

FACTORS IN THE HIGH SCHOOL CURRICULUM PERTAINING
TO SUCCESS IN THE FRESHMAN YEAR AT
HARDING COLLEGE

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CHAPTER I

INTRODUCTION

Institutions of higher learning are faced with the problem of success of the ever-increasing hordes of entering students. This increase in number of freshman students has forced our higher education facilities to operate at near capacity. Selectivity of students capable of achieving success has become a problem of prime importance.

Over the past two decades researchers have developed a variety of methods of predicting the success of freshmen students. The burden of future achievement of the graduates of secondary schools has been borne by the institutions of higher education. In the mind of this researcher, a more desirable approach would place more emphasis upon the role of the secondary school in the prediction of success of their graduates in college. This study was undertaken in hopes that information obtained will enable this end to become a reality.

Research in the past has indicated the area of the high school curriculum as a source of information that would be of some use in predicting college success. If such information could be used in order to identify meaningfully applicants capable of success in their college experiences, it would be extremely valuable to college admissions officials.

McCormick and Asher (40) in a recent study related success of college freshmen to their high school records. They indicated at this

time the desirability of more study in the area of high school preparation.

The selection of a high school curriculum that would be efficient in preparing students for successful completion of college studies is another problem facing professional educators today. Historical evidence indicates the wide changes that have occurred in the curricula of high schools since the beginning of the 20th century. Along with the expansion of course offerings, an observable change in the philosophy of education and in society has occurred. During the early phases of the changing curriculum criteria for evaluation of the changes included the need for the change, the practical aspects of the courses and the interest of the student in the courses involved. These factors were considered important in helping the individual to adapt to his niche in a democratic society.

James R. Spence (54) writing about the changes occurring in the curriculum of the modern secondary school felt that most of the changes were focused upon the curriculum of the college-bound student. The attrition among the admitted and supposedly qualified students is a major area of criticism of institutions of higher learning. Spence indicates that the devices for predicting success of the admitted students have become more sophisticated.

The part played by the high school curriculum in preparing students for college was emphasized in a statement by Dr. James B. Conant (10). He believes that the academically talented youth should select a full program of solid courses in high school. Conant feels that in the United States today it is impossible to relate specific courses of a high school curriculum to the subsequent work of a student in college

unless the collegiate work is defined in very specific terms.

Conant suggests that even in institutions with highly selective admissions policies it would be possible for a bright boy to complete with honors his college studies, even though he entered with little knowledge of science, mathematics, or a foreign language. If he majors in English Literature, for instance, the only possible high school courses considered to be direct preparation would be those in English. The wide variety of possible courses open to the undergraduate in college renders the concept of specific preparation in high school for college work an almost untenable position.

Colleges and universities, during the period of curriculum change in the secondary school, were modifying their entrance requirements to enable them to accept more high school graduates. At the time, high schools began increasing their requirements of a more rigid and fixed college-preparatory curriculum. In actuality, colleges relaxed their entrance requirements while high schools were tightening their requirements for graduation (42). This seemingly paradoxical situation indicates the need for study in this area.

Evolution of the college-preparatory curriculum was brought about by the desire to help the student succeed in his college career. Implied by the term "college-preparatory curriculum" is the ability to successfully complete a course of study in college. The subject matter included in such a course of study may be ideal and useful for some students. On the other hand, some students may feel the need for an entirely different subject matter approach.

The college-preparatory curriculum affords little opportunity for the student to select a course of study based upon his actual interests.

He is guided into a fixed pattern of curriculum experiences that may conflict with his aptitude and interests. It is conceivable that he may at this time pursue a course of study that will jeopardize his interest in further education. The underachievement of many high school students may be due to the pursuit of to them an impractical and meaningless course of study.

In the college-preparatory curriculum the so-called academic subjects have occupied a favored position. Even with great emphasis on academics in high school, there is still a high rate of attrition among college freshmen. The feeling of this writer is that the role of the non-academic subjects in college success may have been overlooked. In the course of this study the area of non-academic subjects will be examined for some indication of their effect upon college success.

