DOCUMENT RESUME

ED 082 732 JC 730 232

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TITLE A Study of Community College Students Who Are Graduates of Vocational Technical and College Preparatory High School Curriculums (19-2017). Final Report.
INSTITUTION Lehigh County Community Coll., Schnecksville, Pa.
SPONS AGENCY Pennsylvania State Dept. of Education, Harrisburg. Bureau of Vocational, Technical, and Continuing Education.
PUB DATE 1 Jul 73
NOTE 101p.

EDRS PRICE MF-$0.65 HC-$6.58
DESCRIPTORS Academic Achievement; College Entrance Examinations; College Students; *Community Colleges; *Comparative Analysis; *Continuation Students; Educational Background; Post Secondary Education; Statistical Data; *Student Characteristics; *Vocational High Schools
IDENTIFIERS *Pennsylvania

ABSTRACT

The options selected by secondary school graduates with varying academic backgrounds, the intellective characteristics of these students, and their completion/noncompletion records were investigated. A comparison was made of 229 male vocational training (VT) graduates and 200 male college preparatory (CP) graduates with respect to demographic data, seven preadmissions educational variables, and achievement in college. An attempt was made to study the 229 VT graduates as they pursued community college programs in one of three areas: college career program related to their secondary school curriculum; college career program unrelated to their secondary school curriculum; or a college transfer program. The study also examined these three VT classifications with regard to demographic data, preadmissions variables, and college achievement. The subjects were enrolled in two comprehensive community colleges in Eastern Pennsylvania. Three hypotheses were tested. The two primary statistical techniques used were chi-square and univariate analysis of variance. The results of the study showed that CP and VT students tend to be similar with regard to demographic variables and to college graduation. They tend to be dissimilar with regard to preadmissions variables and to GPA. The three classifications of VT students tend to be dissimilar on demographic variables and on college achievement but are similar on preadmissions variables. Appendixes to the report provide a Synopsis of Research, List of VT Curriculums, and Year-by-Year Analysis of Enrollment by Curriculum. (DB)

FINAL REPORT

A STUDY OF COMMUNITY COLLEGE STUDENTS WHO ARE GRADUATES OF VOCATIONAL TECHNICAL AND COLLEGE PREPARATORY HIGH SCHOOL CURRICULUMS (19-2017)

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July 1, 1973

PENNSYLVANIA DEPARTMENT OF EDUCATION

BUREAU OF VOCATIONAL, TECHNICAL AND CONTINUING EDUCATION

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ACKNOWLEDGEMENTS

A very special note of gratitude is directed to George W. Elison, Dean of Instruction at Lehigh County Community College, who served as an able consultant to the project. Appreciation is also expressed to Dr. Kenneth Kochey, Dean of Student Services at Northampton County Area Community College, for his cooperation in the data gathering.

ABSTRACT

Community colleges across the nation currently enroll more than two million students. Pennsylvania community colleges enrolled more than 50,000 students in the fall of 1972. Many of these students would not have been admitted to institutions of higher education without a non-selective, open-door policy. As a matter of fact, several research studies have shown that approximately one-third of the students who enter a community college have not taken a secondary school course of study which would permit them to enter a four-year college or university.

Included among those who have not completed a high school college preparatory program is a group generally referred to as vocational-technical students. Although the number of research studies directed at community college students has increased during the past five years, very few research efforts have been directed at graduates of vocational technical programs. Thus, there exists a dearth of information and normative data on this segment of the community college student population, particularly in the Commonwealth of Pennsylvania.

This research study focused on three general areas. First, this study compared 229 male VT graduates and 200 male CP graduates with regard to (a) demographic data (age, direct entry, previous college attendance, military status, marital status, parental status); (b) seven pre-admissions educational variables (ACT English, mathematics, social studies, natural science, and

composite test scores; Intelligence Quotient; and high school rank); and (c) achievement in college (credits, quality points, GPA, and graduation). Second, an attempt was made to study the 229 VT graduates as they pursued community college programs in one of three general areas: (1) a college career program related to their secondary school curriculum; (2) a college career program unrelated to their secondary school curriculum; or (3) a college transfer program. Third, the study examined the three VT classifications with regard to (a) demographic data; (b) pre-admissions variables; and (c) college achievement.

The subjects were selected from two comprehensive community colleges in Eastern Pennsylvania with a combined enrollment of more than 4,500 students. The ex-post-facto project was designed to identify and study students who had begun their post-secondary programs during the years 1967-70.

The following hypotheses were tested: (1) there is no difference between CP and VT graduates with regard to demographic variables; (2) there is no difference between CP and VT graduates with regard to ACT scores in English, mathematics, social studies, natural science, and composite;IQ; and high school rank; (3) there is no difference between CP and VT graduates with regard to college achievement. These same basic hypotheses were tested for the VT graduates enrolled in Related career, Unrelated career, and Transfer programs. Chi-square and univariate analysis of variance were the two primary statistical techniques used in the study.

The four important findings in the CP/VT phase of the study were:

1. VT and CP students tended to be more similar than dissimilar with regard to the demographic variables.

2. VT and CP students were significantly different with regard to each of the seven pre-admission educational variables as measured by univariate analysis of variance. CP students scored higher on all variables except high school percentile rank.

3. VT and CP students were not significantly different in their graduation and membership associations as measured by chi-square.

4. Approximately 34% of the VT graduates received an Associate's degree (42% CP); 18% withdrew in good standing (23% CP); 21% withdrew on probation (21% CP); 20% were suspended (12% CP); and 7% were still enrolled (2% CP).

It was concluded that although the CP and VT students differed on the seven pre-admissions educational variables, they did not differ in their graduation and membership associations, suggesting that although the two groups were dissimilar with regard to past achievement and aptitude, they were similar in their persistence toward graduation.

The five important findings in the VT Related (R), Unrelated (U), and Transfer (T) phase of the study were:

1. VT graduates in the three classifications tended to be more dissimilar than similar with regard to demographic data.

2. VT graduates in R, U, and T college programs differed significantly on ACT tests of mathematics and natural science, but did not differ at a statistically significant level on the five other pre-admissions variables as measured by univariate analysis of variance.

3. VT graduates did differ significantly with regard to their graduation and membership associations as measured by chi-square.

4. Approximately 43% of the VT graduates in R programs received an Associate's degree (35%, U; 20%, T); 14% withdrew in good standing (21%, U; 21%, T); 25% withdrew on probation (8%, U; 25%, T); 10% were suspended (23%, U; 32%, T); and 8% were still enrolled (13%, U; 2%, T).

5. Approximately 7% of the VT graduates in R programs had had previous post-secondary education prior to enrolling at a community college (0%, U; 13%, T); 4% of the VT graduates in R programs were veterans (17%, U; 21%, T); and 16% of the VT graduates in R programs received financial aid (25%, U; 20%, T).

It should be noted that approximately 46% of the VT graduates enrolled in Related community college programs, 21% in Unrelated; and 33% in Transfer programs. Furthermore, although the three VT groups appear to be alike with regard to pre-admissions educational variables, they are dissimilar with regard to their persistence toward college graduation.

PREFACE

American community colleges characteristically maintain an "open-door policy" and offer comprehensive curriculums which include a transfer or college-parallel program and a career program whose major goal is to provide the student with the requisite skills to obtain gainful employment after completing a two-year program. Koos (1970) described the "open-door"policy as no less than a substitute for the concept of democratization with its fullest ramifications. Fields (1962) classified as democratic those community colleges that are non-selective, comprehensive, and accessible. A comprehensive instructional program -- transfer and career offerings -- has been the response to a non-selective admissions policy. One problem revolves around the interpretation of the "open-door" policy. Specifically, should the transfer program be open only to those who have completed a college preparatory secondary curriculum or should any high school graduate or anyone who has reached his eighteenth birthday have access to the transfer program?

Although the answers and interpretations vary from institution to institution, they are seldom based on empirically derived data. Community colleges which do adhere to an open-door policy as described by Fields (1962) permit college preparatory graduates to choose either a transfer or a career program. Also, vocational technical graduates are permitted three options:

(1) they can continue their studies in a college career program which is an extension of their high school program; (2) they can select another career program which bears little or no resemblance to their secondary program; or (3) they can markedly alter their educational goal by enrolling in a college transfer program.

This research study investigates the options selected by secondary graduates with varying academic backgrounds, the intellective characteristics of these students, and their completion/noncompletion records. Three basic questions provide the parameters of the project:

1. Are community college students who are graduates of vocational technical programs similar to or different from graduates of college preparatory programs in intellective and demographic characteristics?

2. What are the relative completion or noncompletion records of college preparatory graduates as compared with vocational technical graduates?

3. What are the intellective and demographic characteristics of the vocational technical graduates who enroll in a related college curriculum, an unrelated one, or in a transfer program?

This research study attempts to answer these questions because the analysis of the data can provide teachers, counselors, and administrators with a better insight into the needs and backgrounds of students.

