

ABSTRACT OF THESIS

SUCCESS OF
NON-HIGH-SCHOOL-GRADUATES
IN COLLEGE

Submitted by
Dean Stinson

In partial fulfillment of the requirements
for the Degree of Master of Education
Colorado

Agricultural and Mechanical College

Fort Collins, Colorado

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ABSTRACT

One new problem which the educational institutions of the United States face is that of the non-high-school-graduate who wishes to attend college. These individuals may have made considerable educational progress in spite of the fact that several years have elapsed since they have had formal classroom instruction. It is important that their educational development be so measured that they will not be handicapped because of the manner in which their education took place. Many of these non-high-school-graduates will be competent to pursue college courses.

The problem of this study is, What factors should be considered in predicting the success in college of non-high-school-graduates?

Analysis of the problem.--1. What is the educational background of college students who are non-high-school-graduates?

2. What are the problems of college students who are non-high-school-graduates?

3. What is the relationship between problems of college students who are non-high-school-graduates and problems of college students who are high-school graduates?

4. What is the relationship between scholastic achievement of college students who are non-high-school-graduates and scholastic achievement of college students who are high-school graduates?

5. What valid conclusions can be drawn from the relationships between college entrance examination scores, General Educational Development Test scores, and achievement of college students who are non-high-school-graduates?

6. How does the General Educational Development Test offer a valid basis for determination of college entrance requirements for non-high-school-graduates?

7. What conclusions concerning the competence of non-high-school-graduates to pursue a college career can be drawn from the personal history record?

8. What valid predictions can be made from the available evidence concerning the probable college success of non-high-school-graduates?

In order to provide data concerning the selection of factors to be used in predicting the success of non-high-school-graduates in college, an investigation was made of 30 non-high-school-graduates who were enrolled at Colorado Agricultural and Mechanical College during the fall and winter quarters of the 1946-47 school year.

The data were obtained by the use of three methods, as follows:

1. An analysis of the records of the college registrar and the college testing bureau to obtain data relative to the college achievement and test scores of non-high-school-graduates.

2. The administration of a questionnaire to the non-high-school-graduates to obtain information pertaining to their educational backgrounds, military service, occupations held, interests, and personal history.

3. The administration of the Personal Interview Form constructed by Hunter (25) to the non-high-school-graduates to obtain data concerning their problems.

Statistical procedures.--For the purpose of determining the significance of the differences in the percentages of two groups who show a certain attribute, t , the critical ratio, was used. This statistic is the ratio of the obtained difference between two percentages (D) to its standard error (SE_D). The standard error of difference between two uncorrelated percentages was obtained by the following formula:

$$SE_D = \sqrt{\frac{p_1q_1}{N_1} + \frac{p_2q_2}{N_2}}$$

p is the percentage of times a given event occurred.

q is $1-p$. N is the number of cases.

The following interpretation was used:

1. \underline{t} , equal to or greater than three, shows a difference very significantly greater than zero since the chances that the true difference is zero are only about 14 in 10,000. These critical ratios were interpreted as very significant.

2. When the critical ratio, \underline{t} , was equal to or greater than two but less than three, it was interpreted as showing a difference significantly greater than zero. The chances that there is not a true difference between the groups, then, are only 228 or less in 10,000.

3. When the critical ratio, \underline{t} , is less than two the difference was not considered significant.

The Pearson "product moment" method of correlation was used to obtain the relationships between grade-point averages and the variables, as well as between the variables themselves for the non-high-school-graduates.

Previous education

Previous educational attainment of the non-high-school-graduates is not a good predictor of college first-quarter grade-point average, the relationship being $-.138$.

Educational attainment of the parents of non-high-school-graduates is not a good predictor of the

college first-quarter achievement of the students. A comparison of the relationship between the first-quarter grade-point average of the students and the education completed by their parents showed that the correlation between achievement of the student and education completed by the father was $-.144$, and the correlation between the achievement of the student and education completed by the mother was $-.130$.

Occupational status of parents has no relationship to first-quarter college achievement of the non-high-school-graduates.

The non-high-school-graduates participated in little or no extracurricular activities in college. Few held extra jobs, and the average academic load for the group was 12.9 quarter hours, which compared with 17.5 hours, the number required of a student to graduate in four years from this institution.

Problems

The major problems of the non-high-school-graduates were as follows:

Academic education

1. Expressing knowledge in writing.
2. Studying effectively.
3. Concentrating during study hours.
4. Getting satisfactory grades.
5. Outlining or taking notes.

General education

1. Budgeting study time.
2. Selecting courses in line with vocation.

Vocation

1. Choosing a vocation.
2. Being satisfied with your vocation.

Social adjustment

1. Speaking in public.
2. Being self-conscious.
3. Finding time for shows, sports, and radio.
4. Being ill at ease at social affairs.

Emotion

1. Getting nervous easily.
2. Taking things too seriously.
3. Wanting a more pleasing personality.
4. Being upset when you have to recite.
5. Having sleepless nights because of over active mind.

Family

1. Family living quarters unsatisfactory.
2. Financial obligation to family.

Health

1. Lacking rest and sleep.
2. Limiting physical handicaps.

Finance

1. Getting enough money for sufficient wardrobe.
2. Getting enough money for social activities.
3. Supporting wife and/or children.

Problems in which the responses of non-high-school-graduates were significantly higher than those of high-school graduates were as follows:

Academic education

1. Expressing knowledge in writing.
2. Concentrating during study hours.
3. Getting satisfactory grades.

General education

1. Selecting courses in line with vocation.

Vocation

1. Choosing a vocation.
2. Being satisfied with your vocation.
3. Concerning the future of vocation.

Social adjustment

1. Finding time for shows, sports, and radio.
2. Selecting activities in line with interests.

Emotion

1. Getting nervous easily.
2. Having sleepless nights because of over active mind.
3. Taking things too seriously.
4. Fearing criticism.
5. Being upset when you have to recite.

Family

No significant differences.

Health

No significant differences.

Finance

No significant differences.

Problems in which the responses of non-high-school-graduates were very significantly higher than those of high-school graduates were as follows:

Social adjustment

1. Speaking in public.

Finance

1. Getting enough money for sufficient wardrobe.

Problems in which the responses of high-school graduates were significantly higher than those of non-high-school-graduates were as follows:

Academic education

1. Understanding class lectures.
2. Finding library references.

Finance

1. Worrying about parental sacrifices.

College achievement

The first-quarter grade-point average of the non-high-school-graduates was 1.940, which was below the student body average of 2.359.

General Educational Development Test

Of the measures studied, the GED test showed the best correlation with the college first-quarter

grade-point average of the non-high-school-graduates.

(r = .591)

College entrance
examinations

The correlations between the college entrance examinations and the first-quarter grade-point average of the non-high-school-graduates were as follows:

1. A.C.E. r = .354
2. English r = .423
3. Chemistry r = .027
4. Reading r = .464

Personal history
data

There was a significant relationship between college first-quarter grade-point averages and ages of the non-high-school-graduates.

Fifty per cent of the non-high-school-graduates stated that more college work in high school would have helped them in college.

Only three of the non-high-school-graduates stated that they thought they were entitled to extra help in college because of their lack of high-school education.

Chemistry and mathematics were the most difficult college subjects for the non-high-school-graduates.

Summary of findings

1. There was a low negative correlation between previous educational attainment and first-quarter grade-point average of the non-high-school-graduates.

2. There was a low negative relationship between educational attainment of each parent of the non-high-school-graduates and the first-quarter college achievement of the students.

3. The problems of non-high-school-graduates which were more significant than those of the high-school graduates concerned study habits, course selection, vocational choice, time for and choice of activities, nervousness, public speaking, money for clothing, and money for social activities.

4. The problems of high-school graduates which were more significant than those of non-high-school-graduates concerned understanding of class lectures, use of the library, and parental sacrifices.

5. The first-quarter grade-point average of the non-high-school-graduates was 1.940, which was below the student body average of 2.359.

6. Of all measures used in this study, the GED test was the best single predictor of first-quarter grade-point average of the non-high-school-graduates.

7. On the basis of comparison with the entrance examinations used at this institution, the GED test seems

to be acceptable for use as an entrance examination for non-high-school-graduates at this college.

8. The college entrance examinations used at this institution do not predict first-quarter grade-point average for the non-high-school-graduates as well as does the GED test.

9. Age is an item in personal history data which has a significant relationship with the success in college of the non-high-school-graduates.

10. Because of the smallness of the sample, no conclusions can be reached regarding race as a factor to be considered in predicting the success in college of the non-high-school-graduates.

11. A feeling of inferiority concerning educational deficiencies on the part of the non-high-school-graduates makes it necessary for the college to give these students more assistance than high-school graduates receive.

Recommendations

1. On the basis of the results of this study, it seems evident that non-high-school-graduates need assistance from the college in order to succeed. This help should be given on an individual basis and should consider for each student the factors which are significant in each particular case concerning his chances for success in college.

2. In the determination of entrance standards for non-high-school-graduates, more tests than the GED test alone should be considered. A battery of entrance tests should be devised for use with these students and, in addition, all factors which seem significant in predicting their success in college should be considered.

Suggestions for
further study

Future studies should seek answers to the following questions:

1. Is first-quarter grade-point average of non-high-school-graduates a good predictor of future academic survival?

2. Are the factors which were found to be significant in predicting the first-quarter grade-point average of the non-high-school-graduates also of value for use in predicting the academic survival of the non-high-school-graduates?

3. What is the most economical combination of variables to use at this college as an entrance examination battery for non-high-school-graduates?

4. What relationship does previous chemistry training have on the predictive value of the Iowa Chemistry Aptitude Test?

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June 1 1947

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY
SUPERVISION BY DEAN STINSON
ENTITLED SUCCESS OF NON-HIGH-SCHOOL-GRADUATES IN
COLLEGE.

BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF EDUCATION

MAJORING IN GUIDANCE AND COUNSELING

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Permission to publish this thesis or any part of it
must be obtained from the Dean of the Graduate School.

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Chapter I

INTRODUCTION

The ending of World War II created many new problems for the educational institutions of the United States. One of these new problems is that of the non-high-school-graduate who wishes to attend college.

In the past, students who had not completed high school presented few educational problems because they left high school voluntarily with no intentions of continuing their education. These students seldom had further contact with the educational system.

Many veterans, however, have had their high-school educations interrupted by the call of the armed forces. Now they have returned, eager for further education, to find that it is no longer practicable to return to high school. Some veterans who left high school before the outbreak of the war, because of reasons beyond their control, now find that they are eligible to receive a college education at government expense.

These veterans may have made considerable educational progress in spite of the fact that several years have elapsed since they have had formal classroom instruction. In general, their in-service educational growth is probably due in a large measure to their own deliberation,

to first-hand observation, to direct experience, to self-directed reading and study, to conversation and informal group discussion, and to a process of maturation intensified and accelerated by the circumstances of the war.

It is extremely important, therefore, that their educational development be so measured that they will not be handicapped because of the manner in which their education took place; in other words, they should not be penalized because of their lack of recent academic experience or formal classroom instruction.

Many returning service men who are unable to satisfy traditional college entrance requirements will be highly competent to pursue and complete college courses.

To aid in the solution of the educational problems presented by these veterans, American colleges and universities have made use of a battery of tests developed by the United States Armed Forces Institute, called "Tests of General Educational Development," hereafter to be referred to as the USAFI GED test. This battery of tests has been so designed that it measures the ultimate objectives of the whole program of education, and minimizes as much as possible the more immediate and temporary objectives of special school subjects. The tests are concerned primarily with the ability of the student to succeed in a program of general education rather than with the method by which he received that ability.

The purpose of giving the USAFI GED test to

veterans is two-fold--to determine the fitness of the veterans to receive a high-school diploma, and to determine their ability to meet college entrance requirements. Norms of veterans who are not high-school graduates are not available, so norms of high-school graduates were used to decide upon a score which could be used as a minimum basis for granting a high-school diploma to the veteran, or as a college entrance requirement. However, there has been no way of determining whether this has been an accurate criterion in judging the fitness of the veteran to receive a high-school diploma or to meet the scholastic requirements of college life.

Because of his educational background, the college student who has not completed high school may face problems different from those of the college student who is a high-school graduate.

The problem

The problem of this study is, What factors should be considered in predicting the success in college of non-high-school-graduates?

Analysis of the problem.--1. What is the educational background of college students who are non-high-school-graduates?

2. What are the problems of college students who are non-high-school-graduates?

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4. What is the relationship between scholastic achievement of college students who are non-high-school-graduates and scholastic achievement of college students who are high-school graduates?

5. What valid conclusions can be drawn from the relationships between college entrance examination scores, General Educational Development Test scores, and achievement of college students who are non-high-school-graduates?

6. How does the General Educational Development Test offer a valid basis for determination of college entrance requirements for non-high-school-graduates?

7. What conclusions concerning the competence of non-high-school-graduates to pursue a college career can be drawn from the personal history record?

8. What valid predictions can be made from the available evidence concerning the probable college success of non-high-school-graduates?

Delimitation.--This study will be confined to 30 veteran students who were enrolled at Colorado Agricultural and Mechanical College during the fall and winter quarters of the 1946-47 school year. These students were non-high-school-graduates and were admitted by the registrar on the basis of having made a standard score of 35 or

better on each of the five General Educational Development Tests, or an average standard score of 45 on all five GED tests.

Chapter II

REVIEW OF LITERATURE

This study is concerned with the factors to be considered in predicting the success of non-high-school-graduates in college.

The literature concerning this problem is grouped as follows:

1. Educational problems of the veteran.

--A study of the educational problems of veterans should be of use in evaluating the educational problems of the subjects of this study, all of whom are veterans.

2. College admission requirements.--The literature concerning college entrance requirements should show to what extent the non-high-school-graduate meets present-day college entrance requirements.

3. Defining college success.--A definition of college success should be necessary in selecting the factors to be considered in predicting college success.

4. The non-high-school-graduate.--Studies have been made in the past of the non-high-school-graduate in college. These studies should be

useful as a background for further research on the subject.

5. The United States Armed Forces Institute.

--One agency which has been concerned with the educational problems of the serviceman is the United States Armed Forces Institute. A study of the functions of the Institute should yield information concerning the educational problems of the veteran.

6. The General Educational Development Tests of the United States Armed Forces Institute.

--One of the devices of the United States Armed Forces Institute which has been used to aid in the solution of veterans' educational problems is the battery of General Educational Development Tests. This battery should provide a basis for determining the factors to be used in predicting the success of the non-high-school-graduate in college.

7. Prediction of college success.--Since this study involves the prediction of college success, a review of other studies on the prediction of college success is appropriate.

Educational problems
of the veteran

Sackett (41) stated in 1944 that the problems of the veteran who planned to enter college fall into two

groups: (1) the making of educational plans, and (2) the determination of eligibility for specific curricula. The solving of these problems hinges upon the ability of the colleges and universities to meet the peculiar needs of the veterans.