Nature of the Problem

During the past 50 years colleges have tended to lessen their specific requirements for entrance. Mumms (42) states that requirements in terms of high school units or credits have become more flexible. An increasing number of colleges no longer require a fixed pattern of high school credits, or the colleges are willing to make exceptions to the required lists of courses.

Studies made by Thorndike, Gates, and others (57) have shown that no one high school subject has special merit in preparing a student for entrance into college.

Evidence that colleges are no longer requiring rigid high school curriculum experiences for admission was presented by Harriger (25). He stated that the applicants general level of scholarship, character,

and academic potential is fast becoming a more acceptable factor for his admission to college.

High schools have apparently succumbed to tradition in the matter of curriculum offerings. They depart sharply from the requirements of most colleges in the amount of work required in college-preparatory subjects. Significantly more mathematics and science are required by high schools than is required for admission by most institutions of higher learning. Nearly one-half of the high schools require three to four units of each of these subjects for graduation, while only two percent of the colleges require as much for admission (42).

The specific problem under investigation in this study was to determine the effects of high school curriculum experiences upon college success in the freshman year of study at Harding College. Hopefully this study will give indications that may prove useful in improving the educational processes and provide a background for increasing efficiency in preparing students for higher education.

The intense competition for acceptance to college, coupled with the climbing costs of education, makes it imperative that educators intelligently guide secondary school students. A primary function of the study was to look for indications of the role played by high school curriculum experiences in the prediction of college success.

Delimitation of the Study

An assumption was made that to offset, to some extent at least, variations in course content and teacher differences in high schools, a restriction of the population of the study was necessary.

This study is limited to those regular full-time students at

Harding College whose transcripts of high school work are on file in the Registrar's office. A further delimitation of the study was made by limiting the population under study to the students making between 20 and 25 on the ACT composite score.

Only those students completing two full semesters of college work were included in the study. No attempt was made to analyze the drop-outs from the freshmen classes. No basis for comparison of foreign students curriculum experiences was found and they are not included in the study.

The population of the study includes the freshmen classes of 1964, 1965, and 1966. The total number of students in the three classes of 1557. The total broken down by years is as follows:

1964	391 students
1965	526 students
1966	640 students

It is apparent that the findings of this study will be applicable to a specific group of students at Harding College. Perhaps the implications of the study will allow generalizations of significance to other groups and other institutions of higher learning. While application of the findings of the study are limited, it is hoped that new avenues for approaching the problem of predicting college success may be suggested.

Harding College - The Institution Whose Students were Included in This Study

Because of the nature of the college at which the study was made, it was felt that some explanation of the college philosophy and its

students would be in order.

Harding College is a Christian institution of higher learning. It seeks to assist its students build a philosophy of life consistent with Christian ideals and to develop skills and abilities necessary for living a useful and happy life (24).

Harding College is fully accredited by the North Central Association of Colleges and Secondary Schools for all work leading to the Bachelor of Arts and Bachelor of Science degrees and to the Master of Arts in Teaching degree. Its undergraduate teacher-education program for preparing both elementary and secondary teachers is accredited by the National Council for Accreditation of Teacher Education. It also is a member of the American Council on Education, the American Association of Colleges for Teacher Education, and the National Commission on Accrediting (not an accrediting agency). The college is an affiliate member of the American Society for Engineering Education. Harding College is approved for training vocational home economics teachers and has a strong pre-professional program in various fields of the medical sciences.

Since Harding College is a Christian institution with deep religious ties, it differs from the tax-supported institutions with which most people are familiar. Faculty and students are drawn closer together by a common religious bond. The close spiritual ties within the college probably have an influence upon student achievement.

Many students have prepared themselves from an early age to attend this particular institution of higher learning. The student body is made up to a large extent of members of the Church of Christ.