CHAPTER I

INTRODUCTION

Ranking first as a totally American contribution to higher education has been the community college, currently enrolling more than two million students, according to the Carnegie Commission on Higher Education (1970). In the fall of 1972, Pennsylvania's community colleges enrolled 50,675 full- and part-time students (12% of all higher education enrollments in the Commonwealth). Of the 50,675 students, 27,941 were full-time. The community college dream of mass education is beginning to come true in terms of the numbers of American youth and adults whom it serves. Johnson (1969) characterized the community college as a "beacon of performance and excellence, a vibrant example of American ingenuity which when applied, tested, evaluated, and further improved, will influence all of education nationally and throughout the world (p. 327)."

Until recently, research projects describing community college students focused mainly on comparisons with non-college students and senior college students. Cross (1970), Medsker and Trent (1965), Knoell (1965), and Medsker and Tillery (1971) have been among the several noted researchers who have been instrumental in changing this research outlook by directing their attention to the two-year college student as an entity unto himself. Furthermore, Cross (1968) has been among those pleading for studies concerning vocationally-oriented students. Noting that approximately one-third of the students who enter a community college have not taken a secondary school course of

study that would permit them to enter a four-year college, Cross speculated as to whether it was the prestige factor of the academic program that attracted them or whether it was an attempt to avoid making a commitment to an occupational future during a period of uncertainty.

Although some attention has been drawn to community college students, very little research has been directed at graduates of vocational technical secondary programs. For example, Leonard V. Koos (1970) devoted only a small portion of his comprehensive work to vocational technical high school graduates. The College Entrance Examination Board (1969) provided descriptive research of community college students enrolled in college parallel, technical, and vocational curriculums. Although this study is comprehensive in its approach to students enrolled in the three programs, it does not include specific data on secondary graduates of vocational technical curriculums. Roueche (1967) stated:

> Junior colleges claim to be multi-purpose comprehensive institutions, yet the typical research study focuses on only one segment of the institution's students -- those who transfer to four-year institutions (p. 21).

The American Vocational Research Corporation (1971) reported that 34.9 per cent of secondary school students in Pennsylvania were enrolled in vocational programs during 1970-71. In the 1970 evaluation report prepared by the same research organization, one of the goals of the State Advisory Council for Vocational Education was to "increase the percentage of high school students served by vocational education programs to 40-50 per cent in the 1970's (p. 6)." The same report, which included a survey

of the 1968 vocational graduates, indicated that 16.3 per cent were enrolled as full-time college students.

Clearly, the numbers of students graduating from vocational technical programs will increase; if these students are to be successful in their search for opportunities to continue their educations, then pertinent student data should be made available to educators at both the secondary and collegiate levels.

The fact that community colleges had their origins deeply rooted in the college parallel or transfer program has had important implications on their present condition. Because the transfer function is the oldest and most revered of the educational services provided by these colleges, the latecomers (vocational, technical, or occupational programs) still must justify their value and continued existence (Blocker, Plummer and Richardson, 1965). Although there is a persistence among students, parents, and educators that vocational or technical education is less than collegiate, Cohen (1971) placed the major share of the responsibility for the low prestige of occupational education on the community college educators themselves and to the tradition which has created an artificial distinction within the academic pecking order. Thus, just as the community college itself was once looked upon as a stepchild of higher education, so, too, has the community college suffered from an internal caste system which, at times, has relegated these career curriculums to a position subservient to the transfer programs.

Accepting the premise of a distinction between career and transfer curriculums, the reader must ask himself a fundamental question: What effect has this difference had and on whom has it had the greatest effect? The most obvious answer to this question revolves around those who benefit from the total educational system -- the student who attends a community college. Having been encouraged by their fathers and mothers, a great many of whom were denied access to a college education, students have had a tendency to look askance at vocational training as second-class education (Gleazer, 1969). Those students have heard critics charge that vocational education, especially in high schools, has been used as dumping ground for those who could not attain satisfactory progress in college preparatory programs. The result of this conditioning process has been a tendency for students to enroll in community college transfer programs. Cross (1971) estimated that between 50 and 75 per cent of all community college students in the nation are enrolled in college parallel programs.

Comparing junior college, non-college, and four-year college students, Cooley and Becker (1966), Tillery (1965), Cross (1968), and Trent (1969) concluded that significant differences existed among the groups. Of the studies comparing junior college transfer and career students, Munday (1969) and Block (1971) found them to be more similar than dissimilar while Nogle (1965) and Brue (1971) arrived at an opposite conclusion. Junior college research projects by Anthony (1964), Van Derslice (1968),

Hakanson (1967), and Neswick (1971) included high school curriculum as a variable; none, however, focused attention on graduates of vocational technical secondary programs. The one commonality among these four projects was an a priori assumption that students who pursue a non-academic or non-traditional secondary program (general, business, industrial arts) are less academically able than those who pursue a traditional college preparatory program. Appendix A contains a synopsis of research studies which are applicable to this research project.

No experience in futurism is needed to predict that the community colleges will continue to expand and to remain a viable force in American society because of their comprehensive curricular offerings, open admissions, geographic accessibility, social desirability, and low cost. Although enrollment patterns in transfer and career curriculums will vary, it is this writer's contention that until more is known about those who benefit from career programs, the second-class stigmatization associated with career programs will linger. One goal that will be achieved by testing the various hypotheses in this study is to identify the intellective characteristics of each group of college preparatory and vocational technical graduates. Also, an equally important goal will be achieved by describing statistically the characteristics of the vocational technical graduates who have exercised one of three curricular options.

Thus, the data derived from this study could be beneficial to educators at both the secondary and collegiate levels who are charged with the guidance and counseling, curriculum planning, course development, and academic advising responsibilities.

Methods and Procedures

This research study was conducted at two comprehensive, open-door community colleges in Eastern Pennsylvania -- Lehigh County Community College, Schnecksville, and Northampton County Area Community College, Bethlehem. Both community colleges opened their doors in the fall of 1967; both are fully accredited by the Middle States Association of Colleges and Universities. Lehigh County Community College is sponsored by twelve school districts (9 in Lehigh County; 3 in Carbon County). Northampton County Area Community College is sponsored by eight school districts, all in Northampton County. The colleges are approximately twenty-five miles apart. Both schools currently have a student body population (part-and full-time) of more than 4,500. Four vocational technical secondary schools (none are comprehensive high schools) operate within the sponsoring districts of the two colleges. Approximately 90 per cent of the 429 students in this study were graduated from high schools in the sponsoring districts.

Sample

A total of 429 males (229 vocational technical graduates and 200 college preparatory graduates) were identified as subjects for this

ex-post facto study. Each student enrolled initially on a full-time basis (12 semester hours or more). The number of vocational technical secondary graduates (229) represents all students who could be identified as having completed a high school program in vocational technical education. Specifically excluded were graduates of commercial, general, industrial arts, and distributive programs. The 200 college preparatory graduates represent a random sample pro-rated among the entry years of 1967, 1968, 1969, and 1970, using as a base the number of vocational technical entrants. The number of entrants per year represents about 10-15 per cent of the full-time male population at each school. Tables 1 and 2 provide the base data for the sample.

Data Collection

The purposes of this research project are: (1) to compare statistically the 200 college preparatory (CP) high school graduates and the 229 vocational technical (VT) graduates (1a) on the basis of their high school program of study and college graduation and (1b) on an intellective basis using five ACT Battery test scores (English, mathematics, social studies, natural sciences, and composite), IQ, and HS percentile rank; (2) to compare the CP and VT graduates using available demographic data. The rationale for comparing the VT group with the CP group has already been established in the earlier chapters of this study, i.e., (1) there is a scarcity of normative data for the graduates of VT programs who enter a

TABLE 1

Groups in the Study

Entry Year	College Preparatory	Vocational Technical
1967	32	37
1968	35	39
1969	66	76
1970	67	77
Totals	200	229

TABLE 2

Vocational Technical Students in the Study

Entry Year	Related Career	Unrelated Career	Transfer
1967	15	5	17
1968	16	10	13
1969	39	19	18
1970	35	14	28
Totals	105	48	76

community college and (2) there is some research to show that students who pursue a non-traditional program of studies in secondary schools (non-college preparatory) usually score lower on measures of academic achievement and aptitude.

The primary source of the data was the student's college transcript and his personnel file which contained his high school transcript, class rank, IQ, and ACT scores. Only students who had ACT scores were considered for the study; others who had not taken the ACT tests were eliminated before the sample was chosen. Three personal contacts were made at three high schools to obtain IQ scores and/or class ranks for approximately 50 students whose records were incomplete.

The selection procedure began with a summary list from each community college which contained the names of all full-time male students who entered the colleges for each of the four years, 1967 through 1970. Each student file was examined to determine the student's high school curriculum. Only those who were graduates of CP and VT programs were considered for the study. All students who completed the VT secondary programs were included in the study, regardless of their community college curriculum. However, only those CP graduates who enrolled in a college transfer program were considered for possible selection. After the number

of VT entrants had been identified on an entry year basis, the number of CP graduates for each entry year was set on a pro-rated basis. A Table of Random Numbers[1] was used to select the actual participants in the study. Data were then collected and keypunched onto hollerith cards for later use by a computer.

