

A FOLLOW-UP STUDY OF THE ACHIEVEMENT OF  
ADULT BASIC EDUCATION STUDENTS IN PRE  
EMPLOYMENT PROGRAMS IN DISTRICT VOCATIONAL  
SCHOOLS OF NEWFOUNDLAND AND LABRADOR

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A FOLLOW-UP STUDY OF THE ACHIEVEMENT OF ADULT BASIC  
EDUCATION STUDENTS IN PRE EMPLOYMENT PROGRAMS  
IN DISTRICT VOCATIONAL SCHOOLS OF  
NEWFOUNDLAND AND LABRADOR

by



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of the requirements for the degree of  
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## ABSTRACT

This study was designed to investigate the achievement of former adult basic education (ABE) students who were enrolled in pre-employment training programs in the Province's vocational institutions during the 1980-81 and 1981-82 school years. The vocational achievement of these students was compared to that of three other groups of students who occupied these programs: Basic Training for Skill Development (BTSD), General Educational Development (GED), and Regular High School Program (RHSP).

Percentage scores in Mathematics, English, Science, Trade Theory and Trade Practical represented the basic data used to compare the achievement of the various student groups within vocational school programs and program clusters. Program clusters consisted of trade programs which were grouped according to similarity of content in the various subject areas.

The achievement of adult basic education students was found to be significantly lower in comparison to the various groups of non-adult-basic-education students on each of the dependent measures. The greatest number and range of achievement discrepancies was found between the adult basic education and the regular high school student groups. Data analysis by program clusters found that adult basic education students were comparable in achievement to the



various groups of non-adult basic education students only in the Business Education cluster. Data also showed significant differences in vocational achievement between sexes.

This study recommended that Adult Education personnel undertake an intensive investigation in an effort to determine why their graduates fail to achieve to the level of their counterparts in vocational school programs.

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## CHAPTER I

### INTRODUCTION

#### Statement of Purpose

During the past decade, widespread attention has been given to the development of Adult Education programs in Newfoundland and Labrador. There are currently 120 Adult Education Centers in the Province, with 65 of these offering programs in Adult Basic Education (ABE). Adult Basic Education is a part-time evening program which makes available courses in English, Mathematics, and Science to adults who wish to upgrade their basic academic skills. A recent survey has established that a majority of the students presently enrolled in ABE programs intend to pursue post-secondary vocational training (Appendix A). The purpose of this study was to determine the population and retention rate of ABE students in vocational programs, and investigate the achievement patterns of students relative to their academic preparation in the ABE program.

#### Rationale and Significance

The ABE program has been the focal point of a considerable amount of research during recent years. A great deal of this research effort has concentrated on gathering information about the types of instructional procedures best

suites to ABE students; measuring the level of student satisfaction with the quality of ABE programs; and, investigating the ABE dropout population (Allen, 1969; Buckley et al., 1979; Valencia et al., 1969; Weisel et al., 1980).

In support of both the public's cry to accountability and the educators' call for evaluation of educational programs, Boone et al. (1980) and Smith (1980) called for the follow-up of students who leave ABE programs. They argued that the benefits derived from participation in ABE programs are only identifiable some months after a student leaves the program. The follow-up procedure is an effective method to tap these effects. Recent studies (Becker et al., 1976; McGonnell, 1971; Thomas, 1974) have recommended the follow-up of former ABE students as a valid and useful procedure to gather information about the strengths and weaknesses of ABE programs.

The majority of follow-up studies in adult education, including those of Brown et al. (1975), Brunner et al. (1978), Falon (1977), and Jordan (1973), were designed to gather information about the extent of student satisfaction with various aspects of ABE programs, including the quality of classroom instruction, the relevance of the curriculum as perceived by students, and student satisfaction with these programs.

Follow-up studies of the academic performance of ABE students who enter post secondary educational programs are extremely rare. Lindsay et al. (1976) and Smith et al. (1976)

addressed the need to relate ABE instructional and program goals to the long term educational needs of students. Lindsay et al. (1976) recommended that "skills associated with occupational programs receive highest priority in the development of the ABE core<sup>3</sup> curricula" (p. 11). Grasskoph et al. (1978) found that ABE students who entered vocational training programs faced a multitude of problems, including a deficiency in basic academic skills necessary for adequate mastery of the content of these programs.

In a survey of former adult graduates of the Stephenville Adult Center, Coombs (1971) reported that eighty-seven percent of these students felt they were adequately prepared in basic academic skills for vocational training.

A survey of the 1981-82 ABE population indicated that seventy percent of the sample group enrolled in the ABE program to upgrade their academic skills in preparation for entry to vocational programs (Hynes, Note 2). In view of the large number of adult students who use the ABE route to prepare for vocational training programs, a knowledge of the number of ABE students admitted to vocational programs, and knowledge of the characteristics of their academic performance while enrolled in these programs would provide some indication of the value of their prerequisite basic skill training.

Shallow (Note 4) stated that a knowledge of the vocational performance of former ABE students would provide invaluable information to the Division of Adult and Continuing

Education for future program development and revision.

Answers to the following questions would assist curriculum personnel in the development of adequate and appropriate skill training programs: (1) Is the ABE program a valid orientation for students who aspire to vocational training programs? (2) Do ABE students perform significantly better in some vocational programs than others? (3) Are ABE students receiving adequate preparation in the basic skill areas of Mathematics, English, and Science to be able to deal effectively with the academic component of vocational programs? (4) How do ABE students perform in comparison to non-ABE students in vocational programs?

Kesteran (Note 3) stated that there are conflicting views concerning the quality of academic preparation of the ABE student for vocational training. It is his opinion that their basic skill training is inadequate. He further stated that it would be beneficial to know how these students actually perform in comparison to other students in vocational programs. Any large scale deficiency in basic academic skills for ABE students should certainly be reflected in the academic performance of these students during their vocational training. Reporting on behalf of the Advanced and Continuing Education Coordinating Committee on Adult Basic Education, Costello (Note 1) noted "feedback from training institutions indicates a strong feeling of dissatisfaction with the competence level of graduates in general" (p. 4).

The findings of this study may yield valuable information for personnel in both Adult and Vocational Education who are involved in planning and developing educational programs. The actual results may provide ABE personnel with a knowledge of how ABE students achieve in vocational programs so that attempts can be made, if necessary, to strengthen components of the ABE program. Knowledge of ABE student achievement in the Mathematics, English, and Science subject areas of vocational programs will provide some insight into the quality and relevance of the ABE program. A knowledge of the achievement results of ABE and non-ABE students in vocational programs will provide both the ABE and Vocational personnel a reference point from which to draw interpretation about the type of prerequisite skill training needed for vocational programs. This information will be of value, as well, to assist vocational personnel in the development of selection criteria for admission to vocational programs.

#### Hypotheses

This study focused chiefly on comparing the achievement of ABE students to the achievement of various groups of non-ABE students in vocational school pre-employment programs. Comparisons between the various student groups were made on the following dependent variables: Mathematics, English, Science, Trade Theory, Trade Practical, Total Grade Point

Average, and Academic Grade Point Average. For the various student groups in Business Education programs, comparisons were made on Business Mathematics and Communication Skills. The following null hypotheses were investigated:

1. It is hypothesized that there are no significant achievement differences between the ABE, and non-ABE groups in vocational school programs.
2. Given that Hypothesis 1 is infirmed, the following hypotheses will be investigated:
  - A. For vocational school program clusters there are no significant achievement differences between the ABE, and non-ABE groups.
  - B. For vocational school programs there are no significant sex differences in achievement between the ABE, and non-ABE groups.

#### Background Information

The ABE evening program is presently being offered in sixty-five Adult Education Centers throughout Newfoundland and Labrador. The program is offered on a part-time basis; for each subject, students have to attend classes a minimum of two hours a week. The program offers courses in English, Mathematics, and Science to adults in Grades VIII-XI.

During recent years, the program has undergone major



changes in both curriculum content and design. In contrast to the general content orientation of the earlier programs, the subject matter of the present program focuses clearly on the knowledge and skills required for post-secondary training. The present Science program, in particular, encompasses a wide variety of subject matter intended to meet the students' immediate needs, and long term career interests. As well, the Science program is individually based, giving flexibility to both the choice of units to be studied, and the rate of the student's progress. These program revisions can be attributed to a variety of factors, not the least of which includes the need to give students an adequate background in basic skills required for post secondary training programs, especially for vocational training programs. As well, program revisions may be partly attributed to the feedback from vocational institutions indicating concern over the quality of academic preparation of ABE students for vocational training programs.

Definition of Terms to be Used

Several terms used in this study are defined as follows:

Adult Basic Education (ABE) - The ABE program is basic academic skills training program offered by the Division of Adult and Continuing Education of the Department of Education.

Basic Training for Skills Development (BTSD) - The BTSD program is offered by the Division of Technical and Vocational Education of the Department of Education. This program offers basic skill training in Mathematics, English, and Science to adults who express an interest in pursuing a vocational training program. The course content of this program is highly similar to that of the ABE program.