The student body is diverse in that students from every state in

the nation and several foreign countries attend the college. These students represent both large and small high schools and provide a group with a diversified curriculum background.

The college population may be more homogenous than that of other colleges due to its religious nature. No attempt was made to validate this assumption, however.

Purpose of the Study

The purpose of the study is to examine the curriculum experiences in high school for factors that may be influential in determining college success.

A big problem confronting professional educators for many years has been the determination of the richness and concomitant learning in various high school courses. People from all walks of life have vigorously expressed their opinions on the solution of this problem. Self-styled critics of American education plus experts in the field have presented conclusions about the answers to our problems in education. There has been little or no agreement upon the actual contribution of the curriculum to achievement of educational goals of the high schools.

Studies, both old and new, tend to emphasize the variance of opinions among educators. Often the conclusions drawn are diametrically opposed. Such diversity in conclusions about the role of curriculum experiences in high school in determining college success indicate the necessity of continued study of the problem. If the study undertaken in this research indicates that certain high school curriculum experiences are not significant to college success, perhaps a new and closer look will be taken of the non-college-preparatory curriculum.

Hypotheses to be Tested

The following hypothesis stated in the null form was tested: H_0 : There is no significant difference in the college success of those students having 75 percent or more of their high school work in college-preparatory curriculum subjects and those students having a smaller percentage of college-preparatory work in high school.

The alternative hypothesis tested is as follows: There is a significant difference in the college success of those students having 75 percent or more of their high school work in college-preparatory curriculum subjects and those students having a smaller percentage of college-preparatory work in high school.

The level of significance upon which to base the decision to reject or fail to reject the null hypothesis was set at the .05 level of confidence.

CHAPTER II

REVIEW OF THE LITERATURE

At no time in educational history has so much concern been expressed about the quantity and quality of students entering college. The questions, "Who should go to college?" and "Where shall they go?", have become matters of wide concern and interest to all.

The wide selection of literature connected with studies in the field of prediction of college success makes it very difficult to assess the really significant contributions. The results obtained by the various researchers are often contradictory which makes it difficult to generalize the overall conclusions of the studies. It is possible, however, to group the studies under similar research patterns.

Basically the design of the literature survey consists of three types of studies in the area of prediction of college success. These types are as follows:

1. General literature pertaining to college success
2. Literature pertaining to the college-preparatory curriculum for high schools
3. Literature pertaining to the non-college-preparatory curriculum for high schools

General Literature Pertaining to College Success

McCormick and Asher (40) in a recent study of the problem of

predicting college success pointed to the need for a valid prediction instrument. They felt that a common tool useful to both the high school counselor and the college admissions official is needed to enable them to do their job properly. Parents and students need to know as accurately as possible the probabilities of the student doing successful college work.

The best predictor of college grades, according to Wilson (64), has been found to be the high school percentile rank of the student. Second to this, he suggests the Ohio State Psychological Examination. The Ohio Examination for College Freshmen was used in the study also but proved to be less accurate than the other methods used.

J. B. Stevenson (56) brings up an interesting thought in reference to the marginal student. In the study conducted in 1965 he outlines the plight of the underachiever in high school. The idea expressed in the study involves the student who will graduate from high school if he is lucky. His record is poor, and his counselor and parents have pointed out that he will probably fail to achieve in college. Stevenson feels that the student has a chance to succeed in college if he gains faith in himself, has determination, and can be admitted to college. The article suggests that motivation of the student is important in achieving success in college.

In an article published late in 1965, Creaser (13) indicates that his research showed that a wide range of differences were observed in the college performance of students from different high schools. This study was based upon the percentile rank in the graduating classes of the students involved in the study. The difficulty of equating the curriculum offerings of different high schools is further emphasized by

this study.