Statistical Design

Except for the demographic data and the graduation and program associations which were tested using a chi-square technique, the primary approach to the data involved univariate analysis of group differences, a common statistical method to test differences between or among group means using a series of t-tests and F-tests for each variable. Analysis of variance is used to test the significance of the differences between or among the means of a number of different samples.

Statistical tests for population normality and homogeneity of variance were not performed. Tate (1965) stated:

> Although normal sampling distribution theory rests on population normality, there is sufficient reason to conclude that population non-normality does not seriously affect the sampling distribution of the mean and various other statistics, provided that the sample is not too small (p. 252).

Ferguson (1966) stated, "One advantage of the analysis of variance is that reasonable departures from the assumptions of normality and homogeneity

[1] Frederick C. Mills. Statistical Methods (3rd Edition). (New York: Holt, Rinehart, & Winston, 1955), p. 665.

of variance may occur without seriously affecting the validity of the inferences drawn from the data (p. 295)."

A chi-square test was used to test the statistical association between high school program of study and college graduation. The BMDOIV computer program[2] was used to test the analysis of variance for each of the intellective variables.

Group membership for the VT graduates was already established by the student's selection of a college curriculum which was either a related or unrelated career program or a transfer program. For example, a VT graduate who majored in Drafting and Design in high school and who enrolled in a college Mechanical Technology program was classified as RELATED; a student who completed a secondary Electronics program and enrolled in a college Accounting curriculum was classified as UNRELATED; a VT graduate who enrolled in Liberal Arts was classified as TRANSFER.

Hypotheses

The hypotheses for this study are sub-divided into two categories; (1) those that apply to the total sample of 429 students and (2) those that apply only to the 229 vocational technical high school graduates.

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[2] W. J. Dixon. BMD: Biomedical Computer Programs. (Los Angeles: University of California Press, 1967), pp. 486-494.

I. ALL STUDENTS (429)

1. There is no significant difference between VT and CP graduates with respect to demographic data.

2. There is no significant difference between CP and VT graduates with respect to seven pre-admissions educational variables.

3 There is no significant difference between the CP and VT graduates with respect to college achievement.

II. VOCATIONAL TECHNICAL GRADUATES (229)

1. There is no significant difference among VT graduates who enroll in a related career program, an unrelated career program, or a transfer program with respect to demographic data.

2. There is no significant difference among VT graduates who enroll in a related career program, an unrelated career program, or a transfer program with respect to seven pre-admissions educational variables.

3. There is no significant difference among VT graduates who enroll in a related career program, an unrelated career program, or a transfer program with respect to college achievement.

Definitions and Terms

For the purposes of this research study, the following definitions are applicable:

American College Test Battery (ACT) --

These tests of academic potential are subdivided into English, mathematics, social studies, and natural sciences. The ACT composite score is the simple

average of the four scores which are reported on a standard scale ranging from 1 to 36. The tests are commonly administered to students before they begin their first semester in a college.

Career Student --

Any student enrolled in a community college occupational, technical, or vocational technical curriculum for which the Associate in Applied Science Degree is awarded.

College Preparatory Curriculum --

A sequence of secondary-level subjects or groups of courses which are prescribed for students who desire to enter institutions of higher education.

Community College --

A publicly-supported, two-year institution of higher education which offers programs designed either to prepare students for employment immediately upon graduation or to provide the first two years of a baccalaureate degree. The former are generally called career programs or occupational programs, while the latter are usually referred to as transfer programs.

Occupational Education --

A generic term for all community college curriculums whose major goal is that the student shall be prepared for gainful employment after a course of study requiring two years (60 semester hours or more) for completion. Vocational, Vocational-Technical, Technical, and Semi-professional are terms that are used interchangeably in this paper. In previous years, these programs had been called terminal programs, a term no longer in favor because of its negative connotations and because of the number of graduates from these programs who have continued their educations at more advanced levels.

Transfer Education --

A generic term for a community college curriculum whose major goal is to provide the student with the first two years (60 semester hours or more) of a baccalaureate degree program at a senior institution.

Transfer Student --

Any student enrolled in a community college transfer program for which the Associate in Arts or Science Degree is awarded.

Vocational, Technical or Occupational Curriculum --

A program of education on the secondary level which is organized to prepare the learner for entrance into a particular occupation usually associated with science, technology, design, or production. Specifically excluded from this study are commercial, general, industrial arts, agriculture, and distributive programs. A complete list of vocational technical curriculums offered at the four area technical schools is contained in Appendix B.

Vocational Technical Graduate --

Any student who completed one year or more of a vocational, technical, or occupational high school program (as certified by the Commonwealth of Pennsylvania) during his tenth, eleventh, or twelfth grades.

CHAPTER II

FINDINGS AND ANALYSIS

The main purposes of this chapter are to present the findings of the data generated in this project and to discuss the analysis of the data. The chapter is subdivided into two phases: Phase I -- data applicable to the 429 students (200 CP; 229 VT); and Phase II -- data applicable to the 229 VT students enrolled in Related (105), Unrelated (48), and Transfer (76) programs. The data for each phase are subdivided into (a) demographic; (b) pre-admissions educational variables; (c) college achievement. Each section is followed by a discussion of the findings. The .05 level of significance was adopted to test all hypotheses.

PHASE I

Total Sample (429)

Demographic Data (Ia)

The demographic data for the sample (200 CP; 229 VT) consists of seven variables: average age at college entry; direct entry from high school to college; previous college attendance; military status; marital status; parental status; and financial aid. By reviewing the demographic data, the reader should be able to form a picture of the two groups which are being studied.

Average Age at College Entry

The average age at college entry for the 429 students is 18.88

years. The CP graduates were slightly older (18.92) at entry than the VT graduates (18.85). Table 3 shows the trends by entry year.

Direct Entry from High School to College

Table 4 shows that 74% of the 429 graduates entered the community colleges directly from high school. With the exception of the 1970 entering group, the VT enrollments had ranged from 81 to 87% in each of the three previous years. The percentage of CP graduates entering directly from high school was also relatively constant for the three previous years (69 to 74%). Thus, the 64% direct entrants in 1970 were inconsistent with the ranges from 1967, 1968, and 1969. One possible factor for this trend could be the percentage of veterans in the 1970 group (15%CP; 22%VT).

Previous College Attendance

Included in the category of previous college attendance is any post-secondary institution of higher education (other community colleges, four-year colleges, technical institutes, etc.). Table 5 shows a significant statistical difference between the two groups. Of the CP group, 26.5% had attended another college compared with 7.4% of the VT group. Thus, the implication of this finding should be relatively clear -- CP graduates tend to enroll at the community college after they have pursued post-secondary education at another institution whereas VT graduates tend to select the community college as their first choice. The null hypothesis that there is no significant difference between the two groups with regard to previous college attendance is not accepted.

TABLE 3

Average Age at Entry
(CP and VT)

Entry Year	CP		VT	
	N	Age	N	Age
1967	32	18.84	37	18.84
1968	35	18.57	39	18.31
1969	66	19.00	76	18.54
1970	67	19.07	77	19.42
Totals	200	18.92	229	18.85

TABLE 4

Direct Entrants From
High School to Community College
(CP and VT)

Entry Year	College Prep		Vocational-Technical		Totals	
	N	%	N	%	N	%
1967	23/31	74%	30/37	81%	53/68	78%
1968	25/36	69%	34/39	87%	59/75	79%
1969	48/66	73%	65/76	86%	113/142	80%
1970	43/67	64%	49/77	64%	92/144	64%
Totals	139/200	70%	178/229	78%	317/429	74%

TABLE 5

Chi-Square Analysis of Previous College Study (CP and VT)

Program	Previous Study	No Previous Study	Totals
CP	53	147	200
VT	17	212	229
Totals	70	359	429

Chi-Square = 26.06
df = 1
P > .005

Military Status

Table 6 shows no significant statistical difference between the CP and VT groups with regard to military status (veteran vs. non-veteran). Of the CP group, 9% (18) were veterans compared with 12% (28) of the VT group. The null hypothesis that there is no significant difference between the two groups with regard to military status is accepted.

In summary, 4.5% (6) of the CP graduates were both veterans and had had previous college study compared with 2.6% (9) of the VT graduates.

Marital Status

Table 7 shows no significant statistical difference between the two groups with regard to marital status (married vs. not married). Of the CP graduates, 9.5% (19) were married at entry compared with 11.4% (26) of the VT graduates. The null hypothesis that there is no significant difference between the two groups with regard to marital status is accepted.

Parental Status

Data on parental status (both parents alive vs. one or both deceased) were available for only 209 of the 429 total. Table 8 shows no significant difference between the two groups with regard to this variable. Of the CP graduates 95.2% (100) had living parents at the time of entry compared with 89.4% (93) of the VT graduates. The null hypothesis that there is no significant difference between the two groups with regard to parental status is accepted.