General Educational Development (GED) - The General Educational Development Program is offered by the Division of Tests and Measures of the Department of Education. Adults who are nineteen years or over, and who did not graduate from high school, are qualified to write GED provincial examinations. The GED tests are comprised of a battery of five comprehensive examinations in the areas of English, Mathematics, Natural Sciences, Social Studies, and Literature. Adults who pass the tests successfully receive a diploma indicating their achievement level or grade equivalent (i.e. Grade VIII equivalency, Grade IX equivalency, Grade X equivalency, or Grade XI equivalency). These certificates, for the purposes of entrance requirements, are recognized by the vocational schools and many other post secondary institutions throughout the province.

Regular High School Training Program (RHSP) - This term refers to the Regular High School Program in which students complete regular courses in Mathematics, English, and Science.

Total Grade Point Average (TGPA) - This term refers to a score found by combining and averaging the English, Mathematics, Science, Trade Theory, and Trade Practical scores.

Academic Grade Point Average (AGPA) - This term refers to a score found by combining and averaging the English, Mathematics, and Science scores.

Vocational Programs - This refers to the nine-month-duration pre-employment programs offered at the Province's District Vocational Schools and the College of Trades and Technology.

Program Clusters - This term refers to groups of vocational programs which are similar in context in the academic subjects, Mathematics, English, and Science. The clusters are as follows: Mechanical, Construction, Electrical, Services, and Business Education. Those clusters and the specific programs comprising them are reported in Table 1 of Chapter III.

Limitations

The findings of this study were limited to the College of Trades and Technology and to the Province's District Vocational Schools, with the exception of the District Vocational School at Springdale. This particular school reported that no former ABE students were enrolled there during the past two school years.

As well, the findings of this study are limited to the vocational programs in which ABE students were enrolled.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

This chapter discusses the general nature of adult education programs, and, in particular, the Adult Basic Education program in Newfoundland. It presents a summary of existing research dealing with the performance of ABE students in vocational training programs.

#### What is Adult Education

For decades educators have grappled with the problem of adequately defining adult education. Part of this problem may be attributed to the wide variety of programs sponsored by departments of adult education. Knowles (1960) added to the discontent of those searching for a valid definition when he stated that

Adult education is assumed to include all those government sponsored organized learning activities, of all types and levels, including elementary, secondary, vocational-technical, collegiate, graduate and professional which are designed to assist adults to improve themselves and their occupational competencies, after their formal education has either been completed or interrupted .... (p. 238)

London and Wenhert (1964) compounded the difficulty by proposing that

Adult education refers to a more delimited area of social life, namely to those activities whose primary

purpose is to educate .... and whether activity is defined as adult education depends on the purposes of the organizers of that activity. (p. 168)

They further confused the issue by noting that adult education is a whole composed of many parts:

Adult education is partly a duplication of instruction offered by the formal educational institutions, partly a remedial effort, partly a testing ground for formal education, partly an emergency operation to handle special educational contingencies, partly a structure providing education in matters of primary interest to adults and partly a means by which special interests may receive instructional aid. (p. 195)

Other writers prefer a more specific definition of adult basic education. Baltensperger (1970) stated that Adult Basic Education is a program designed "to prepare undereducated and unqualified students for admission to vocational schools and the institutes of trades and technology" (p. 21). Brown (1971) agreed that "the primary objective in these programs is to upgrade citizens academically whereby they can become eligible for skill or trade training with the hope of making them competitive in the labor market" (cited in Coombs, 1971, p. 107). In this context, adult basic education meets the broader goal of enabling adults to gain the necessary knowledge and coping skills to adjust to the various role changes in this age of innovation.



### Follow-up Studies

In recent years there has been a phenomenal increase in the number of follow-up studies in adult education. These studies have largely been in response to the public's cry for accountability and to the educator's call for more effective educational programs (Boone et al., 1980). Many of these studies have investigated the reasons behind the reported high dropout rate of ABE students in upgrading programs (Baker, 1980; Beal & Mael, 1980; Long, 1980; Maradian, 1979; Rasor et al., 1980; Rolfe & Wilson, 1978; Weisel et al., 1980). Recommendations of these studies have included the provision of vocational information to ABE students, improved instructional and grading techniques, and subject matter tailored to the individual needs of students. Other researchers have concentrated their efforts in the large scale evaluation of such aspects of ABE programs as relevance of subject matter, improvements in students' basic computation and communication skills, students' satisfaction with the ABE experience, employability of graduates, cost effectiveness of programs, and inservice needs of teaching staff (Dauzat, 1978; Griffith, 1974; Jordan, 1973; Kent, 1974; McGonnell, 1971; Mezirow, 1975). Results of these studies pointed to the need for improvements in the ABE curriculum, inservice of teaching personnel, and further investigation of basic skill growth of ABE students.

While there is a large body of literature concerning

adult education, there is a paucity of research concerning the academic performance of ABE students who enroll in post-secondary training programs. Becker (1976) and McGonnell (1971) voiced concern for the lack of follow-up of the performance of adult basic education students in vocational programs. McGonnell (1971) and Smith (1980) stated that follow-up studies in adult education need to go beyond looking at the amount of money spent, demographic and attendance data, and the number of persons supposedly trained. Thomas (1974) argued that the effectiveness of upgrading programs should be weighted in the vocational performance of former students, and that the

follow-up procedure should offer recommendations concerning areas of curriculum deficiency having an adverse effect on the employability of job candidates, and the performance of students enrolled in post-secondary educational institutions. (p. 7)

Reports from administrative and teaching personnel in vocational education strongly indicate that ABE students enter training programs with highly inflated grade point averages in the prerequisite skill area of Mathematics, English, and Science (Costello, Note 1). In many cases students encounter difficulties in coping with the academic demands of their training programs. These reports were, at least partly, responsible for the recommendation put forward by Costello (Note 1) suggesting that the ABE program be reorganized to "include administration of a common standard examination to enable potential graduates to demonstrate

content mastery" (p. 3).

In a follow-up study of adult students (BTSD) who attended the Stephenville Adult Centre during the 1968-69 school year, Coombs (1971) reported that eighty-seven percent of the respondents felt adequately prepared by the upgrading program. The remaining thirteen percent reported that the courses offered at the Adult Centre had not prepared them adequately for trade school programs. No attempt was made, however, to gather the actual achievement results of these students in their respective trade programs, or to report the number of students who successfully completed their program (or to determine significance level of 13% of his sample).

In a follow-up study of ABE students, Falon (1977) reported that fifty-six percent of students who enrolled in the adult program were preparing academically for entry to other educational programs, while thirty-three percent of the enrollees actually entered post-ABE training programs. However, no effort was made to determine how well these students were prepared for their vocational training courses.

In a follow-up study conducted by the Oklahoma State Department of Education, it was reported that fifty-nine percent of former ABE graduates sought further training. This study was designed to assess the effectiveness of a former project developed to offer occupational information to adults while in attendance in ABE classes, and to research the vocational performance of these students. The study,

however, fell far short of intended goal and did not investigate the academic performance of these students.

Lloyd (1978), in a follow-up study of adult students in Cambridge, Massachusetts, reported that thirty-seven students out of a total sample of ABE graduates entered a college, community college or some other post-secondary institution. However, no mention was made of the vocational performance of these students.

Grosskoph et al. (1978) attempted to identify the entry-level academic competencies needed by ABE students who pursued occupational training programs. Four separate groups of twenty-five students were interviewed to gather their views of academic skill deficiencies ABE students encounter in occupational training programs. The sample was comprised as follows: (1) students who were in the first several months of occupational training; (2) students who were mid-way through the occupational training program; (3) students who failed to complete their program; and, (4) students who had graduated from their respective occupational programs. Instructors of these students were interviewed as well, to determine their perception of students' difficulties.

Basic skill deficiencies in Math were reported by thirty-eight percent of the respondents; Writing/speaking deficiencies, as well as reading deficiencies, were reported by thirty percent and twenty-eight percent of the respondents, respectively. Instructors also rated the basic skill areas of writing/speaking, and reading, to be the chief problem areas for the ABE student.

## CHAPTER III

### METHODOLOGY

#### Research Design

The basic procedure in this study involved the identification of vocational school programs in which ABE students were enrolled, and the collection of achievement scores in the following vocational subject areas: English, Mathematics, Science, Trade Theory, and Trade Practical. The ABE, BTSD, GED and RHSP groups of students were then compared on these variables to determine similarities and differences in achievement.

#### Description of Sample and Sampling Procedure

The first step in the data collection process was to identify the vocational institutions in the Province in which former ABE students were enrolled during the 1980-81 and 1981-82 school years. This was done by, first, obtaining the permission of the Division of Technical and Vocational Education to be given access to students' files. The principals of the various vocational institutions were then contacted to assist in the identification of ABE students and the programs in which they were enrolled (Appendix B). Once the ABE students were identified by school and by

program, further contact with the principals was necessary to identify by student group the non-ABE students in these programs (Appendix C). The list of students by vocational training programs became the basis for the data collection procedures.

These programs were then grouped on the basis of similarity of course content across vocational subject areas under the following program clusters: Mechanical Trade Cluster, Construction Trade Cluster, Electrical Trade Cluster, Services Trade Cluster, and Business Education Cluster. A list of vocational programs within program clusters is presented in Table 1.

The total sample for this study was selected from fifteen of the sixteen provincial district vocational institutions, as well as from the College of Trades and Technology in St. John's. The district vocational school at Springdale reported that no ABE students were enrolled there during either of the two school years, and for this reason the school did not participate in the study.