Jefferson indicates concern over the lack of a major study in the area of the total flow of students from high school to college. He states that approximately 1,450,000 high school graduates entered college in 1965 (32). According to Jefferson, college admissions officials should be concerned with the flow of students in transition from high school to college. He also suggests that because curriculum experiences tend to be similar in most high schools the student bodies of our colleges have become dangerously homogeneous.

Elton (17) made a study of admission based upon the partial grade point average in high school. He equated college success with this factor in the course of study. One of the significant conclusions reached by the researcher applied to the colleges that use the high school grade point average as a basis for admission to college. Evidence was presented that showed the grade point average at the end of the 11th grade was as accurate in predicting success in college as the full four year average proved to be.

An example of the variety of approaches used in the prediction of college success was set forth by Willingham (61). He used the application blank as an instrument of predicting college. The application blank contains a number of student characteristics not reflected by ordinary measures of academic potential. By scoring items of the application blank, it was used to predict freshmen grades. The feeling exists that potential dropouts might also be identified by this means. Most of the items significant to the freshman grade point average reflect either self-assurance or a willingness to work. The scale developed in the study was as effective in predicting the freshman grade

point average as was the high school grade point average.

Joseph Guisti (23) has published the results of a number of studies involving prediction of college success. In a study made in 1964, he pointed out that the continued increase in numbers of students applying for admission to a four-year degree-granting institution places new emphasis upon the problem of determining those capable of achieving success in college. He also brought up the question of which curriculum experiences are most significant in predicting success. The researcher felt that of all the prediction tools available, the high school grade point average is unquestionably the most stable and dependable as a single source of data for predicting academic success in college.

Two older studies also expressed confidence in the high school grade point average as a predictor of academic success. Jones and Laslett (34) conducted a study on the high school records of 500 freshmen at Oregon State College. They concluded in their results that the best means of predicting college success was by using the composite high school grade point average.

In another study conducted at Temple University, Gladfelter (21) used the college records to show that the four-year average of all grades in high school was a more accurate predictor of success in college than any other of the factors studied. This average proved to be more accurate than the averages of selected subjects or groups of subjects.

Willingham (62) states that institutions using the high school percentile rank as a basis for admission might improve the accuracy of predictions by expressing rank on a stanine scale. This is more easily

determined than academic average and significantly improves the accuracy of predictions.

The unprecedented growth in numbers of high school graduates desiring to attend college has created a problem in the prediction of college success, according to Cashen (5). His study of January, 1967, utilized parents, teachers, students, and counselors to evaluate the students' chance for succeeding in college. In predicting grade point average, each of the groups tended to predict on the high side. They were, however, remarkably uniform in their predictions. This attempt was considered to be sufficiently accurate to warrant consideration by students and parents.

Research conducted in Utah, Florida, and Georgia during 1964, indicated the average grade received in high school is one of the most effective predictors of college success. In this study by Aiken (1), conclusions were reached indicating that regardless of computational differences, high school size, and varying standards, the average grade in high school predicts success more accurately than any other factor. The study also included percentile rank in class as a predictive factor. This proved difficult to use; but when normalized ranks were used, significant differences were observable between graduates of large schools and those from small schools.

Further indications of the value of the grade point average as a predictive instrument was worked out by Diehl (14) in 1966. He made a comprehensive study of prediction and indicated that the patterns established over the years had value in predicting success. He believes that reasonable accuracy is possible in predicting the performance of a candidate for college entrance. The best single factor he found was the

high school grade point average. The writer believed that the total picture of successful prediction is far from complete.

Actually, prediction of academic achievement at the level now practiced is relatively easy according to Mayhew (39). He suggests a variety of means will bring about the desired end. Among the suggested means he includes the following: a look at the students ethnic background, home location, mother's educational level, and the father's income. All of these are considered important and useful tools in his study. They are favorably comparable to the high school grade point average in the accuracy of the results.

At Stephens College, high school rank was the most dependable factor found in predicting success. Second was academic aptitude, followed closely by the student's answer to the question, "Do you like academic subjects better than non-academic subjects?" In this order they proved useful as predictors of college success (1).