TABLE 6

Chi-Square Analysis of
Military Status
(CP and VT)

Program	Veteran	Non-Veteran	Totals
CP	18	182	200
VT	28	201	229
Totals	46	383	429

Chi-Square = .88
df = 1
$.50 > p > .25$

TABLE 7

Chi-Square Analysis of
Marital Status at Entry
(CP and VT)

Program	Married	*Not-Married	Total
CP	19	181	200
VT	26	203	229
Totals	45	384	429

Chi-Square = .21
df = 1
.75 > p > .50

*Includes Single, Divorced, Widowed

TABLE 8

Chi-Square Analysis of
Parental Status
(CP and VT)

Program	Both Alive	One or both Deceased	Totals
CP	100	5	105
VT	93	11	104
Totals	193	16	209

Chi-Square = 1.83
df = 1
$.25 > p > .10$

Financial Aid

As defined in this study, financial aid includes loans, grants, and scholarships. GI benefits were excluded. Table 9 shows no significant difference between the two groups with regard to the number in each group receiving financial aid. Of the CP graduates, 16.5% (33) were receiving financial aid at some time during their college study compared with 19.2% (44) of the VT graduates. The null hypothesis that there is no significant difference between the two groups with regard to receiving financial aid is accepted.

Pre-Admissions Educational Variables (Ib)

As defined in this report, pre-admissions educational variables include five ACT scores, IQ, and High School percentile rank. The ACT battery, usually taken by students prior to college matriculation, is a measure of academic achievement and aptitude. The IQ scores represent several different tests with varying scales. However, this limitation should pose no serious problems because IQ tests generally have a mean of 100 and a standard deviation range of 10-15. High School percentile rank can be interpreted as a measure of past achievement. The percentile rank is a precise measure because it equalizes the effect of class size. Table 10 shows the means and standard deviations of the two groups with regard to the seven educational variables.

Discussion

The CP graduates scored significantly higher than the VT graduates on the seven educational variables tested, with the exception of HS rank.

TABLE 9

Chi-Square Analysis
of Financial Aid
(CP and VT)

Program	Yes	No	Totals
CP	33	167	200
VT	44	185	229
Totals	77	352	429

Chi-Square = .54
df = 1
$.50 > p > .25$

TABLE 10

Means ($\bar{x}$) and Standard Deviations (s)
for CP and VT Graduates
(Educational Variables)

Variable	CP		VT		F Ratio	df	Level of Significance
	$\bar{x}$	s	$\bar{x}$	s			
ACT English	17.06	4.30	14.42	4.48	38.1	1/427	.01
ACT Math	20.23	4.95	17.74	5.54	23.8	1/427	.01
ACT Soc.Stu.	18.53	5.41	15.92	5.94	22.3	1/427	.01
ACT Nat.Sci.	20.41	5.32	17.92	5.59	23.6	1/427	.01
ACT Comp.	19.17	4.02	16.58	4.09	43.2	1/427	.01
I.Q.	110.44	9.74	106.55	8.83	18.8	1/427	.01
H.S.%tile Rank	39.47	23.09	45.92	22.92	8.4	1/427	.01

Accepting the premise that HS rank is a measure of past success, one could conclude that the VT students had achieved greater success in their high school studies than did the CP students. Perhaps this is a valid conclusion for the community college CP group because the high-ranked CP graduates would tend to matriculate at four-year colleges and universities, leaving the middle- and lower-ranked CP students as community college entrants. The reader should be aware that the HS rank is calculated for all major subjects (including VT subjects) for all students in the twelfth grade by the home high school.

The ACT scores for both groups are reasonably consistent with national norms for two-year college students. The CP graduates scored highest in Mathematics, followed by Natural Science, Social Studies, and English, respectively. This pattern is similar to the VT scores, except that Mathematics and Natural Science are reversed in ranked ordering. The English and the Social Studies scores generally reflect verbal or reading abilities and aptitudes.

In summary, the statistical tests of univariate analysis of variance reveal that the VT graduates score significantly lower than the CP graduates on tests of academic achievement and aptitude. The VT graduates averaged higher with regard to past achievement as measured by High School percentile rank. The null hypotheses with regard to the seven educational variables are not accepted.

College Achievement (Ic)

College achievement, as defined in this report, includes first semester credits, quality points, and grade point averages; final credits, quality points, and grade point averages; and college graduation. Table 11 presents a summary of the CP and VT graduates' achievement in college.

Discussion (First Semester)

Although there is no statistically significant difference between the CP and VT graduates with regard to the number of credits attempted, there is a difference with regard to first semester GPA. Of the 229 VT students, 8 (3.5%) formally withdrew compared with 4 (2%) of the CP students. The significantly higher first semester GPA attained by the CP students can possibly be associated with their higher ACT scores. The null hypothesis that there is no difference in first semester grade point average between the two groups is not accepted.

Discussion (Final Grades)

The computation of final credits, quality points, and averages is calculated on the students' last semester in attendance. Based on the entry years (1967-70) used in the study, each student had a minimum of five semesters in which to complete his program. The results were tabulated after the fall 1972 semester. The CP students achieved significantly higher final grades (2.40) than did the VT students (2.27). The null hypothesis that there is no difference between the two groups in final grade point average is not accepted.

TABLE 11

Means ($\bar{x}$) and Standard Deviations (s)
for CP and VT Graduates
(Achievement)

Variable	CP		VT		F Ratio	df	Level of Significance
	$\bar{x}$	s	$\bar{x}$	s			
1st Sem.Crs.	13.53	3.28	12.85	4.00	3.6	1/427	NS
1st Sem. QP's	29.10	14.08	25.14	15.36	7.7	1/427	.01
1st Sem. GPA	2.15	.89	1.95	.97	10.0	1/427	.01
Final Crs.	46.45	20.05	42.44	22.21	3.8	1/427	NS
Final QP's	111.51	63.48	96.39	72.94	5.2	1/427	.05
Final GPA	2.40	.81	2.27	.99	11.1	1/427	.01

Discussion (College Graduation)

The chi-square analysis of college graduation in Table 12 shows no significant difference between the CP and VT groups. The over-all college graduation percentage was 37.5 (33.6 for VT; 42.0 for CP). The null hypothesis that there is no difference between the two groups with regard to college graduation is accepted.

The non-significant relationship between community college graduation and high school curriculum is a relatively important finding regarding the over-all persistence toward a degree between the two groups. A further investigation of the 268 non-graduates (152 VT; 116 CP) shows that of the 152 VT's 42 (28%) had withdrawn in good standing; 15 (10%) were still enrolled; 49 (32%) had withdrawn on probation; and 46 (30%) were suspended. Of the 116 CP non-graduates, 47 (41%) had withdrawn in good standing; 4 (3%) were still enrolled; 41 (35%) had withdrawn on probation; and 24 (21%) were suspended.

In summary, the two groups differed significantly in the seven pre-admissions educational variables, in the first semester GPA, and in the final GPA. However, they did not differ with regard to graduation from college. One implication of this pattern is that the VT and CP graduates persist to graduation at about the same rate despite the fact that the VT students were not so well prepared initially and did not achieve as well during their enrollment in college.

TABLE 12

Chi-Square Analysis of College Graduation
(CP and VT)

Program	Graduate	Non-Graduate	Totals
Vocational Technical	77	152	229
College Preparatory	84	116	200
Totals	161	268	429

Chi-Square = 2.66
df = 1
$.25 > P > .10$

Table 13 shows a summary of the 429 students with regard to their enrollment by program and subsequent college experiences.

PHASE II

Vocational Technical Students (229)

Phase II of this chapter focuses on the 229 VT graduates who enrolled in related career (105), unrelated career (48), and transfer programs (76). The major subdivisions of Phase II are: (a) demographic data; (b) pre-admissions educational variables; and (c) college achievement. Each section is followed by a discussion of the findings. It should be noted that the .05 level of significance was adopted to test all hypotheses. Abbreviations used are: Related (R); Unrelated (U); and Transfer (T).

Demographic Data (IIa)

The demographic data for the 229 VT graduates (105 Related; 48 Unrelated; 76 Transfer) consists of eight variables: curricular enrollment patterns; average age at college entry; direct entry from high school to college; previous college attendance; military status; marital status; parental status; and financial aid. By reviewing the demographic data, the reader should be able to form a picture of three classifications of VT graduates being studied.