During the two year period covered by this study, 233 ABE students were enrolled in the various vocational institutions in this Province. A total of 38 students did not complete their programs for a drop-out percentage of 16 over a two-year period. Total enrollment and drop-out figures are presented in Table 2.



Table 1

## List of Vocational Programs by Program Cluster

Program Cluster	Program
Mechanical	Motor Vehicle Repair (Body and Mechanical) Heavy Duty Equipment Repair Diesel Mechanics Small Equipment Repair Oil Burner Mechanics Welding Machinist Millwright Refrigeration Steam-Pipefitting
Construction	Carpentry Plumbing and Domestic Heating
Electrical	Basic Electrical Electrical Power Utilities Basic Electronics
Services	Beauty Culture Barbering
Business Education	Bookkeeper-Clerk Typing Clerk Accounting Stenography Dicta-Typing Shorthand Typing

Table 2

Enrollment and Drop-Out Statistics for ABE Students  
for the 1980-82 School Years

Year	Number Enrolled	Number Dropped Out	Dropout Percentage
1980-81	73	16	22
1981-82	160	22	14
Totals	233	38	36

With the exception of students in the Business Education cluster, all students in each of the four student groups for both school years were included in this study. Students who were enrolled in Business Education programs during the 1981-82 school year only, were included in the study sample. This reduced the number of Business Education students from 2,584 to 1,244. Within this group there were 54 ABE students, 28 BTSD students, 27 GED students,

and 1,135 RHSP students. Due to the disproportionately large number of RHSP students, it was decided to further reduce the sample size by randomly selecting three RHSP students for each ABE student in Business Education programs within particular schools. This procedure would reduce the large volume of data for RHSP students to manageable size. All ABE, BTSD and GED students were included in the sample. Tables 3 and 4 give a complete breakdown of student enrollments for this study.

#### Data Collection

Two different procedures were used to collect data for this study. Either the investigator travelled to the vocational schools or the principals gathered and forwarded the data by mail. The choice of method to use was based on two factors: the volume of data to be collected at a particular school and the travelling distances involved. A consideration of both factors resulted in the investigator travelling to ten of the sixteen institutions involved.

Written permission was granted by Mr. Arthur Van Kesteren, Director of Technical and Vocational Education, to have access to the personal files of students within vocational schools. Information gathered from students' files consisted of first term and second term grade scores

Table 3

Enrollment Figures and Percentages for Various Student  
Groups in Vocational School Programs

Student Group	Enrollment
ABE	195
BTSD	69
GED	68
RHSP	943
Totals	1,275

Table 4

Distribution of Total Study Sample by Student  
Groups and Program Cluster

Program Cluster	ABE	BTSD	GED	RHSP	Totals
Mechanical	60	15	16	370	461
Construction	28	6	10	171	215
Electrical	15	5	7	99	126
Services	38	15	8	140	201
Business Education	54	28	27	163	272
Totals	195	69	68	943	1,275

in Mathematics, English, Science, Trade Theory, and Trade Practical, and for Business Education students, instructors' ratings in Business Mathematics and Communication Skills.



## CHAPTER IV

### ANALYSIS OF THE DATA

In this chapter the results of the various statistical analyses conducted to investigate the hypotheses of this study are presented.

Descriptive statistics were computed on the various achievement scores of each of the four groups of students across vocational school programs and within program clusters. One and two way analyses of variance, and Scheffe multiple comparisons were used to determine which groups differed significantly on the various achievement scores.

#### Hypothesis 1

It is hypothesized that there are no significant differences in vocational achievement between the ABE and each of the non-ABE groups on any dependent variable.

Preliminary analysis of the data was done on each of the achievement variables to determine if there were significant differences in mean scores by school year. An examination of the achievement variable means and standard deviations contained in Table 5 reveals exceptionally slight differences by year. As reported in Table 6, a subsequent series of t-tests of each of the variables by year indicated that Trade Practical was significantly different ( $p < .05$ ). However, further reference to the means and standard



Table 5

## Means and Standard Deviations of Achievement Variables by School Year

Achievement Variable	Year (1980-81)			Year (1981-82)		
	$\bar{X}$	SD	N	$\bar{X}$	SD	N
Mathematics	71.8	16.1	407	71.5	15.6	595
English	69.8	11.5	406	69.7	11.3	596
Science	66.3	15.2	397	67.2	14.1	590
Trade Theory	74.0	9.9	407	74.9	9.5	479
Trade Practical	71.3	7.1	407	72.4	6.9	479
Total Grade Point Average	70.9	9.6	396	71.2	9.3	478
Academic Grade Point Average	69.6	12.3	396	69.6	11.9	589

Table 6

## T-Values of Achievement Variable Scores by School Year

Achievement Variable	Degrees of Freedom	T-Value	2-tail Probability
Mathematics	1000	0.28	0.783
English	1000	0.29	0.775
Science	985	0.92	0.358
Trade Theory	884	-1.42	0.158
Trade Practical	884	-2.22	0.027*
Total Grade Point Average	872	-0.44	0.657
Academic Grade Point Average	983	-0.01	0.99

\*  $p < .05$

deviations in Table 5 shows that the Trade Practical mean score increased from 71.3 in the 1980-81 school year to 72.4 in the 1981-82 school year, for a mean difference of 1.1 percentage units. As well, the standard deviations differed only by .2 deviations between school years. In view of these very marginal differences for Trade Practical, this declared significant difference was discounted as probable Type I error. This lack of significant yearly differences in achievement prompted the combination of both school years for all subsequent analyses.

Table 7 provides the means and standard deviations of each of the achievement variables for the four student groups. The ABE group shows strikingly consistent patterns of achievement on each of the variables. This group reported the lowest means on all achievement variables. On many of the variables they were much lower than the other student groups.

These observed differences were tested for statistical significance by analysis of variance. The results of this analysis presented in Table 8 revealed that there were significant differences between student groups on each of the achievement variables. Subsequent Scheffe multiple comparisons contained in Table 9 revealed that the ABE group scored significantly lower than at least one of the groups on each of the achievement variables ( $p < .10$ ). A probability level of  $p < .10$  for Scheffe was selected because it is a very conservative test with regard to

Table 7

## Means and Standard Deviations of Achievement Scores for Student Groups

Student Group	Math			English			Science			Trade Theory			Trade Practical			Total Grade Point Avg.			Academic Grade Point Avg.		
	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N
ABE	64.6	16.1	141	65.3	10.3	141	62.8	14.6	137	71.8	10.5	123	70.9	6.7	123	67.0	9.3	121	64.3	11.9	137
BTSD	69.8	16.1	41	67.2	13.2	41	68.4	14.0	41	76.4	10.1	34	73.6	8.4	34	71.6	9.9	34	68.6	13.0	41
GED	67.1	17.5	41	71.9	11.4	41	62.9	15.7	41	77.4	9.6	34	74.7	6.8	34	71.0	10.8	34	67.4	13.5	41
RHSP	73.3	15.3	779	70.6	11.2	779	67.6	14.4	768	74.8	9.4	695	71.8	7.0	695	71.7	9.2	685	70.7	11.7	766

Table 8

One Way Analysis of Variance of Achievement  
Scores by Student Group

Achievement Variable	Source	Degrees of Freedom	Mean Squares	F-ratio
Mathematics	Between	3	3331.8	13.9***
	Within	998	240.4	
	Total	1001		
English	Between	3	1240.3	9.9***
	Within	998	125.5	
	Total	1001		
Science	Between	3	1094.6	5.2**
	Within	983	210.0	
	Total	986		
Trade Theory	Between	3	465.3	5.1**
	Within	882	91.7	
	Total	885		
Trade Practical	Between	3	160.1	3.3*
	Within	882	48.7	
	Total	885		
Total Grade Point Average	Between	3	760.3	8.8***
	Within	870	86.3	
	Total	873		
Academic Grade Point Average	Between	3	1643.1	11.7***
	Within	981	140.1	
	Total	984		

\*  $p < .05$   
 \*\*  $p < .01$   
 \*\*\*  $p < .001$

Table 9

Scheffe Multiple Comparisons of Achievement Variable Means by Student Group

Achievement Variable	Student Group		ABE	BTSD	GED	RHSP
		$\bar{X}$	64.6	69.8	67.1	73.3
Mathematics	ABE	64.6	0	5.2	2.5	8.7*
	BTSD	69.8		0	2.7	3.5
	GED	67.1			0	6.2
	RHSP	73.3				0
		$\bar{X}$	65.3	67.2	71.9	70.6
English	ABE	65.3	0	1.9	6.6*	5.3*
	BTSD	67.2		0	4.7	3.4
	GED	71.9			0	1.3
	RHSP	70.6				0
		$\bar{X}$	62.8	68.4	62.9	67.6
Science	ABE	62.8	0	5.5	.1	4.7*
	BTSD	68.4		0	5.5	.8
	GED	62.9			0	4.7
	RHSP	67.6				0
		$\bar{X}$	71.8	76.4	77.4	74.8
Trade Theory	ABE	71.8	0	4.6*	5.6*	3.0*
	BTSD	76.4		0	1.0	1.6
	GED	77.4			0	2.6
	RHSP	74.8				0
		$\bar{X}$	70.9	73.6	74.7	71.8
Trade Practical	ABE	70.9	0	2.7	3.8*	.9
	BTSD	73.6		0	1.1	1.8
	GED	74.7			0	2.9
	RHSP	71.8				0
		$\bar{X}$	67.0	71.6	71.0	71.7
Total Grade Point Average	ABE	67.0	0	4.6*	4.0	4.7*
	BTSD	71.6		0	.6	.1
	GED	71.0			0	.7
	RHSP	71.7				0
		$\bar{X}$	64.3	68.6	67.4	70.7
Academic Grade Point Average	ABE	64.3	0	4.3	3.1	6.4*
	BTSD	68.6		0	1.2	2.1
	GED	67.4			0	3.3
	RHSP	70.7				0

\* p < .10



Type I error.

