well in pressure situations (6)
- ...Low-ability employees perform some tasks better than do higher ability employees (6)

TABLE 13

RELATIONSHIP OF UNATTRACTIVENESS OF TASKS TO TASKS
BETTER PERFORMED BY LOW-ABILITY OFFICE EMPLOYEES

OFFICE SIZE	CORRELATION	DESCRIPTIVE MEANING*		
		Direction	Strength	Commonality
Smaller	+ .16	Positive	Slight	3%
Larger	+ .49	Positive	Moderate	24%
Combined	+ .35	Positive	Low	12%

TABLE 14

RELATIONSHIP OF UNATTRACTIVENESS OF TASKS TO TASKS
HAVING SPECIFIC POLICIES REGARDING THEIR PERFORMANCE

OFFICE SIZE	CORRELATION	DESCRIPTIVE MEANING*		
		Direction	Strength	Commonality
Smaller	+ .60	Positive	Moderate	36%
Larger	+ .59	Positive	Moderate	35%
Combined	+ .61	Positive	Moderate	37%

TABLE 15

RELATIONSHIP OF TASKS BETTER PERFORMED BY LOW-ABILITY
OFFICE EMPLOYEES TO TASKS HAVING SPECIFIC POLICIES
REGARDING THEIR PERFORMANCE

OFFICE SIZE	CORRELATION	DESCRIPTIVE MEANING*		
		Direction	Strength	Commonality
Smaller	+ .05	Positive	Slight	0%
Larger	+ .18	Positive	Slight	3%
Combined	+ .21	Positive	Low	4%

TABLE 16

RELATIONSHIP OF TASKS BETTER PERFORMED BY LOW-ABILITY
OFFICE EMPLOYEES IN SMALLER OFFICES TO LARGER OFFICES

CORRELATION	DESCRIPTIVE MEANING*		
	Direction	Strength	Commonality
+ .85	Positive	High	72%

TABLE 17

RELATIONSHIP OF TASKS HAVING SPECIFIC POLICIES REGARDING
THEIR PERFORMANCE IN SMALLER OFFICES TO LARGER OFFICES

CORRELATION	DESCRIPTIVE MEANING*		
	Direction	Strength	Commonality
+ .87	Positive	High	77%

TABLE 18

RELATIONSHIP OF UNATTRACTIVENESS OF LOW-ABILITY TASKS
IN SMALLER OFFICES TO LARGER OFFICES

CORRELATION	DESCRIPTIVE MEANING*		
	Direction	Strength	Commonality
+ .72	Positive	High	52%

TABLE 19

RELATIONSHIP OF CORRELATION TO STRENGTH

CORRELATION	0-20	21-40	41-70	71-90	91-100
STRENGTH	Slight	Low	Moderate	High	Very High

*SOURCE: Courtney and Sedgwick (1972)

- ...A low-ability office employee who works is more valuable than a high-ability employee who loafes (6)
- ...Low-ability employees are kept busy in the office (5)
- ...Low-ability employees work with their hands, not their heads (4)
- ...Low-ability employees require standards for accuracy, procedures, and quantity (4)
- ...Employers prefer to hire part-time help over low-ability employees to perform low-ability tasks (3)
- ...Low-ability employees are working to their capacity-- if they could do more they would not be low-ability (3)
- ...Most mistakes made by low-ability office employees are detected early (2)

Summary of Findings

Office supervisory personnel participating in this study reported that:

1. Low-ability office employees work at sixty different tasks in the organizations surveyed
2. The most common task performed by low-ability office employees is operating the photocopier
3. A greater variety of low-ability tasks exists in larger offices than in smaller offices
4. Fifty-five pre-requisite skills are necessary to perform the low-ability tasks in an office