Curricular Enrollment Patterns

The 229 VT graduates pursued eleven different programs of study at the secondary level. Table 14 shows the distribution by high school curriculum as well as the college enrollment patterns. It is interesting to note

TABLE 13

Summary for CP and VT Students

Disposition	CP		VT		Total	
	N	%	N	%	N	%
Graduated	84	42%	77	34%	161	37.5%
Continuing/ Good Standing	4	2%	14	6%	18	4.2%
Continuing/ Probation	0	0%	1	1%	1	.3%
Withdrew/ Good Standing	47	23%	42	18%	89	20.7%
Withdrew/ Probation	41	21%	49	21%	90	21.0%
Suspended	24	12%	46	20%	70	16.3%
Totals	200	100%	229	100%	429	100 %

TABLE 14

Enrollment Patterns by
High School Curriculum
For VT Graduates

H.S. Curriculum	Total No.	Related N	Related %	Unrelated N	Unrelated %	College Transfer N	College Transfer %
Auto	10	0	0%*	4	40%	6	60%
Carpentry/Wood	12	0	0%*	4	33%	8	67%
Chemistry	1	1	100%	0	0%	0	0%
Commercial Art	7	5	71%	0	0%	2	29%
Data Processing	18	15	83%	1	6%	2	11%
Civil/Draft./Arch.Tech.	54	27	50%	11	20%	16	30%
Electrical/Radio/Elect.	88	52	59%	14	16%	22	25%
Machine	14	5	36%	2	14%	7	50%
Metal/Welding	10	0	0%*	8	80%	2	20%
Plumbing	2	0	0%*	0	0%	2	100%
Printing	13	0	0%*	4	31%	9	69%
Totals	229	105	46%	48	21%	76	33%

* No Related Community College Programs Available

that 33% (76) of the VT graduates pursued a community college transfer program, indicating perhaps that some factors had altered their future plans (i.e., immediate employment or interests in other fields of study). Furthermore, in the five areas where no related college curriculum existed (Auto, Carpentry, Metal, Plumbing, and Printing), 56% (27/48) enrolled in a college transfer program. Appendix C contains a complete year-by-year analysis of each secondary curriculum.

Average Age at College Entry

The average age at college entry for VT graduates is 18.85. Table 15 shows the trends by entry years. The Related group remained relatively consistent during the four-year period. The Unrelated and the Transfer groups show fluctuations during the four-year period. What is evident, of course, is that the U and T groups tend to attract older students (veterans; those who worked for a year, etc.).

Direct Entry from High School to College

Closely related to average age at entry is the number who enrolled in a community college directly from high school. Table 16 shows that 78% (178/229) of the VT graduates enrolled immediately after being graduated from high school. There is, however, a wide range among the three groups: R = 90%; U = 77%; T = 62%. The indication is that VT graduates who pursue related college career programs do so immediately after high school while students who eventually select unrelated and transfer programs delay their entry into the community college.

TABLE 15

Average Age at Entry
(VT Graduates)

Entry Year	Related		Unrelated		Transfer	
	N	Age	N	Age	N	Age
1967	15	18.20	5	18.00	17	19.65
1968	16	18.31	10	18.70	13	18.00
1969	39	18.23	19	19.05	18	18.44
1970	35	18.20	14	20.07	28	20.61
Totals	105	18.23	48	19.16	76	19.43

TABLE 16

Direct Entrants From
High School to Community College
(VT Graduates)

Entry Year	Related N	Related %	Unrelated N	Unrelated %	Transfer N	Transfer %	Totals N	Totals %
1967	14/15	93%	4/5	80%	12/17	76%	30/37	81%
1968	15/16	94%	10/10	100%	9/13	69%	34/39	87%
1969	35/39	90%	15/19	79%	15/18	83%	65/76	86%
1970	30/35	86%	8/14	57%	11/28	39%	49/77	64%
Totals	94/105	90%	37/48	77%	47/76	62%	178/229	78%

Previous College Attendance

Included in the category of previous college attendance is any post-secondary institution of higher education (other community colleges, four-year schools, technical institutes, etc.). Table 17 shows no significant statistical difference among the three groups. Of the R group 7% (7) had had previous study compared with 0% of the U group and 13% (10) of the T group. The null hypothesis that there is no significant difference among the three groups with regard to previous study is accepted.

Military Status

Table 18 shows a significant statistical difference among the three groups with regard to military status (veteran vs. non-veteran). Of the R group, 4% (4) were vets compared with 17% (8) of the U group and 21% (16) of the T group. The null hypothesis that there is no difference among the three groups with regard to marital status is not accepted.

Marital Status

Table 19 shows a significant statistical association among the three groups with regard to marital status (married vs. not married). Of The R group 3% (3) were married at entry to college compared with 21% (10) of the U group and 17% (13) of the T group. The null hypothesis that there is no difference among the three groups with regard to marital status is not accepted.

TABLE 17

Chi-Square Analysis of Previous College Study (VT Graduates)

Program	Previous Study	No Previous Study	Totals
Related	7	98	105
Unrelated	0	48	48
Transfer	10	66	76
Totals	17	212	229

Chi-Square = 7.52
df = 2
.25 > p > .10

TABLE 18

Chi-Square Analysis of
Military Status
(VT Graduates)

Program	Veteran	Non-Veteran	Totals
Related	4	101	105
Unrelated	8	40	48
Transfer	16	60	76
Totals	28	201	

Chi-Square = 13.24
df = 2
p> .005

TABLE 19

Chi-Square Analysis of
Marital Status At Entry
(VT Graduates)

Program	Married	*Not Married	Totals
Related	3	102	105
Unrelated	10	38	48
Transfer	13	63	76
Totals	26	203	

Chi-Square = 14.71
df = 2
$p > .005$

*Includes Single, Divorced, Widowed

Parental Status

Data on parental status (both parents alive vs. one or both deceased) were available for only 104 of the VT graduates. Table 20 shows no statistical difference among the three groups. Of the R group, 92% (48) had living parents at college entry compared with 83% (15) of the U group and 88% (30) of the T group. The hypothesis that there is no difference among the three groups with regard to parental status is accepted.

Financial Aid

As defined in this study, financial aid includes loans, grants, and scholarships. GI benefits were excluded. Table 21 shows no significant association among the three groups. Of the R group, 16% (17) received financial aid compared with 25% (12) of the U group and 20% (15) of the T group. The null hypothesis that there is no significant difference among the three groups with regard to receiving financial is accepted.

Pre-Admission ducational Variables (IIb)

As defined in this report, pre-admissions educational variables include five ACT scores, IQ, and High School percentile rank. Table 22 shows the means and standard deviations of the three groups with regard to the seven educational variables.

Discussion

The two statistica' significant variables on which the groups

TABLE 20

Chi-Square Analysis of
Parental Status
(VT Graduates)

Program	Both Alive	One or Both Deceased	Totals
Related	48	4	52
Unrelated	15	3	18
Transfer	30	4	37
Totals	93	11	104

Chi-Square = 1.23
df = 2
.75 > p > .50

TABLE 21

Chi-Square Analysis of
Financial Aid
(VT Graduates)

Program	Received Aid	No Aid	Totals
Related	17	88	105
Unrelated	12	36	48
Transfer	15	61	76
Totals	44	185	229

Chi-Square = .17
df = 2
$.95 > p > .90$

TABLE 22

Means ($\bar{x}$) and Standard Deviations (s)
for Vocational and Technical Graduates
(Educational Variables)

Variable	Related		Unrelated		Transfer		F Ratio	df	Level of Significance
	$\bar{x}$	s	$\bar{x}$	s	$\bar{x}$	s			
ACT English	14.37	4.41	15.25	4.54	13.97	4.54	1.2	2/226	NS
ACT Math	18.59	5.14	16.14	6.95	17.57	4.88	3.3	2/226	.05
ACT Soc.Stu.	16.55	5.75	15.43	6.40	15.35	5.90	1.1	2/226	NS
ACT Nat.Sci.	19.01	5.63	17.37	5.99	16.76	5.02	3.9	2/226	.05
ACT Comp.	17.16	3.97	15.87	4.57	16.23	3.86	2.1	2/226	NS
IQ	107.33	8.91	104.94	9.83	106.50	8.00	1.2	2/226	NS
H.S. %tile	47.48	22.68	44.85	24.23	44.44	22.57	.5	2/226	NS

differed were the ACT scores in Mathematics and Natural Science. There were no significant differences among the three groups on the other five educational variables. It is interesting to note that the Related group scored higher than the other two groups on each of the variables, with the exception of the ACT English score. One possible explanation for the trend in test scores is based in the demographic data. The reader should remember that 90% of the Related group entered the college immediately after being graduated from high school. As a result, this group was perhaps more conditioned to the testing process and less directly removed from the formalities of the educational process than either of the two other groups.

A rank ordering of the ACT scores shows that in each of the three groups the Social Studies and English scores were third and fourth respectively. For the R and U groups, the Natural Science and Mathematics scores were first and second respectively; the T group scored highest in Mathematics and second in Natural Science. This trend among the groups can be more readily understood if the reader would remember that the English and Social Studies tests relate to verbal skills while Mathematics and Natural Science reflect quantitative skills. It appears that as a group, the VT students are less proficient in the former and more proficient in the latter. The null hypothesis that there is no difference among the three groups is not accepted with regard to Mathematics

and Natural Science scores and is accepted with regard to the five other pre-admissions educational variables. In summary, the groups appear to be more similar than dissimilar.

College Achievement (IIc)

As defined in this report, college achievement includes first semester and final credits, quality points, and averages as well as college graduation. Table 23 presents a summary of the three groups' achievement in college.