Sackett (41) further stated that in the determination of eligibility for specific curricula, added maturity and unusual learning resulting from military experience will not lend themselves easily to credit evaluation. The most valid instrument for determining possible fitness to pursue specific courses will be a carefully guided and observed trial in the chosen curriculum.

In 1944, Rosenlof (40) compared the problems of the returning serviceman of today with those of the veteran of World War I. He stated that there should be no granting of college credit indiscriminately today as there was after World War I. Most of the training and experience received by the veteran while in service can be evaluated in terms of college credit.

In 1944, Prior (37) made the following comment concerning the educational attainment of the returning veteran:

We must expect normal veterans to be mature, diverse, but responsible; we must expect them to be weaker in some ways than the average boy, but stronger in others. Procedure and curriculum should be planned to strengthen the weak points and exploit the strong ones. The returning

veteran's weakest point is likely to be in grasp of fundamentals. He will have been trained, rather than educated; he will have forgotten a great deal. He will have lost something; scholastic habits, mathematical facility and a certain mental flexibility. (37:125)

Rolfe (39) stated in 1945 that the universities and colleges of this country were face to face with the problem of orienting at least one million veterans who planned to enter college. Whether high-school graduates or non-graduates, they wished to return to college and were making plans accordingly.

From a sample taken of Army men (white enlisted) by the American Council on Education (15) in 1945, it was estimated that 887,240 men in the Army had plans for full-time education, and 1,686,110 had plans for part-time education after discharge from the Army. On the basis of this sample it was estimated that 61.3 per cent of the men in the Army had not completed high school and that about 17,500 non-high-school-graduates planned full-time education, and 130,000 planned part-time education after discharge from the Army.

Hadley (22) in 1946 reported the results of a survey made among college authorities. The authorities were in general agreement that the following were characteristics of veterans:

1. A definite and noticeable maturity in veterans which cannot be attributed merely to chronological age.

2. A seriousness of purpose which is reflected in rather specific vocational decisions, in expressed goals which frequently exceed any past performance, and in a desire to "get into action" rather promptly.

3. An overwhelming confidence, yes, even a faith in formal education as a means of acquiring vocational and personal fitness. (22:323)

Hunter (25) made a survey of student problems at Colorado Agricultural and Mechanical College in 1946. A Personal Interview Form was administered to 100 men and 100 women. Of the 100 men, 58 were veterans. Eight major problem areas and a total of 78 contributing items were used in the Personal Interview Form. The problem areas were as follows:

1. Academic Education
2. General Education
3. Vocation
4. Social Adjustment
5. Emotion
6. Family
7. Health
8. Finance (25:42)

A comparison of the problems of men students (including veterans) and veteran students (men) follows:

Table 1.--PROBLEMS OF MEN STUDENTS CONTRASTED WITH PROBLEMS OF VETERAN STUDENTS AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1945-46. After Hunter (25:184)

Problem area	Men (N=100)		Veterans (N=58)	
	Number	Per Cent	Number	Per Cent
Academic education				
Finding library references	23	23	11	19.0

Table 1.--PROBLEMS OF MEN STUDENTS CONTRASTED WITH PROBLEMS OF VETERAN STUDENTS AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1945-46. After Hunter (25:184).
--Continued.

Problem area	Men (N=100)		Veterans (N=58)	
	Number	Per Cent	Number	Per Cent
<u>Academic education</u>				
--continued				
Feeling at ease with professors	20	20	10	17.4
Outlining or taking notes	24	24	10	17.4
Getting satisfactory grades	10	10	7	12.1
Understanding class lectures	17	17	7	12.1
Studying effectively	26	26	5	8.6
Expressing knowledge in writing	7	7	4	6.8
Concentrating during study hours	8	8	4	6.8
Worrying excessively about examinations	4	4	3	5.2
Concentrating in class	4	4	2	3.4
Expressing knowledge in recitation	0	0	0	0.0
Carrying out laboratory procedures	0	0	0	0.0
<u>General education</u>				
Budgeting study time	42	42	18	31.0
Planning extracurricular activities not to interfere with academic school life	21	21	6	10.4
Scheduling too many units	10	10	5	8.6

Table 1.--PROBLEMS OF MEN STUDENTS CONTRASTED WITH PROBLEMS OF VETERAN STUDENTS AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1945-46. After Hunter (25:184).
--Continued.

Problem area	Men (N=100)		Veterans (N=58)	
	Number	Per Cent	Number	Per Cent
<u>General education</u>				
--continued				
Scheduling outside work not to interfere with studying	12	12	3	5.2
Understanding methods of grading	3	3	1	1.7
Selecting courses in line with vocation	0	0	0	0.0
Getting conferences with professors	1	1	0	0.0
<u>Vocation</u>				
Choosing a vocation	2	2	2	3.4
Being satisfied with your vocation	3	3	1	1.7
Evaluating suitability for your vocation	3	3	1	1.7
Concerning the future of vocation	1	1	1	1.7
Getting vocational information	2	2	1	1.7
Finding no interest in any vocation	1	1	1	1.7
Deciding upon prospective employment	8	8	0	0.0
Locating prospective employment	1	1	0	0.0
<u>Social adjustment</u>				
Being self-conscious	12	12	6	10.4

Table 1.--PROBLEMS OF MEN STUDENTS CONTRASTED WITH PROBLEMS OF VETERAN STUDENTS AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1945-46. After Hunter (25:184).
--Continued.

Problem area	Men (N=100)		Veterans (N=58)	
	Number	Per Cent	Number	Per Cent
<u>Social adjustment</u>				
--continued				
Being ill at ease at social affairs	10	10	5	8.6
Wishing for more social contacts	12	12	4	6.8
Knowing proper etiquette for social functions	9	9	4	6.8
Fitting into pattern of college life	11	11	4	6.8
Making friendly contacts with opposite sex	8	8	3	5.2
Making friends easily	6	6	2	3.4
Being accepted into social groups	6	6	2	3.4
Selecting activities in line with interests	1	1	1	1.7
Conversing with people	3	3	1	1.7
Speaking in public	3	3	1	1.7
Finding time for shows, sports, and radio	0	0	0	0.0
Wishing for more contacts with town people	3	3	0	0.0
Wishing for fewer social contacts	0	0	0	0.0
<u>Emotion</u>				
Wanting a more pleasing personality	18	18	7	12.1

Table 1.--PROBLEMS OF MEN STUDENTS CONTRASTED WITH PROBLEMS OF VETERAN STUDENTS AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1945-46. After Hunter (28:184).
--Continued.

Problem area	Men (N=100)		Veterans (N=58)	
	Number	Per Cent	Number	Per Cent
<u>Emotion--continued</u>				
Lacking in self-confidence	8	8	3	5.2
Worrying about what to wear	4	4	3	5.2
Being upset when you have to recite	3	3	2	3.4
Being hurt easily	3	3	2	3.4
Having difficulty accepting regulations of the college	4	4	2	3.4
Fearing lack of success in life	3	3	1	1.7
Wanting to confide in someone	6	6	1	1.7
Fearing you will make social mistakes	3	3	1	1.7
Having the blues often	3	3	1	1.7
Lacking in leadership ability or opportunity	4	4	0	0.0
Worrying about national or world-wide problems	4	4	0	0.0
Taking things too seriously	2	2	0	0.0
Being discouraged easily	3	3	0	0.0
Getting nervous easily	1	1	0	0.0
Fearing criticism	0	0	0	0.0

Table 1.--PROBLEMS OF MEN STUDENTS CONTRASTED WITH PROBLEMS OF VETERAN STUDENTS AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1945-46. After Hunter (25:184).
--Continued.

Problem area	Men (N=100)		Veterans (N=58)	
	Number	Per Cent	Number	Per Cent
<u>Emotion--continued</u>				
Having sleepless nights because of overactive mind	0	0	0	0.0
Dreading to introduce folks at a party	0	0	0	0.0
Wanting religious advice	0	0	0	0.0
<u>Family</u>				
Family living quarters unsatisfactory	15	15	7	12.1
Family living quarters provide no suitable place to study	14	14	6	10.4
Family unable to live together because of lack of accommodations	1	1	1	1.7
Family unable to live together because of finances	1	1	1	1.7
Financial obligation to family	9	9	1	1.7
Family dominance in choice of vocation	1	1	0	0.0
Family inequality in educational background	1	1	0	0.0
<u>Health</u>				
Lacking rest and sleep	12	12	3	5.2
Becoming tired easily	8	8	2	3.4

Table 1.--PROBLEMS OF MEN STUDENTS CONTRASTED WITH PROBLEMS OF VETERAN STUDENTS AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1945-46. After Hunter (25:184).
--Continued.

Problem area	Men (N=100)		Veterans (N=58)	
	Number	Per Cent	Number	Per Cent
<u>Health--continued</u>				
Limiting physical handicaps	4	4	1	1.7
Lacking variety and nutrition in meals	3	3	1	1.7
Being nervous over trifles	4	4	0	0.0
Having poor complexion	2	2	0	0.0
Intermittent illness causing absence from classes	0	0	0	0.0
Having indigestion	1	1	0	0.0
Worrying continually about health	1	1	0	0.0
<u>Finance</u>				
Desiring to start a home	38	38	18	31.0
Getting enough money for social activities	18	18	8	13.6
Buying and spending wisely	19	19	7	12.1
Getting enough money for sufficient wardrobe	12	12	6	10.4
Supporting wife and/or children	13	13	6	10.4
Worrying about parental sacrifices	6	6	0	0.0
Getting enough money for college fees	0	0	0	0.0

Summary and implications.---The colleges and universities of this country face the problem of admitting an unprecedented number of veteran students. Part of these students will be non-high-school-graduates. These veteran students do not fit into the pattern of the pre-war college freshmen because of age, war maturity, and absence from formal education during the war years. These veteran students may have to make many adjustments to fit into college life.

College admission requirements

Studies were made before the war concerning the feasibility of college admission without satisfying traditional college entrance requirements. In 1941 Morgan (33) reported that at Princeton University the four-year old plan of "admission without examination of students coming from preparatory and high schools not familiar with the requirements of the College Entrance Examination Board" had been justified.

As early as 1944, while this country was still at war, it was recognized by some authorities that special educational problems would arise from the return of war veterans to colleges and universities. In 1944 McGrath (30) stated:

In appraising the veteran's education while in the service, the evaluation of the less tangible outcomes such as growth in intellectual power and the maturity which results from new contacts will present a new problem.

Many have lived so long in foreign countries that they speak the tongue fluently. They have been made wise beyond their years by privation, horror and death.

Nevertheless serious consequences may result if credit is granted indiscriminately without first determining if real educational growth has occurred. It should be carefully assessed.

The service-man has a real interest in a fair appraisal of his educational growth. He will be impatient with institutions which fail to recognize and accredit his previous educational achievements. (30:344-45)

Concerning the granting of credit to the returning serviceman in order to meet college admission requirements, Bryans (6) stated in 1944:

Nearly every case of credit application for the returning veteran will be a special one and will call for the exercise of considerable judgment, both in credit evaluation, and in setting further credit requirements. To give credit to a veteran for knowledge he does not possess just because he is a veteran will do no one any good. (6:124)

A report made in 1945 by the Committee on Admission of Veterans (1), appointed by the Pacific Coast Association of College Registrars, concerning the admission of non-high-school-graduates made these recommendations:

1. Students who have not graduated from high school, but who have achieved educational competence worthy of recognition by colleges should be admitted on the basis of scores made on the USAFI GED tests.
2. Such students should remain in a special status until 45 quarter hour credits are earned.
3. Each institution in cooperation with the Veterans Administration should carry out a pre-

liminary screening to limit the giving of the USAFI GED tests to promising candidates. (1:258)

Summary and implications.--Because many veterans will be unable to satisfy traditional college entrance requirements, special credit given these veterans for military training or for educational growth should be carefully assessed. Colleges and universities of this country are constantly evaluating their admission requirements in terms of post-war education.

Defining college success

Janney (26) said in 1939 that there were important criteria of college success other than scholastic achievement. One of these is social competence.

Asher-Gray (2) found in 1940 that the common point-hour-ratio criterion of college success was a relatively poor one because it failed to take into account the element of survival. It did not distinguish between those who maintained satisfactory scholarship for only one quarter and those who completed four years of college.

In 1945 Leonard (28) summarized the results of a study made by the Commission on the Relation of School and College of the Progressive Education Association. A group of faculty members from representative institutions constructed a list of criteria by which college success could be judged. The criteria were as follows:

1. Intellectual competence.
2. Cultural development; use of leisure time; appreciative and creative aspects.
3. Practical competence; common sense and judgment; ordinary manual skills; environmental adaptability
4. Philosophy of life.
5. Character traits.
6. Emotional balance.
7. Social fitness.
8. Sensitivity to social problems.
9. Physical fitness. (28:330)

Summary and implications.--There may be criteria of college success other than scholastic achievement alone.

The non-high-school-graduate

Brumbaugh (5) stated in 1943 that acceleration, which is the entrance of the college freshman student before the completion of 12 years of grade and high school, is desirable in some cases.

Before the end of the war some consideration had been given the problem of the college student who had not completed high school. In 1944 Dammon (9) summarized the results of an inquiry sent to the 48 state superintendents of public instruction concerning the college admission of non-high-school-graduates. In answer to the query if they had a plan for students to enter college before high school graduation, 13 had no plan, 14 had a plan in operation, and seven had plans for the awarding of a high-school diploma on the basis of college work completed.

The results of a study made at the University of Michigan on 12 high-school graduates and 15 non-high-school-graduates, who were specially selected, for the

first term gave a grade-point average of 2.79 for the high-school graduates, and 2.70 for the non-high-school-graduates. A study made at the University of Illinois in 1943 on three groups of non-high-school-graduates showed that out of 56 students, 43, or 76.8 per cent, made a grade-point average of 3.33 or better, which was the student body average.

The students in this study were selected on the basis of superior high-school achievement and cannot be compared to the unselected non-high-school-graduate.

Summary and implications.---The results of studies made concerning the competence of non-high-school-graduates to pursue college courses indicate that selected non-high-school-graduates may be able to compete successfully against college students who are high-school graduates.

The United States
Armed Forces Institute

In 1944 Hansen (23) defined the objectives of the United States Armed Forces Institute by quoting from the directive that established the Institute:

The school is intended to provide continuing educational opportunities to meet the requirements of the command; in particular to furnish assistance to personnel who lack educational prerequisites for assignment to duty which they are otherwise qualified to perform, and to assist individual soldiers in meeting requirements for promotion; to enable those whose education is interrupted by military service to maintain relations with educational institutions and thus increase the proba-

bility of the completion of their education on their return to civil life. (23:14-15)

In 1944 Brown (4) stated that an important duty of the United States Armed Forces Institute was to evaluate college credit for service work or service schools completed by the veteran. The Institute transmits to the institution designated by the serviceman a complete transcript of his specialist jobs and the educational courses he took while in service. The evaluation of these courses or jobs in terms of college academic credit is then done by the college.