Further examination of the results revealed that the ABE group scored significantly lower than the RHSP group on each of the variables except Trade Practical ( $p < .10$ ). The ABE group's mean scores on English, Trade Theory and Trade Practical were significantly lower than were those of the GED group ( $p < .10$ ). On Trade Theory and the Total Grade Point Average, the ABE group's mean scores were significantly lower than were those of the BTSD group ( $p < .10$ ). Interestingly, with the exclusion of the ABE group, none of the remaining three groups were significantly different on any of the achievement variables ( $p < .05$ ). To facilitate reader comparisons of the performance of the four student groups, achievement scores on the TGPA variable are grouped within quartiles and are presented graphically in Figure 1 (see Appendix D1). The TGPA variable represents a measure of the overall vocational achievement for each of the four student groups, and reflects the relative standing of the ABE group on each of the variables.

Hypothesis II

Due to the nature and extent of the significant differences found in Hypothesis I, a further analysis was conducted to determine if there were significant differences in achievement between the ABE and non-ABE groups within program clusters. The analysis deals with the following program clusters: Mechanical, Construction, Electrical,

Services, and Business Education. The analysis of the Business Education cluster will be reported independently of the other clusters since there was no acceptable criterion for assigning equivalent grade percentages to instructors' ratings. Further elaboration of analysis procedures for the Business Education cluster will be discussed later in this chapter.

Table 10 presents descriptive statistics of the means and standard deviations of each of the achievement variables for student groups within program clusters. Two striking scoring patterns emerge from this table. First, the ABE group continues to report lower scores than are reported for each of the non-ABE groups within program clusters. Second, there appears to be a relatively consistent scoring pattern among clusters irrespective of student groups, with mean scores in the Services cluster being highest. These observed differences were tested for statistical significance by means of a four x four way (student group x program cluster) analysis of variance. The results of this analysis, presented in Table 11, indicate that both main effects were significant for each of the achievement variables. The lack of a significant interactive effect between student groups and program clusters and the presence of a significant main effect for program cluster prompted the calculation of Scheffe multiple comparisons to determine which program clusters were significantly different from each other on the achievement variables. The results, presented in Table 12

Table 10

Means and Standard Deviations of Achievement Variables  
for Student Groups Within Program Clusters

Program Cluster	Student Group	Mathematics		English		Science		Trade Theory		Trade Practical		Total Grade Point Average		Academic Grade Point Average	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Mechanical	ABE	62.5	16.7	65.1	10.3	60.2	14.1	70.9	10.0	70.7	5.1	65.6	8.5	62.7	11.7
	BTSD	65.7	17.3	67.0	16.5	64.0	11.8	75.8	6.4	71.0	5.0	70.0	6.6	65.7	13.5
	GED	67.4	15.8	75.0	7.0	62.6	15.0	75.3	7.5	73.7	6.4	71.3	8.2	68.4	10.7
	RHSP	72.3	15.6	70.1	11.1	65.5	14.4	73.4	8.3	71.4	5.7	70.5	8.9	69.4	11.7
Construction	ABE	61.2	16.5	64.6	11.4	61.0	15.7	69.9	8.5	70.8	7.0	65.6	9.7	62.4	13.0
	BTSD	71.2	17.7	66.0	11.2	71.6	14.4	76.5	11.0	72.1	6.6	71.3	11.4	70.0	13.7
	GED	54.7	18.8	65.0	14.8	54.0	16.0	72.6	8.9	73.1	6.1	63.8	11.6	58.0	15.5
	RHSP	72.0	16.4	68.7	12.4	66.0	15.6	74.0	9.1	70.1	6.2	70.4	9.6	69.0	12.9
Electrical	ABE	63.8	14.7	62.9	8.4	59.3	13.0	68.0	12.4	68.0	8.0	64.4	9.3	62.2	10.5
	BTSD	75.1	19.5	72.6	16.5	69.8	20.0	75.0	13.1	77.5	8.9	74.2	14.6	72.6	18.2
	GED	80.5	10.4	77.2	8.5	73.3	12.0	85.2	8.3	77.1	7.5	78.7	8.0	77.1	9.7
	RHSP	76.3	14.0	73.2	9.2	68.9	11.3	75.0	10.6	72.4	7.3	73.2	8.5	73.0	9.9
Services	ABE	70.7	14.2	67.2	10.0	70.9	12.7	77.5	10.7	73.2	8.0	73.3	8.3	69.6	10.6
	BTSD	71.6	13.5	66.0	9.5	70.9	14.3	77.8	12.7	75.6	11.5	72.3	10.8	69.7	10.9
	GED	70.1	16.1	69.9	13.2	65.6	16.0	82.6	11.8	77.8	9.2	74.0	12.3	68.6	13.4
	RHSP	75.0	13.0	72.1	10.9	75.2	12.3	80.1	10.0	74.7	10.1	76.9	8.0	74.9	9.8

Table 11

Two Way Analysis of Variance of Achievement Variables  
by Student Group and Program Cluster

Achievement Variable	Source of Variation	Degrees of Freedom	Mean Squares	F
Mathematics	Main Effects	6	2634.5	11.3
	Student Group	3	3434.4	11.7***
	Program Cluster	3	2103.9	9.0***
	Student Group Program Cluster	9	315.5	1.3
	Between	15	1243.1	5.3
	Within	858	234.0	
	Total	873	251.3	
English	Main Effects	6	990.3	8.3
	Student Group	3	1235.7	10.4***
	Program Cluster	3	838.4	7.1***
	Student Group Program Cluster	9	150.6	1.3
	Between	15	486.5	4.1
	Within	858	118.7	
	Total	873	125.0	
Science	Main Effects	6	2292.7	11.4
	Student Group	3	1179.1	5.9**
	Program Cluster	3	3580.5	17.8***
	Student Group Program Cluster	9	281.6	1.4
	Between	15	1086.1	5.4
	Within	858	201.0	
	Total	873	216.2	
Trade Theory	Main Effects	6	1146.1	13.4
	Student Group	3	545.2	6.4***
	Program Cluster	3	1821.7	21.3***
	Student Group Program Cluster	9	112.9	1.3
	Between	15	526.2	6.2
	Within	858	85.4	
	Total	873	93.0	

Table 11 (Cont'd)

Achievement Variable	Source of Variation	Degrees of Freedom	Mean Squares	F
Trade Practical	Main Effects	6	491.1	11.3
	Student Group	3	147.9	3.4*
	Program Cluster	3	841.2	19.3***
	Student Group			
	Program Cluster	9	43.8	1.0
	Between	15	222.7	5.1
	Within	858	43.6	
	Total	873	46.6	
Total Grade Point Average	Main Effects	6	1167.7	14.5
	Student Group	3	883.0	10.9***
	Program Cluster	3	1575.2	19.5***
	Student Group			
	Program Cluster	9	122.9	1.5
	Between	15	540.8	6.7
	Within	858	80.7	
	Total	873	88.6	
Academic Grade Point Average	Main Effects	6	1693.3	12.6
	Student Group	3	1691.4	12.6***
	Program Cluster	3	1886.1	14.0***
	Student Group			
	Program Cluster	9	196.9	1.5
	Between	15	795.5	6.0
	Within	858	134.6	
	Total	873	146.0	

\*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$



Table 12

## Scheffe Multiple Comparisons of Achievement Variable Means for Program Clusters

			Mechanical	Construction	Electrical	Services
		$\bar{X}$	70.7	69.8	75.0	73.7
Mathematics	Mechanical	70.7	0	.9	4.3	3.0
	Construction	69.8	0	0	5.2*	3.9
	Electrical	75.0	0	0	0	1.3
	Services	73.7	0	0	0	0
		$\bar{X}$	69.5	67.9	72.2	70.6
English	Mechanical	69.5	0	1.6	2.7	1.1
	Construction	67.9	0	0	4.3*	2.7
	Electrical	72.2	0	0	0	1.6
	Services	70.6	0	0	0	0
		$\bar{X}$	64.6	64.9	68.0	73.6
Science	Mechanical	64.6	0	.3	3.4	9.0*
	Construction	64.9	0	0	3.1	8.7*
	Electrical	68.0	0	0	0	5.6*
	Services	73.6	0	0	0	0
		$\bar{X}$	73.2	73.5	74.7	79.5
Trade Theory	Mechanical	73.2	0	.3	1.5	6.3*
	Construction	73.5	0	0	1.2	6.0*
	Electrical	74.7	0	0	0	4.8*
	Services	79.5	0	0	0	0
		$\bar{X}$	70.8	71.4	72.3	74.6
Trade Practical	Mechanical	70.8	0	.6	1.5	3.8*
	Construction	71.4	0	0	.9	3.2*
	Electrical	72.3	0	0	0	2.3
	Services	74.6	0	0	0	0
		$\bar{X}$	69.9	69.5	72.5	75.7
Total Grade Point Average	Mechanical	69.9	0	.4	2.6*	5.8*
	Construction	69.5	0	0	3.0*	6.2*
	Electrical	72.5	0	0	0	3.2*
	Services	75.7	0	0	0	0
		$\bar{X}$	67.6	68.4	71.9	73.2
Academic Grade Point Average	Mechanical	67.6	0	.8	4.3*	5.6*
	Construction	68.4	0	0	3.5*	4.8*
	Electrical	71.9	0	0	0	1.3
	Services	73.2	0	0	0	0

