5-1970

The Establishment and Comparison of Prediction Equations for Determining Minimum GPA's in Applied Arts Programs at Dixie College

Robert L. Cobb
Utah State University

THE ESTABLISHMENT AND COMPARISON OF PREDICTION EQUATIONS FOR DETERMINING MINIMUM GPA'S IN APPLIED ARTS PROGRAMS AT DIXIE COLLEGE

by

Robert L. Cobb

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

of

MASTER OF SCIENCE

in

Industrial Education

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

1970

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to the members of my thesis committee, Dr. Austin G. Loveless, Dr. William E. Mortimer, Dr. Neill C. Slack, and Dr. David R. Stone. Their suggestions and encouragement helped a great deal in clarifying many difficult points.

To Dr. Austin G. Loveless, I offer a special thanks. As committee chairman, he offered suggestions and assistance which made the completion of this thesis possible.

I would like to thank Nolan E. Ashman, Assistant Professor of Psychology at Dixie College, for his helpful suggestions; and Vern R. Thomas, Registrar at Dixie College, for his help and cooperation in the collection of the data for this study.

Finally, to my wife, Georgia, for her understanding and hours of typing, I extend a special thanks.

Robert L. Cobb

Robert L. Cobb

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

ABSTRACT

The Establishment and Comparison Of Prediction Equations For Determining Minimum GPA's In Applied Arts Programs At Dixie College

by

Robert L. Cobb, Master of Science

Utah State University, 1970

Major Professor: Dr. Austin G. Loveless
Department: Industrial and Technical Education

This study was an attempt to establish and compare prediction equations for determining a minimum GPA of 2.00 in the Applied Arts programs at Dixie College. It also attempted to compare the derived prediction equations used to determine minimum GPA's in both the Academic Arts and Applied Arts Divisions. The study compared the derived prediction equations used to determine minimum GPA's for each vocational program in the Applied Arts Division. The study attempted to determine and compare the most reliable predictor in the Academic Arts Division, total Applied Arts Division, and each vocational program in the Applied Arts Division.

In conclusion, the thesis illustrates what percent of the total variation of GPA could be accounted for by the derived prediction equations in the Academic Arts Division, total Applied Arts Division, and in each vocational program in the Applied Arts Division. It also determined that the ACT Social Science subtest score proved to be the best single

predictor for both the Academic Arts and Applied Arts Divisions at Dixie College as well as for the vocational programs of Architectural Drafting and Airline Stewardess. The ACT Composite score proved to be the best single predictor in the vocational programs of Auto Mechanics, Electronics, and Business Education at Dixie College.

(69 pages)

CHAPTER I

INTRODUCTION

Origin and Nature of Problem

At the present time the vocational students at Dixie College are not required to take any kind of vocational preference or aptitude tests. Without the aid of such tests, the proper counseling and guidance of these vocational students is very inadequate. Many students spend their first year at Dixie trying to decide which vocational program to pursue. The advisors of these students have no way of predicting that a student will or will not earn and maintain at least a minimum grade-point average (GPA) of 2.00 at Dixie College.

At this time Dixie College is expanding the present vocational programs and establishing new programs which broaden the total vocational curriculum considerably. The need for a good vocational counseling and guidance program to assure the most successful and economical student placement is realized now more than ever before. In order for these vocational programs to be effective and to meet the needs of the students enrolled, a good local predictive instrument is needed. This local predictive instrument must be designed to make use of the present testing program used for counseling and guidance of academic students at Dixie College.

It is purposed that predictive equations for use in vocational program placement be established to make use of the American College Testing Program (ACT), which is now being used by the counseling department for advising and placement of academic students. These

predictive equations will be derived by the statistical method of multiple correlations with categorical comparisons using ACT data and GPA's of former vocational and academic students enrolled at Dixie College during the academic years of 1966-67 and 1967-68.

Objectives

1. To establish a predictive equation in order to determine vocational students' minimum GPA's using ACT data and GPA's of former students in the Applied Arts Division at Dixie College.
2. To compare the derived prediction equations used to determine minimum GPA's in both the Academic Arts and Applied Arts Divisions at Dixie College.
3. To compare the derived prediction equations used to determine minimum GPA's for each vocational program in the Applied Arts Division at Dixie College.
4. To determine and compare the most reliable predictor in the Academic Division, total Applied Arts Division, and each vocational program in the Applied Arts Division.

CHAPTER II

REVIEW OF LITERATURE

Lack of Predictive Instruments for Vocational Counseling

The problem of predicting success in trade and vocational programs has received relatively little attention in view of its importance. Compared to studies of academic success at the college level, there is a void of good studies concerned with predicting success in trade and vocational programs (Patterson, 1956b, and Sommerfeld and Fatzinger, 1967).

Patterson gave the following reasons for the lack of any good predictive research in trade and vocational areas:

> Students are frequently assigned to trade and vocational programs because of failure to adapt to the academic curriculum. Students are thus negatively selected, and if they are unable to master academic subjects, and must, or wish to remain in school, they are compelled to take trade and vocational courses, and the schools are not able to exercise any positive selection. This situation discourages research on the selection of vocational school students. (Patterson, 1956a, p. 353)

According to Van Derslice (1967), there has been little emphasis given to the counseling and guidance of vocational students at the community college level. Due to the large number of students that do not continue their education beyond the community college level, it is evident that the vocational counseling of these students must be expanded with the use of proper guidelines.

Johnson and Johnson (1968) emphasized the need for predictive instruments in the vocational counseling area. They point out the fact that the major problem facing vocational counselors is how to help

young people develop vocational goals when the students' knowledge and experience are too limited to provide a basis for evaluating the alternatives. The vocational counselors have the typical occupational information available to schools and college counseling centers, but this type of information can be of little help to the counselor in predicting a student's success in a vocational area.

Harrington (1956) found that most vocational schools have admission standards comparable to requirements for four-year institutions of higher learning, but there is a great need for psychological data which will enable the counselor and the student to review the alternatives of further education on a sound basis.

McCall (1965) stated that even though psychologists can obtain a good measure of vocational interest by the inventory scale methods, such as the Kuder Preference Record-Vocational and the Strong Vocational Interest Blank, there still remains a lot to be done if a counselor is to link interest scores to motivation, learning, or personality variables.

Progress in Predicting Vocational Success

A review of recent literature showed some small gains made in the prediction of trainee success or failure in trade and vocational programs.

Success in Navy vocational training can be predicted by strength of measured interests on vocational interest tests (Gordon and Alf, 1962). A combination of achievement and intelligence tests was found to be predictive of dropouts in trade school courses (Patterson, 1956b). A predictor of success in military recruit training was the subject's

ability to follow instructions in a test situation (Stern and Gordon, 1961). Predictors of trainee success at the Michigan Veterans Vocational School were intelligence, prior grade level, and arithmetic achievement (Graybiel, 1959).

American College Testing Program as a Predictor

LaPray (1962, p. 10) stated that "little research has been done by private investigators on the American College Testing Program Examination due to its very recent development and use as a predictor of success." The American College Testing Program was founded in 1959 and the majority of the participating universities did not start using the examination until 1961.