In 1945 Espy (16) defined the purposes of the United States Armed Forces Institute. It was begun in April, 1942, to provide enlisted men in the Army with suitable opportunities to continue school careers interrupted by the war, to undertake special studies for increasing their efficiency as soldiers, and to maintain personal interests for later civilian life.

According to Espy (16) the Institute was first established because of the desires of enlisted men to use some of their time for study. Some military men reacted to these desires with a certain amount of misgiving. They believed that men with opportunity for off-duty study might be distracted from the job of learning to become a soldier. It was soon shown that men given the chance for study showed an overwhelming preference for studies which might help them to become better soldiers.

As pointed out by Espy (16) the Institute was merely a correspondence school in the beginning. Its services have expanded since that time. Today it helps to enroll men for hundreds of regular extension courses offered by some 80 colleges and universities.

Summary and implications.--The United States Armed Forces Institute was established to meet the needs of the serviceman on active duty. It may serve in a post-war capacity by helping colleges and universities to evaluate military service in terms of college academic credit.

The United States Armed
Forces Institute Tests of
General Educational Development

A description of the Tests of General Educational Development, as published in the "Examiners' Manual," American Council on Education (44) in 1944, listed the major purposes of the tests as follows:

1. To provide a more adequate basis for the educational and vocational guidance of those who have served in the armed forces.
2. To assist the schools in the appropriate placement in a program of general education of the students returning from military service.
3. To help the schools determine the amount of academic credit which should be granted students for their educational experience in military service. (44:5)

The "Examiners' Manual" (44) has listed two separate batteries of the test: one for use at the high

school level and the other to be used for the first two years of college. The tests measure educational growth in five fields: social studies, natural sciences, humanities, correctness and effectiveness of expression, and general mathematical ability. The tests were designed to measure the extent to which all educational experiences, including military experience, have contributed to the individual's general educational development, or his ability to succeed in a program which the academic high school and the first two years of the liberal arts college provide.

The "Examiners' Manual" (44) stated that the educational objectives of the tests were defined in terms of behavior; that is, the student should be able to do definite things which are indicative of his attainment of each objective. The intellectual skills and abilities which are measured are those needed by the student for success in his college life.

The "Examiners' Manual" (44) further stated that the major use of the tests is to determine the veteran's fitness to receive a certificate of equivalency comparable to a high-school diploma. Another use is to determine the veteran's fitness to pursue a college course.

In 1944 Crawford-Burnham (8) reported the results of a study to determine the feasibility of using the GED tests as college entrance examinations, or as

alternates for present college entrance examinations. The GED tests were given to a group of 135 college freshmen chosen at random. The total GED score correlated .56 with the freshman first-term grade-point achievement. The average of all College Entrance Examination Board tests correlated .53 with first-term grade-point achievement on the same 135 students. While the number of cases used permits only tentative conclusions, it does appear that:

1. GED tests show promise of being wholly acceptable alternates for college board examinations in the verbal subjects.

2. The total GED scores correlated with first-term achievement as well as do the college entrance examination board tests.

3. The GED tests make no pretense of measuring abilities in mathematics, mechanical engineering, or descriptive geometry. (8:268)

In 1945 Dyer (12) reported the results of a study made at Harvard University with the GED tests. The group taking the college level tests consisted of 114 undergraduates whose careers had not been interrupted by military service. Their performance, therefore, cannot be compared with the college-minded veteran. The findings are tentative but do suggest the following:

1. The GED tests show a statistically significant relationship with the amount of work completed by science concentrators. The magnitude is such that it does not provide a sound basis for placing students in advanced standing.

2. The GED tests show no relationship with

the amount of work completed by non-science concentrators.

3. The total GED scores when combined with the students' school rank provide a reasonably good prediction of his subsequent academic success in college life.

4. The GED tests seem to measure general aptitude, rather than general educational development.

5. The score patterns seem to differentiate the students interested in social studies from those interested in the natural sciences.

6. The social studies test may be useful with students of scientific bent as a predictor of general academic ability.

7. The natural sciences test provides a useful instrument for predicting success in the sciences. (12:331-33)

In 1946 Bradley (3) summarized the results of the GED social studies test which was given to 100 women students at MacMurray College for Women. These students were members of three social studies classes. The results were as follows:

Scores on this test correlate to a significant degree with grade averages, but are not significantly related to the number of hours of study the testees have had in the field of social studies, nor to grade placement within a range, at least, of four years. (3:268)

In 1946 Donahue (10) reported the results of three of the GED tests administered to 1,314 college freshmen, both men and women, with women predominating. The GED tests given were Correctness and Effectiveness of Expression, Social Studies, and the Natural Sciences. The results of this study indicated that the national

norms for the GED tests, even for type I institutions, are somewhat low in comparison to the university group.

Summary and implications.--The General Educational Development Tests were devised to meet particular educational needs of the serviceman. Research on the validity of these tests has been conducted largely on groups composed of college students who were high-school graduates. It may be that results of research conducted on non-high-school-graduates will not be directly comparable to the results of previous studies, but should be more significant.

Prediction of college success

The prediction of college success has been the subject of many studies during the past 30 years.

In 1927 Odell (36) found that a range of from .40 to .50 or somewhat higher was the usual correlation found between intelligence test scores and freshman college achievement. These data held true with various intelligence tests on students picked at random.

Freeman (19) stated in 1931 that all investigations of the prediction of college scholarship have yielded valuable data, but none has dealt with the fundamental problem of survival.

In 1933 Edds and McCall (14) found the following correlations between certain criteria and college success during the first semester of college:

<u>Criteria</u>	<u>r</u>
High-school marks	.650
Intelligence	.502
English ability	.443
Total of three criteria	.810 (14:129)

Edds and McCall (14) further stated that data of this sort were upset by lack of discrimination in grading in certain college departments.

That correlations of from .40 to .50 were not sufficiently high to be of prognostic value was advanced by Lasley (13) in 1933. This low relationship may be explained by the following:

1. The correlations may actually be higher than they seem because of other factors, which are determiners of college success. These are: industry, adjustment, background, and outside activities.

2. The reliability of the measures used may be low.

3. The validity of the measures used may be low. (13:272)

Segel (42) stated in 1934 that the most valid method of determining probable scholastic achievement was to examine previous scholastic achievement. Scholarship is the best criterion of college scholastic success for the following reasons:

1. The student may attend college and survive, but acquire habits of laziness in doing so.

2. There are a great many factors which bring about elimination from college.

3. The correlation between results on general mental tests and survival is less than between such tests and scholarship. This indicates the weakness of survival as a criterion of success. (42:7)

Feder (18) concluded in 1935 that the function of prediction in education is not to achieve rigid determinism, but to facilitate guidance. It is desirable to secure the best predictions possible in order to make guidance accurate and meaningful. In the prediction of college achievement the following facts hold true:

1. Reasonably high predictive coefficients should logically be expected to decrease under the influence of improved instructional methods and guidance.

2. The best basis for prediction is the student's previous record of achievement.

3. Prognostic tests designed to meet specifically certain subject matter requirements have more power for such prediction than do tests of general mental ability. (18:602)

In 1936 Mills (32) cited the following information in support of the contention that the low correlations obtained in all investigations of college scholastic prediction indicated the need of further research in the field of prediction:

Of 101 first-quarter freshmen who failed to pass the minimum number of hours at the University of Colorado, 46.53 per cent were in the lowest quartile on the basis of scores made on the American Council on Education Psychological Examination, 31.68 per cent were in the third or next lowest quartile, 13.86 per cent were in the second or next to the highest quartile, and 7.92 per cent were among those in the highest quartile. (32:308)

That the correlation of test scores with scholarship is not a stable factor in prediction was explained by Williamson (45) who stated in 1937 that the constantly decreasing correlation of test scores with scholarship over a period of the last several years in the College of Science, Literature, and Arts in the University of Minnesota may be due to these factors:

Certain changes in educational and personnel practices and in grading procedures. (45:7)

An indication of the effectiveness of the personnel program in bringing about better adjustments between academic pursuits and student aptitudes and interests. (45:13)

The low reliability of college grades.
(45:9)

Manning (31) stated in 1938 that high-school grades by themselves have little predictive value for college success. However, his findings led him to report that a combination of the American Council on Education Psychological Examination and high-school rank has value for predictive purposes.

In 1939 Rigg (38) reported that the correlation between intelligence and first-semester scholarship was higher than the correlation between intelligence and four-year scholarship. The criterion of intelligence used was the American Council on Education Psychological Examination. The study was performed on students picked at random. One reason advanced to explain this difference in correlation was that the poorer students dropped out of

school during the four years.

Nemzek (34) reported in 1939 that such variables as chronological age at entrance to elementary school, amount of education of parents, occupational status, and related items have little value for purposes of prediction of college success.

In the prediction of college success there may be criteria other than grades by which to judge. Hepner (24) stated in 1939 that grades are a sorry measure of the success with which an individual meets the college situation, yet these have been used universally as a criterion for the lack of anything better.

In summarizing the use of the coefficient of correlation between various prognostic factors and college marks, Butsch (7) concluded in 1939 that the primary need is for every school to find its own correlation coefficient. The variation is so wide that a particular section which furnishes the best single predictor for one college may be entirely negligible in its contribution for another.

In 1942 Livingood's (29) studies led him to conclude that a battery of standardized tests administered to college freshmen with a derived aptitude index can serve to indicate probable scholastic achievement, particularly during the first one or two years.

After studying the wide range of scores made on the American Council on Education Psychological Examination

at various schools over the nation, Douglass (11) stated in 1943:

The principal conclusion is that it is not only futile but dangerous to attempt to advise categorically any given individual whether or not he should go to college, or even whether he could probably make an average scholastic record. As much apparently depends on the institution he enters, the curriculum he follows, as his general mental ability. (11:186)

The results of a study made by Gould (21) at Colorado State College in 1944 indicated that the best single predictor of college scholastic achievement was the American Council on Education Psychological Examination. The second best single predictor was high-school rank. The strongest and most economical predictive combination of variables was found to be the one which included the American Council on Education Psychological Examination; Iowa Placement Series, Chemistry Aptitude; and high-school rank.

In terms of predicting the college success of the veteran, Hadley (22) stated in 1946 that it is now a reasonably established fact that scholastic records and even test data accumulated during high-school years are not very valid in terms of predicting what the veteran will do in college upon his return.

Summary and implications.--A majority of the studies made on the prediction of college success agree on the following points:

1. Intelligence is a good predictor of college success, ranging in most studies from .40 to .50.
2. High-school grades are a good predictor of college success.
3. Because of the many variables involved, each school should find its own predictors.
4. Much research needs to be done to make the prediction of college success more efficient than it is at present.

Chapter III

METHODS AND MATERIALS

In order to study the factors to be considered in predicting the success in college of non-high-school-graduates, data were obtained from the following sources: Records of GED test scores from the Colorado Agricultural and Mechanical College Testing Bureau, records of college achievement and college entrance examination scores from the office of the college registrar, a study made by Hunter of problems of college students, a questionnaire of problems of non-high-school-graduates, and a questionnaire covering personal history data.

Records have been kept at the Colorado Agricultural and Mechanical College Testing Bureau of all veterans who have taken the United States Armed Forces Institute Tests of General Educational Development. An examination of the records in the office of the college registrar revealed that 19 of these veterans had entered this college on the basis of satisfactory achievement made on the GED tests.

During routine counseling interviews, the writer found four additional veterans who had been admitted to this college on the basis of achievement in the GED tests. A notice inserted in the college newspaper asking for the

names of veterans who had taken the GED tests elsewhere resulted in seven veterans contacting the writer. This made a total population of 30 veteran students, enrolled at Colorado Agricultural and Mechanical College, who were non-high-school-graduates.

All of these students indicated an interest in the study, and are therefore included. As far as could be determined, this sample includes the total population of non-high-school-graduates who are enrolled in or have been enrolled in Colorado Agricultural and Mechanical College.

This population of non-high-school-graduates had been admitted to Colorado Agricultural and Mechanical College by the registrar on the basis of having made a standard score of 35 or better on each of the five GED tests, or an average standard score of 45 or better on all five tests.

Analysis of the records in the office of the college registrar was taken in order to obtain data on the college achievement and college entrance examination scores of non-high-school-graduates. These data included raw scores on the following tests:

1. The American Council on Education Psychological Examination, to be referred to as the A.C.E.

2. Iowa Placement Examination Series CA-2, Form M, Chemistry Aptitude, to be referred to as the Chemistry test.

3. The Cooperative English Test, to be referred to as the English test.

4. The Nelson-Denny Reading Test, to be referred to as the Reading test.

Data concerning the college achievement of non-high-school-graduates obtained from the records in the office of the college registrar included first-quarter achievement in terms of grade-point average, to be referred to as G.P.A.

G.P.A. was obtained by the following method:

Letter grades for the first quarter of college were weighted so that an "A" equaled 4, a "B" equaled 3, a "C" equaled 2, a "D" equaled 1, and an "F" equaled 0. Courses marked as "withdrawn failing" were counted as an "F." Courses marked as "withdrawn passing" were not counted. These weights were multiplied by the number of hours a student had registered for in each case.

The resultant figure, which represents the number of quality points, was then divided by the number of hours to obtain the G.P.A. The following is an example of a student who received the following grades:

(A) Grades	(B) Grade Points	(C) Number of hours for which registered	(D) (BxC)
B	3	5	15
C	2	2	4
B	3	3	9
A	4	3	Total 12
A	4	3	grade 12
Total credit hours		16	points 52

The total grade points divided by the total number of credit hours gives a G.P.A. of 3.25.

To remain in good standing at this institution a student must maintain a G.P.A. of 2.0.

In order to gain a valid comparison of the problems of non-high-school-graduates, as contrasted to the problems of high-school graduates in college, it was decided to use the Personal Interview Form 1/ constructed by Hunter (25) for studying the problems of college students.

The basis for the Personal Interview Form was found in an analysis of the problems which students had expressed to Hunter (25) and in the review of literature concerning the problems of college students. Eight major problem areas and a total of 78 contributing items were used in its construction. The problem areas were as follows:

1. Academic Education
2. General Education
3. Vocation
4. Social Adjustment
5. Emotion
6. Family
7. Health
8. Finance

1/ See Appendix A.

The system of random sampling used by Hunter (25) consisted in selecting every fifth and sixth name in the Student Directory as published for the school year 1945-46.

Two persons assisted Hunter (25) in the administration of the Personal Interview Forms. The interviews with the students were conducted in an informal manner, and the students interviewed seemed to be honest and frank in their responses.

In order to gain a valid and reliable comparison of the problems of college students as found by Hunter (25) and the problems of college students who were non-high-school-graduates the same Personal Interview Form as used by Hunter was administered to the subjects of this study. The same Directions for Administering 2/ the Personal Interview Form were followed. One of the interviewers used by Hunter (25), a senior man majoring in psychology, was used by the writer to interview the subjects of this study. The interview procedure was the same as that used by Hunter.