\* $p < .05$



showed that students in the Services cluster scored significantly higher than did students in each of the other three clusters on the Science, Trade Theory, Trade Practical, and Total Grade Point Average variables ( $p < .05$ ). A similar result occurs on the Academic Grade Point Average variable. Services cluster students scored significantly higher than their counterparts in both the Mechanical and Construction clusters. However, they did not score significantly higher than did students in the Electrical cluster. Students in the Electrical cluster scored significantly higher on the Mathematics, English, and Academic Grade Point Average variables than did students in the Construction cluster. They also scored significantly higher on the latter two variables than did students in the Mechanical cluster ( $p < .05$ ).

As a general observation, students in the Services cluster were superior in achievement on most of the variables to their counterparts in the other three clusters. As well, students in the Electrical cluster tended to score higher than their counterparts in the Construction cluster on many of the achievement variables. Using the Total Grade Point Average as an overall measure of vocational achievement, the relative ranking of student achievement in ascending order by program cluster was as follows: Services > Electrical > Mechanical = Construction.

### Business Education Cluster

This cluster represented a group of programs in which students were assigned skill ratings instead of the usual percentage scores. Skill ratings were assigned to each of the performance objectives by program instructors using a scale ranging from 1 to 5. Reference to Appendix E will provide an explanation of the performance objectives and the evaluation procedure used to assign skill ratings.

Since the purpose of this study was to provide meaningful information on the academic performance of the ABE students within vocational programs, the evaluation of large numbers of practical objectives which dominated the Business Education programs was omitted from this study. The collection of such large amounts of data relating to practical performance, and its subsequent analysis was neither relevant nor critical to the research questions of this study. Consequently, this section will analyze only the Business Mathematics and Communication Skills components of the total program. Instructors' ratings of performance objectives within each of these subject areas were added to form a total score. These two scores were then analyzed for each of the four student groups.

Table 13 presents the means and standard deviations of both achievement variables for the four groups of students. An examination of this Table shows that the BTSD group ranked lowest on both achievement variables. This observation was tested for statistical significance by a four x two

Table 13

Means and Standard Deviations of Achievement Variables  
for Student Groups in Business Education  
Program Cluster

Student Group	Business Mathematics			Communication Skills		
	$\bar{X}$	SD	N	$\bar{X}$	SD	N
ABE	2.73	.57	26	2.43	.47	51
BTSD	2.53	.46	19	2.34	.38	28
GED	2.67	.36	17	2.67	.38	27
RHSP	2.87	.43	53	2.57	.44	162

way (student group x achievement variable) analysis of variance. The results of this analysis, presented in Table 14, indicate that there were significant differences between student groups for both the Business Mathematics variable ( $F = 2.75$ ,  $df = 3/111$ ,  $p = .046$ ) and the Communication Skills variable ( $F = 4.01$ ,  $df = 3/264$ ,  $p = .001$ ). Subsequent Scheffe multiple comparisons indicated that the BTSD group scored significantly lower than the RHSP group on the Business Mathematics variable ( $p < .10$ ), and significantly lower than both the GED and RHSP groups on the Communication Skills variable ( $p < .10$ ). Although the mean performance ratings for the significant findings appear to be only slightly different (.34, .33 and .23 respectively), these mean differences have to be interpreted in reference to the restricted range of actual performance ratings assigned by instructors (1 to 5). In fact, on the 1-5 scale, the values of 1 and 5 were infrequently assigned, resulting in a large majority of the ratings falling within the 1 to 3 range. To facilitate reader comparisons of the performance of the four student groups, instructors' ratings on each of the variables are grouped within quartiles and are presented graphically in Figures 2 and 3 (see Appendix D2 and D3).

It would have been interesting to see how males compared with females, on the achievement variables in Business Education. However, the small number of male students in these programs would not permit such an analysis. Only four percent of the Business Education student sample was male.

Table 14

One Way Analysis of Variance of Achievement Variables  
by Student Groups in Business Education

Achievement Variable	Source	SS	df	MS	F
Business Mathematics	Between	1.7478	3	0.5826	2.750*
	Within	23.5176	111	0.2119	
Communication Skills	Between	2.2860	3	0.7620	4.005**
	Within	50.2293	264	0.1903	

\*  $p < .05$

\*\*  $p < .01$



### Hypothesis 2B

It is hypothesized that there are no significant sex differences in achievement between the ABE, and non-ABE groups in vocational school programs. Table 15 presents descriptive statistics on each of the dependent variables for the sex factor within student groups. An examination of this table reveals that in ninety-three percent of the cases the mean scores for females were superior to those of males. A subsequent four x two way (student groups and sex) analysis of variance was conducted to determine if these observed differences were significant. The results of this analysis, presented in Table 16, indicate a significant main effect for sex on each of the dependent variables, with no significant interaction between sex and student group.

The presence of a significant main effect for sex prompted a further analysis of this factor to determine the nature of the differences. An examination of the means and standard deviations presented in Table 17 reveals that females scored very much higher than did males on each of the variables except English and Mathematics. On both of these variables, females scored only slightly higher than did males. These observed differences were tested for statistical significance by analysis of variance ( $p < .05$ ). The results of this analysis, presented in Table 18, indicated that there were significant sex differences in achievement on each of the variables except Mathematics and



Table 15

Means and Standard Deviations of Achievement Variables by Sex Within Student Groups

Entry Group		Math			English			Science			Trade Theory			Trade Practical			Total Grade Point Avg.			Academic Grade Point Avg.		
		N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
ABE	Male	103	62.5	16.2	103	64.4	10.2	102	60.1	14.2	93	69.9	9.9	93	70.2	5.9	93	65.1	8.7	102	62.4	11.7
	Female	38	70.4	14.5	38	67.7	10.1	35	71.3	12.6	30	77.5	10.3	30	73.1	8.5	28	73.4	8.6	35	69.9	10.6
BTSD	Male	27	69.1	17.3	27	67.8	14.8	27	67.1	13.7	24	76.2	9.0	24	73.3	7.0	24	71.5	9.5	27	68.1	13.9
	Female	14	71.1	13.8	14	66.0	9.8	14	70.8	14.8	10	77.0	13.1	10	74.6	11.6	10	71.7	11.2	14	69.4	11.3
GED	Male	33	66.3	18.0	33	72.4	11.1	33	62.3	15.8	30	76.7	9.3	30	74.3	6.5	30	70.5	10.7	33	67.1	13.6
	Female	8	70.1	16.1	8	69.9	13.2	8	65.6	16.0	4	82.6	11.8	4	77.8	9.2	4	74.0	12.3	8	68.6	13.4
RHSP	Male	642	73.0	15.6	642	70.3	11.4	640	66.5	14.2	588	73.9	8.9	588	71.4	6.3	583	70.9	9.1	638	70.0	11.8
	Female	137	74.7	13.7	137	71.8	10.7	128	73.5	14.0	107	79.5	10.4	107	74.5	9.5	102	76.1	8.6	128	73.9	10.7

Table 16

Analysis of Variance of Achievement Variables  
for Sex and Student Group

Achievement Variable	Source of Variation	Degrees of Freedom	Mean Squares	F
Mathematics	Main Effects	4	3307.8	14.0
	Student Group	3	3449.1	14.6***
	Sex	1	3736.1	15.8***
	Student Group Sex	3	301.5	1.3
	Between	7	2019.4	8.5
	Within	866	237.0	
	Total	873	251.3	
English	Main Effects	4	1111.9	9.2
	Student Group	3	1247.8	10.4***
	Sex	1	1020.7	8.5**
	Student Group Sex	3	159.3	1.3
	Between	7	703.6	5.8
	Within	866	120.4	
	Total	873	125.0	
Science	Main Effects	4	2744.0	13.5
	Student Group	3	1181.7	5.8**
	Sex	1	7961.2	39.1***
	Student Group Sex	3	404.7	2.0
	Between	7	1741.5	8.5
	Within	866	203.9	
	Total	873	216.2	
Trade Theory	Main Effects	4	1475.6	17.0
	Student Group	3	575.2	6.6***
	Sex	1	4490.6	51.9***
	Student Group Sex	3	93.0	1.1
	Between	7	883.1	10.2
	Within	866	86.6	
	Total	873	93.0	
Trade Practical	Main Effects	4	521.5	11.7
	Student Group	3	158.9	3.6*
	Sex	1	1663.5	37.3***
	Student Group Sex	3	15.2	.341
	Between	7	304.5	6.834
	Within	866	44.6	
	Total	873	46.6	