5. The basic skill most often required of a low-ability office employee is the ability to read
6. The skills listed in Table 6 form the basis of selection criteria for low-ability office employees
7. Low-ability office employees operate 28 different machines in the office
8. The office machine most often used by low-ability office employees is the electric typewriter, then is the photocopier
9. Low-ability employees need to master reading, writing, and arithmetic
10. Low-ability office employees are capable of performing more tasks in the office provided they have more pre-employment training
11. The low-ability task most unattractive to office supervisory personnel is operating the photocopier
12. Low-ability office employees have very few opportunities for advancement
13. Most of the commonly performed low-ability tasks have specific policies describing performance
14. Larger offices have more policies regarding the performance of low-ability tasks
15. Low-ability tasks are being performed by office employees of all ability levels

16. Low-ability office employees can outperform higher ability employees at seven tasks
17. A low, positive relationship exists between the unattractiveness of tasks and tasks better performed by low-ability office employees
18. A moderate, positive relationship exists between the unattractiveness of tasks and tasks having specific policies regarding their performance
19. A low, positive relationship exists between tasks better performed by low-ability office employees and tasks having specific policies regarding their performances
20. Low-ability office employees are not trained on the job to do low-ability tasks

V. SUMMARY, CONCLUSIONS, IMPLICATIONS
AND RECOMMENDATIONS

Summary

Introduction to the Problem

The main purpose of this study was to identify the tasks performed by low-ability office employees as viewed by office supervisory personnel in Alberta, and, also, to analyze these tasks. Low-ability tasks were analyzed by determining the following: tasks performed by low-ability office employees, skills required to perform low-ability tasks, machinery and equipment operated by low-ability office employees, tasks low-ability persons could perform if provided with additional training, and skills required to increase the employability of low-ability persons.

Also, low-ability tasks were rated in four categories: unattractiveness, opportunities for advancement, efficiency of low-ability office employees, and opportunities for decision making (relative to having specific policies).

Procedures

An instrument was designed to obtain the data for this study from office supervisory personnel employed by member firms of the AMS. Data were

collected in a structured-interview format, and interviews continued until data had been collected from thirty different organizations in Edmonton and Calgary each, making a total population of sixty respondents.

Method of Treatment

The data were organized according to frequency distribution. Spearman Rank Order Correlation was used to analyze the data.

Conclusions

In consideration of the limitations of this study, the following conclusions are offered:

1. Low-ability office employees performed 60 different tasks. The three most common tasks performed by low-ability office employees were: operating the photocopier, answering the telephone, and typing miscellaneous jobs. The task of answering the telephone was performed by low-ability office employees more frequently in smaller offices than in larger offices.
2. Low-ability tasks were performed by both low-ability and higher ability office employees. Seven tasks were identified as being performed as well as or better by low-ability employees than by higher ability employees, over a period of time. These

tasks were: collating, running odd jobs, placing names on envelopes, sorting incoming mail, running post office errands, pulling files, and stamping and sealing envelopes. Employers preferred to hire low-ability persons for these tasks. As a result, there was a large proportion of low-ability office employees performing such tasks.

3. Low-ability persons had very limited opportunities for advancement. None of the more frequently performed tasks offered the low-ability office employee an opportunity to advance.
4. Most tasks performed by low-ability office workers had specific policies describing the method for execution. Many of these tasks could only be performed correctly one way, and deviations would have resulted in error. This was consistent regardless the size of the office.
5. Low-ability tasks were unattractive to office supervisory personnel. The most unattractive tasks involved simple, repetitive hand motions, such as operating the photocopier, typing from copy, refiling cards, and stamping and sealing envelopes.
6. Low-ability office employees operated 28 different pieces of machinery or equipment. The most common piece of equipment used by low-ability office

employees was the electric typewriter, followed by the photocopier. Low-ability employees in larger offices operated more equipment and machinery and tended to be more specialized than were low-ability office employees in smaller organizations.

7. Office employees required 55 different skills to perform the low-ability tasks in an office.

Approximately one half of these skills could have been learned or developed in the classroom, while many of the others related to physical and personal characteristics. A low-ability person with severe physical handicaps was not employable in the office; however, a high-ability person with similar physical handicaps may have been profitably employed.

8. Some low-ability office employees were not being utilized to their maximum. Low-ability students could be taught to perform many tasks which at the time were being taught inadequately or not at all. Employers were looking for low-ability persons who could operate the following: a switchboard, a programmable typewriter, a dictaphone, or microfilm equipment.