With one possible exception, all of the students interviewed showed an interest in the study, and they showed honesty and careful consideration in checking the problems.

In order to obtain valid material concerning

2/ See Appendix B.

the various factors to be used in predicting the success of non-high-school-graduates in college, it was decided that some form of personal interview with the 30 non-high-school-graduates enrolled at Colorado Agricultural and Mechanical College should be made. After due consideration, a questionnaire 3/ was devised to obtain information from each student pertaining to the following fields:

1. Educational background
2. Military service
3. Family status
4. Financial status
5. Social background
6. Interests
7. Educational problems.

All students interviewed showed an interest in the study. Many of them volunteered information concerning their problems before the questionnaire was administered. Several expressed a desire to see the results of the study after its completion.

3/ See Appendix C.

Chapter IV

ANALYSIS OF DATA

In order to provide data concerning the selection of factors to be used in predicting the success of non-high-school-graduates in college, an investigation was made of 30 non-high-school-graduates who were enrolled at Colorado Agricultural and Mechanical College during the fall and winter quarters of the 1946-47 school year.

The data were obtained by the use of three methods, which were as follows:

1. An analysis of the records of the college registrar and the college testing bureau to obtain data relative to the college achievement and test scores of non-high-school-graduates.
2. The administration of a questionnaire to the 30 non-high-school-graduates to obtain information pertaining to their educational backgrounds, military service, occupations held, interests, and personal history.
3. The administration of the Personal Interview Form constructed by Hunter (25) to the 30 non-high-school-graduates to obtain data concerning their problems.

These data will be presented under the following headings:

Description of the Sample

Educational Background of Non-high-school-graduates

Problems of Non-high-school-graduates

Differences between Problems of Non-high-school
graduates and High-school graduates

Relationship between First-quarter College

Achievement of Non-high-school-graduates
and College Achievement of High-school
Graduates

Relationships between College Entrance Examination
Scores, General Educational Development Test
Scores, and First-quarter College Achievement
of Non-high-school-graduates

Relationship of Personal History Data of Non-
High-school-graduates to Success in College
Comments and Suggestions by Students.

Description of the sample

Thirty students participated in this study, all of whom were veterans who had not completed high school. They had been admitted to Colorado Agricultural and Mechanical College on the basis of achievement in the GED tests. As far as could be determined, this group represented the total population of non-high-school-graduates enrolled at Colorado Agricultural and Mechanical College.

Fifteen, or 50 per cent, of the students were married, Table 3. Of the married students, four had one child each, and one had two children, Table 2.

The ages of the students ranged from 19.7 years to 34.6 years. The mean age of the group was 25.1 years, Table 2.

Twenty-eight students were of the white race, one was Negro, and one was Spanish-American.

Thirteen of the students were born in Colorado or claimed it as their home.

Of 24 students reporting, the three major occupations of their fathers were as follows: farmer, 10; unskilled labor, four; and semi-skilled labor, four.

Five of the students held extra jobs in addition to their school duties. The average pay per month for the extra jobs was \$54 per month, Table 3.

Twenty of the 30 non-high-school-graduates reported a strong interest in one or more hobbies. Ten students reported that they had no hobbies of any kind at the present time, but six of these said that the pressure of college studies kept them from engaging in any hobbies, Table 3.

Only two of the group reported a lack of interest in social activities of any kind, including movies, dancing, and other social affairs, Table 3.

Table 2.--PERSONAL CHARACTERISTICS OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Case Number	Children	Age (Months)	Home state	Father's occupation	Race
1	0	354	Colo.		White
2	0	246	Colo.	Trucker	White
3	0	322	Mich.	Broker	White
4	0	310	Minn.	Farmer	White
5	0	272	Okla.	Business	White
6	0	360	S.Dak.		White
7	0	335	Colo.	Clerk	White
8	1	317	Texas	Mail clerk	White
9	0	293	Penn.	Machinist	White
10	0	247	Colo.	Laborer	White
11	0	268	Colo.		White
12	0	386	Colo.	Miner	Negro
13	0	305	Ill.	Farmer	White
14	2	415	Mo.		White
15	0	320	Nebr.	Farmer	White
16	0	245	Kansas	Farmer	White
17	0	330	Colo.		White
18	0	259	Colo.	Farmer	White
19	0	300	N.Dak.	Farmer	White
20	0	246	Colo.	Laborer	Spanish-American
21	1	260	N.Y.		White
22	0	317	Wyo.	Oil man	White
23	0	241	Colo.	Plasterer	White

Table 2.--PERSONAL CHARACTERISTICS OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Case Number	Children	Age (Months)	Home state	Father's occupation	Race
24	1	394	Colo.	Farmer	White
25	0	323	Okla.		White
26	0	266	Mont.	Rancher	White
27	1	341	Penn.	Broker	White
28	0	254	Colo.	Farmer	White
29	0	260	Wyo.	Farmer	White
30	0	236	Colo.	Laborer	White

Table 3.--DESCRIPTION OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE RELATIVE TO MARITAL STATUS, HOBBIES, SOCIAL ACTIVITIES, AND WORK, 1946-47.

Item	Yes	Per Cent	No	Per Cent	Average monthly pay
Married	15	50.0	15	50.0	
Hobbies	20	66.7	10	23.3	
Like social activities	28	93.3	2	6.7	
Hold an extra job	5	16.7	25	83.3	\$54.00

Educational background of non-high-school-graduates

The grades completed by the non-high-school-graduates ranged from Grade eight to Grade 11½, Table 4.

The high-school grade completed by the largest

number of students was Grade 11, 11, or 36.67 per cent, of the students of the group having completed this grade. Grade 11½ was completed by six students, or 20 per cent, of the group, and Grade 10½ was completed by five students, or 16.67 per cent of the group.

Of the 30 students, eight, or 26.67 per cent, of the group did not complete a grade higher than the 10th grade. The mean grade completed by the group of 30 non-high-school-graduates was Grade 10.5.

Table 4.--SCHOOL GRADE COMPLETED BY NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Grade completed	Number	Per Cent
8	2	6.67
8½	2	6.67
9	2	6.67
9½	0	0.0
10	2	6.67
10½	5	16.67
11	11	36.67
11½	6	20.0

Of the 30 fathers of the non-high-school-graduates, 15, or 50 per cent, completed only the eighth grade; eight, or 26.67 per cent, completed only high school; four, or 13.33 per cent, completed less than four years of college; and three, or 10 per cent, completed four

years of college, Table 5.

Of the 30 mothers of the non-high-school-graduates, 12, or 40 per cent, of the group completed only the eighth grade; nine, or 30 per cent, completed only high school; six, or 20 per cent, completed less than four years of college; and three, or 10 per cent, completed at least four years of college.

Table 5.--EDUCATION OF THE PARENTS OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

<u>Grade completed</u> <u>Fathers</u>		<u>Grade completed</u> <u>Mothers</u>	
	Number		Number
4	2	2	2
5	2	3	1
6	1	4	0
7	1	5	1
8	9	6	2
9	1	7	1
10	1	8	5
11	0	9	1
12	6	10	2
13	1	11	0
14	2	12	6
15	1	13	3
16	3	14	3
		15	0
		16	1
		17	1
		18	1

The major reason given by the non-high-school-graduates for not attending or not completing the secondary school was military service, Table 6. Thirteen, or 43.3 per cent, gave this as a reason. Work was the reason given by seven, or 23.3 per cent, as a reason for leaving school. The third major reason given was finances. Six, or 20 per cent, of the group gave this as a reason for leaving school.

Table 6.--REASONS GIVEN FOR NOT ATTENDING OR NOT COMPLETING SECONDARY SCHOOL BY NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Reason for leaving school	Number	Per cent
Military service	13	43.3
Work	7	23.3
Finances	6	20.0
Lack of interest	2	6.7
No higher grade available	1	3.3
Restless	1	3.3

Only one student indicated a strong participation in extracurricular activities while in high school, Table 7. Sixteen students, or 53.4 per cent, of the group indicated some participation in extracurricular activities, and 13, or 43.3 per cent, indicated little participation in extracurricular activities while in high school.

Twenty-five, or 83.3 per cent, indicated little or no participation in extracurricular activities while in college, while five, or 16.7 per cent, indicated a moderate amount of participation in extracurricular activities.

Table 7.--EXTENT OF PARTICIPATION IN EXTRACURRICULAR ACTIVITIES BY NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Degree of participation	High school		College	
	Number	Per cent	Number	Per cent
Strong	1	3.3	0	0.0
Some	16	53.4	5	16.7
Little	13	43.3	25	83.3

The three divisions with the greatest enrollment of non-high-school-graduates were the Science and Arts Division with nin, or 30 per cent; Engineering with eight, or 26.7 per cent; and Agriculture with seven, or 23.3 per cent, Table 8.

Table 8.--ENROLLMENT IN MAJOR DIVISIONS OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Division	Number	Per cent
Science and Arts	9	30.0
Engineering	8	26.7
Agriculture	7	23.3
Forestry	3	10.0
Veterinary Medicine (Pre-Vet)	3	10.0

The number of hours of college credit carried by non-high-school-graduates ranged from seven to 20, Table 9. The average number of hours carried was 12.9. This compares with 17.5 which is the number of hours required per quarter to graduate in four years from this institution.

Table 9.--NUMBER OF HOURS OF CREDIT CARRIED BY NON-HIGH-SCHOOL-GRADUATES DURING THE FIRST QUARTER AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Hours carried	Number	Per cent
7	2	6.7
8	2	6.7
9	0	0.0
10	3	10.0
10½	1	3.3
11	2	6.7
12	4	13.3
13	4	13.3
14	0	0.0
15	4	13.3
16	5	16.7
17	1	3.3
18	1	3.3
19	0	0.0
20	1	3.3

Over 53 per cent of the 30 non-high-school-graduates served in the United States Army, Table 10. Thirteen, or 43.3 per cent, of the students served in the United States Navy, and one student served in the United States Marine Corps.

Table 10.--FORMER BRANCHES OF SERVICE OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Branch of service	Number	Per cent
United States Army	16	53.3
United States Navy	13	43.3
United States Marine Corps	1	3.3

Of the 16 non-high-school-graduates whose former branch of service was the United States Army, five were commissioned officers, Table 11. The lowest grade represented was that of private first-class, of whom there were three.

The highest grade of the 13 non-high-school-graduates whose former branch of service was the United States Navy was that of Aviation Chief Machinists Mate. The lowest grade was that of Seaman first-class, of whom there were three.

The non-high-school-graduate whose former branch of service was the United States Marine Corps attained the rank of corporal.

Table 11.--FORMER MILITARY GRADE OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Grade	Number
United States Army	
First lieutenant	2
Second lieutenant	3
Technical sergeant	1
Sergeant	2
Technician-fourth grade	1
Corporal	1
Technician-fifth grade	3
Private first-class	3
United States Navy	
Chief petty officer	1
First-class petty officer	5
Second-class petty officer	3
Third-class petty officer	1
Seaman first-class	3
United States Marine Corps	
Corporal	1

Problems of non-high-school-graduates

The problems will be grouped under the following headings: Academic education, General education, Vocation, Social adjustment, Emotion, Family, Health, and Finance, Table 12.

Academic education.--The five academic education problems mentioned most frequently by the students included in this sample were "expressing knowledge in writing," 33.3 per cent; "studying effectively," 30 per cent; "concentrating during study hours," 30 per cent; "getting satisfactory grades," 30 per cent; and "outlining or taking notes," 23.3 per cent.

General education.--The two most prevalent problems in the area of general education concerned "budgeting study time," 30 per cent; and "selecting courses in line with vocation," 16.7 per cent.

Vocation.--There were two major problems in the vocation area. They were "choosing a vocation," 23.3 per cent; and "being satisfied with your vocation," 16.7 per cent.

Social adjustment.--Four major problems in the area of social adjustment were named by students. They were "speaking in public," 33.3 per cent; "being self-conscious," 23.3 per cent; "finding time for shows, sports, and radio," 20 per cent; and "being ill at ease at social affairs," 16.7 per cent. The two minor problems in the area of social adjustment were "wishing for fewer social contacts," 3.3 per cent; and "wishing for more contacts with town people," 3.3 per cent.

Emotion.--The five major problems in the area of emotion were "getting nervous easily," 23.3 per cent; "taking things too seriously," 16.7 per cent; "wanting a

more pleasing personality," 16.7 per cent; "being upset when you have to recite," 16.7 per cent; and "having sleepless nights because of over-active mind," 16.7 per cent. "Wanting religious advice," was not mentioned as a problem by any student.

Family.--The two major problems in the area of the family were "family living quarters unsatisfactory," 30 per cent; and "financial obligation to family," 20 per cent. "Family dominance in choice of vocation," and "family unable to live together because of finances," were not mentioned as problems by any student.

Health.--The two major problems in the health area were "lacking rest and sleep," 16.7 per cent; and "limiting physical handicaps," 13.3 per cent. Three problems were not mentioned by any student. They were "lacking variety and nutrition in meals," "having poor complexion," and "having indigestion."

Finance.--The three major problems in the finance area were "getting enough money for sufficient wardrobe," 46.7 per cent; "getting enough money for social activities," 36.7 per cent; and "supporting wife and/or children," 30 per cent.

Table 12.--RESPONSES OF 30 NON-HIGH-SCHOOL-GRADUATES TO
PERSONAL INTERVIEW FORM AT COLORADO AGRICULTURAL AND
MECHANICAL COLLEGE, 1946-47.

<u>Problem area</u>	<u>Number</u>	<u>Per cent</u>
<u>Academic education</u>		
Expressing knowledge in writing	10	33.3
Studying effectively	9	30.0
Concentrating during study hours	9	30.0
Getting satisfactory grades	9	30.0
Outlining or taking notes	7	23.3
Feeling at ease with professors	4	13.3
Worrying excessively about examinations	3	10.0
Finding library references	2	6.7
Carrying out laboratory procedures	2	6.7
Understanding class lectures	1	3.3
Concentrating in class	1	3.3
Expressing knowledge in recitation	1	3.3
<u>General education</u>		
Budgeting study time	9	30.0
Selecting courses in line with vocation	5	16.7
Understanding methods of grading	4	13.3
Scheduling outside work not to interfere with studying	4	13.3
Planning extracurricular activities not to interfere with academic school life	3	10.0
Scheduling too many units	1	3.3
Getting conferences with professors	1	3.3

Table 12.--RESPONSES OF 30 NON-HIGH-SCHOOL-GRADUATES TO
PERSONAL INTERVIEW FORM AT COLORADO AGRICULTURAL AND
MECHANICAL COLLEGE, 1946-47.--Continued.