The results of a study using the following three predictive criteria, American College Test (ACT), Scholastic Aptitude Test (SAT), and the average of high school recommending grades (HSRG), as predictors of first semester grade-point average (GPA) showed that the HSRG yielded the highest predictive validity for first semester GPA. The ACT and SAT scores had slightly higher validities comparison where the differences between the highest and the next highest validities were of any practical significance (Passons, 1967).

In a study conducted by Munday (1967), a TH Index was developed. The T correlation (T Index) is the multiple regression coefficient (R) resulting from optimally weighting the four ACT sub-tests of English, Mathematics, Social Sciences, and Natural Sciences. The H correlation (H Index) is the multiple regression coefficient (R) derived from optimally weighting four high school grades in the subject areas of English, Mathematics, Social Sciences, and Natural Sciences. The TH

Index was found to be a predictive instrument equivalent to an eight-variable multiple regression equation. The American College Testing Program recommends this TH Index to colleges as their best estimate of the relationship between the ACT record and college grades.

Peters and Plog (1961) found that by using the American College Test (ACT) instead of the Ohio State University entrance examination (OSU), they would increase error in placement of freshmen students at Ohio State University. This study shows that the closer a test is designed to fit a particular purpose and to meet the particular conditions under which it is to be used, the less error there is likely to be.

In Malloy's (1964) investigation of the scholastic over- and under-achievement of 400 women freshmen students at the University of Nebraska, he determined that aptitude and achievement tests accounted for only one-half the variance in college grades.

Mahmoudi (1962) stated that the ACT is a combination of four different subtests:

Test 1: English This test measures the student's educational development in understanding and using the basic elements in correct and effective writing, punctuation, capitalization, diction, phraseology, and organization. The test measures the student's ability to put his knowledge of the English language to use.

Test 2: Mathematics This test measures the student's educational development in using arithmetical and mathematical principles in the solution of practical quantitative problems and in the interpretation of graphs and charts.

Test 3: Social Sciences This test measures the student's educational development in the ability to interpret and evaluate reading

selections in the social studies and to do the types of reasoning and problem solving characteristic of the social studies. The test attempts to discriminate between students who have acquired a broad understanding of social principles and those who have not.

Test 4: Natural Sciences This test measures the student's educational development in the ability to interpret and evaluate reading materials in the natural sciences, and to do the kind of reasoning characteristic of the natural sciences. It actually is designed to draw as heavily upon the student's science background as upon his ability to comprehend the content of the reading passages.

Composite The composite score is the mean of the four educational development scores and is viewed as an index of the total educational development. It has proven in other educational development batteries to be the strongest predictor of freshman success in college.

Other Predictive Instruments

Bloom and Peters (1961) state that the best prediction of what a student will do in the future is the evidence of what he has done in the past. They point out that the best predictor of academic grades in the future is the history of the student's previous academic grades and that the consistency of the student's academic achievement at the high school and college levels clearly places renewed importance on high school grades as predictors of college potential.

Lavin (1965) suggests that the best prediction of the overall grade-point average for college freshmen is obtained from multiple correlations in which a battery of intellective variables is used. The single best predictor of performance on the college level is the high school academic record.

Stone (1954) conducted a study at Brigham Young University which showed that entrance test data and high school grade-point average could provide the counseling service at Brigham Young University with the basis for making differential predictions of academic success. The most efficient single predictor of academic success was the high school grade-point average.

Two studies conducted in the late 1940's indicated that the high school grade-point average was the most important single factor in the prediction of college freshmen's success (Garrett, 1949, and Hertel and DiVesta, 1948).

In a study conducted at Utah University for the purpose of predicting freshman scholarship at institutions of higher learning in the state of Utah, it was found that the average high school grade consistently appeared to be the best single indicator of probable college success. It was also found that standardized tests of achievement in the high school subjects are somewhat superior to scholastic aptitude tests for predicting college scholarship (Jex, 1966).

The Need for Predictive Instruments

In a panel discussion held at the University of Minnesota, Paul L. Trump, President of the American College Testing Program, stressed the importance of the individual and prediction of student success in academic and vocational areas of higher education:

> American higher education has a long tradition of respect for individual differences. We have always believed that different students should be exposed to different kinds of experiences to insure the most effective education for all. And, interestingly enough, a number of special programs based upon this philosophy all depend upon a common condition, the college's ability to forecast the probable academic outcome of one or another contingency. Hence, the effectiveness

> of honors programs, remedial programs, advising programs, counseling programs, special admission programs, (early admissions, trial admissions, etc.), and programs designed to encourage the financially needy student--all depend to a considerable extent upon the ability of the college to forecast probable academic outcomes for various kinds of students in various learning situations. (Trump, 1964, p. 492)

It appears that if and when schools offering trade and vocational programs desire to select, by use of a predictive instrument, those students most likely to succeed, it would be possible to do so with some degree of success. It will be necessary for each school to determine its own selection procedure, in terms of critical scores, in relation to the nature, level, and purpose of its training program (Patterson, 1956a).

Jex (1966, p. iv) pointed out that a great attempt to predict college success has been made over the past fifty years with varying degrees of success. Many predictive instruments have been devised and tested, but there is still the need for local research which will answer the question: "In which course of higher education is this student most apt to succeed?"

CHAPTER III

METHOD AND PROCEDURES

Population Selection

The population for this study included all students in the Academic Arts and Applied Arts Divisions at Dixie College who were enrolled for any three quarters in either of the academic years 1966-67 or 1967-68 (Table 1).

Table 1. Population breakdown for Academic Arts and Applied Arts Divisions by sex

Students	Academic Arts Division	Applied Arts Division
Males	420	88
Females	330	76
Totals	750	164

The population for the Applied Arts Division was selected from the vocational programs of auto mechanics, architectural drafting, electronics, airline stewardess, and business education. The population for each of the vocational programs was made up of only those students who were counted by Dixie College on the Utah State Vocational year-end reports in each of the respective programs (Table 2).

Table 2. Population breakdown for vocational programs in the Applied Arts Division by sex

Students	Auto Mechanics	Architectural Drafting	Electronics	Airline Stewardess	Business Education
Males	25	12	18	0	33
Females	0	0	0	21	55
Totals	25	12	18	21	88

Population Deletions

All those students failing to complete the American College Test (ACT) during the academic years 1966-67 or 1967-68 were excluded from the population.

All special and part-time students were excluded from the population. Dixie College defines a special student as a student who is permitted to enroll in college classes regardless of the amount of previous education he or she may have acquired. Dixie College defines a part-time student as a student registering for one to ten hours of credit for any one quarter.

Those students enrolled in the vocational auto body program during the academic years of 1966-67 and 1967-68 were excluded from the population because of the insignificant number of students enrolled in the program.

Collection of Data

The data for the entire population are available at the Registrar's Office on the Dixie College campus.

All the ACT data have been collected by accumulating all scores from national and residual ACT testing programs. The ACT data consist of subtest standard scores only.