Combining high school rank and the results of scholastic aptitude tests resulted in correlations ranging from .37 to .83 with a median of .62. When more than these two indices were used the gain in correlation was so slight it was considered virtually useless in predicting freshman grade point averages (18).

Certain tests have been found to be of value in predicting success in college. In 1966 at Louisiana College, a study was conducted to establish the validity of the School and College Ability Test in prediction of academic performance. The study revealed that the verbal scale of the test was more reliable than the quantitative scale (15).

McDaniel and others (41) studied new ways to predict academic success in college. They mentioned that researchers had long sought the

golden nugget for prediction of college success. The trend seems to turn from the worked out vein of academic aptitude factors to the uncertainties of non-cognitive factors. The exploratory study made by these workers used the concept of utility as developed by the theory of games. Probable usefulness of this idea was indicated by the conclusions reached in the study. No real application was made of the results of the study.

In comparing the validity of the College Entrance Examination Board Scholastic Aptitude Test and the Cooperative School and Ability Test when combined with the high school rank, superb results were obtained in predictive study. The study was made in an effort to predict the first year grade point average at Seton Hill, a liberal arts college for women. Both of the tests say about the same thing in regards to information useful in predicting success in college.

Scales for predicting first year college grades and extra-curricular activities were developed by item analysis from four item pools. These included the California Psychological Inventory (CPI), the Vocational Preference Inventory (VPI), the Adjective Check List (ACL), and an experimental Objective Behavior Inventory (OBI). The results of the study indicated that the CPI and OBI had higher validity than did the ACL and VPI. The best predictor of success discovered by the study was rank in high school class. The non-intellective scales were next best, followed by the aptitude test scores (44).

Rezler (49) states that correlation between the commonly used aptitude tests and college grade point average is only 0.47. The accuracy of prediction can be improved by considering the total high school record.

Prediction of degree performance involves many assessments in order to accomplish the task accurately. The relative prognostic value of examination grades plus the headmaster's reports are important factors in predicting college achievement in English schools (45).

McCormick and Asher (40) in a study conducted in 1964, felt that a more reliable means of predicting college success was badly needed. They concluded that curriculum area grade point average plus the Otis Test of Mental Maturity gave a correlation of 0.69. The best single factor in predicting the first semester grade point average in college was the high school grade point average.

Willingham (63) feels that in order to do a good job of predicting college grade point averages more than finding the magic equation is involved. He believes that the grading policy of the institution under study is needed. This is of critical importance in making accurate predictions.

Wheatley (58) indicates that prediction of college grade point average is a fundamental concern of applied psychology. Psychologists who counsel students in the process of making decisions about college are directly involved with prediction. Research has shown that past scholastic performance and tested scholastic ability are the best predictive factors available. The poorest of the predictive factors consistently fail to weigh these variables.

The necessity for simplification of the predictive processes was emphasized by the results of a study involving counseling psychologists. Bartlett and Green (3) based their hypothesis upon the statistical theory of shrinkage. They felt that the efficiency of the predictive process would shrink as a result of using too many predictive factors. Experienced counseling psychologists predicted grade point average using

two sets of factors. One set involved the use of four predictive tools, and the other set utilized twenty two factors. Without exception all were more accurate using the smaller number of predictive factors.

Admission to college should be conditioned only by the quality of the high school record plus the results of academic tests, according to Fricke (19). He believes that colleges should state explicitly in their catalogs the criteria for admission. Students would then be selected according to their college qualification rank. This would be a combination of the high school percentile rank and academic ability tests. These are highly useful in predicting college success.

The flood of post-World War II babies has turned into a tidal wave. In 1965, 40.4 percent of college-age youths were going on to college. Holt (30) believes that the debate over measures of academic proficiency and prediction of college success have raged long enough. Use of the American College Testing Program to demonstrate the academic background of students is wide spread throughout the country. Despite the inadequacies of this device, the mean score in all fields of the ACT program continues to rise. This instrument is becoming more useful as a predictor of college success.