Problem area	Number	Per cent
<u>Vocation</u>		
Choosing a vocation	7	23.3
Being satisfied with your vocation	5	16.7
Evaluating suitability for your vocation	4	13.3
Concerning the future of vocation	4	13.3
Getting vocational information	2	6.7
Finding no interest in any vocation	2	6.7
Locating prospective employment	2	6.7
Deciding upon prospective employment	2	6.7
<u>Social adjustment</u>		
Speaking in public	10	33.3
Being self-conscious	7	23.3
Finding time for shows, sports, and radio	6	20.0
Being ill at ease at social affairs	5	16.7
Being accepted into social groups	5	16.7
Fitting into pattern of college life	5	16.7
Making friends easily	4	13.3
Making friendly contacts with opposite sex	4	13.3
Selecting activities in line with interests	4	13.3
Knowing proper etiquette for social functions	4	13.3
Conversing with people	3	10.0

Table 12.--RESPONSES OF 30 NON-HIGH-SCHOOL-GRADUATES TO
PERSONAL INTERVIEW FORM AT COLORADO AGRICULTURAL AND
MECHANICAL COLLEGE, 1946-47.--Continued.

Problem area	Number	Per cent
<u>Social adjustment.</u> --continued		
Wishing for more social contacts	3	10.0
Wishing for fewer social contacts	1	3.3
Wishing for more contacts with town people	1	3.3
<u>Emotion</u>		
Getting nervous easily	7	23.3
Taking things too seriously	5	16.7
Wanting a more pleasing personality	5	16.7
Being upset when you have to recite	5	16.7
Having sleepless nights because of over active mind	5	16.7
Fearing criticism	4	13.3
Wanting to confide in someone	4	13.3
Fearing you will make social mistakes	3	10.0
Having difficulty accepting regula- tions of the college	3	10.0
Worrying about national or world- wide problems	3	10.0
Having the blues often	2	6.7
Being discouraged easily	2	6.7
Lacking in self-confidence	2	6.7
Fearing lack of success in life	2	6.7
Dreading to introduce folks at a party	2	6.7
Being hurt easily	1	3.3

Table 12.--RESPONSES OF 30 NON-HIGH-SCHOOL-GRADUATES TO
PERSONAL INTERVIEW FORM AT COLORADO AGRICULTURAL AND
MECHANICAL COLLEGE, 1946-47.--Continued.

Problem area	Number	Per cent
<u>Emotion.--continued</u>		
Lacking in leadership ability or opportunity	1	3.3
Worrying about what to wear	1	3.3
Wanting religious advice	0	0.0
<u>Family</u>		
Family living quarters unsatisfactory	9	30.0
Financial obligation to family	6	20.0
Family living quarters provide no suitable place to study	2	6.7
Family inequality in educational background	2	6.7
Family unable to live together because of lack of accommodations	1	3.3
Family dominance in choice of vocation	0	0.0
Family unable to live together because of finances	0	0.0
<u>Health</u>		
Lacking rest and sleep	5	16.7
Limiting physical handicaps	4	13.3
Intermittent illness causing absence from classes	3	10.0
Becoming tired easily	2	6.7
Being nervous over trifles	2	6.7
Worrying continually about health	1	3.3
Lacking variety and nutrition in meals	0	0.0

Table 12.--RESPONSES OF 30 NON-HIGH-SCHOOL-GRADUATES TO PERSONAL INTERVIEW FORM AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.--Continued.

Problem area	Number	Per cent
<u>Health.--continued</u>		
Having poor complexion	0	0.0
Having indigestion	0	0.0
<u>Finance</u>		
Getting enough money for sufficient wardrobe	14	46.7
Getting enough money for social activities	11	36.7
Supporting wife and/or children	9	30.0
Buying and spending wisely	7	23.3
Desiring to start a home	7	23.3
Getting enough money for college fees	1	3.3
Worrying about parental sacrifices	0	0.0

Differences between problems of non-high-school-graduates and high-school graduates

In order to compare the differences between the problems of the non-high-school-graduates in this study and the problems of the high-school graduates reported by Hunter (25) the data were analyzed in terms of the significance of differences between percentages for each problem.

The data will be grouped under the following headings: Academic education, General education, Voca-

tion, Social adjustment, Emotion, Family, Health, and Finance.

Statistical procedures.---For the purpose of determining the significance of the differences in the percentages of two groups which show a certain attribute, t , the critical ratio, was used. This statistic is the ratio of the obtained difference between two percentages (D) to its standard error (SE_D). The standard error of difference between two uncorrelated percentages was obtained by the following formula:

$$SE_D = \sqrt{\frac{p_1q_1}{N_1} + \frac{p_2q_2}{N_2}}$$

p is the percentage of times a given event occurred.

q is $1-p$. N is the number of cases.

The following interpretation was used:

1. t , equal to or greater than three, shows a difference very significantly greater than zero since the chances that the true difference is zero are only about 14 in 10,000. These critical ratios were interpreted as very significant.

2. When the critical ratio, t , was equal to or greater than two but less than three, it was interpreted as showing a difference significantly greater than zero. The chances that there is not a true difference between the groups then are only 228 or less in 10,000.

3. When the critical ratio, t , is less than two, the difference was not considered significant.

Academic education.--On two problems in the area of academic education, "understanding class lectures" and "finding library references," the responses of the high-school graduates were significantly higher than those of the non-high-school-graduates. The responses of non-high-school-graduates were significantly higher for "expressing knowledge in writing," "concentrating during study hours," and "getting satisfactory grades," Table 13.

General education.--On one problem in the area of general education, "selecting courses in line with vocation," the responses of the non-high-school-graduates were significantly higher than those of the high-school graduates, Table 13.

Vocation.--On three problems in the area of vocation, "choosing a vocation," "being satisfied with your vocation," and "concerning the future of the vocation," the responses of the non-high-school-graduates were significantly higher than those of the high-school graduates, Table 13.

Social adjustment.--On one problem in the area of social adjustment, "speaking in public," the responses of the non-high-school-graduates were very significantly higher than those of the high-school graduates. On two problems in the area of social adjustment, "finding time

for shows, sports, and radio" and "selecting activities in line with interests," the responses of the non-high-school-graduates were significantly higher than those of the high-school graduates, Table 13.

Emotion.--On five problems in the area of emotion, "getting nervous easily," "having sleepless nights because of over active mind," "taking things too seriously," "fearing criticism," and "being upset when you have to recite," the responses of the non-high-school-graduates were significantly higher than those of the high-school graduates, Table 13.

Family.--There were no significant differences in the area of family.

Health.--On one problem in the area of health, "lacking variety and nutrition in meals," the responses of the high-school graduates approached significance over those of the non-high-school-graduates. On one problem in the area of health, "intermittent illness causing absence from classes," the responses of the non-high-school-graduates approached significance over those of the high-school graduates, Table 13.

Finance.--On one problem in the area of finance, "worrying about parental sacrifices," the responses of the high-school graduates were significantly higher than those of the non-high-school-graduates. On one problem in the area of finance, "getting enough money for sufficient wardrobe," the responses of the non-high-school-

graduates were very significantly higher than those of the high-school graduates. On two problems in the area of finance, "getting enough money for social activities" and "supporting wife and/or children," the responses of the non-high-school-graduates approached significance over those of the high-school graduates, Table 13.

Table 13.--PROBLEMS SHOWING SIGNIFICANT DIFFERENCES BETWEEN NON-HIGH-SCHOOL-GRADUATES AND HIGH-SCHOOL GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Problems	Significance of differences of percentages		
	D	SE _D	t
<u>Academic education</u>			
Understanding class lectures	-13.7	4.9	2.8
Expressing knowledge in writing	26.3	8.9	2.9
Finding library references	-16.3	6.2	2.6
Concentrating during study hours	22.0	8.8	2.5
Getting satisfactory grades	20.0	8.9	2.2
<u>General education</u>			
Selecting courses in line with vocation	16.7	6.8	2.5
<u>Vocation</u>			
Choosing a vocation	21.3	7.8	2.7
Being satisfied with your vocation	13.7	7.0	2.0
Concerning the future of vocation	12.3	6.2	2.0
<u>Social adjustment</u>			
Speaking in public	30.3	8.7	3.5
-indicates high-school graduates higher than non-high-school-graduates			

Table 13.--PROBLEMS SHOWING SIGNIFICANT DIFFERENCES BETWEEN NON-HIGH-SCHOOL-GRADUATES AND HIGH-SCHOOL GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.--Continued.

Problems	Significance of difference of percentages		
	D	SE _D	t
<u>Social adjustment.--continued</u>			
Finding time for shows, sports, and radio	20.0	7.3	2.7
Selecting activities in line with interests	12.3	6.3	2.0
<u>Emotion</u>			
Getting nervous easily	22.3	7.7	2.9
Having sleepless nights because of over active mind	16.7	6.8	2.5
Taking things too seriously	14.7	6.9	2.1
Fearing criticism	13.3	6.2	2.1
Being upset when you have to recite	13.7	7.0	2.0
<u>Family</u>			
No significant differences			
<u>Health</u>			
Lacking variety and nutrition in meals	- 3.0	1.7	1.8
Intermittent illness causing absence from classes	10.0	5.5	1.8
<u>Finance</u>			
Getting enough money for sufficient wardrobe	34.7	9.6	3.6
Worrying about parental sacrifices	- 6.0	2.4	2.5
- indicates high-school graduates higher than non-high-school-graduates			

Table 13.--PROBLEMS SHOWING SIGNIFICANT DIFFERENCES BETWEEN NON-HIGH-SCHOOL-GRADUATES AND HIGH-SCHOOL GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.--Continued.

Problems	Significance of difference of percentages		
	D	SE _D	t
<u>Finance.--continued</u>			
Getting enough money for social activities	18.7	9.6	1.9
Supporting wife and/or children	17.0	9.0	1.9

-indicates high-school graduates higher than non-high-school-graduates

Relationship between first-quarter college achievement of non-high-school-graduates and college achievement of high-school graduates

The grade-point average for veteran students enrolled at Colorado Agricultural and Mechanical College during the fall quarter of 1946-47 was 2.367, Table 14. This was higher than the grade-point average of non-veteran students during the same time, which was 2.342, or that of the entire student body, which was 2.359. The grade-point average of first-quarter non-high-school-graduates during the fall and winter quarters, 1946-47, was 1.940, which was lower than that of any group studied, and lower than the 2.0 grade-point average required to remain in good standing at this institution.

Table 14.--COMPARISON OF FIRST-QUARTER GRADE-POINT AVERAGE OF NON-HIGH-SCHOOL-GRADUATES WITH OTHER GROUPS AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, FALL QUARTER, 1946-47.

Student group	Grade-point average
Veterans	2.367
Women	2.384
Non-veterans	2.342
Student body	2.359
Men	2.335
First-quarter non-high-school-graduates	1.940

Relationships between college entrance examination scores, General Educational Development test scores, and first-quarter college achievement of non-high-school-graduates

The Pearson "product moment" method of correlation was used to obtain the relationships between grade-point averages and the following variables, as well as between the variables themselves for the non-high-school-graduates:

1. GED test number 1, Correctness and Effectiveness of Expression
2. GED test number 2, Interpretation of Reading Materials in the Social Studies
3. GED test number 3, Interpretation of Reading Materials in the Natural Sciences
4. GED test number 4, Interpretation of Literary Materials
5. GED test number 5, General Mathematical Ability

6. Total GED score

7. The American Council on Education Psychological Examination, to be called the A.C.E.

8. The Cooperative English test, to be called the English test.

9. The Iowa Chemistry Aptitude test, to be called the Chemistry test.

10. The Nelson-Denny Reading test, to be called the Reading test.

The GED test is the best single predictor of first-quarter college achievement, the coefficient of correlation with first-quarter grade-point average of non-high-school-graduates being .591, Table 15. No one section of the GED test correlated as high with first-quarter grade-point average as did the total GED test. The two sections of the GED test with the best predictive values are the Interpretation of Reading Materials in the Social Studies, which has a correlation of .485 with first-quarter grade-point average, and the Interpretation of Literary Materials, which has a correlation of .463 with the first-quarter grade-point average of non-high-school-graduates. The section of the GED test entitled General Mathematical Ability correlated lowest of all sections of the test with first-quarter grade-point average, with a correlation of .218.

Of the college entrance examinations, the Reading test correlated highest with first-quarter grade-point average of non-high-school-graduates with a correla-

tion of .464. The next best predictor was the English test, which had a correlation of .423 with first-quarter grade-point average. The lowest correlation obtained between any college entrance examination test and first-quarter grade-point average was -.027 in the Chemistry test.

The intercorrelations between variables showed a correlation between the GED test and the Reading test of .841, and between the GED test and the A.C.E. of .814. The correlation between the Reading test and the English test was .292.

Table 15.--RELATIONSHIP BETWEEN FIRST-QUARTER GRADE-POINT AVERAGE, GENERAL EDUCATIONAL DEVELOPMENT TEST SCORES, AND COLLEGE ENTRANCE EXAMINATION SCORES OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Test	G.P.A.	A.C.E.	English	Chemistry	Reading
GED 1	.400				
GED 2	.485				
GED 3	.272				
GED 4	.463				
GED 5	.218				
Total GED	.591	.814	.454	.413	.841
A.C.E.	.354		.442	.500	.677
English	.423			.430	.292
Chemistry	-.027				.346
Reading	.464				

Relationship of personal
history data of non-high-
school-graduates to
success in college

These data will be presented under the following headings: Age, Education, Race, and Scholarship.

Age.--The ages of the group of non-high-school-graduates ranged from 19.7 years to 34.6 years, Table 2. The mean age of the group was 25.1 years. Use of the "product moment" method of correlation showed that the relationship between age and first-quarter grade-point average was .414 for the group of 30 non-high-school-graduates, Table 16.

Education.--The school grades completed by non-high-school-graduates ranged from Grade eight to Grade 11 $\frac{1}{2}$, Table 4. The correlation between secondary school grade completed and first-quarter grade-point average in college was -.138 for the group of 30 non-high-school-graduates.

The education completed by the 30 fathers of non-high-school-graduates ranged from Grade four to four years of college, Table 5. The correlation between amount of education completed by fathers and college first-quarter grade-point average was -.144 for the group of 30 non-high-school-graduates, Table 16.

The education completed by the 30 mothers of non-high-school-graduates ranged from Grade two to six years of college, Table 5. The correlation between

amount of education completed by mothers and college first-quarter grade-point average was -.130 for the group of 30 non-high-school-graduates, Table 16.

Table 16.--RELATIONSHIP BETWEEN FIRST-QUARTER GRADE-POINT AVERAGE OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, AND AGE, SCHOOL GRADE COMPLETED, EDUCATION OF FATHER, AND EDUCATION OF MOTHER, 1946-47.

Item	Grade-point average
Age	.414
Grade completed	-.138
Education of father	-.144
Education of mother	-.130

Race.--Twenty-eight of the 30 non-high-school-graduates were of the white race, one was Negro, and one was Spanish-American 1/. The Negro dropped out of college after completing one quarter of work. His grade-point average was 1.38 1/. The Spanish-American student also dropped out of college after completing one quarter of work. His grade-point average was 0.0 1/. Four other non-high-school-graduates dropped out of college after completing one quarter of work. Their case numbers 1/ and grade-point averages were as follows:

<u>Case number</u>	<u>G.P.A.</u>	<u>Case number</u>	<u>G.P.A.</u>
8	.80	5	1.25
2	.95	14	2.00

1/ See Appendix E.