Computer Card Data

The data for each student in the population were key punched on a computer card as follows:

First entry	ACT subtest score for English
Second entry	ACT subtest score for Mathematics
Third entry	ACT subtest score for Social Sciences
Fourth entry	ACT subtest score for Natural Sciences
Fifth entry	ACT Composite score
Sixth entry	A for Academic Arts Division
	B for Applied Arts Division
	B1 for vocational Auto Mechanics
	B2 for vocational Architectural Drafting
	B3 for vocational Electronics
	B4 for vocational Airline Stewardess
	B5 for vocational Business Education
Seventh entry	1 for males
	2 for females
Eighth entry	Grade-point average

Procedure

The data on each student in the population were key punched on computer cards. These data included male or female, divisions of the college and vocational program for those in the Applied Arts Division, ACT subtest and Composite scores, and overall GPA. The computer cards were then submitted to a program of multiple correlation with categorical comparison for computer analysis. Using derived partial regression coefficients from the computer analysis program, predictive equations for determining minimum grade-point average of 2.00 were formulated. Predictive equations were established for the Academic Arts and total Applied Arts Divisions as well as for each vocational program within the Applied Arts Division. The R^2 [1] presented for each set of partial regression coefficients used to formulate a prediction equation will show what percent of the total variance of GPA can be accounted for by that prediction equation. Each variable deleted from the computer analysis was deleted in the order of "least contributive" to "most contributive," and a new prediction equation was formulated after each deletion. The R^2 for the remaining partial regression coefficient was designed to indicate what percent of the total variation of GPA could be accounted for by the new equation.

Treatment of Results

Predictive equations were established for the Academic Arts and

---

[1] R^2 is derived from the summation of partial regression coefficients for each component in a variable set and indicates the proportion of variance that is accounted for by ACT subtest scores, ACT Composite scores, and sex ($1-R^2$).

total Applied Arts Divisions as well as for each vocational program within the Applied Arts Division.

The R^2's of the predictive equations for the Academic Arts and the total Applied Arts Divisions were compared to determine which equation could account for the highest percent of the total variance of GPA.

The R^2's of the predictive equations for each vocational program in the Applied Arts Division were compared to determine which equation could account for the highest percent of the total variance of GPA down to the equation which could account for the lowest percent of the total variance of GPA.

The best predictors for the Academic Arts, total Applied Arts, and each vocational program in the Applied Arts were statistically determined. The R^2's for each predictor were compared to illustrate which predictor could account for the highest percent of the total variance of GPA.

CHAPTER IV

RESULTS

Introduction

In each section of results covered in this chapter, the predictive equations and R^2 values are derived from partial regression coefficients shown in the tables for each equation.

Each of the tables in this chapter will have the following headings:

Source Indicates the variables used in the computer analysis

Degrees of freedom Indicate the number of variables that are free to vary

Variable 1 ACT English subtest score

Variable 2 ACT Mathematics subtest score

Variable 3 ACT Social Sciences subtest score

Variable 4 ACT Natural Sciences subtest score

Variable 5 ACT Composite score

Variable 6 Sex

Coefficient Indicates the derived partial regression coefficient from the computer program for each component in a variable set

The R^2 value for each predictive equation is derived from the summation of those partial regression coefficients for each component in a variable set and indicates the proportion of variance that is accounted for by ACT subtest scores, ACT Composite scores, and sex.

The prediction equations are derived by multiplying each ACT subtest score and ACT Composite score by its respective computed partial regression coefficient and adding the sum of these products to the partial regression coefficient for the variable component, sex.

Example

A male Academic Arts student receives the ACT test scores of: English 23, Mathematics 24, Social Science 19, Natural Science 25, and Composite score of 23. This student's ACT scores are applied to the derived Academic Arts prediction equation.

$$\text{Predicted GPA} = .669 + (.021)(23) + (.024)(24) + (.023)(19) + (.022)(25) - (.012)(23) - .251$$

The predicted GPA for this Academic Arts student is 2.188. The R^2 value indicates that 34 percent of the total variation of GPA for this student can be accounted for by this equation and that 66 percent of the total variation of GPA for this student cannot be accounted for by this equation.

Academic Arts Division

This section of results illustrated the derivation of predictive equations and R^2 values for the Academic Arts Division at Dixie College.

In the tables and formulas in this section, the numbered variables indicate: V,1 = ACT English subtest score; V,2 = ACT Mathematics subtest score; V,3 = ACT Social Science subtest score; V,4 = ACT Natural Science subtest score; V,5 = ACT Composite score; and V,6 = sex.

In the computation of the partial regression coefficient for V,6, a positive (+) coefficient was derived for females and a negative (-) coefficient was derived for males.

Table 3. Derived Academic Arts prediction equation and R^2 value with all variables analyzed

Source	Degrees of freedom	Variable	Coefficient
Total	749	0	0.669
V,1	1	1	0.021
V,2	1	2	0.024
V,3	1	3	0.023
V,4	1	4	0.022
V,5	1	5	-0.012
V,6	1	6	0.251
Error	743		R^2 = 0.340

Predicted GPA = .669 + (.021) (V,1) + (.024) (V,2) + (.023) (V,3) + (.022) (V,4) - (.012) (V,5) + .251 for females or - .251 for males

The R^2 is the summation of the coefficients for the six variable components in Table 3 and indicates that 34 percent of the total variation of GPA in Academic Arts can be accounted for by this equation and 66 percent of the total variation of GPA cannot be accounted for by this equation.

Table 4. Derived Academic Arts prediction equation and R^2 value with variable 5 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	749	0	0.666
V,1	1	1	0.019
V,2	1	2	0.021
V,3	1	3	0.020
V,4	1	4	0.019
V,6	1	6	0.252
Error	244		R^2 = 0.340

Predicted GPA = .666 + (.019) (V,1) + (.021) (V,2) + (.020) (V,3) + (.019) (V,4) + .252 for females or - .252 for males

The R^2 is the summation of the coefficients for the five variable components in Table 4 and indicates that 34 percent of the total variation of GPA in the Academic Arts Division can be accounted for by this equation and that 66 percent of the total variation of GPA cannot be accounted for by this equation.

Table 5. Derived Academic Arts prediction equation and R^2 value with variables 5 and 1 deleted

ource	Degrees of freedom	Variable	Coefficient
Total	749	0	0.688
V,6	1	6	0.312
V,2	1	2	0.023
V,3	1	3	0.025
V,4	1	4	0.023
Error	745		R^2 = 0.331

Predicted GPA = .688 + (.023) (V,2) + (.025) (V,3) + (.023) (V,4) + .312 for females or - .312 for males

The R^2 is the summation of the coefficients for the four variable components in Table 5 and indicates that 33 percent of the total variation of GPA in the Academic Arts Division can be accounted for by this equation and that 67 percent of the total variation of GPA cannot be accounted for by this equation.

Table 6. Derived Academic Arts prediction equation and R^2 value with variables 5, 1, and 4 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	749	0	0.846
V,6	1	6	0.288
V,2	1	2	0.029
V,3	1	3	0.037
Error	746		R^2 = 0.310

Predicted GPA = .846 + (.029) (V,2) + (.037) (V,3) + .288 for females
or - .288 for males

The R^2 is the summation of the coefficients for the three variable components in Table 6 and indicates that 31 percent of the total variation of GPA in the Academic Arts Division can be accounted for by this equation and that 69 percent of the total variation of GPA cannot be accounted for by this equation.