Discussion (First Semester)

The three groups show a statistically significant difference on each of the first semester variables. It should be noted that the R group ranked highest among the three groups on each variable. Furthermore, only the R group achieved a first semester GPA of more than 2.00, the commonly accepted level for continuing in "good standing." The null hypotheses that there are no differences among the three groups with regard to first semester college achievement are not accepted.

Discussion (Final Grades)

The computation of final credits, quality points, and GPA is based on the students' last semester in attendance. Similar to the findings for the first semester, the R group ranked higher than either of the two other groups. In terms of final GPA compared with first semester GPA,

TABLE 23

Means ($\bar{x}$) and Standard Deviations (s)
for Vocational Technical Graduates
(Achievement)

Variable	Related		Unrelated		Transfer		F Ratio	df	Level of Significance
	$\bar{x}$	s	$\bar{x}$	s	$\bar{x}$	s			
1st Sem.Crs.	13.62	3.81	12.79	3.96	11.81	4.08	4.7	2/226	.05
1st Sem.QP's	28.76	15.91	24.02	14.96	20.84	13.69	6.3	2/226	.01
1st Sem. GPA	2.11	.96	1.87	1.00	1.76	.93	3.8	2/226	.05
Final Crs.	46.87	22.36	48 31	22.02	32.76	19.04	12.0	2/226	.01
Final QP's	112.12	74.43	104.35	73.87	69.28	65.25	8.3	2/226	.01
Final GPA	2.39	.95	2.16	.97	2.11	.95	5.1	2/226	.05

the R group increased its grade point average by .28 compared with .29 for the U group and .35 for the T group. The null hypotheses that there are no significant differences among the three groups with regard to final college achievement are not accepted.

Discussion (College Graduation)

The chi-square analysis of college graduation in Table 24 shows a significant difference among the VT students enrolled in related, unrelated, or transfer programs. The hypothesis that there is no statistical association among the three groups with regard to college graduation is not accepted. The over-all graduation percentage was 33.6 (42.8 for related; 35.4 for unrelated; and 19.7 for transfer).

Unlike the two-group comparison (CP vs. VT) which revealed no statistically significant association with regard to graduation and membership, the three group VT analysis shows a significant relationship beyond the .01 level. Also, the percentage of graduation decreases as one moves from related (42.9%) to unrelated (35.4%) to transfer (19.7%) programs. It is fairly obvious that the relatively low percentage of graduation among the VT students enrolled in the transfer programs affected the statistical analysis. Had only the VT graduates who enrolled in any career program (related or unrelated) been considered, the graduation percentage would have increased to 40.5. One could conclude that VT graduates who elect a transfer program have about one chance in five of receiving an Associate's degree.

TABLE 24

Chi-Square Analysis of College Graduation
for Vocational Technical Students

Program	Graduate	Non-Graduate	Totals
Related	45	60	105
Unrelated	17	31	48
Transfer	15	61	76
Totals	77	152	229

Chi-Square = 9.43
df = 2
$.01 > p > .005$

A further investigation of the 152 non-graduates (60, R; 31, U; 61, T) shows that 10% (15) were continuing in good standing (12%, R; 19%, U; 3%, T);1%(1) was continuing on probation (2%, R; 0%, U; 0%, T); 27% (41) had withdrawn in good standing (25%, R; 32%, U; 26%, T); 32% (49) had withdrawn on probation (43%, R; 13%, U; 31%, T); and 30% (46) were suspended (18%, R; 36%, U; 40%, T).

Table 25 shows the disposition of the 229 VT students with regard to their initial enrollment by program and subsequent college experiences.

TABLE 25

Summary of VT Students

Disposition	Related N	Related %	Unrelated N	Unrelated %	Transfer N	Transfer %	Totals N	Totals %
Graduated	45	43%	17	35%	15	20%	77	33.6%
Continuing/ Good Standing	7	7%	6	13%	2	2%	15	6.6%
Continuing/ Probation	1	1%	0	0%	0	0%	1	.5%
Withdrew/ Good Standing	15	14%	10	21%	16	21%	41	17.9%
Withdrew/ Probation	26	25%	4	8%	19	25%	49	21.4%
Suspended	11	10%	11	23%	24	32%	46	20.0%
Totals	105	100%	48	100%	76	100%	229	100 %

CHAPTER III

CONCLUSIONS AND RECOMMENDATIONS

The purposes of this research project were: (1) to compare CP and VT graduates who enrolled in two community colleges with regard to (a) demographic data; (b) pre-admissions educational variables; and (c) achievement in college; and (2) to compare VT graduates who enrolled in Related career, Unrelated career, and Transfer programs with regard to the same three dimensions.

On a demographic comparison, the CP and VT students tended to be more similar than dissimilar. The two groups were significantly different on each of the seven pre-admissions educational variables tested, suggesting that they are dissimilar with regard to past achievement and aptitude. With the exception of high school rank, the VT graduates scored significantly lower on the ACT battery and IQ tests than did the CP graduates. On college achievement, the CP graduates achieved significantly higher first semester and final grade point averages. However, the two groups did not differ at a statistically significant level with regard to their persistence to graduation from college.

An examination of the VT graduates who enrolled in Related, Unrelated, and Transfer college programs showed that on a demographic comparison, the groups appeared to be more dissimilar than similar. On a pre-admissions educational variables comparison, the groups tended to be more similar than dissimilar. In terms of college achievement, the

three groups tended to be dissimilar, particularly with regard to college graduation.

The ACT scores reported on pages 32 and 51 of this research report can be compared with those reported in two studies. The Research and Development Division of the American College Testing Program (1966) compared ACT scores and high school grades for 334 institutions of higher education by four levels: two-year, four-year, five-year, and Ph.D.-granting. The ACT composite averages respectively were 18.2, 19.3, 19.6, and 22.1. Although no levels of significance were reported, the researchers concluded that "students at two-year colleges scored lower on ACT tests and earned lower high school grades than students attending institutions at the other levels . . . (p.20)." Hoyt (1966) studied 898 students enrolled in terminal programs at six junior colleges. Compared with the academic potential of all other college students as well as non-terminal junior college students, these terminal students were "consistently below average (p.21)," particularly in the areas of English and social studies. The ACT Battery averages reported were English, 15.5; mathematics, 16.9; social studies, 16.9; natural science, 17.5, and composite, 16.9. Thus, it can be seen that the ACT scores of the VT and CP graduates in this study are reasonably consistent with scores reported in other research studies. The reader is reminded that Appendix A contains a synopsis of other research studies dealing with community college students.

The chi-square analysis of college graduation reported on Page 37 is noteworthy. Despite the fact that the CP and VT groups differed significantly with respect to the seven educational variables, the association between graduation and group membership was not significant, indicating a discrepancy between past achievement and/or aptitude as measured by the seven variables and graduation from a community college. This finding itself does perhaps add a degree of credibility to the open admissions policy, particularly with regard to the VT students. On the one hand, the graduation percentages (42% CP and 33.6% VT) are less than impressive, despite the fact that they are reasonably consistent with those reported in other research studies. On the other hand, the percentages of graduation could be interpreted as at least average or better-than-average considering the high-risk-level of the entrants.

Graduation statistics for the three classifications of VT students are reported on page 55. It is fairly obvious the VT graduates who enroll in college transfer programs tend not to complete their degrees. They also accumulate fewer credits and earn lower grades than the VT students in the two other groups. Furthermore, they are, on the average, an older group of students who do not enroll in college directly from high school. Therefore, it appears that this group of VT graduates needs the special attention of faculty, counselors, and academic advisers with regard to curricular choice and to achievement.

The curricular enrollment patterns of the VT students show that approximately 33% enroll in college transfer programs compared with 46% who enroll in related career programs and 21% in unrelated career programs. It is also interesting to note that of the 48 VT graduates who completed secondary VT programs for which there was no corresponding community college program, 27 (56%) enrolled in transfer programs. The reader must be cautious in assessing this statistic; however, it does have some long-range implications, particularly for the many graduates of VT programs who do not pursue their education beyond high school. In essence, are VT graduates hindered in their search for post-secondary education because their local community college (if there is one) does not offer a curriculum which might add to their educational skill or occupational development?

In conclusion, the data derived from this study can benefit educators at both the secondary and collegiate levels, particularly curriculum planners, academic advisers, and guidance counselors. Normative data, enrollment patterns, and achievement are the primary contributions of the report. This project has shown that CP and VT students tend to be similar with regard to demographic variables and to college graduation. They tend to be dissimilar with regard to pre-admissions variables and to GPA. The three classifications of VT students, on the other hand, tend to be dissimilar on demographic variables and on college achievement and similar on pre-admissions variables.

If the stated goal of vocational educators to serve 40-50% of the Commonwealth's high school students is achieved, then other research projects dealing with VT graduates should be conducted. These might include interest inventory studies, follow-up studies tied closely with the Vocational Education Management Information System (VEMIS), and a continuing follow-up of the 229 VT students included in this project.