Funches (20) investigated the secondary school transcript along with the composite ACT scores to determine the validity of each as a predictor of college success. The study involved 540 freshmen students of Jackson State College during the fall of 1965. The study was organized around four basic subjects (English, mathematics, social science, and science). By assigning these subjects certain weights the grade point average was calculated and recorded. The first semester's grade point average at Jackson State was recorded along with the composite

ACT score. A coefficient of correlation was obtained between these factors. Both the composite ACT score and the information from the high school transcript yielded a positive degree of correlation. The ACT composite score was judged to be the more reliable of the two.

There is concern in the educational world today regarding the differences in difficulty of the academic programs of the high schools of the nation. The prediction of college success is heavily weighted by the high school grade point average and rank in the graduating class. Since admission to college depends upon these factors, parents have a valid reason for concern. To Phelps (42), it appears that students from the higher quality schools may suffer in comparison with students in the lower quality schools. He suggests that colleges should give attention to this problem.

Literature Pertaining to the College- Preparatory Curriculum

Literature in this area of the survey usually had very strong, specific conclusions presented in an effort to solve the problems of college admissions. Men recognized throughout the world in the field of education have contributed much towards the solution of the problem. Most of these experts leave little doubt as to the direction they believe education should take.

In 1956 Hunt (31) stated that 47 percent of the high school graduates continued their education in college. The researcher felt that all qualified students should go on to college and finish their chosen degree programs. He suggested that the time had come for high schools to devote more time and effort in preparation of students for college.

His suggestion was for a special and definite curriculum plan for the college-bound student. Hunt believed that the student would best be able to face the complexities of science and technology as well as the complicated society in which we live, only by taking such a program of studies.

Grant Jensen (33) thinks that one of the difficult problems facing educators today is the admission of students to college and selecting those who may be able to achieve a degree of success. He believes that high schools using the track approach are better able to prepare students to meet the requirements of colleges. In his article he states that the college-preparatory curriculum is best suited to meet this end.

James B. Conant (9) in his book published in 1964 stated, "There is a revolution at hand in the world of education. This revolution calls for a stiffened curriculum with increased attention given to the academic subjects. To prepare for college and insure success, youths of our nation need new courses in mathematics, sciences, and languages."

Hyman G. Rickover (50) has been an outspoken critic of American education. He advocates formation of college-preparatory high schools. This type of school would have advantages over the ordinary or even the track-type high school. It would, in effect, separate the serious student from the trivialities of the easy school environment.

The National Education Association advocates continued emphasis on college-preparatory subjects in the secondary schools. The feeling exists in this organization that the curriculum has been traditionally subject-centered, planned in advance in terms of knowledge, with stress placed upon subjects justifying admission to college. The organization endorses this plan in order to insure success in college (48).

Lee (35) states that the college-preparatory function of the high school looms larger than ever before in today's world. The school codes of many states provide by law for the offering of a college-preparatory curriculum in every high school district in the state.

Rickover (50) reinforces his earlier statement with a blow at traditionalism in high schools. He feels that the schools have done a good job of Americanizing a motley group of foreigners from all corners of the earth. This job is now finished, and schools must now concentrate on developing the intellectual powers of each child to its highest level. To do this he advocates special courses designed to enable the student to absorb knowledge and prepare him to use this knowledge.

Who will be admitted to college? This question plagues those in charge of admissions into institutions of higher learning. High schools are attempting to solve this problem by using the track approach in their curriculum plans. This college-preparatory curriculum best suits the need for insuring success in college (68).

In a later book, Rickover (51) stated that every American youngster must have knowledge in the basic subjects of language, mathematics, science, government, and history. All this knowledge must be cultivated to capacity. Every child has the same need for development of his intellectual factors in order to be able to reason logically and achieve his place in society. Successful pursuit of college courses depends upon this basic curriculum approach.