Table 7. Derived Academic Arts prediction equation and R^2 value with variables 5, 1, 4, and 6 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	749	0	1.327
V,3	1	3	0.040
V,2	1	2	0.022
Error	747		R^2 = 0.265

Predicted GPA = 1.327 + (.040) (V,3) + (.022) (V,2)

The R^2 is the summation of the coefficients for the two variable components in Table 7 and indicates that 27 percent of the total variation of GPA in the Academic Arts Division can be accounted for by this equation and that 73 percent of the total variation of GPA cannot be accounted for by this equation.

Table 8. Derived Academic Arts prediction equation and R^2 value with variables 5, 1, 4, 6, and 2 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	749	0	1.493
V,3	1	3	0.050
Error	748		R^2 = 0.231

Predicted GPA = 1.493 + (.050) (V,3)

The R^2 is the coefficient for the variable component in Table 8 and indicates that 23 percent of the total variation of GPA in the Academic Arts Division can be accounted for by this equation and that 77 percent of the total variation of GPA cannot be accounted for by this equation.

Total Applied Arts Division

This section of results illustrates the derivation of prediction equations and R^2 values for the total Applied Arts Division at Dixie College. In the tables and formulas in this section, the numbered variables indicate: V,1 = ACT English subtest score; V,2 = ACT Mathematics subtest score; V,3 = ACT Social Science subtest score; V,4 = ACT Natural Science subtest score; V,5 = ACT Composite score; and V,6 = sex.

In the computation of the partial regression coefficients for V,6, a positive (+) coefficient was derived for females and a negative (-) coefficient was derived for males.

Table 9. Derived Applied Arts prediction equation and R^2 value with all variables analyzed

Source	Degrees of freedom	Variable	Coefficient
Total	163		
V,1	1	1	0.054
V,2	1	2	0.042
V,3	1	3	0.051
V,4	1	4	0.040
V,5	1	5	-0.136
V,6	1	6	0.032
Error	157		R^2 = 0.178

Predicted GPA = (.054) (V,1) + (.042) (V,2) + (.051) (V,3) + (.040) (V,4) - (.136) (V,5) + .032 for females or - .032 for males

The R^2 is the summation of the coefficients for the six variable components in Table 9 and indicates that 18 percent of the total variation of GPA in the Applied Arts Division can be accounted for by this equation and 82 percent of the total variation of GPA cannot be accounted for by this equation.

Table 10. Derived Applied Arts prediction equation and R^2 value with variable 6 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	163		
V,1	1	1	0.051
V,2	1	2	0.045
V,3	1	3	0.051
V,4	1	4	0.041
V,5	1	5	-0.137
Error	158		R^2 = 0.177

Predicted GPA = (.051) (V,1) + (.045) (V,2) + (.051) (V,3) + (,041) (V,4) - (.137) (V,5)

The R^2 is the summation of the coefficients for the five variable components in Table 10 and indicates that 18 percent of the total variation of GPA in the Applied Arts Division can be accounted for by this equation and 82 percent of the total variation of GPA cannot be accounted for by this equation.

Table 11. Derived Applied Arts prediction equation and R^2 value with variables 6 and 4 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	163		
V,1	1	1	0.030
V,2	1	2	0.023
V,3	1	3	0.032
V,5	1	5	-0.037
Error	159		R^2 = 0.152

Predicted GPA = (.030) (V,1) + (.023) (V,2) + (.032) (V,3) - (.037) (V,5)

The R^2 is the summation of the coefficients for the four variable components in Table 11 and indicates that 15 percent of the total variation of GPA in the Applied Arts Division can be accounted for by this equation and 85 percent of the total variation of GPA cannot be accounted for by this equation.

Table 12. Derived Applied Arts prediction equation and R^2 value with variables 6, 4, and 5 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	163		
V,1	1	1	0.020
V,2	1	2	0.011
V,3	1	3	0.018
Error	160		R^2 = 0.145

Predicted GPA = (.020) (V,1) + (.011) (V,2) + (.018) (V,3)

The R^2 is the summation of the coefficients for the three variable components in Table 12 and indicates that 15 percent of the total variation of GPA in the Applied Arts Division can be accounted for by this equation and 85 percent of the total variation of GPA cannot be accounted for by this equation.

Table 13. Derived Applied Arts prediction equation and R^2 value with variables 6, 4, 5, and 2 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	163		
V,1	1	1	0.022
V,3	1	3	0.021
Error	161		$R^2 = 0.137$

Predicted GPA - (.022) (V,1) + (.021) (V,3)

The R^2 is the summation of the coefficients for the two variable components in Table 13 and indicates that 14 percent of the total variation of GPA in the Applied Arts Division can be accounted for by this equation and 86 percent of the total variation of GPA cannot be accounted for by this equation.

Table 14. Derived Applied Arts prediction equation and R^2 value with variables 6, 4, 5, 2, and 1 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	163		
V,3	1	3	0.012
Error	162		R^2 = 0.119

Predicted GPA = (.012) (V,3)

The R^2 is the coefficient for the variable component in Table 14 and indicates that 12 percent of the total variation of GPA in the Applied Arts Division can be accounted for by this equation and 88 percent of the total variation of GPA cannot be accounted for by this equation.

Auto Mechanics Vocational Program

This section of the results illustrates the derivation of prediction equations and R^2 values for the Auto Mechanics vocational program in the Applied Arts Division at Dixie College. In the tables and equations in this section, the numbered variables indicate: V,1 = ACT English subtest score; V,2 = Act Mathematics subtest score; V,3 = ACT Social Science subtest score; V,4 = ACT Natural Science subtest score; and V,5 = ACT Composite score. Variable 6 (sex) was eliminated from this section of results since all students in the Auto Mechanics vocational program were males.

Table 15. Derived Auto Mechanics prediction equation and R^2 value with variable 6 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	24	0	1.965
V,1	1	1	-0.033
V,2	1	2	-0.075
V,3	1	3	-0.089
V,4	1	4	-0.096
V,5	1	5	0.316
Error	19		R^2 = 0.088

Predicted GPA = 1.965 - (.033) (V,1) - (.075) (V,2) - (.089) (V,3) - (.096) (V,4) + (.316) (V,5)

The R^2 is the summation of the coefficients for the five variable components in Table 15 and indicates that 9 percent of the total variation of GPA in Auto Mechanics can be accounted for by this equation and 91 percent of the total variation of GPA cannot be accounted for by this equation.

Table 16. Derived Auto Mechanics prediction equation and R^2 value with variables 6 and 1 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	24	0	1.997
V,5	1	5	0.185
V,2	1	2	-0.044
V,3	1	3	-0.055
V,4	1	4	-0.063
Error	20		R^2 = 0.085

Predicted GPA = 1.997 + (.185) (V,5) - (.044) (V,2) - (.055) (V,3) - (.063) (V,4)

The R^2 is the summation of the coefficients for the four variable components in Table 16 and indicates that 9 percent of the total variation of GPA in Auto Mechanics can be accounted for by this equation and 91 percent of the total variation of GPA cannot be accounted for by this equation.