Scholarship.---In reply to the question, "Do you feel that you might be doing better work in college today if you had completed high school?", 15 of the non-high-school-graduates answered yes, 11 answered no, and four were undecided, Table 17.

In reply to the question, "Do you feel that as a non-high-school-graduate in college, you should receive special help with your studies?", 26 of the non-high-school-graduates answered no, three answered yes, and one was undecided.

Table 17.--RESPONSES OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE TO ITEMS ON QUESTIONNAIRE, 1946-47.

Item	No.		No.		No.	
	Yes	Per cent	No	Per cent	Undecided	Per cent
Do you feel that you might be doing better work in college today if you had completed high school?	15	50	11	36.7	4	13.3
Do you feel that as a non-high-school-graduate in college you should receive special help with your studies?	3	10	26	86.7	1	3.3

Chemistry was the college course listed as most difficult by the greatest number of non-high-school-graduates, Table 18. Nine students, or 30 per cent, of the group listed it as the most difficult course. Mathematics was named by eight students, or about 27 per cent, of the group as the most difficult college course, while

English was named by six students, or 20 per cent, of the group as the most difficult college course.

Table 18.--MOST DIFFICULT COLLEGE COURSES OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Course	Number	Per cent
Chemistry	9	30.0
Mathematics	8	26.7
English	6	20.0
Drawing	1	3.3
Botany	1	3.3
Undecided	5	16.7

There was a wide difference of opinion as to the easiest college courses, Table 19. Twenty-four students named 12 different courses as easiest in college. Six students were undecided. English was named by seven students as the easiest college course.

Table 19.--EASIEST COLLEGE COURSES OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Course	Number	Per cent
English	7	23.3
Mathematics	4	13.4
Drawing	3	10.0
History	2	6.8
Livestock	1	3.3

Table 19.--EASIEST COLLEGE COURSES OF NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.--Continued.

Course	Number	Per cent
Chemistry	1	3.3
Forestry	1	3.3
Education	1	3.3
Agriculture	1	3.3
Biology	1	3.3
Science	1	3.3
Horticulture	1	3.3
Undecided	6	20.0

Comments and suggestions
by students

Comments made by the students during the interviews were recorded in the exact words of the students. Over 34 per cent of the comments concerned improvement of instruction, Table 20. Fifteen per cent of the comments related to class preparation, 15.4 per cent to advisement, and over 13 per cent to housing. Financial needs, orientation, and social relationships accounted for over one fifth of the comments made. The comments of the above will be presented in the following sections: Improvement of instruction, Class preparation, Advisement, Housing, Financial needs, Orientation, and Social relationships.

Improvement of instruction.--The largest number of comments made by students concerned the improvement of

instruction. The comments were as follows:

"Limit size of class, so that students can discuss problems in class."

"Some professors are lousy lecturers, and little can be learned in a class with this kind of instructor."

"Eliminate 'grading on the curve' in small classes. This is a stupid and unfair way of grading. An improved grading system, generally, would be of considerable benefit to all concerned."

"There should be less concentrated and more thorough study courses."

"Instructors could have better teaching ability, and possibly fewer degrees."

"Class time should be utilized more effectively."

"The college should cooperate more with fellows who have to have extra jobs, by arranging more convenient class hours."

"There should be classes in how to study effectively and on how to take notes."

"Class size should be limited."

"There should be more beginning math classes."

"More cooperation from the mechanical drawing teacher."

"Get instructors that can lecture, and do not read things out of a book."

"I'd like a class in how to take notes and use the library."

"I sure don't understand the grading system used here."

"One prof talks about everything except the subject we're supposed to be studying."

"Teachers won't take time to explain things."

"I have one professor who won't answer a

question in class unless it is on his lecture notes."

"I can't keep up in class."

Class preparation.--Over 15 per cent of the comments offered by the non-high-school-graduates pertained to class preparation. The comments were as follows:

"I want to become a civil engineer, yet I find mathematics distasteful."

"I find it difficult to finish my assignments in time at night to get any sleep."

"If it weren't for my wife's help I would never get my assignments completed."

"I never finish all my assignments."

"I dislike studying on Saturdays and Sundays."

"I can't seem to get into the study groove again."

"I feel that my study habits have improved over what they were when I first entered college."

"It seems like I should be able to use my time more effectively."

Advisement.--Approximately 15 per cent of the total comments made by students related to advisement. The comments were chiefly concerned with a need for advisement concerning course selection. The comments were as follows:

"There should be better counseling about courses."

"I sure needed advice on what courses to take."

"I'm not sure I want to become a civil engineer. I wish I could find out my real interests."

"I can never find my advisor."

"I felt that my advisor tried to get me to take engineering because that was in his department."

"I didn't know you could receive vocational guidance at this college."

"The counseling I received when I took the GED tests helped me a lot."

"How can I find out if I'm taking the right courses?"

Housing.---Most of the comments made by the students concerning housing facilities concerned present living quarters.

"The college should provide more places to live at the vet village."

"We've been promised a house. I hope it's soon."

"Isn't this a hell of a place to have to live."

"I suppose the college is doing the best it can with housing students."

"My wife got a job down-town because she couldn't stand to stay in this dump all day."

"I've been in worse places."

"We've been lucky in getting a decent place."

Financial.---Comments concerning finance were largely related to the inability of students to live on the government subsistence allowance.

"The VA allowance should be larger."

"I'd like to earn extra money, but my studies prevent that."

"It's a good thing my wife took a job."

"It would help if the cost of living would go down."

"\$90 a month isn't much for a couple to live on these days."

Orientation.--Comments concerning orientation were concerned largely with the problem or readjustment to school life.

"The college routine threw me for awhile."

"It's hard to readjust to school life after a lapse of 12 years."

"It takes a quarter of school to get used to the educational routine."

Social relationships.--Comments concerning social problems were mentioned least by the students.

"There should be more social life on the campus."

"I never had a chance to join any social clubs."

"Some fraternities and sororities look down their noses at you because of social standing-acceptance into these organizations should not be because of who you are, but what you are."

Table 20.--COMMENTS BY NON-HIGH-SCHOOL-GRADUATES CONCERNING THEIR PROBLEMS AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE, 1946-47.

Areas of comments	Number of comments	Per cent of total
Improvement of instruction	18	34.5
Class preparation	8	15.4

Table 20.--COMMENTS BY NON-HIGH-SCHOOL-GRADUATES CONCERN-
ING THEIR PROBLEMS AT COLORADO AGRICULTURAL AND
MECHANICAL COLLEGE, 1946-47.--Continued.

Areas of comments	Number of comments	Per cent of total
Advisement	8	15.4
Housing	7	13.5
Financial	5	9.6
Orientation	3	5.8
Social relationships	3	5.8

Totals	52	100.0

Chapter V

DISCUSSION

The problem of this study, What factors should be considered in predicting the success in college of non-high-school-graduates?, will be discussed under the following headings:

1. Previous education
2. Problems
3. College achievement
4. General Educational Development Test
5. College entrance examinations
6. Personal history data

Previous education

The school grades completed by the non-high-school-graduates ranged from Grades eight to 11½. Seventeen of the students completed Grade 11 or higher. Twenty-four of the students completed Grade 10 or higher.

The correlation between grade completed and first-quarter grade-point average was only -.138 for the group, which would seem to indicate that previous educational attainment alone is not a good predictor of first-quarter grade-point average of the non-high-school-graduates. It is significant that the three students

with the highest grade-point averages, 3.27, 3.25, and 3.23, were students who had completed Grade eight, Grade nine, and Grade eight, respectively.

An analysis of the reasons given by the students for leaving school showed that low scholarship was not a significant factor. Military service was the reason given by 13 students; seven left school to work; six left for financial reasons; two left because of a lack of interest; one left because no grade higher than Grade 10 was available; and one left because he was restless.

A comparison of the relationship between the first-quarter grade-point average of the students and the education completed by their parents showed that the correlation between achievement of the student and education completed by the father was $-.144$, and the correlation between the achievement of the student and education completed by the mother was $-.130$.

One possible explanation of this negative relationship is the desire of a parent with little education to see that his children obtain a good education.

It is significant that while nearly 27 per cent of the parents of the students in this study completed at least one year of college, the occupations of these parents were largely in the fields of agriculture, skilled labor, and unskilled labor. None of the professions was represented in the occupations of the parents.

It may be concluded with a fair degree of certainty that the educational attainment of parents is not a factor to be considered in predicting the first-quarter college grade-point average of the non-high-school-graduates. It may also be concluded that occupational status of parents has no relationship to first-quarter college achievement of the non-high-school-graduates.

The statement of the above findings agrees with Nemzek (34) that such variables as chronological age at entrance to school, amount of education of parents, occupational status, and related items have little value for purposes of the prediction of college success.

Thirteen students reported little or no participation in high-school extracurricular activities. Twenty-five students reported little or no participation in extracurricular activities while in college. It is significant that some students felt such participation would interfere with their academic study schedules.

It was stated by part of the students that they did not hold extra or part-time jobs because it might interfere with their study progress.

The group of students carried an average load of 12.9 academic hours, which is below the required 17.5 hours required per quarter to graduate in four years from this institution. In some cases individual students did not carry enough hours to receive the full financial benefits of the "G.I. Bill of Rights." Most of these

students stated that they were carrying light academic loads during the first quarter in order to determine if a heavier load could be carried during the succeeding quarters of school.

Prior (37) commented that the returning veteran's weakest educational point is likely to be in the grasp of fundamentals, mathematical facility, and loss of scholastic habits. It may be that these students realized their educational weaknesses and were trying to regain lost skills, improve present habits, and build up their self-confidence before undertaking the task of a full-time college course.

An analysis of the data has led the writer to conclude that the students as a whole were deeply concerned with the task of succeeding in college. There is no way to determine if members of this group were more sincere in this attitude than is the average college student, but it seems logical to conclude that on the basis of available evidence the primary motive of these students was to attain academic success in college.

The tenacity with which the students clung to their determination to succeed in college was noticeable even in those students whose first-quarter grade-point averages were well below the required standard. One explanation for this attitude has been advanced by Hadley (22) who stated that one very noticeable characteristic of the veteran was his confidence, even his faith, in

formal education as a means of acquiring vocational and personal fitness.

Five of the students were enrolled in General Science. These students were taking a general course in order to determine from exploratory courses in the curriculum what major courses would be suitable for them to take. Vocational counseling for these students before enrollment should be of value to them in helping them to select courses for which they are suited.

Problems

A comparison was made between the problems reported by the students in this study and the problems of a representative group of college men who were high-school graduates as reported by Hunter (25).

On two problems of academic education, "understanding class lectures," and "finding library references," the responses of the high-school graduates were significantly higher than those of the non-high-school-graduates.

There may be an explanation why these two problems are less significant for the non-high-school-graduates. The realization of the educational handicaps under which they work and knowing that they may have to put forth more effort than is required of the average college student may act as an incentive to make the non-high-school-graduate pay strict attention to class lectures.

The non-high-school-graduate with no knowledge of how to use the library finds himself studying under a serious handicap, so he may take the time during the first weeks of school to acquire a knowledge of how to use the library. This knowledge may do much to prevent problems involving future use of the library.

The problem mentioned most frequently by the non-high-school-graduates was "expressing knowledge in writing," and the least-mentioned problem was "expressing knowledge in recitation." One reason for the wide variance in these two problems may be that during the years when these students were not in school and were gaining their education through means other than formal schooling, they frequently expressed their knowledge and opinions orally, but seldom had occasion to do written work.

"Concentrating during study hours," and "getting satisfactory grades" were two problems in the area of academic education in which the responses of the non-high-school-graduates were significantly higher than those of the high-school graduates. The loss of study habits and skills which the students have experienced during the long interval in which they were not in school are apparently factors which operate to make it difficult for students to maintain the concentration necessary for regular study hours. That non-high-school-graduates are on probation from the time of their entry in school is a factor which increases the pressure on these students to maintain a

satisfactory grade-point average. Other students can fall below a 2.0 average for two quarters before being put on probation so that extra effort on their part to increase grades may not come until the third quarter of school.

On one problem in the area of general education, "selecting courses in line with vocation," the responses of the non-high-school-graduates were significantly higher than those of the high-school graduates. In the area of vocation, "choosing a vocation" was a major problem for the non-high-school-graduates. In an analysis of the above, it should be kept in mind that a majority of the non-high-school-graduates took advantage of the guidance services offered by this institution at the time they took the GED test, but these students indicated as many problems concerning vocational guidance as did those who had no guidance. It might be advantageous to furnish counselors at this college with information concerning the peculiar problems of the non-high-school-graduates so that the counseling which these students or others like them receive will be based in part, at least, on the premise that the vocational problems of non-high-school-graduates may be different from those of average college students.

These students should be encouraged to take their problems to counselors and to come back for aid when it is needed. Some of the students were unaware

of the fact that a vocational guidance center is located at this institution.

On one problem in the area of social adjustment, "speaking in public," the responses of the non-high-school-graduates were very significantly higher than those of the high-school graduates. In their comments, the students in this study have consistently revealed their feelings of academic inferiority to other college students. An analysis of these comments showed that this feeling of inferiority may have its highest expression in classes where the non-high-school-graduates compete against other students in public speaking. If this is true, the problem is not so much one of the inability to speak as it is a self-consciousness which inhibits good speech by the students.

It is significant that the students who had completed the least amount of education were the ones who experienced the greatest difficulty in learning to speak in public, yet, generally speaking, these same students were those with the highest first-quarter achievement.

It is significant that some students noted an improvement in their ability to speak in public after one quarter of actual experience in public speaking. This improvement may have been the result of an increased confidence brought about through successful public speaking.

On five problems in the area of emotion, "getting nervous easily," "having sleepless nights because of over active mind," "taking things too seriously," "fearing criticism," and "being upset when you have to recite," the responses of non-high-school-graduates were significantly higher than those of high-school graduates.

A study of these problems showed that possibly the emotional problems involved were not deep-seated ones, but rather ones caused by worry over such things as finances and success in college. It is significant to note that a number of students volunteered remarks concerning the fact that they felt their problems in the field of emotion were decreasing. They stated that better orientation to college life in the second quarter and evidence of their ability to succeed, as represented by satisfactory grades, were factors that caused some emotional problems to become minimized.

The problem area with the greatest number of responses, both for high-school graduates and for non-high-school-graduates, was finance. On one problem in this area, "getting enough money for sufficient wardrobe," the responses of the non-high-school-graduates were very significantly higher than those of the high-school graduates.

The fact that the majority of the non-high-school-graduates did not hold extra jobs and were living

largely on the subsistence furnished them through the "G.I. Bill of Rights" may be the factor that has caused the non-high-school-graduates to be in poorer financial circumstances than the average veteran student.