Table 16 (Cont'd)

Achievement Variable	Source of Variation	Degrees of Freedom	Mean Squares	F
Total Grade Point Average	Main Effects	4	1414.7	17.2
	Student Group	3	899.9	10.9***
	Sex	1	3378.2	41.0***
	Student Group Sex	3	128.7	1.6
	Between	7	863.6	10.5
	Within	866	82.3	
	Total	873	88.6	
Academic Grade Point Average	Main Effects	4	2049.0	15.0
	Student Group	3	1704.0	12.4***
	Sex	1	3694.5	27.0***
	Student Group Sex	3	217.5	1.6
	Between	7	1264.1	9.2
	Within	866	136.9	
	Total	873	145.9	

\*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$

Table 17

Means and Standard Deviations of Achievement Variables  
for Student Sex

Student Sex	Mathe- matics		English		Science		Trade Theory		Trade Practical		Total Grade Point Average		Academic Grade Point Average	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Male	71.2	16.2	69.5	11.5	65.5	14.4	73.6	9.2	71.4	6.3	70.2	9.3	68.9	12.2
Female	73.5	14.0	70.5	10.7	72.5	13.9	79.0	10.5	74.3	9.4	75.2	9.0	72.6	10.9

Table 18

## Analysis of Variance of Achievement Variables and Student Sex

Achievement Variable	Source	Degrees of Freedom	Mean Squares	F ratio
Mathematics	Between	1	759.3	3.04
	Within	1000	249.2	
	Total	1001		
English	Between	1	143.9	1.12
	Within	1000	128.8	
	Total	1001		
Science	Between	1	7434.7	36.2***
	Within	985	205.4	
	Total	986		
Trade Theory	Between	1	3657.0	41.1***
	Within	884	88.9	
	Total	885		
Trade Practical	Between	1	1071.7	22.3***
	Within	884	48.0	
	Total	885		
Total Grade Point Average	Between	1	2958.9	34.7***
	Within	872	85.3	
	Total	873		
Academic Grade Point Average	Between	1	2106.3	14.8***
	Within	983	142.7	
	Total	984		

\*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$

English ( $p < .001$ ). To further facilitate comparisons by sex, achievement scores on the TGPA variable are grouped within quartiles and are presented in Figure 4 (see Appendix D4). The TGPA variable represents an index of the overall vocational achievement for both sexes, and reflects their relative standing on each of the achievement variables.

In conclusion, the results presented in this chapter failed to support the hypotheses under investigation. The achievement of ABE students in vocational school programs was significantly lower than that of students in the various non-ABE groups. The greatest number and range of achievement differences was found between the ABE and RHSP student groups. Data analyses by program clusters found that the achievement of ABE students was comparable to non-ABE students only in the Business Education cluster. The data also showed that females scored significantly higher than males on most of the achievement variables.



## CHAPTER V

### DISCUSSION

This chapter gives a summation of the purpose, methodology and results of this study. As well, implications of the results are discussed and recommendations are made for further research.

#### Summary

##### The Purpose

The general purpose of this study was to investigate the achievement of ABE students in vocational school programs in Newfoundland and Labrador to determine if the adult basic education program is a valid orientation for students who pursue post-secondary training programs of a trade and occupational nature. The review of the literature and discussions with personnel of the Adult Education Division of the Department of Education revealed that little research has been done in the field of adult education in Newfoundland, and virtually none in the area of adult basic education.

##### Methodology

Vocational school programs in which ABE students were enrolled during the 1980-82 school years were identified and data relating to their achievement within the following

subject areas were collected: Mathematics, English, Science, Trade Theory, and Trade Practical. Similar data were collected for the various groups of non-ABE students occupying these programs. The students' achievement scores within these subject areas were used as a basis to compare the achievement of the ABE and the various non-ABE groups in vocational school programs and program clusters.

These data were then compiled for analysis using descriptive and inferential statistical procedures.

#### Results of the Study

The following are the major findings of this study:

1. The hypothesis that no significant differences in achievement would be found between the ABE group and each of the non-ABE groups in vocational school programs was rejected. The ABE group scored significantly lower than at least one of the non-ABE groups on each of the achievement variables. Furthermore, using the TGPA variables as an overall measure of vocational achievement, the ABE group scored significantly lower than both the BTSD and RHSP groups.

The greatest achievement discrepancies were found between the ABE and RHSP groups. With the exception of the Trade Practical variable, the academic achievement of RHSP students was significantly higher than that of ABE students on each of the remaining variables: Trade Theory, English, Mathematics,

Science, Total Grade Point Average, and Academic Grade Point Average. On the Trade Practical variable, only the GED students scored significantly higher than the ABE students. This finding suggests GED students excel in terms of their practical, trade-related knowledge. Their superiority in achievement on this variable may be a consequence of the fact that many of these students return from the work force to pursue studies related to their field of practical expertise. This hypothesis is further supported by the significantly higher Trade Theory score for GED students in comparison to ABE students.

As mentioned earlier, BTSD students scored significantly higher than ABE students on the TGPA variable. As well, these students scored significantly higher than ABE students on the Trade Theory variable. This is an interesting finding. It may reflect the type of upgrading program these students complete. Apart from the fact that BTSD students became generally familiar with vocational schools through their upgrading program, these students often gain exposure to the theory behind many of the pre-employment programs offered at these schools. Furthermore, instructors in the BTSD program frequently offer encouragement and guidance to have students choose study units which best relate to their area of vocational interest. Such features are absent from the ABE upgrading program.

It was also demonstrated that females scored significantly higher than males on all of the achievement variables

except Mathematics and English. The lack of adequate representation of both sexes within some vocational programs (i.e. Mechanical) imposes a possible limitation of the generalizability of the results. However, where both sexes were adequately represented, as in the Services program clusters, females showed a consistently higher scoring pattern on all achievement variables, except Mathematics and English.

This finding may be of sufficient interest to Services cluster teaching personnel to prompt an investigation of the nature of these achievement differences. Do the achievement differences indicate that females have a greater aptitude for the Services trades than do males? Are the achievement differences indicative of stronger academic and practical skills for females? Are the achievement differences a result of culturally developed behavior patterns which may influence the teacher's expectations of males in skill areas traditionally dominated by females? Until a plausible explanation of these achievement differences is found, male students may find it difficult to compete academically with females in their Services training programs.

2. The hypothesis that no significant differences in achievement would be found between the ABE group and each of the non-ABE groups within program clusters was also rejected. Grouping vocational programs within clusters did not affect the achievement status of the ABE group. These students continued to score significantly lower than each of the non-ABE groups on the achievement variables. Only

in the Business Education program cluster were ABE students comparable in achievement to the various groups of non-ABE students. This finding carries serious implications for ABE students applying for admission to vocational school programs. Vocational school admission personnel may be prompted to institute more stringent screening measures for ABE applicants, i.e. entrance examinations and/or elevated minimum percentage scores in prerequisite subject areas. Such measures may significantly reduce the number of ABE graduates being admitted to vocational school programs, and cause potential students to reject the ABE program as a suitable upgrading program for subsequent vocational training. As well, the institution of more stringent admission criteria for ABE students now would only serve to make it even more difficult for ABE students to gain admission to vocational school programs.

3. Significant achievement differences were found between program clusters on many of the variables. Students in the Services cluster showed significantly higher achievement than students in the Electrical, Mechanical and Construction clusters. In descending order, mean score rankings on the TGPA variable were as follows: Services, Electrical, Mechanical and Construction. A similar scoring pattern was evident on many of the achievement variables. Vocational school personnel may see the need to be concerned about these achievement differences in view of the lack of guidance



services in many of the schools. Without access to adequate guidance services, students who do not have firm career goals in mind may select either clusters or courses that are not compatible with their unique patterns of abilities and encounter difficulties because of their choices. Vocational school personnel may see a further need to investigate both the causes and the implications of these achievement differences between program clusters.

#### Conclusion

The results of this study may be of interest to those who are charged with the responsibility of developing and implementing adult basic education programs for students in this province. While this study made no direct attempt to investigate the causes of achievement differences, the results prompt speculation that may assist those concerned with the subject. If the opinions of vocational school instructional personnel can be taken as a possible source of helpful information, then the issue of basic academic skill deficiencies appears to be a very plausible explanation of the achievement differences. In many instances, instructors reported that ABE students need considerable attention in basic academic skill development upon entry to vocational programs.

Whatever the causes of these achievement differences, the implications could be serious for ABE students who enter



vocational school programs. These students may face serious problems in attempting to reach the academic standards required in their programs. Although many ABE students graduate from their vocational school programs, their career achievement scores may create difficulties in their competing with fellow graduates for employment in the labor force. Quite often, the quality of an applicant's training record is the most important factor in determining suitability for employment.

The following recommendation is offered as a possible avenue for future research of the nature of achievement problems of the ABE students in vocational school programs.

1. The opinions of adult and vocational education personnel, and students enrolled in vocational programs, should be gathered to suggest possible causes of the lower achievement scores of ABE graduates.