Table 17. Derived Auto Mechanics prediction equation and R^2 value with variables 6, 1, and 2 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	24	0	1.889
V,5	1	5	0.100
V,4	1	4	-0.038
V,3	1	3	-0.039
Error	21		R^2 = 0.058

Predicted GPA = 1.889 + (.100) (V,5) - (.038) (V,4) - (.039) (V,3)

The R^2 is the summation of the coefficients for the three variable components in Table 17 and indicates that 6 percent of the total variation of GPA in Auto Mechanics can be accounted for by this equation and 94 percent of the total variation of GPA cannot be accounted for by this equation.

Table 18. Derived Auto Mechanics prediction equation and R^2 value with variables 6, 1, 2, and 3 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	24	0	2.027
V,5	1	5	0.047
V,4	1	4	-0.029
Error	22		R^2 = 0.028

Predicted GPA = 2.027 + (.047) (V,5) - (.029) (V,4)

The R^2 is the summation of the coefficients for the two variable components in Table 18 and indicates that 3 percent of the total variation of GPA in Auto Mechanics can be accounted for by this equation and 97 percent of the total variation of GPA cannot be accounted for by this equation.

Table 19. Derived Auto Mechanics prediction equation and R^2 value with variables 6, 1, 2, 3, and 4 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	24	0	2.076
V,5	1	5	0.011
Error	23		R^2 = 0.008

Predicted GPA = 2.076 + (.011) (V,5)

The R^2 is the coefficient for the variable component in Table 19 and indicates that 1 percent of the total variation of GPA in Auto Mechanics can be accounted for by this equation and 99 percent of the total variation of GPA cannot be accounted for by this equation.

Architectural Drafting Vocational Program

This section of the results illustrates the derivation of predictive equations and R^2 values for the Architectural Drafting vocational program in the Applied Arts Division at Dixie College. In the tables and equations in this section, the numbered variables indicate; V,1 = ACT English subtest score; V,2 = ACT Mathematics subtest score; V,3 = ACT Social Science subtest score; V,4 = ACT Natural Science subtest score; and V,5 = ACT Composite score. Variable 6 (sex) was eliminated from this section of results since all students enrolled in the Architectural Drafting vocational program were males.

Table 20. Derived Architectural Drafting prediction equation and R^2 value with variable 6 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	11	0	-0.005
V,1	1	1	0.013
V,2	1	2	0.075
V,3	1	3	0.151
V,4	1	4	0.123
V,5	1	5	-0.237
Error	6		R^2 = 0.641

Predicted GPA = -.005 + (.013) (V,1) + (.075) (V,2) + (.151) (V,3) + (.123) (V,4) - (.237) (V,5)

The R^2 is the summation of the coefficients for the five variable components in Table 20 and indicates that 64 percent of the total variation of GPA in Architectural Drafting can be accounted for by this equation and 36 percent of the total variation of GPA cannot be accounted for by this equation.

Table 21. Derived Architectural Drafting prediction equation and R^2 value with variables 6 and 1 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	11	0	0.037
V,5	1	5	-0.222
V,2	1	2	0.075
V,3	1	3	0.150
V,4	1	4	0.120
Error	7		R^2 = 0.639

Predicted GPA = .037 - (.222) (V,5) + (.075) (V,2) + (.150) (V,3) + (.120) (V,4)

The R^2 is the summation of the coefficients for the four variable components in Table 21 and indicates that 64 percent of the total variation of GPA in Architectural Drafting can be accounted for by this equation and 36 percent of the total variation of GPA cannot be accounted for by this equation.

Table 22. Derived Architectural Drafting prediction equation and R^2 value with variables 6, 1, and 2 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	11	0	0.063
V,5	1	5	-0.025
V,4	1	4	0.072
V,3	1	3	0.080
Error	8		R^2 = 0.591

Predicted GPA = .063 - (.025) (V,5) + (.072) (V,4) + (.080) (V,3)

The R^2 is the summation of the coefficients for the three variable components in Table 22 and indicates that 59 percent of the total variation of GPA in Architectural Drafting can be accounted for by this equation and 41 percent of the total variation of GPA cannot be accounted for by this equation.

Table 23. Derived Architectural Drafting prediction equation and R^2 value with variables 6, 1, 2, and 5 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	11	0	-0.004
V,3	1	3	0.070
V,4	1	4	0.063
Error	9		R^2 = 0.587

Predicted GPA = -.004 + (.070) (V,3) + (.063) (V,4)

The R^2 is the summation of the coefficients for the two variable components in Table 23 and indicates that 59 percent of the total variation of GPA in Architectural Drafting can be accounted for by this equation and 41 percent of the total variation of GPA cannot be accounted for by this equation.

Table 24. Derived Architectural Drafting prediction equation and R^2 value with variables 6, 1, 2, 5, and 4 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	11	0	0.968
V,3	1	3	0.078
Error	10		R^2 = 0.339

Predicted GPA = .968 + (.078) (V,3)

The R^2 is the coefficient for the variable component in Table 24 and indicates that 34 percent of the total variation of GPA in Architectural Drafting can be accounted for by this equation and 66 percent of the total variation of GPA cannot be accounted for by this equation.

Electronics Vocational Program

This section of the results illustrates the derivation of prediction equations and R^2 values for the Electronics vocational program in the Applied Arts Division at Dixie College. In the tables and equations in this section, the numbered variables indicate: V,1 = ACT English subtest score; V,2 = ACT Mathematics subtest score; V,3 = ACT Social Science subtest score; V,4 = ACT Natural Science subtest score; and V,5 = ACT Composite score. Variable 6 (sex) was eliminated from this section of results since all students in the Electronics vocational program were males.

Table 25. Derived Electronics prediction equation and R^2 value with variable 6 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	17	0	2.323
V,1	1	1	0.042
V,2	1	2	0.080
V,3	1	3	0.037
V,4	1	4	0.040
V,5	1	5	-0.180
Error	12		R^2 = 0.510

Predicted GPA = 2.323 + (.042) (V,1) + (.080) (V,2) + (.037) (V,3) + (.040) (V,4) - (.180) (V,5)

The R^2 is the summation of the coefficients for the five variable components in Table 25 and indicates that 51 percent of the total variation of GPA in Electronics can be accounted for by this equation and 49 percent of the total variation of GPA cannot be accounted for by this equation.

Table 26. Derived Electronics prediction equation and R^2 value with variables 6 and 4 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	17	0	2.498
V,1	1	1	0.035
V,2	1	2	0.080
V,3	1	3	0.037
V,5	1	5	-0.139
Error	13		R^2 = 0.463

Predicted GPA = 2.498 + (.035) (V,1) + (.080) (V,2) + (.037) (V,3) - (.139) (V,5)

The R^2 is the summation of the coefficients for the four variable components in Table 26 and indicates that 46 percent of the total variation of GPA in Electronics can be accounted for by this equation and 54 percent of the total variation of GPA cannot be accounted for by this equation.