Items such as "getting enough money for social activities," "supporting wife and/or children," "desiring to start a home," and "buying and spending wisely" were major problems for both groups of students.

On one problem in the area of finance, "worrying about parental sacrifices," the responses of high-school graduates were significantly higher than those of non-high-school-graduates. Many in the group of high-school graduates were dependent on parental financial support while in school, whereas the group of non-high-school-graduates was all veterans who were taking advantage of the "G.I. Bill of Rights" to provide financial support while in college.

College achievement

The first-quarter college grade-point average of the non-high-school-graduates was below that of the student body average. The student body average for the fall quarter, 1946-47, was 2.359; for veterans it was 2.367; for non-veterans, 2.342; for men, 2.335; and for women, 2.384. The grade-point average for non-high-school-graduates was 1.940, which is below the 2.0 average required to remain in good standing at this institution.

Two thirds of the group made a grade-point average of 2.0 or better; four made a grade-point average of from 1.0 to 2.0; and six made less than a 1.0 grade-point average.

In terms of predicting college success, Segel (42) stated that the best criterion of future achievement is past performance. Freeman (19) stated that while many studies have investigated the prediction of college success in terms of one or two quarters, none has dealt with the problem of survival. Data concerning the achievement of the students will be discussed in relation to the criteria of past performance and of academic survival.

Such factors as age, war experience, change in attitudes, and lack of recent formal education can be discounted as causes for the low grade-point average for this group, because these factors were also evident in the other group of veterans, which had a higher grade-point average.

No conclusions can be accepted with a high degree of confidence concerning the competence of the group to pursue college courses on the basis of first-quarter grade-point average until the following questions have been answered:

1. Is there evidence to support the contention that because of difficulty in rapid orientation to college life, second and third quarter grade-point averages of non-high-school-

graduates will show a considerable improvement?

2. Will special help given by the college to solve the problems peculiar to this group aid in helping them to achieve better first-quarter grade-point averages?

3. Will stricter standards of college admission for non-high-school-graduates result in the elimination of those whose chances for college success are small?

General Educational Development Test

The total GED test scores were found to correlate .591 with first-quarter grade-point average of non-high-school-graduates. This is higher than the coefficients between grade-point average and any individual GED test. The GED test 2 (Social Science) was found to be the best individual GED test as a predictor of college achievement ($r=.485$). The lowest correlation obtained between grade-point average and any GED test was for Test 5 (Mathematical Ability) with a correlation of .218.

On the basis of the correlations found between various criteria and first-quarter grade-point average, the GED test is the best of the measures used in this study for predicting first-quarter college grade-point averages for non-high-school-graduates.

On the basis of this evidence, the GED test seems to be acceptable as a college entrance examination.

This was found to be true in other studies. Crawford-Burnham (8) reported that the correlation of the GED test with first-quarter college achievement of high-school graduates was .56, and that the GED test showed promise of being acceptable as an alternate for college entrance examinations in the verbal subjects. Dyer (12) reported that the GED test when combined with school rank provided a reasonably good predictor of academic success in college for high-school graduates.

While it seems feasible to use the GED test as an entrance examination for non-high-school-graduates, it may also be necessary to keep the students admitted in this manner in a special status until their ability to do college work is shown. The Committee on the Admission of Veterans (1) recommended that veterans be admitted to college by the GED test and then remain in a special status until 45 quarter hours of credit are completed.

One disadvantage in using the GED test as a college entrance examination is the fact that the usual time for administration is 10 hours. Further research is needed to determine what combination of variables including the GED test and college entrance examinations provides the best and most economical battery of entrance tests for non-high-school-graduates.

The present basis on which a non-high-school-graduate is admitted to this institution is the attainment of a standard score of 35 or better on each GED test

or an average standard score of 45 on the five tests which make up the total GED test. These students are on probation until their ability to do college work has been established.

The findings regarding the GED test are tentative because of the smallness of the sample but do suggest the following:

1. The GED test is the best predictor of the measures used in this study for determining first-quarter grade-point average of the non-high-school-graduates.

2. The GED test 2 (Social Studies) is the best individual GED test for predicting the first-quarter grade-point average of the non-high-school-graduates.

3. Further studies need to be made in determining the best battery of tests for predicting the first-quarter grade-point average of non-high-school-graduates.

College entrance examinations

The entrance examinations used at this institution correlated lower than the GED test with the first-quarter grade-point average of the non-high-school-graduates in this study. In comparison with the GED test which correlated .591 with the college achievement of the students, the correlation of the A.C.E. test was .354; of

the English test, .423; of the Chemistry test, -.027; and of the Reading test, .464.

A study made by Gould (21) at Colorado State College in 1944 showed the predictive values of certain entrance examinations with an entire freshman class. The examinations showed the following correlations with first-term grade-point average: the A.C.E. test had a correlation of .634; the Chemistry test correlation was .589; and the English test correlation was .559.

A comparison of these results showed that the A.C.E. test, the Chemistry test, and the English test did not predict college first-term grade-point average as well for non-high-school-graduates as they did for high-school graduates. The greatest variance occurred on the Chemistry test where Gould (21) obtained a relationship of .589, and the results of this study showed a correlation of -.027. This difference may be due to differences in high-school training between the students in this study and the students in the study made by Gould (21), or it may be due to the wide disparity between the educational backgrounds of non-high-school-graduates and high-school graduates.

In the determination of the best examinations to be used for general predictive purposes, authorities have stated that there may be several criteria to be used in predicting college academic achievement. Edds and McCall (14) reported that intelligence correlated

with first-semester college success .502 and that English ability correlated .443.

Williamson (45) stated that the correlation of test scores with scholarship is not a stable factor in prediction. Factors which may cause a decreasing correlation in this way are changes in educational and personnel practices, better adjustment of students, and the low reliability of college grades.

Feder (18) concluded that the function of prediction in education is not to achieve rigid determinism but to facilitate guidance. Mills (32) stated that because of the many variables involved, much research needs to be done in the field of prediction of college success.

Kasley (13) stated that correlations of from .40 to .50 are not sufficiently high to be of prognostic value.

It seems evident, then, that ways must be found of using entrance examinations in such a way that higher correlations with grade-point average can be found. Further research in the field of prediction of college success must find more efficient combinations of variables to be used in predicting the college success of non-high-school-graduates.

Personal history data

The ages of the members of the group ranged from 19.7 years to 34.6 years. The mean age of the group

was 25.1 years. A significant relationship was found between age and first-quarter grade-point average ($r=.414$). Before any conclusions can be made regarding the significance of this correlation, a study should be made to determine if a significant correlation also exists among other representative college groups. An evaluation should be made of the possible reasons for its existence if such a correlation does exist. Further study will reveal if age can be considered a stable factor in the prediction of college success.

It is difficult to determine the influence of race in determining predictive factors, because only two of the 30 students were not of the white race. One was Negro and one was Spanish-American. Both of these students dropped out of college after the completion of one quarter of work. The GED score for the Negro was 52, which was near the mean score for the group. Although this would indicate that his chances of success were fair, his first-quarter grade-point average was 1.38. The GED score of the Spanish-American was 38, which was the lowest GED score of the group, and his first-quarter grade-point average was 0.0. On the basis of the limited sample, it seems that no valid conclusions can be made concerning race as a factor in prediction.

Fifty per cent of the group stated that further work in high school would have aided them in their college work. Four students were not sure if more work completed

in high school would have been of benefit to them in their college work.

Only three of the students stated that they thought they were entitled to special help in college because of their lack of high-school education, yet a large majority of the students were highly critical of the methods of instruction used in college. This apparent disparity in statements by the students may be explained in view of the fact that throughout this study the students have shown evidence of feelings of inferiority regarding their educational achievement. Because of this reluctance on their part to accept special help of any kind, it may be necessary to administer special help to the students in such a manner that they are unaware of their having received more aid than the average college student has received.

Chemistry and mathematics were named as the most difficult subjects by most of the students. In order to determine if these characteristics are primarily those of non-high-school-graduates or are those of students in general, a study should be made of this problem.

Summary

On the basis of available evidence, the following conclusions can be made:

1. There was little or no correlation between

previous educational attainment and first-quarter grade-point average of the non-high-school-graduates.

2. There was a low negative correlation between educational attainment of each parent and college first-quarter grade-point average of the non-high-school-graduates.

3. The problems of non-high-school-graduates which were more significant than those of the high-school graduates concerned study habits, course selection, vocational choice, time for and choice of activities, nervousness, public speaking, money for clothing, and money for social activities.

4. The college achievement of the non-high-school-graduates was below that of the average of the student body.

5. Of all measures used in this study, the GED test was the best single predictor of first-quarter grade-point average of the non-high-school-graduates.

6. On the basis of comparison with the entrance examinations used at this institution, the GED test seems to be acceptable for use as an entrance examination for non-high-school-graduates at this college.

7. The college entrance examinations used at this institution do not predict first-

quarter grade-point average for the non-high-school-graduates as well as does the GED test.

8. Age is an item in personal history data which has a significant relationship with the success in college of the non-high-school-graduates.

9. Because of the smallness of the sample, no conclusions can be reached regarding race as a factor to be considered in predicting the success in college of the non-high-school-graduates.

10. A feeling of inferiority concerning educational deficiencies on the part of the non-high-school-graduates may make it difficult for the college to give these students the extra assistance that they need in order to succeed in college.

Recommendations

1. On the basis of the results of this study, it seems evident that non-high-school-graduates need assistance from the college in order to succeed. This help should be given on an individual basis and should consider for each non-high-school-graduate the factors which are significant in each particular case concerning his chances for success in college.

2. In the determination of entrance standards for non-high-school-graduates, more tests than the GED test alone should be considered. A battery of entrance tests should be devised for use with these students and, in addition, all factors which seem significant in predicting their success in college should be considered.

Suggestions for
further study

Future studies should seek answers to the following questions:

1. Is first-quarter grade-point average of non-high-school-graduates a good predictor of future academic survival?

2. Are the factors which were found to be significant in predicting the first-quarter grade-point average of the non-high-school-graduates also of value for use in predicting the academic survival of the non-high-school-graduates?

3. What is the most economical combination of variables to use at this college as an entrance examination battery for non-high-school-graduates?

4. What relationship does previous chemistry training have on the predictive value of the Iowa Chemistry Aptitude test?

Chapter VI

SUMMARY

In order to provide data concerning the selection of factors to be used in predicting the success of non-high-school-graduates in college, an investigation was made of 30 non-high-school-graduates who were enrolled at Colorado Agricultural and Mechanical College during the fall and winter quarters of the 1946-47 school year.

The data were obtained by the use of three methods. They were as follows:

1. An analysis of the records of the college registrar and the college testing bureau to obtain data relative to the college achievement and test scores of non-high-school-graduates.
2. The administration of a questionnaire to the 30 non-high-school-graduates to obtain information pertaining to their educational backgrounds, military service, occupations held, interests, and personal history.
3. The administration of the Personal Interview Form constructed by Hunter (25) to the 30 non-high-school-graduates to obtain

data concerning their problems.

Summary of
findings

1. There was a low negative correlation between previous educational attainment and first-quarter grade-point average of the non-high-school-graduates.

2. There was a low negative relationship between educational attainment of each parent of the non-high-school-graduates and the first-quarter college achievement of the students.

3. The problems of non-high-school-graduates which were more significant than those of the high-school graduates concerned study habits, course selection, vocational choice, time for and choice of activities, nervousness, public speaking, money for clothing, and money for social activities.

4. The problems of high-school graduates which were more significant than those of non-high-school-graduates concerned understanding of class lectures, use of the library, and parental sacrifices.

5. The first-quarter grade-point average of the non-high-school-graduates was 1.940, which was below the student body average of 2.359.

6. Of all measures used in this study, the GED test was the best single predictor of first-quarter grade-point average of the non-high-school-graduates.

7. On the basis of comparison with the entrance examinations used at this institution, the GED test seems to be acceptable for use as an entrance examination for non-high-school-graduates at this college.

8. The college entrance examinations used at this institution do not predict first-quarter grade-point average for the non-high-school-graduates as well as does the GED test.

9. Age is an item in personal history data which has a significant relationship with the success in college of the non-high-school-graduates.

10. Because of the smallness of the sample, no conclusions can be reached regarding race as a factor to be considered in predicting the success in college of the non-high-school-graduates.

11. A feeling of inferiority concerning educational deficiencies on the part of the non-high-school-graduates makes it necessary for the college to give these students more assistance than high-school graduates receive.

Recommendations

1. On the basis of the results of this study, it seems evident that non-high-school-graduates need assistance from the college in order to succeed. This help should be given on an individual basis and should consider for each student the factors which are significant in each particular case concerning his chances for success in college.

2. In the determination of entrance standards for non-high-school-graduates, more tests than the GED test alone should be considered. A battery of entrance tests should be devised for use with these students and, in addition, all factors which seem significant in predicting their success in college should be considered.

Suggestions for further study

Future studies should seek answers to the following questions:

1. Is first-quarter grade-point average of non-high-school-graduates a good predictor of future academic survival?

2. Are the factors which were found to be significant in predicting the first-quarter grade-point average of the non-high-school-

graduates also of value for use in predicting the academic survival of the non-high-school-graduates?

3. What is the most economical combination of variables to use at this college as an entrance examination battery for non-high-school-graduates?

4. What relationship does previous chemistry training have on the predictive value of the Iowa Chemistry Aptitude Test?

A P P E N D I X

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Appendix A.--SAMPLE OF FORM OF
QUESTIONNAIRE "PERSONAL
INTERVIEW FORM" FROM HUNTER

PERSONAL INTERVIEW FORM

117

Department _____ Major _____ Year _____ Age _____ Race _____ Sex _____

Years of Service _____ Self-supporting _____ Amount of Assistance _____

Marital Status _____ Children _____ Hours per Week of Outside Work _____

Problem Areas	Sources of Help	Student Reactions
---------------	-----------------	-------------------

I. Do you have trouble:

1. Studying effectively.....
2. Worrying excessively about examinations.....
3. Outlining or taking notes.....
4. Concentrating in class.....
5. Concentrating during study hours.....
6. Expressing knowledge in writing.....
7. Expressing knowledge in recitation.....
8. Finding library references.....
9. Getting satisfactory grades.....
10. Understanding class lectures.....
11. Carrying out laboratory procedures.....
12. Feeling at ease with professors.....
- 13.
- 14.

II. Do you have trouble:

1. Selecting courses in line with vocation.....
2. Scheduling too many units.....
3. Budgeting study time.....
4. Getting conferences with professors.....
5. Understanding methods of grading.....
6. Planning extra curricular activities not to interfere with academic school life.....
7. Scheduling outside work not to interfere with studying.....
- 8.
- 9.