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APPENDIX A

## Adult Basic Education

## Survey Results

1981-82

Number of adult education regions sampled	<u>6</u>
Total Sample Size	<u>250</u>
Selection of adult centers - <u>random selection within regions</u>	
Grade Levels sampled	<u>IX, X, XI</u>

<u>Responses</u>	<u>Percentage of Sample</u>
1. Upgrade academic skills to prepare for entry into vocational institutions in the province	<u>70%</u>
2. To become better able to help members of my family with their school work	<u>5%</u>
3. To get a high school equivalency certificate, but not continue my education at vocational institutions in the province	<u>12%</u>
4. To help me become better skilled in my present job.	<u>3%</u>
5. To increase my chances of finding employment	<u>10%</u>

APPENDIX B

Introduction Letter to Vocational School Principals

P.O. Box 48  
Graduate Student  
Education Building  
Memorial University of Nfld.  
St. John's, Nfld.  
A1B 3X8

Principal  
District Vocational School  
Newfoundland

Dear Sir:

I am a Graduate student in the Department of Educational Psychology, Memorial University. To fulfill the research component of my program, I have chosen to investigate the Adult Basic Education Upgrading Program\* (evening - part-time students) in the Province.

Part of my study sample will include former ABE students who are presently enrolled and/or who were enrolled in vocational training programs at post-secondary institutions in the Province during the past two years. I hope to be able to obtain information from these students in an attempt to determine if the ABE program is a valid orientation for those who entered post-secondary training. I'm sure you will find this type of information very interesting from both a personal and professional viewpoint.

At this time I am chiefly interested in identifying the number and names of former ABE students presently enrolled at your institution or who were enrolled at some time this current school year or last year (see attached sheets). I would be interested as well in knowing the programs in which they are/were enrolled.

I have had a number of discussions with Mr. Van Kesteren of the Department of Vocational Education and Mr. W. Shallow of the Adult and Continuing Education Department. Both of these gentlemen are extremely interested in the study and strongly endorse it. They have ensured me of their full support in every respect. I'm certain that you are just as interested and would be willing to offer your cooperation and assistance.

I hope to have the data for the study collected before vocational and technical institutions close in June. As you can see, time is an important factor for the closure of this study. For this very reason, I am requesting your prompt attention and cooperation in helping identify the ABE students at your institution. You could do this by completing the enclosed form and returning it in the self-addressed and stamped envelope.

.../2



I extend my deepest thanks, in advance, for your anticipated cooperation in this matter. Kindest regards, as well, for a prosperous and successful school year.

Sincerely,

Leonard Hynes

LH/bm

c.c. Arthur Van Kestern  
Director of Vocational Education.

\*Note: ABE program does not refer to BTSD program.



PRELIMINARY SURVEY SUMMARY SHEET

1. Name of Institution \_\_\_\_\_  
Address \_\_\_\_\_
  
2. a. Number of former ABE students who were enrolled at your school in the 1980-81 school year in some form of vocational training program (include students who completed as well as those who withdrew from their programs). \_\_\_\_\_  
b. Number of former ABE students who enrolled during the 1981-82 school year in some form of vocational training program (include students who withdrew as well as those presently enrolled). \_\_\_\_\_  
c. Number of former Adult Basic Education (ABE) students now enrolled at your school in some form of vocational program. \_\_\_\_\_
  
3. Please complete the attached form. Use an alternate form, if you wish.

THANK YOU FOR YOUR COOPERATION AND PROMPT  
ATTENTION!

(Check  appropriate year)

STUDENT'S NAME	1980-81	1981-82	Name of Program	Presently Enrolled	Dropped Out	Graduated

APPENDIX C

Letter to Vocational School Principals Requesting  
Information on the Academic Background of Students

P.O. Box 48  
Education Building  
Memorial University  
St. John's, Nfld.  
A1B 3X3

The Principal  
District Vocational School  
Newfoundland

Dear Sir:

In your recent correspondence to me you indicated that ABE students are enrolled in the following programs:


I would like to thank you for your very generous assistance and co-operation in this matter. I hate to have to bother you again, but there is one further item of information which I need before I can gather data for my study. I hope that you are able to find the time to assist me once again.

In the following programs listed above, I need to know the names of the students enrolled and their previous educational background (i.e. ABE, BTSD, High School Regular Program, High School General Program, etc.). While I realize and appreciate the many pressing demands on your time, I hope that you are able to find a few minutes to obtain the aforementioned information. Would you, as well, extend my deepest thanks to those at your school who were/are involved in obtaining this information.

Thank you in advance for your prompt attention in this matter. I look forward to meeting you before school terminates.

Yours sincerely,

Leonard J. Hynes

APPENDIX D

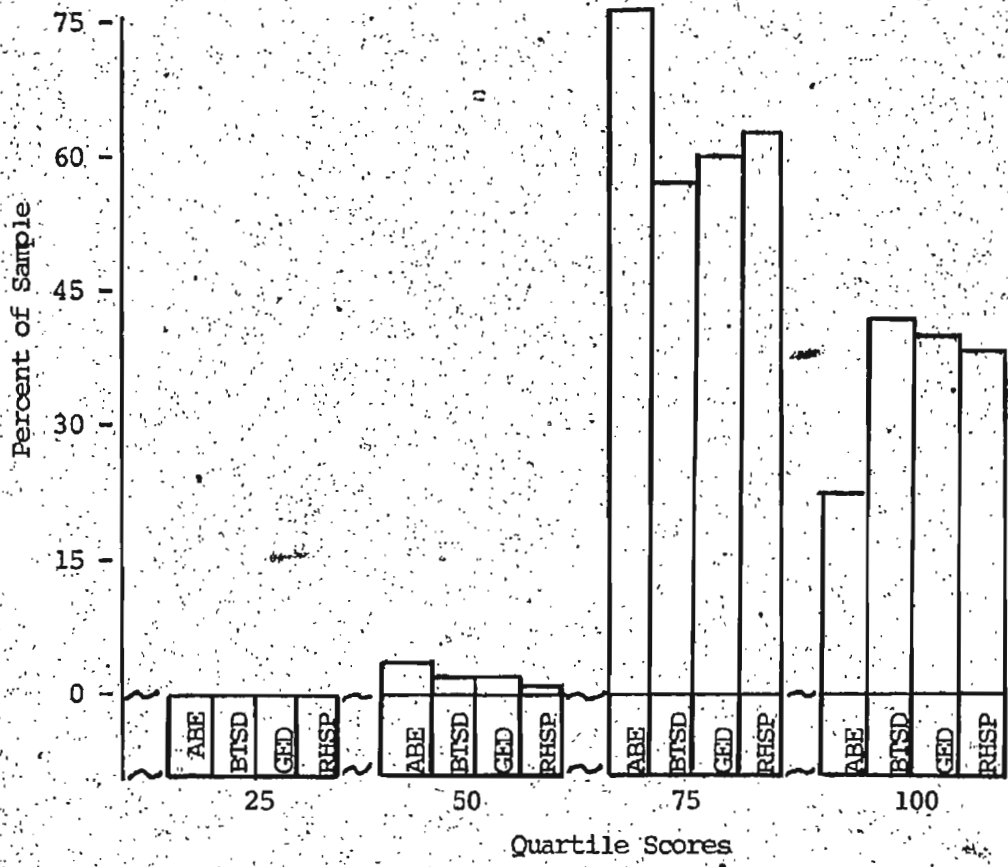


Figure 1. Distribution of total grade point average scores by quartile range for student groups