To summarize, employers sought low-ability persons to fill vacant positions in their organizations. This was due to the following factors:

1. Low-ability persons can perform low-ability office tasks, sometimes with more success than can higher ability employees
2. Low-ability persons are hired to perform specific tasks and can be productive almost immediately
3. Low-ability tasks tend to be unattractive to higher ability employees

Implications

Based upon the results and the conclusions of this study, the researcher offers the following observations:

1. Office supervisory personnel can identify low-ability tasks in the office. These tasks are distinguished by: being mastered in a very short time; involving simple, repetitive manipulations or movements; and generally done without cooperation or communication to other employees. Office employees of all ability levels perform low-ability tasks.
2. Low-ability persons can perform low-ability office tasks but are not hired to perform higher ability

tasks. Low-ability persons cannot perform a variety of low-ability tasks, but must specialize in some low-ability activity. This reduces the opportunities for employment of low-ability persons, for they can only be hired by organizations having positions consisting purely of low-ability tasks.

3. Following implication two, low-ability persons are hired to do the basic tasks which belong to one related activity. For example, low-ability employees may be considered mail clerks (performing the tasks in the mail room), file clerks (doing the pulling and replacing of records), messengers (delivering messages and materials to other locations), or duplicating clerks (operating the duplicating equipment). A low-ability office employee generally does not perform tasks in two different areas, such as filing records and weighing parcels.
4. To be employable, low-ability persons must possess the requisite personable and physical characteristics, and be able to perform the skills essential for completing the tasks. Because many low-ability persons learn the skills in school, very little training of low-ability persons takes

place on-the-job, except in situations unique to an organization. For this reason, business education programs must provide low-ability students with the basic skills to make them competitive in the labor market. This has resulted in many low-ability business and office education students seeking employment immediately upon completion of high school.

5. Employers are aware of the capabilities and limitations of low-ability persons. Many office positions are designed for low-ability employees. Low-ability employees do not advance beyond these positions.

Recommendations

Recommendations for Action

1. Curriculum designers should consult with business people in the development of programs for low-ability students
2. Employers should design jobs for low-ability employees based on the low-ability tasks identified in this study and through intercourse with low-ability employees
3. Guidance counselors should be aware of this study to better advise students seeking office employment

Recommendations for Further Research

1. To help low-ability business and office education students seek and obtain employment, three areas need to be researched. These areas are:
 - office tasks that low-ability employees perform
 - ways to prepare low-ability persons to do these tasks
 - employment opportunities for low-ability business and office education studentsThese studies must be continually updated due to technological advancements and changes in the supply and demand of low-ability employees.
2. These kinds of studies pertaining to an analysis of low-ability office tasks should be replicated in other job markets (i.e. law enforcement, home economics, etc.)
3. The instrument used in this study should be used again to investigate low-ability tasks as viewed by low-ability employees. This would allow the views of the employer and the worker to be compared
4. A study should be made of the vocational aspirations of low-ability students
5. Typewriting was identified as one of the major unattractive tasks performed by low-ability

personnel. A study of alternate keyboarding arrangements and their effect on productivity, fatigue, and general attitude might be considered for further research

6. A study should be made to determine if a relationship exists between low-ability and juvenile delinquency in high school students

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APPENDICES

Appendix I

RESEARCH PROJECT DESCRIPTION

I am conducting a survey to obtain the input of businessmen regarding the work tasks performed by office employees. This input may assist in developing a more realistic curriculum for students in business and office education in Alberta, which in turn will benefit businessmen.

Your organization has been selected as one which I am inviting to participate with me. If you agree to participate in this project, a follow-up interview will be scheduled to collect the necessary data. Approximately 45 minutes will be required to collect the data.

The questions will center on those office tasks performed by the lower ability employee. A profile of characteristics of the lower ability person is provided for your review. The interview-questionnaire is also included for review. The data received from this project will be aggregated so as to assure protecting the identity of the participating offices.