APPENDICES

Appendix A

Synopsis of Research

Researcher and Date	General Design	Findings/Results
Aiken (1968)	Comparison of withdrawees (46) and continuers (44)	1. Withdrawers had significantly lower GPA's. No other variables would help in the prediction of withdrawers. 2. Withdrawers and persisters are similar.
American College Testing Program (1966)	Compared ACT scores of students at two-year, four-year, five-year, and Ph. D. institutions.	1. Two-year college students scored lower on ACT tests and had lower high school grades than students at other levels. 2. ACT Composite averages 18.2, 19.3, 19.6, and 22.1 respectively.
Anthony (1964)	Compared transfer and terminal students in three Texas junior colleges.	1. Transfer students were higher in socioeconomic level, high school grades, and entrance examination scores. 2. Terminal students had a tendency to be drawn from high school backgrounds which stressed occupational preparation rather than general academic performance. 3. No difference in quartile class ranks between the two groups. 4. Community college students represent a cross-section of their community.

Researcher and Date	General Design	Findings/Results
Baird, Richards, and Shevel (1969)	Follcw-up of sophomore Junior College students (4,009) in public, independent, and church-related schools.	1. 58.3 per cent indicated their major purpose was to transfer to a four-year school; 24 per cent to increase their preparation for employment and 4.8 per cent to prepare for a specific job. 2. ACT averages for males were: English, 17.0; math, 20.1; social studies, 20.1; natural sciences, 20.8.
Behm (1968)	Compared personalities of occupational and transfer community college students (628).	1. No significant differences on age, marital status, father's occupation, parents' educational levels, sources of financial support, and high school class rank. 2. Transfer males had higher scholastic abilities than male students and tended to be more sensitive and socially oriented.
Black (1969)	Prediction of dropouts, probationers, and suspensioners	1. H.S. GPA and ACT English were best predictors.
Block (1971)	Compared graduates of occupational programs (234) and transfer programs (542) who transferred to senior institutions.	1. Two groups tended to be more alike than dissimilar.

Researcher and Date	General Design	Findings/Results
Bossen (1968)	Comparison of withdrawers (50) and persisters (50).	1. Almost half of withdrawers returned to school within one year. 2. Profile of withdrawers -- father is unskilled, neither parent attended college, carried low academic load, undecided about educational and vocational goals.
Bowles and Slocum (1968)	Study of 3,117 high school students and their post-graduation plans.	1. Students who planned to pursue vocational education after high school perceived their H.S. experiences as unsuccessful and uninteresting. They had low self-images of their intellectual and scholastic abilities.
Brodsky (1964)	Compared 40 matched pairs of engineering technician enrollees and those in a pre-technology, non-credit semester	1. High school records correlated unusually low with first semester GPA. SCAT scores correlated at .648.
Brue (1971)	Comparison of occupational and transfer males in three Iowa Community Colleges.	1. Occupational males received significantly higher college grades (2.53 GPA) than did transfer males (2.11 GPA).

Researcher and Date	General Design	Findings/Results
Campanile (1971)	Compared predictive efficiency of SAT and the Comparative Guidance and Placement test.	1. CGP and SAT are equally effective predictors of academic success.
Carmody and Shevel (1972)	Studied 4,009 two-year students to ascertain consistency of students' aspirations and vocational choices.	1. Students in engineering, agriculture, and technology were most consistent (61%) in making initial choice and same choice two years later. 2. Two-year colleges may cause students to raise their degree aspirations if they had planned less than a B.A. and may lower those who planned for a Master's or higher.
Cohen (1971)	Descriptive Research	1. Major share of the responsibility for the low prestige of occupational education in the community colleges rests with community college educators.
Cooley & Becker (1966)	Analysis of Project TALENT data	1. Definite statistical differences among Junior College, non-college, and four-year college students on measures of learned information, aptitude, and achievement. 2. Junior College students are products of middle socioeconomic level.

Researcher and Date	General Design	Findings/Results
Cross (1968)	Descriptive Research	1. Junior college, non-college, and four-year college students are significantly different on tests of academic ability and occupational aspirations. 2. Junior college students have practical orientations to life and to college. 3. Junior college student is a product of the middle socioeconomic level. 4. Non-persisting Junior college students have lower high school GPA and lower aptitude test scores than persisters.
Cross (1970)	General description	1. Predicted that 2/3 of all college-age youth will be in college in 1980. 2. Emphasizes the needs of the "New Student" -- those scoring in the lowest third on tests of academic achievement. 3. Cites "motivation" as the key to learning. 4. Occupational programs have a "past" to overcome; image-building needed.
Davidson (1969)	Follow-up of 36 graduates of a two-year terminal institute in New York.	1. 20% continued their educations and received a baccalaureate degree.

Researcher and Date	General Design	Findings/Results
Easton (1970)	Compared 200 community college and 200 four-year students.	1. No difference between the groups on educational variables. 2. Community college students placed higher values on lower cost, lower tuition, and living at home.
Fenske (1969)	compared 3,952 Wisconsin high school seniors who had indicated plans for college, vocational technical school, and non-college.	1. 39.5% indicated college plans; 15.5% vocational technical; no degree; 45% non-college. 2. Vo-tech students are apt to be underachievers with higher aptitude than their high school records indicated.
Florida Community Junior College Research Council	Attrition study of 491 students	1. 61% of those who entered in 1966 did not graduate or transfer; 22% graduated and did transfer; 8% graduated but did not transfer; 9% did not graduate but transferred.
Frost and Spector (1967)	Compared 67 technology students with 693 other community college students on ACT percentile ranks.	1. No differences on composite, social studies. and natural sciences. Significant differences on English and math.

Researcher and Date	General Design	Findings/Results
Gartland and Carmody (1970)	Compared junior/community college students (689) with 351 post-secondary vocational technical school students.	1. Vo-tech school students had higher completion rates (70.3%) than two-year college students (49.9%) 2. Vo-tech schools may deal with students more efficiently and effectively than colleges. But the students may be a dissimilar group.
Godfrey and Holmstrom (1970)	Studied 7,673 two-year students enrolled in branch campuses, junior colleges, technical institutes, and vocational technical centers.	1. Of all full-time males, 54.9 per cent had taken college prep in high school; 30.8, general; 4.7, business or commercial; 8.1, vocational technical 2. Of the Junior College males, 61.8 per cent were college preps; 25.6, general; 5.2, business or commercial; 4.9, vocational technical
Gwydir (1958)	Study of construction technology students to predict graduation	1. Best predictor was high school math average (.487 correlation); Numerical Ability Test (.424); and composite high school average (.403).
Hakanson (1967)	Study of freshmen students at six California Community Colleges. Also focused on occupational students.	1. Men in occupational curriculums scored significantly lower on tests of academic ability than transfer students. 2. 60 per cent of occupational program entrants dropped out before completing their degree. 3. Loss of interest by occupational students is attributable to general education requirements.

Researcher and Date	General Design	Findings/Results
Hall (1967)	Description of 1,770 "average" students who enrolled in a California Community College during eleven year period.	1. 21.6% of terminal students graduated or transferred; 35.7% of transfer students graduated or transferred.
Halsey (1957)	Studied 389 freshmen in technical curriculums to identify predictors for first year success.	1. High school GPA had highest correlation (.52).
Hoyt (1966)	Studied 898 students enrolled in terminal programs at six junior colleges.	1. General level of academic potential among the students was homogeneous. 2. Terminal students were consistently below average compared with non-terminal and other college students particularly in English and social studies scores, but their college GPA was slightly higher. 3. Terminal ACT averages were: English, 15.5; math, 16.9; social studies, 16.9; natural science, 17.8; composite, 16.9. 4. ACT scores and high school grades were equally predictive.

Researcher and Date	General Design	Findings/Results
Iffert (1958)	General study of attrition.	1. 60% of entering freshmen do not graduate from the college they entered initially although 20% of these "dropouts" receive their degree at another school. 2. Positive correlation between HS class rank and persistence in college. 3. Men had slightly higher attrition rates (61%) than women (59%).
Ivey, Peterson, and Trebbe (1966)	Prediction of Attrition	1. HS Rank is the most effective predictor of collegiate success or failure
Jaffe and Adams (1970)	Dropout study	1. Dropout rate for junior college is nearly three times as great as the rate at senior colleges. 2. Of the non-college prep two-year entrants, 75% dropped out.
Johnston (1972)	Attrition rates at two-year colleges	1. Over-all graduation rate for students who entered in 1966 was 38.4% (36.6% males; 41.2% females).

Researcher and Date	General Design	Findings/Results
Koelsche (1956)	Dropout study	1. The withdrawee is frequently doubtful of his vocational choice; he shows a pattern of disinterest and non-involvement in college affairs. 2. 38% of withdrawees were achieving satisfactory grades when they left college.
Libby (1964)	Comparison of ACT scores and HS achievement as predictors of college success	1. ACT scores were better predictors, particularly composite and mathematics.
March (1966)	Review of attrition literature	1. Ability and achievement ratings of students are useful in spotting students at the low end of the scale who might drop out due to academic failure. 2. No consistent pattern has emerged that satisfactorily explains why students leave college.
Matson (1955)	Comparison of withdrawers (144) and persisters (217)	1. Dropouts were older, enrolled in clerical programs or were undecided, had financial problems, and generally pursued non-college preparatory HS curriculums.