III. Do you find you have a problem:

1. Choosing a vocation.....
2. Getting vocational information.....
3. Being satisfied with your vocation.....
4. Evaluating suitability for your vocation....
5. Concerning the future of vocation.....
6. Finding no interest in any vocation.....
7. Locating prospective employment.....
8. Deciding upon prospective employment.....
- 9.
- 10.

Personal Interview Form Cont'd-

Problem Areas	Sources of Help	Student Reactions
---------------	--------------------	----------------------

IV. Have you experienced difficulty:

- | | | |
|--|-------|-------|
| 1. Conversing with people..... | _____ | _____ |
| 2. Being ill at ease at social affairs..... | _____ | _____ |
| 3. Being accepted into social groups..... | _____ | _____ |
| 4. Wishing for more social contacts..... | _____ | _____ |
| 5. Wishing for fewer social contacts..... | _____ | _____ |
| 6. Being self-conscious..... | _____ | _____ |
| 7. Speaking in public..... | _____ | _____ |
| 8. Making friends easily..... | _____ | _____ |
| 9. Making friendly contacts with opposite sex.... | _____ | _____ |
| 10. Finding time for shows, sports, and radio..... | _____ | _____ |
| 11. Selecting activities in line with interests... | _____ | _____ |
| 12. Wishing for more contacts with town people.... | _____ | _____ |
| 13. Fitting into pattern of college life..... | _____ | _____ |
| 14. Knowing proper etiquette for social functions. | _____ | _____ |
| 15. | _____ | _____ |
| 16. | _____ | _____ |

V. Do you find you are:

- | | | |
|--|-------|-------|
| 1. Taking things too seriously..... | _____ | _____ |
| 2. Fearing you will make social mistakes..... | _____ | _____ |
| 3. Having the blues often..... | _____ | _____ |
| 4. Getting nervous easily..... | _____ | _____ |
| 5. Being discouraged easily..... | _____ | _____ |
| 6. Lacking in self-confidence..... | _____ | _____ |
| 7. Fearing criticism..... | _____ | _____ |
| 8. Being hurt easily..... | _____ | _____ |
| 9. Wanting to confide in someone..... | _____ | _____ |
| 10. Wanting religious advice..... | _____ | _____ |
| 11. Fearing lack of success in life..... | _____ | _____ |
| 12. Lacking in leadership ability or opportunity.. | _____ | _____ |
| 13. Wanting a more pleasing personality..... | _____ | _____ |
| 14. Being upset when you have to recite..... | _____ | _____ |
| 15. Dreading to introduce folks at a party..... | _____ | _____ |
| 16. Having sleepless nights because of over
active mind..... | _____ | _____ |
| 17. Worrying about what to wear..... | _____ | _____ |
| 18. Having difficulty accepting regulations of
the college..... | _____ | _____ |
| 19. Worrying about national or world-wide problems | _____ | _____ |
| 20. | _____ | _____ |
| 21. | _____ | _____ |

Personal Interview Form Cont'd =

Problem Areas	Sources of Help	Student Reactions
VI. Have you had difficulty because of:		
1. Financial obligation to family.....	_____	_____
2. Family dominance in choice of vocation.....	_____	_____
3. Family unable to live together because of finances.....	_____	_____
4. Family unable to live together because of lack of accommodations.....	_____	_____
5. Family living quarters unsatisfactory.....	_____	_____
6. Family living quarters provide no suitable place to study.....	_____	_____
7. Family inequality in educational background....	_____	_____
8.	_____	_____
9.	_____	_____

VII. Have you had health problems such as:

1. Lacking rest and sleep.....	_____	_____
2. Lacking variety and nutrition in meals.....	_____	_____
3. Intermittent illness causing absence from classes.....	_____	_____
4. Worrying continually about health.....	_____	_____
5. Having poor complexion.....	_____	_____
6. Having indigestion.....	_____	_____
7. Becoming tired easily.....	_____	_____
8. Being nervous over trifles.....	_____	_____
9. Limiting physical handicaps.....	_____	_____
10.	_____	_____
11.	_____	_____

VIII. Do you find you have a problem:

1. Getting enough money for college fees.....	_____	_____
2. Getting enough money for social activities.....	_____	_____
3. Getting enough money for sufficient wardrobe....	_____	_____
4. Buying and spending wisely.....	_____	_____
5. Worrying about parental sacrifices.....	_____	_____
6. Supporting wife and/or children.....	_____	_____
7. Desiring to start a home.....	_____	_____
8.	_____	_____
9.	_____	_____

Suggestions to remedy the problems you have stated:

Appendix B.--SAMPLE OF FORM "DIRECTIONS
FOR ADMINISTERING THE PERSONAL
INTERVIEW FORM" FROM HUNTER

DIRECTIONS FOR ADMINISTERING
THE PERSONAL INTERVIEW FORMS

We are making an investigation of the problems students have encountered since the first quarter which began last October. We are interested in the difficulties, large and small, that have perplexed the students and we hope, through the results of this investigation, to arrive at definite suggestions which may help solve some of your problems. The results of this study are to be used in a Master's Thesis.

Investigations have shown that under normal circumstances the average college student has problems confronting him. This study is to determine what the particular problems are on this campus.

You are one of the 200 students chosen at random from the Student Directory to participate in this investigation. I should like to find out what problems you have experienced since last October. Your name will not appear on this interview form nor will your name be used in any way. A straight forward response to inquiries and statements of your problems will be of great benefit to the outcome of this investigation. If there is any hesitancy about giving your true response, to any item, it is better that you do not answer it at all.

Here is one of the forms for you to examine as I fill in the blanks and make note of your problems.

Appendix C.--SAMPLE OF FORM OF QUESTIONNAIRE
"PERSONAL HISTORY DATA"

The following information is to be used in a study of non-high-school- graduates at Colorado A&M College. **123**

All information gathered is to be considered strictly confidential.

The study will use no names.

It is hoped that such a study will provide a basis for the college to be of assistance in helping to solve the problems of students on the campus.

Name

C Number

Home address (Town, state)

Present address

Phone

Date entered active service

Date of discharge

Rank

Branch of service

Race

Date of birth

Place of birth (City, state)

Married yes ___ no ___

No. of dependents (include wife)

Father's occupation

Mother's occupation

No. of years of school completed by father: (circle)

1 2 3 4 5 6 7 8 9 10 11 12 College 1 2 3 4 5 6

No. of years of school completed by mother: (circle)

1 2 3 4 5 6 7 8 9 10 11 12 College 1 2 3 4 5 6

Name of high school attended by you

Grade completed: (circle) 7 $7\frac{1}{2}$ 8 $8\frac{1}{2}$ 9 $9\frac{1}{2}$ 10 $10\frac{1}{2}$ 11 $11\frac{1}{2}$

Reason for leaving school

Extra-curricular activities in high school

Extra-curricular activities in collrge

Do you have any hobbies?

What kind of books or magazines do you enjoy reading?

Do you participate in any sports?

Do you enjoy movies?

Dancing?

Social clubs?

What kinds of jobs have you held?

Which have you liked best?

Do you have an extra job now?

How much does it pay you a month?

Do you own a car?

Do you own your home?

Present major in college is _____

What do you intend to do after finishing college?

Do you feel that you might be doing better work in college today if you had finished high school?

Which courses have you found most difficult in college?

Which courses have you found easiest in college?

Do you feel, that as a non-high-school-graduate in college you should receive special help with your studies?

Have you any suggestions to make as to how the college can help you to better advantage, both with your study problems and with other problems?

Appendix D.--MASTER DATA SHEETS

Responses of 30 non-high-school-graduates
at Colorado Agricultural and Mechanical
College to "Personal Interview Form"

RESPONSES OF 30 NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL
AND MECHANICAL COLLEGE TO PERSONAL INTERVIEW FORM

I												II												III												IV												V												VI												VII												VIII												IX												X												XI												XII												XIII												XIV												XV												XVI												XVII												XVIII												XIX												XX												XXI												XXII												XXIII												XXIV												XXV												XXVI												XXVII												XXVIII												XXIX												XXX												XXXI												XXXII												XXXIII												XXXIV												XXXV												XXXVI												XXXVII												XXXVIII												XXXIX												XXXX												XXXXI												XXXXII												XXXXIII												XXXXIV												XXXXV												XXXXVI												XXXXVII												XXXXVIII												XXXXIX												XXXXX												XXXXXI												XXXXXII												XXXXXIII												XXXXXIV												XXXXXV												XXXXXVI												XXXXXVII												XXXXXVIII												XXXXXIX												XXXXXX												XXXXXXI												XXXXXXII												XXXXXXIII												XXXXXXIV												XXXXXXV												XXXXXXVI												XXXXXXVII												XXXXXXVIII												XXXXXXIX												XXXXXXX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXXXXXIX												XXXXXXXI												XXXXXXXII												XXXXXXXIII												XXXXXXXIV												XXXXXXXV												XXXXXXXVI												XXXXXXXVII												XXXXXXXVIII												XXXX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Responses of 58 veteran students at
Colorado Agricultural and Mechanical
College to "Personal Interview Form"
Hunter p. 184

[illegible]

Master data sheet

MASTER DATA SHEET FOR 30 NON-HIGH-SCHOOL-GRADUATES AT COLORADO AGRICULTURAL AND MECHANICAL COLLEGE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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HORIZONTAL NUMBERS

- ```

1 GRADE POINT AVERAGE
2 ACS RAW SCORE
3 ENGLISH RAW SCORE
4 READING RAW SCORE
5 CHEMISTRY RAW SCORE
6 QED TEST NO 1 STANDARD SCORE
7 QED TEST NO 2 STANDARD SCORE
8 QED TEST NO 3 STANDARD SCORE
9 QED TEST NO 4 STANDARD SCORE
10 QED TEST NO 5 STANDARD SCORE
11 QED TEST TOTAL STANDARD SCORE
12 ROADS CARRIED
13 AGE IN MONTHS
14 GRADE COMPLETED
15 FATHER'S SCHOOLING
16 MOTHER'S SCHOOLING
17 MONTHS IN SERVICE
18 MARRIED
19 DEPENDENTS
20 OWNS CAR
21 OWNS HOME
22 RACE
23 ANY HOBBIES?
24 ENJOY SOCIAL ACTIVITIES?
25 EXTRA JOB?
26 EXTRA MONEY PER MONTH
27 BETTER COLLEGE WORK IF HIGH SCHOOL HAD BEEN COMPLETED?
28 SHOULD YOU HAVE RECEIVED SPECIAL HELP IN COLLEGE?
29 EXTRA-CURRICULAR ACTIVITIES IN HIGH SCHOOL?
30 EXTRA-CURRICULAR ACTIVITIES IN COLLEGE?
31 BEST-LIKED JOB
32 MOST DIFFICULT COLLEGE COURSE
33 EASIEST COLLEGE COURSE
34 COLLEGE MAJOR
35 BIRTHPLACE
36 FATHER'S OCCUPATION
37 REASON FOR LEAVING SCHOOL
38 BRANCH OF SERVICE
39 RANK

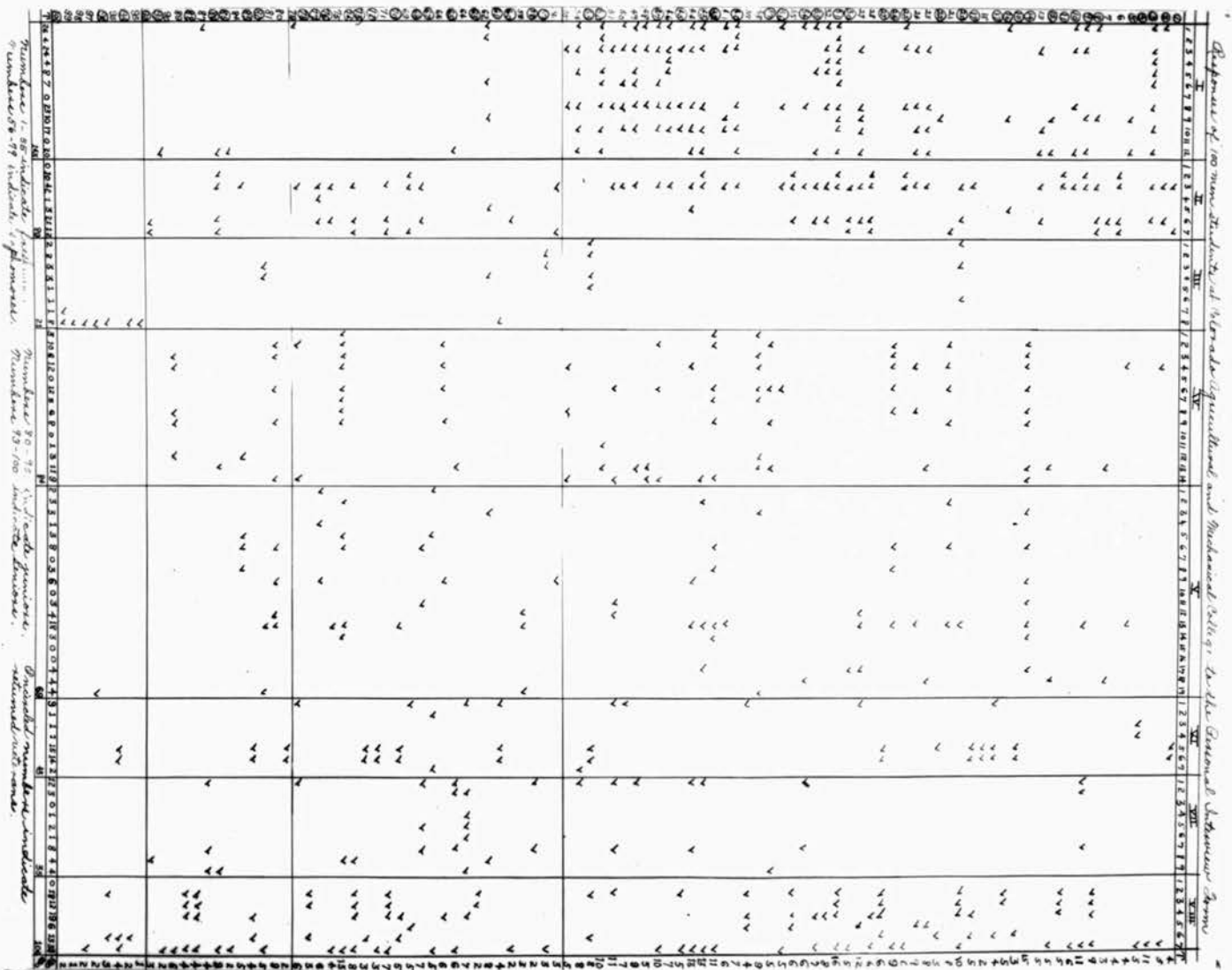
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### VERTICAL NUMBERS

- |      |            |
|------|------------|
| 1-30 | STUDENTS   |
| 31   | YES TOTALS |
| 32   | NO TOTALS  |
| 33   | AVERAGE    |



Responses of 100 men students at  
Colorado Agricultural and  
Mechanical College to the  
"Personal Interview Form"



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