Your help in completing this survey will be very much appreciated. The findings of this survey will be sent to you.

Donald Rencz
Doctoral Candidate
Oregon State University

Appendix II

PROFILE OF LOW-ABILITY PERSONS

Low-Ability persons share one or more of the following characteristics:

1. learn at a slower rate than the normal
2. are consistently below grade level in academic progress
3. have poorer reasoning ability than average
4. have more physical defects than average
5. respond to immediate goals rather than delayed ones

Appendix III
INTERVIEW QUESTIONNAIRE

TASKS PERFORMED AS WELL AS OR BETTER BY		OPPORTUNITIES FOR ADVANCEMENT		SPECIFIED POLICY (NO DECISION-MAKING)		RANK OF DISLIKE	LOW-ABILITY TASKS	EQUIPMENT OR MACHINERY OPERATED	REQUIREMENTS: SKILLS ABILITIES KNOWLEDGES	COMMENTS
LOW	HIGH	YES	NO	YES	NO					

Appendix IV

School of Business



Corvallis, Oregon 97331

November 7, 1977

W. E. Bauer
Alberta Wheat Pool
P. O. Box 2700
Calgary, Canada

Dear Mr. Bauer:

Please inform your membership that I have shared your chapter roster with Don Rencz. Don is a graduate student in vocational education at Oregon State University.

Don's Major concentration is business education. His doctoral research concerns employment opportunities in Alberta, Canada.

I have asked him to contact you for any needed liaison. Until he does so, you may contact him by writing c/o my office.

Sincerely,

Patricia A. Wells, Director
Administration Office Management

PW:se

*I hope you will ask your members
to cooperate with Don in his research.*

Appendix V

LIST OF GRADUATE STUDENTS USED AS JURY
IN DEVELOPING THE INSTRUMENT

Patrick Brooks

Thomas Hagg

Gary Kramer

Bradley Lessley

Henry Talbot

Pamela Vote

Appendix VI

LIST OF ORGANIZATIONS PARTICIPATING IN PILOT STUDY

Safeway Stores, Incorporated

State of Oregon, Employment Division

Appendix VII

LIST OF PARTICIPATING ORGANIZATIONS

Alberta Government Telephones
Alberta Wheat Pool
Allied Farm Equipment Limited
Bow Valley Industries Limited
Brahama Meat Exporters Limited
Burns Foods Limited
Burroughs Business Machines Limited
CN Telecommunications
The Calgary Herald
Calgary Power Limited
Canada Packers Limited
Canada Safeway Limited
Canadian Dominion Leasing Corporation, Limited
Canadian Liquid Air Limited
Canadian Utilities Limited
Cohos, Evamy and Partners
Collins Barrow
Cominco Limited
Chevron Standard
Crown Tire Service Limited
Edmonton Fur Auctions
Explosives Limited
Foothills Pipe Lines Limited
Freeway Construction
Glenbow Alberta Institute
Guardian Insurance Company of Canada
Gulf Oil Canada Limited
Hallmark Mortgage
Healy Ford Centre
Hudson's Bay Oil and Gas Company, Limited

List of Participating Organizations (continued)

Husky Oil Operations Limited
IBM Canada Limited
Loveseth Limited
Mac's Convenience Stores Limited
Manpower Temporary Services
Marshall Wells Limited
Maze, Hickey and Redman Limited
The Mercantile Press Limited
Molson Alberta Brewery Limited
Montreal Trust Company
Moore Business Forms Limited
National Datacentre Corporation
Norcen Energy Resources Limited
Northern Alberta Institute of Technology
Northwestern Utilities Limited
Owlco Limited
Oxford Shopping Centres Limited
Palm Dairies Limited
Province of Alberta--Department of the Environment
Reed, Shaw and Stenhouse Limited
Revelstoke Company Limited
Right Hand Employment Services
Shell Canada Resources Limited
Slate Personnel
Southern Music Limited
Sun Life of Canada
Underwood, McLellan and Associates
University of Alberta--Faculty of Nursing
Western Supplies Limited
Xerox of Canada Limited