Table 27. Derived Electronics prediction equation and R^2 value with variables 6, 4, and 1 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	17	0	2.450
V,5	1	5	-0.125
V,2	1	2	0.087
V,3	1	3	0.048
Error	14		R^2 = 0.427

Predicted GPA = 2.450 - (.125) (V,5) + (.087) (V,2) + (.048) (V,3)

The R^2 is the summation of the coefficients for the three variable components in Table 27 and indicates that 43 percent of the total variation of GPA in Electronics can be accounted for by this equation and 57 percent of the total variation of GPA cannot be accounted for by this equation.

Table 28. Derived Electronics prediction equation and R^2 value with variables 6, 4, 1, and 3 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	17	0	2.536
V,5	1	5	-0.086
V,2	1	2	0.088
Error	15		R^2 = 0.326

Predicted GPA = 2.536 - (.086) (V,5) + (.088) (V,2)

The R^2 is the summation of the coefficients for the two variable components in Table 28 and indicates that 33 percent of the total variation of GPA in Electronics can be accounted for by this equation and 67 percent of the total variation of GPA cannot be accounted for by this equation.

Table 29. Derived Electronics prediction equation and R^2 value with variables 6, 4, 1, 3, and 2 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	17	0	3.017
V,5	1	5	-0.028
Error	16		R^2 = 0.053

Predicted GPA = 3.017 - (.028) (V,5)

The R^2 is the coefficient for the variable component in Table 29 and indicates that 5 percent of the total variation of GPA in Electronics can be accounted for by this equation and 95 percent of the total variation of GPA cannot be accounted for by this equation.

Airline Stewardess Vocational Program

This section of the results illustrates the derivation of prediction equations and R^2 values for the Airline Stewardess vocational program in the Applied Arts Division at Dixie College. In the tables and equations in this section, the numbered variables indicate: V,1 = ACT English subtest score; V,2 = ACT Mathematics subtest score; V,3 = ACT Social Science subtest score; V,4 = ACT Natural Science subtest score; and V,5 = ACT Composite score. Variable 6 (sex) was eliminated from this section of results since all students enrolled in the Airline Stewardess vocational program were females.

Table 30. Derived Airline Stewardess prediction equation and R^2 value with variable 6 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	20	0	1.463
V,1	1	1	0.062
V,2	1	2	0.072
V,3	1	3	0.121
V,4	1	4	0.068
V,5	1	5	-0.270
Error	15		R^2 = 0.235

Predicted GPA = 1.463 + (.062) (V,1) + (.072) (V,2) + (.121) (V,3) + (.068) (V,4) - (.270) (V,5)

The R^2 is the summation of the coefficients for the five variable components in Table 30 and indicates that 24 percent of the total variation of GPA in Airline Stewardess can be accounted for by this equation and 76 percent of the total variation of GPA cannot be accounted for by this equation.

Table 31. Derived Airline Stewardess prediction equation and R^2 value with variables 6 and 1 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	20	0	1.524
V,5	1	5	-0.044
V,2	1	2	0.018
V,3	1	3	0.065
V,4	1	4	0.010
Error	16		R^2 = 0.225

Predicted GPA = 1.524 - (.044) (V,5) + (.018) (V,2) + (.065) (V,3) + (.010) (V,4)

The R^2 is the summation of the coefficients for the four variable components in Table 31 and indicates that 23 percent of the total variation of GPA in Airline Stewardess can be accounted for by this equation and 77 percent of the total variation of GPA cannot be accounted for by this equation.

Table 32. Derived Airline Stewardess prediction equation and R^2 value with variables 6, 1, and 4 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	20	0	1.537
V,5	1	5	-0.027
V,2	1	2	0.013
V,3	1	3	0.062
Error	17		R^2 = 0.224

Predicted GPA = 1.537 - (.027) (V,5) + (.013) (V,2) + (.062) (V,3)

The R^2 is the summation of the coefficients for the three variable components in Table 32 and indicates that 22 percent of the total variation of GPA in Airline Stewardess can be accounted for by this equation and 78 percent of the total variation of GPA cannot be accounted for by this equation.

Table 33. Derived Airline Stewardess prediction equation and R^2 value with variables 6, 1, 4, and 5 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	20	0	1.450
V,3	1	3	0.047
V,2	1	2	0.007
Error	18		R^2 = 0.220

Predicted GPA = 1.450 + (.047) (V,3) + (.007) (V,2)

The R^2 is the summation of the coefficients for the two variable components in Table 33 and indicates that 22 percent of the total variation of GPA in Airline Stewardess can be accounted for by this equation and 78 percent of the total variation of GPA cannot be accounted for by this equation.

Table 34. Derived Airline Stewardess prediction equation and R^2 value with variables 6, 1, 4, 5, and 2 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	20	0	1.487
V,3	1	3	0.049
Error	19		R^2 = 0.217

Predicted GPA = 1.487 + (.049) (V,3)

The R^2 is the coefficient for the variable component in Table 34 and indicates that 22 percent of the total variation of GPA in Airline Stewardess can be accounted for by this equation and 78 percent of the total variation of GPA cannot be accounted for by this equation.

Business Education Vocational Program

This section of the results illustrates the derivation of prediction equations and R^2 values for the Business Education vocational program in the Applied Arts Division at Dixie College. In the tables and equations in this section, the numbered variables indicate: V,1 = ACT English subtest score; V,2 = ACT Mathematics subtest score; V,3 = ACT Social Science subtest score; V,4 = ACT Natural Science subtest score; V,5 = ACT Composite score, and V,6 = sex.

In the computation of the partial regression coefficient for V,6, a negative (-) coefficient was derived for females and a positive (+) coefficient was derived for males.

Table 35. Derived Business Education prediction equation and R^2 value with all variables analyzed

Source	Degrees of freedom	Variable	Coefficient
Total	87	0	1.427
V,1	1	1	0.015
V,2	1	2	-0.002
V,3	1	3	0.006
V,4	1	4	0.004
V,5	1	5	0.048
V,6	1	6	-0.084
Error	81		R^2 = 0.238

Predicted GPA = 1.427 + (.015) (V,1) - (.002) (V,2) + (.006) (V,3) + (.004) (V,4) + (.048) (V,5) - .084 for females or + .084 for males

The R^2 is the summation of the coefficients for the six variable components in Table 35 and indicates that 24 percent of the total variation of GPA in Business Education can be accounted for by this equation and 76 percent of the total variation of GPA cannot be accounted for by this equation.

Table 36. Derived Business Education prediction equation and R^2 value with variable 2 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	87	0	1.425
V,1	1	1	0.017
V,6	1	6	-0.083
V,3	1	3	0.008
V,4	1	4	0.006
V,5	1	5	0.040
Error	82		R^2 = 0.238

Predicted GPA = 1.425 + (.017) (V,1) + (.008) (V,3) + (.006) (V,4) + (.040) (V,5) - .083 for females or + .083 for males

The R^2 is the summation of the coefficients for the five variable components in Table 36 and indicates that 24 percent of the total variation of GPA in Business Education can be accounted for by this equation and 76 percent of the total variation of GPA cannot be accounted for by this equation.