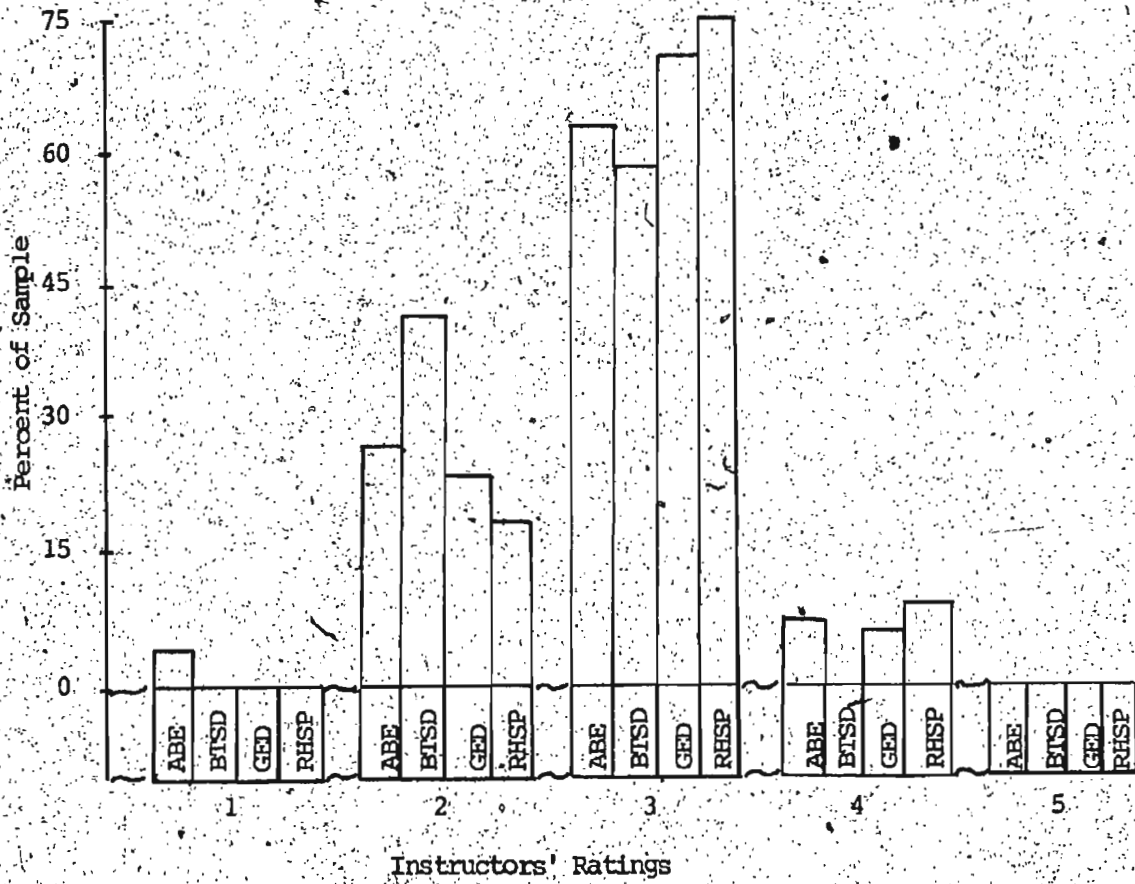


Figure 2: Distribution of Business Mathematics ratings by student group.

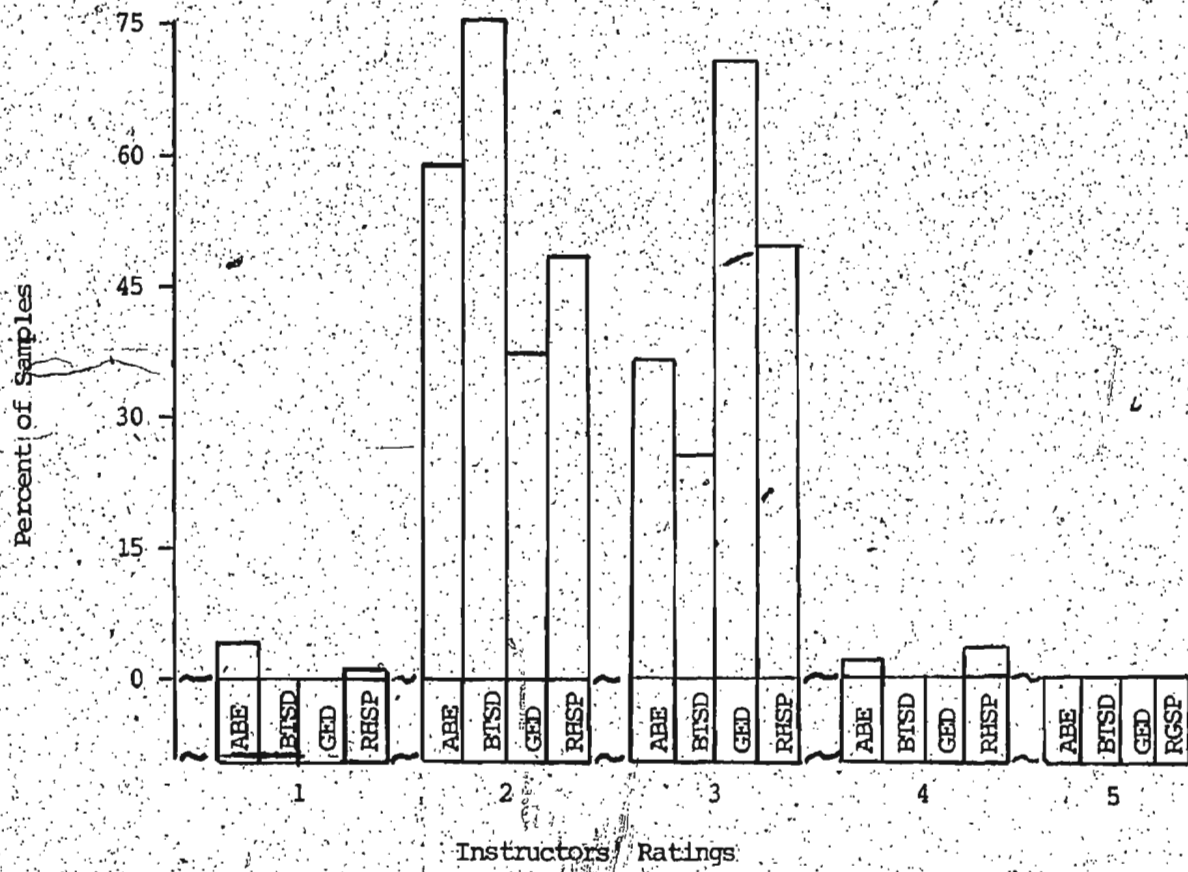


Figure 3. Distribution of communication skills ratings for student groups

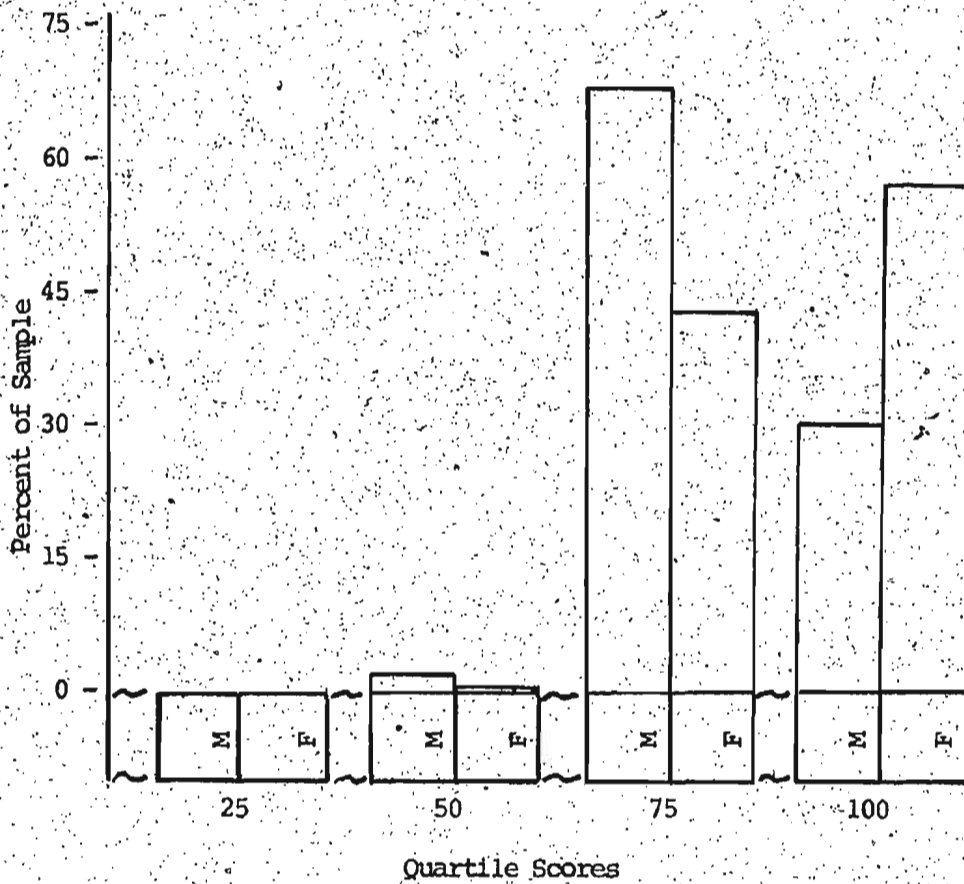


Figure 4. Distribution of total grade point average scores by quartile range for student sex.

APPENDIX E

Performance Objectives and Evaluation Key for Business  
Education Program

Evaluation KeyPerformance Rating

- 5 - Can perform the task without supervision or assistance with proficiency in speed and quality.
- 4 - Can perform the task satisfactorily without assistance and/or supervision.
- 3 - Can perform the task satisfactorily but requires periodic supervision and/or supervision.
- 2 - Can perform some parts of the task satisfactorily but requires instruction and supervision to perform the entire task.
- 1 - Knowledge and skill required for completion of the task not sufficiently developed for participation in a work environment.

Performance ObjectivesBusiness Mathematics

1. Perform Basic Mathematical Calculations
2. Perform Basic Calculations with Fractions
3. Perform Basic Calculations with Decimals
4. Perform Basic Calculations with Percentages
5. Calculate Trade and Cash Discounts
6. Calculate Simple Interest
7. Calculate Mark-up and Margin
8. Perform Practical Measurements



Business Communication Skills

1. Use Correct Spelling.
2. Employ Correct Grammar and Punctuation in Written Communication.
3. Proofread for Spelling, Punctuation, Meaning and Grammatical Structure.
4. Carry Out Written and Verbal Instructions.
5. Communicate Verbally.
6. Compose Routine Memos and Business Letters.
7. Compose Teletype and Telegram Messages.