The junior high school level is none too early to begin planning to get into college. It is virtually impossible to get into some colleges unless the high school curriculum has been thoroughly planned in advance. By the time the student reaches the 9th grade he should have a definite

plan in mind. In order to be admitted to most liberal arts colleges he must have four units of English, one of algebra, one of plane geometry, two of a foreign language, one of a social science, and one of natural science. Credit will not be allowed for such subjects as typewriting, shorthand, shop, and vocational agriculture (69).

Young (67) states that many first year college students fail by the end of the first year in college. Much of the blame for the failure may be placed upon the inability of the student to adjust from the protected high school life to the sudden independence and self-reliance of college life. In selecting a college for matriculation, the student must prepare for it. His real concern is to be sure that he enrolls in a curriculum that will prepare him for college.

Hays (26) made a five year study of freshmen entering the University of Portland. Seven factors were considered and found to be reliable indicators of the ability to achieve success in college. Included in the study were the following factors:

1. High school English grades
2. Scholastic Ability Test (verbal and mathematics areas)
3. High school studies in general
4. College class load
5. Sex
6. College program undertaken by the student
7. Factors not correlated (a) size of the graduating class in high school (b) students expressed vocational goal

The study resulted in the conclusion that high school English grades are the best predictors of college success. By counting the semesters of high school sciences, mathematics, and foreign languages, one could

predict college success to a fairly accurate degree.

Chapman and Counts (8) concluded that a study of languages, mathematics, and the exact sciences were the best means of developing the abilities to think clearly.

Literature Pertaining to the Non-College- Preparatory Curriculum

Much information is available for review in this area. An attempt was made by this researcher to look at both old and new studies on this subject. The citations listed here represent an attempt to present an overall view of research performed in the area of the non-college-preparatory curriculum.

A study made in the 1920's, investigated the part played by certain courses in the success achieved by students in specific areas of study. This success was to be measured in the verbal and mathematical skills achieved by the students. No significant difference was found in the abilities of the experimental groups at the close of the study. One of the groups studied mathematics and foreign languages for a year, while the other group studied sewing and typewriting for a similar period of time. The conclusions of this study cast a doubt upon the usefulness of certain subjects in preparing for achievement in a specific area.

One of the older significant studies in this area is the Eight Year Study (7). The study compared graduates of thirty high schools that deviated from the traditional curriculum for the college-bound students, with graduates who continued to study the college-preparatory curriculum in high school.

A summary of the study leads to the conclusion that the students

with a deviate and diverse curriculum experience in high school achieved better in college. Those trained in the college-preparatory curriculum failed to reach the level of attainment of the other group. The results of the study indicate that a college-preparatory sequence is not necessarily best for those going on to college.

Shulman (53) in 1967, stated that twenty years ago colleges felt that the college-preparatory curriculum graduate from high school was a better risk than those from other courses of study. The pattern has changed in later years. In state schools, high school rank is viewed as more significant to college success than the secondary school curriculum experience of the student.

As colleges become oriented to making decisions upon the basis of prediction of college grades, they seek to simplify the selection of candidates as much as possible. At Georgia Institute of Technology a study was made that compared the total high school curriculum with courses of the traditional college-preparatory curriculum as predictive factors. No significant difference was found in the study. The difference in multiple correlations of these course types is so insignificant that they recommend that institutions not concern themselves with defining subjects considered to be academically oriented (28).

Hills (27) believes that there is nothing unfair in a college being selective in its admission policies. The selection of candidates should be based upon carefully developed and implemented goals. Many feel that academic promise should be the basis for selection. High school grade point average is commonly used as a predictor of college success. Hills feels that we are probably making a mistake by requiring certain high school units for admission. These should be proven to be related to

college success, or they form an artificial barrier to admission to college.