Table 37. Derived Business Education prediction equation and R^2 value with variables 2 and 4 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	87	0	1.431
V,1	1	1	0.014
V,6	1	6	-0.082
V,3	1	3	0.006
V,5	1	5	0.049
Error	83		R^2 = 0.238

Predicted GPA = 1.431 + (.014) (V,1) + (.006) (V,3) + (.049) (V,5) - .082 for females or + .082 for males

The R^2 is the summation of the coefficients for the four variable components in Table 37 and indicates that 24 percent of the total variation of GPA in Business Education can be accounted for by this equation and 76 percent of the total variation of GPA cannot be accounted for by this equation.

Table 38. Derived Business Education prediction equation and R^2 value with variables 2, 4, and 3 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	87	0	1.389
V,1	1	1	0.013
V,6	1	6	-0.074
V,5	1	5	0.058
Error	84		R^2 = 0.237

Predicted GPA = 1.389 + (.013) (V,1) + (.058) (V,5) - .074 for females or + .074 for males

The R^2 is the summation of the coefficients for the three variable components in Table 38 and indicates that 24 percent of the total variation of GPA in Business Education can be accounted for by this equation and 76 percent of the total variation of GPA cannot be accounted for by this equation.

Table 39. Derived Business Education prediction equation and R^2 value with variables 2, 4, 3, and 6 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	87	0	1.274
V,1	1	1	0.009
V,5	1	5	0.062
Error	85		R^2 = 0.234

Predicted GPA = 1.274 + (.009) (V,1) + (.062) (V,5)

The R^2 is the summation of the coefficients for the two variable components in Table 39 and indicates that 23 percent of the total variation of GPA in Business Education can be accounted for by this equation and 77 percent of the total variation of GPA cannot be accounted for by this equation.

Table 40. Derived Business Education prediction equation and R^2 value with variables 2, 4, 3, 6, and 1 deleted

Source	Degrees of freedom	Variable	Coefficient
Total	87	0	1.277
V,5	1	5	0.071
Error	86		R^2 = 0.232

Predicted GPA = 1.277 + (.071) (V,5)

The R^2 is the coefficient for the variable component in Table 40 and indicates that 23 percent of the total variation of GPA in Business Education can be accounted for by this equation and 77 percent of the total variation of GPA cannot be accounted for by this equation.

CHAPTER V

DISCUSSION

The first objective of this study was accomplished by establishing prediction equations and R^2 values for the Academic Arts and total Applied Arts Divisions at Dixie College as well as for each vocational program in the Applied Arts Division.

The R^2 value for the derived prediction equation in the Academic Arts Division indicated that 34 percent of the total variation of GPA in the Academic Arts Division could be accounted for by the equation. The R^2 value for the derived prediction equation in the total Applied Arts Division indicated that 18 percent of the total variation in the Applied Arts Division could be accounted for by the equation. The second objective in this study was satisfied when these R^2 values for the Academic Arts and total Applied Arts Divisions indicated that a higher percent of total variation of GPA could be accounted for by the derived Academic Arts prediction equation than could be accounted for by the derived total Applied Arts prediction equation.

The third objective of this study was satisfied when the R^2's of the prediction equations for each vocational program in the Applied Arts Division were compared. This comparison was made to determine which equation could account for the highest percent of total variation of GPA down to the equation accounting for the lowest percent of total variation of GPA. These R^2 values indicated that the highest percent (64 percent) of total variation of GPA could be accounted for by the derived Architectural Drafting prediction equation. The second highest percent

(51 percent) of total variation of GPA could be accounted for by the derived Electronics prediction equation. The third highest percent (24 percent) of total variation of GPA could be accounted for by both the derived Airline Stewardess and Business Education prediction equations. The lowest percent (9 percent) of total variation of GPA could be accounted for by the derived Auto Mechanics prediction equation. The prediction equations and R^2 values used in fulfilling the third objective were derived by analyzing all the variables available in each vocational program. These variables included the four ACT subtest scores and the ACT Composite score with one exception--in the Business program the variable of sex was also included.

Accomplishment of the fourth objective is illustrated in Table 41. In this table the best predictor in the Academic Arts Division, Applied Arts Division, and each vocational program in the Applied Arts Division was listed in rank order of "most contributive" to "least contributive" based on R^2 values.

Table 41. Best predictor for Academic Arts Division, Applied Arts Division, and each vocational program in the Applied Arts Division in rank order based on R^2 values

Best predictor	R^2 value of predictor	Division or program
ACT Social Science subtest score	34 percent	Architectural Drafting
ACT Social Science subtest score	23 percent	Academic Arts Division
ACT Composite score	23 percent	Business Education
ACT Social Science subtest score	22 percent	Airline Stewardess
ACT Social Science subtest score	12 percent	Applied Arts Division
ACT Composite score	5 percent	Electronics
ACT Composite score	1 percent	Auto Mechanics

CHAPTER VI

SUMMARY AND CONCLUSIONS

Introduction

At the present time the vocational students at Dixie College do not receive the proper counseling and guidance due to the lack of vocational preference and aptitude tests. The advisors of these vocational students have no way of predicting that a student will or will not earn and maintain at least a minimum GPA of 2.00 at Dixie College.

Prediction equations for use in vocational program placement were established by making use of the American College Testing Program (ACT) which was available at Dixie College. These prediction equations were derived by the statistical method of multiple correlations with categorical comparisons using ACT data and GPA's of former vocational and academic students enrolled at Dixie College during the academic year of 1966-67 or 1967-68.

Objectives

1. To establish a predictive equation in order to determine vocational students' minimum GPA's using ACT data and GPA's of former students in the Applied Arts Division at Dixie College.
2. To compare the derived prediction equations used to determine minimum GPA's in both the Academic Arts and Applied Arts Divisions at Dixie College.
3. To compare the derived prediction equations used to determine

minimum GPA's for each vocational program in the Applied Arts Division at Dixie College.

4. To determine and compare the most reliable predictor in the Academic Arts Division, total Applied Arts Division, and each vocational program in the Applied Arts Division.

Procedure

The data on each student in the population were key punched on computer cards and submitted to a computer program of multiple correlation with categorical comparison. Using derived partial regression coefficients from the computer program, prediction equations and R^2 values were established for the Academic Arts and total Applied Arts Divisions as well as for each vocational program within the Applied Arts Division. The R^2 value of a prediction equation indicated the percent of the total variation of GPA that could be accounted for by that prediction equation. Each variable was deleted from the computer analysis in order of "least contributive" to "most contributive" and a new prediction equation and R^2 value was formulated after each deletion.

Findings

The first objective of this study was accomplished by establishing prediction equations and R^2 values for the Academic Arts and total Applied Arts Divisions at Dixie College as well as for each vocational program in the Applied Arts Division.