Researcher and Date	General Design	Findings/Results
McCallum (1967)	General description	1. Males enrolled in occupational education scored lower on tests of academic ability than transfer males.
Metcalf (1965)	State of Washington study.	1. 87.4% of the 315,014 student credit hours being carried by 30,951 students were being spent in academic courses (transfer), the remainder in vocational courses.
Miller (1970)	Compared transfer and occupational community college graduates (240) with regard to time needed to graduate and achievement	1. Transfer students -- 31.3% completed in four semesters; 28.8% needed five semesters; 13.5% needed six semesters. 2. Career Students -- 28.6% completed in four semesters; 20.8% needed five semesters; 23.4% needed six semesters. 3. The more semesters a student takes to complete his degree, the more likely he is to have a lower GPA.
Munday (1969)	Comparison between transfer and occupational Community College students	1. Transfer students scored higher on academic entrance examinations but had lower high school grades than terminal students.

Researcher and Date	General Design	Findings/Results
Neswick (1971)	Compared College Preparatory and Vocational Cooperative high school graduates who attended junior and senior colleges.	1. No difference between groups on first year college GPA. 2. Predictors for one group were not applicable to those of another group.
Newman (1971)	Dropout study	1. Student dissatisfaction with the institution and its offerings is the underlying force motivating the dropout to leave college. Academic failure has decreased in importance as a reason for leaving.
Nogle (1965)	Compared 100 transfer males and 100 occupational males in a California community college.	1. Transfer males were higher in scholastic ability and scholarship in high school.
Novak (1969)	Study of 352 entering community college freshmen.	1. 94% of entering males were 19 or younger when they registered.
Richards & Braskamp (1969)	Compared student body characteristics and institutional environments at 102 two-year colleges.	1. Two-year colleges attract pragmatic students seeking vocational training. They are less attractive to talented students who are intellectually and academically oriented. 2. Two-year students are likely to be the first in their family to attend college, which is seen as an instrument of social mobility.

Researcher and Date	General Design	Findings/Results
Richards, Holland, & Lutz (1966)	Prediction of college grades for 12,000 students.	1. HS Rank was the most consistent predictor. 2. Past performance predicts future performance.
Roueche (1967)	Comparison of dropouts & persisters	1. Basic differences are non-intellectual rather than intellectual ones. 2. Aptitude scores are of little value in predicting dropouts.
Skaling (1971)	Literature review of dropouts	1. Dropping out of college is a complex process. We do not know how to lower the rate. 2. Major reasons for dropping out in the 1960's seems to be "dissatisfaction with the college environment" not academic failure. 3. Dropouts usually have lower test scores than persisters.
Stewart (1966)	Study of 608 junior college students in trade and technical education	1. Vocational courses are not the dumping grounds for poor students.

Researcher and Date	General Design	Findings/Results
Summerskill (1962)	Literature review of Attrition studies	1. Median attrition rates at various institutions was 50%. This figure has remained constant for the last 50 years.
Taylor & Hecker (1967)	Comparison of junior college students (941) in 5 different curriculums.	1. Trade and Industrial students were similar to Terminal Business and General Education Non-Science students on SCAT but statistically lower than the Collegiate Technical and General Education Science students. 2. High school achievement of the five groups did not seem to be of much practical value in differentiating among the groups.
Tillery (1965)	Comparison of University of California and community college "University-eligible" students.	1. Junior College freshmen are less well-prepared academically, less socially mature, less intellectually motivated, less responsive to new experiences, and less flexible in ideas and values.
Trent (1969)	Descriptive Research	1. Community college students are less academically able, less introspective, less likely to reach their goals, less autonomous, less original than four-year college students. 2. CC Transfers usually take more than four years to earn a B. A.

Researcher and Date	General Design	Findings/Results
Trent & Medsker (1968)	Dropout study	1. Factor most related to presistence is motivation, which is formed very early in life due to parental influence and early school experience.
VanDerslice (1968)	Comparison of Engineering & Technology students.	1. On verbal comprehension test, technical students score at 45th percentile; engineering, 61st percentile. On quatitative test, technical, 47th percentile; engineering, 73rd percentile. On reading comprehension, technical, 40th percentile; engineering, 60th percentile. 2. Average age of technical students is 19. They have C averages in high school. Math background is limited to algebra I and geome. y. Science background is general science and biology.
Waller (1964)	Attrition study.	1. One-third of all withdrawals were attributable to academic reasons, 1/3 to motivational factors, and 1/3 to financial reasons.

Appendix B

List of Curriculums

Secondary Vocational-Technical Curriculums	Bethlehem AVTS	Carbon County AVTS	Eastern Northampton Co. AVTS	Lehigh County AVTS
Agriculture			x	x
Appliance Repair	x		x	x
Auto Body Repair	x	x	x	x
Auto Mechanics	x	x	x	x
Auto Svc. Mech.	x			x
Bldg. Maintenance (Maint. Mech.)			x	x
Cabinet Making	x	x		x
Carpentry	x	x	x	x
Civil Technology	x			
Commercial Art	x	x		x
Cosmetology	x	x	x	x
Data Processing	x	x	x	x
Distributive Ed.	x		x	x
Drafting Tech (Mech. Tech.)	x	x	x	x
Electrical Constr.	x	x	x	x
Electronics Comm.	x			x
Electronics Tech.	x	x	x	x
Fashion Industries (Apparel)	x	x	x	x
Health Assistant	x		x	x
Heating/Refrig./ Air Cond./Plumb.	x	x	x	x
Horticulture/ Florticulture	x		x	x
Machine Trades	x	x	x	x
Painting/Decor.			x	x
Printing Trades (Graphic Arts)	x		x	x
Restaurant Prac. (Foods Serv.)	x	x	x	x
Sheet Metal Tr.	x			x
Trowel Trades (Masonry)	x		x	x
Warehousing				x
Welding	x	x	x	x

Appendix C

Year-by-Year Analysis Of Secondary Curriculums

SUMMARY TABLES OF COLLEGE ENROLLMENTS BY SECONDARY CURRICULUMS

TOTAL ENROLLMENT

	Related	Unrelated	Transfer	Total
1967	15	5	17	37
1968	16	10	13	39
1969	39	19	18	76
1970	35	14	28	77
TOTAL	105	48	76	229

AUTOMOBILE AND AUTOMOTIVE

	Related	Unrelated	Transfer	Total
1967	--	--	1	1
1968	--	--	--	--
1969	--	3	1	4
1970	--	1	4	5
TOTAL	--	4	6	10

CARPENTRY, CABINETMAKING
WOODWORKING

	Related	Unrelated	Transfer	Total
1967	--	--	--	--
1968	--	3	--	3
1969	--	--	4	4
1970	--	1	4	5
TOTAL	--	4	8	12

CHEMICAL TECHNOLOGY

	Related	Unrelated	Transfer	Total
1967	--	--	--	--
1968	--	--	--	--
1969	--	--	--	--
1970	1	--	--	1
TOTAL	1	--	--	1

CIVIL TECHNOLOGY, DRAFTING, AND ARCHITECTURAL TECHNOLOGY

	Related	Unrelated	Transfer	Total
1967	2	3	4	9
1968	2	--	5	7
1969	7	4	1	12
1970	16	4	6	26
TOTAL	27	11	16	54

COMMERCIAL ART

	Related	Unrelated	Transfer	Total
1967	1	--	--	1
1968	--	--	--	--
1969	3	--	1	4
1970	1	--	1	2
TOTAL	5	--	2	7

DATA PROCESSING

	Related	Unrelated	Transfer	Total
1967	2	--	--	2
1968	1	--	1	2
1969	8	--	1	9
1970	4	1	--	5
TOTAL	15	1	2	18

ELECTRICAL, ELECTRONICS, AND RADIO

	Related	Unrelated	Transfer	Total
1967	10	1	3	14
1968	11	5	6	22
1969	18	6	4	28
1970	13	2	9	24
TOTAL	52	14	22	88

MACHINE SHOP

	Related	Unrelated	Transfer	Total
1967	--	--	2	2
1968	2	--	--	2
1969	3	--	2	5
1970	--	2	3	5
TOTAL	5	2	7	14

METAL SHOP, WELDING, AND METALLURGY

	Related	Unrelated	Transfer	Total
1967	--	1	--	1
1968	--	1	--	1
1969	--	3	2	5
1970	--	3	--	3
TOTAL	--	8	2	10

PLUMBING, HEATING, AIR CONDITIONING, AND REFRIGERATION

	Related	Unrelated	Transfer	Total
1967	--	--	--	--
1968	--	--	1	1
1969	--	--	--	--
1970	--	--	1	1
TOTAL	--	--	2	2

PRINTING TRADES, AND GRAPHIC ARTS

	Related	Unrelated	Transfer	Total
1967	--	--	7	7
1968	--	1	--	1
1969	--	3	2	5
1970	--	--	--	--
TOTAL	--	4	9	13

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