The second objective in this study was satisfied when the R^2 values for the Academic Arts and total Applied Arts Divisions indicated that a higher percent of total variation of GPA could be accounted for by the

derived Academic Arts prediction equation than could be accounted for by the derived total Applied Arts prediction equation.

The third objective of this study was satisfied when the R^2 values for the prediction equations of the vocational programs indicated that the highest percent (64 percent) of total variation of GPA could be accounted for by the derived Architectural Drafting prediction equation. The second highest percent (51 percent) of total variation of GPA could be accounted for by the derived Electronics prediction equation. The third highest percent (24 percent) of total variation of GPA could be accounted for by both the derived Airline Stewardess and Business Education prediction equations. The lowest percent (9 percent) of total variation of GPA could be accounted for by the derived Auto Mechanics prediction equation.

The fourth objective of this study was accomplished by listing the best predictor for the Academic Arts Division, Applied Arts Division, and each vocational program in the Applied Arts Division in rank order of "most contributive" to "least contributive" based on R^2 values. These predictors were ranked as follows: ACT Social Science subtest score in Architectural Drafting with an R^2 value of 34 percent, ACT Social Science subtest score in the Academic Arts Division and ACT Composite score in Business Education with an R^2 value of 23 percent, ACT Social Science subtest score in Airline Stewardess with an R^2 value of 22 percent, ACT Social Science subtest score in the Applied Arts Division with an R^2 value of 12 percent, ACT Composite score in Electronics with an R^2 value of 5 percent, and ACT Composite score in Auto Mechanics with an R^2 value of 1 percent.

Conclusions

The conclusions drawn from the findings of this study were:

1. Prediction of academic freshmen student success at the 2.00 GPA level in programs requiring background information that can be measured by the use of scholastic aptitude tests such as ACT is higher than the prediction of vocational freshmen student success at the 2.00 GPA level using the same scholastic aptitude tests.
2. The ACT Social Science subtest score proved to be the best single predictor for both Academic Arts and Applied Arts Divisions at Dixie College.
3. The ACT Composite score proved to be the best single predictor for the vocational programs of Auto Mechanics, Electronics, and Business Education at Dixie College.
4. The ACT Social Science subtest score proved to be the best single predictor for the vocational programs of Architectural Drafting and Airline Stewardess at Dixie College.
5. The present testing instruments used at Dixie College are not adequate for predicting success at the 2.00 GPA level for freshmen vocational students.
6. A predictive instrument designed to consider student interests, preference, and general aptitude in addition to scholastic aptitude could strengthen the Dixie College testing program.

LITERATURE CITED

Bloom, Benjamin S. and Frank R. Peters. 1961. The Use of Academic Prediction Scales for Counseling and Selecting College Entrants. The Free Press of Glencoe, Inc., New York. 324 p.

Garrett, Harley F. 1949. A Review and Interpretation of Investigations of Factors Related to Scholastic Success in Colleges of Arts and Science and Teachers Colleges. Journal of Experimental Education 18:91-138.

Gordon, Leonard V. and Edward F. Alf. 1962. The Predictive Validity of Measured Interest for Navy Vocational Training. Journal of Applied Psychology 46(3):212-219.

Graybiel, W. A. 1959. Predicting Training Success at the Michigan Veterans Vocational School. Unpublished masters thesis, Western Michigan University, Kalamazoo, Michigan.

Harrington, Gordon M. 1956. Technical Education. Review of Educational Research 25:398-403.

Hertel, J. P. and Francis J. DiVesta. 1948. An Evaluation of Five Factors for Predicting the Success of Students Entering the New York State College of Agriculture. Educational and Psychological Measurements 8:389-395.

Jex, Frank B. 1966. Predicting Academic Success Beyond High School. Office of Institutional Studies, University of Utah, Salt Lake City. 41 p.

Johnson, Richard G. and Walter F. Johnson. 1968. A Brief History of Vocational Guidance. National Business Education Quarterly 37(2):13-21, 34. December.

LaPray, Anthony J. 1962. Predicting Success of General Registration Students. Unpublished masters thesis, Utah State University, Logan, Utah.

Lavin, David E. 1965. The Prediction of Academic Performance. Russell Sage Foundation, Connecticut Printers, Inc., Hartford, Connecticut. 420 p.

Mahmoudi, Homayoun M. 1962. A Cross-Cultural Study of the Cattell Culture-Free Intelligence Test in Comparison with the American College Test. Unpublished masters thesis, Utah State University, Logan, Utah.

Malloy, John. 1964. An Investigation of Scholastic Over- and Under-Achievement Among Female College Freshmen. Journal of Counseling Psychology 92(10):997-1002 June.

McCall, John N. 1965. Trends in the Measurement of Vocational Interest. Review of Educational Research 35:53-62 Fall.

Munday, Leo. 1967. Predicting College Grades Using ACT Data. Educational and Psychological Measurement 27:401-406 Summer.

Passons, William R. 1967. Predictive Validities of the ACT, SAT and High School Grades for First Semester GPA and Freshman Courses. Educational and Psychological Measurement 27:1143-1144 Winter.

Patterson, C. H. 1956a. Predicting Success in Trade and Vocational School Courses: Review of the Literature. Educational and Psychological Measurement 16:352-400.

Patterson, C. H. 1956b. The Prediction of Attrition in Trade School Courses. Journal of Applied Psychology 40:154-157.

Peters, Frank R. and Eugenia L. Plog. 1961. The Effectiveness of the ACT for Selection and Placement at the Ohio State University. Educational Research 40:232-241 December.

Sommerfeld, Donald and Frank A. Fatzinger. 1967. The Prediction of Trainee Success in a Manpower Development and Training Program. Educational and Psychological Measurement 27:1155-1161 Winter.

Stern, F. and L. V. Gordon. 1961. Ability to Follow Instructions as a Predictor of Success in Recruit Training. Journal of Applied Psychology 45:2225.

Stone, Joics B. 1954. Differential Prediction of Academic Success at Brigham Young University. The Journal of Applied Psychology 38(2):109-110.

Trump, Paul L. 1964. National Admissions Testing Programs--Their Value to Colleges--Their Impact on Secondary Schools. College and University 39:488-514 Summer.

Van Derslice, John F. 1967. The Educational and Economic Background of Engineering and Technical Students Analyzed for the Purposes of Establishing Profiles for use in Counseling. Unpublished dissertation, Utah State University, Logan, Utah.

VITA

Robert L. Cobb

Candidate for the Degree of

Master of Science

Thesis: The Establishment and Comparison of Prediction Equations for Determining Minimum GPA's in Applied Arts Programs at Dixie College

Major Field: Industrial Education

Biographical Information:

Personal Data: Born at Evanston, Wyoming, April 3, 1942, son of Carl E. and Betty Louise Cobb; married Georgia Heward, September 8, 1962; two children--Steven and Jennifer.

Education: Attended elementary school in Evanston, Wyoming; graduated from Evanston High School in 1961; received the Bachelor of Science degree from Utah State University, with a major in Industrial Arts Education in 1965.

Professional Experience: 1968 to present, Department Head of Trade and Industrial Education, Dixie College; 1967-68, Instructor, Trade and Industrial Education, Dixie College.