Since the advent of Sputnik I, America's educational conscience has been awakened. Students have been subjected to so many pressures which condition them to think that the only goal in life is to get into college. This can be a detriment to the mental health of high school students. He is often ostracized by his fellow students if he fails to elect a college-preparatory course of study. This often leads to needless personality problems (2).

Kimball Wiles and Franklin Patterson (59) state that one-third to one-half of every student's curriculum experiences should be devoted to general education in high school. This will aid him in implementing a study of national and international relations. It will provide needed insight into our economic organization. The required courses should focus on the promotion of these qualities. Too many of the so-called academic courses ignore this basic need.

Guisti (22) made a study in the College of Education at Pennsylvania State College. He studied the relationship of certain high school curriculum experiences to the college grade point averages. The high school records were studied with respect to six variables. The variables were the High School Index - the average grade point in all subjects taken in high school; and five high school subject matter fields: English, mathematics, science, history, and foreign language. Of these variables the High School Index proved to be a more reliable indicator of college success, although it was not a really outstanding indicator.

J. W. Lewis (36) reports investigation of the efficiency of pre-college variables as predictors of college success. The study was

carried out by the School of Pharmacy of the State University of Iowa during 1964. The variables under study included: rank in high school graduating class, high school grade point average, number of units of high school physical sciences, and college entrance test percentile rank. The rank in the high school graduating class and the college entrance test composite score were significant predictors of college success. None of the variables were significant beyond the sophomore level. The special subjects revealed no significant correlation with the prediction of college success.

There have been numerous studies concerning the relative value of single subjects or groups of subjects in the high school curriculum. Many of these involve a study of college success in a specific area of study. Most of the studies are concerned with subjects considered to be college-preparatory in nature.

Cook and Martinson (11) point out that the aura surrounding certain courses in high school suggests that they are essential in order to succeed in high school and college. They believe that more research is needed to establish the extent to which certain courses are needed to insure success in college. The study which they conducted revealed that particular courses in high schools had little relationship to college grades.

Research upon factors in the high school curriculum that were predictive of success in college mathematics was carried out at Washburn Municipal University. The conclusions reached by the researchers indicated that the number of units of high school mathematics seemed to play a very insignificant role in the college success of students in mathematics after the first course in college mathematics (52).

At East Texas State Teachers College a study was made regarding the role of high school chemistry to success in college chemistry. A total of 171 students were involved in the study. These were about evenly divided between those having had a course in high school chemistry and those not having had such a course. The conclusion reached in the study revealed that those having had a course in high school chemistry had an insignificant advantage over those not having had a course in high school chemistry (60).

Hoff (29) at State Teachers of LaCrosse, Wisconsin, conducted a study similar to the one mentioned above. This study involved 340 students in freshman chemistry. Ninety-two of the students had not had high school chemistry and 248 had at least one course in high school. After the scores were equalized, the conclusion was drawn indicating that high school chemistry had no significance on grades achieved in college chemistry.

In a more recent study involving success in college chemistry, the researcher attempted to identify factors of the high school curriculum that related to success in college chemistry. The research indicated that in a small percentage of cases, high school chemistry was significant at the .05 level of confidence. The most significant factor identified as a predictor of success in college chemistry was the average grade achieved in all high school mathematics courses (43).

Woodward (66) in a study conducted at Oklahoma State University, studied the correlation of high school physics courses and college physics. The correlation proved to be very low. The best correlation obtained in the study was 0.347. This was between Physics 114 and the high school physics course. This does not indicate a significant value

for high school physics in preparing for college physics.

Boyce (4) suggested that the best predictor of success in college consisted of integrated high school grade point average with a freshman aptitude test. He believed that no value was to be found in high school subject matter background.

Guisti (22) revealed that the results of an investigation of the relationship of five fields of high school subjects had little value in predicting college success. The subject matter fields used in the study were: mathematics, science, history, English, and foreign languages. He measured the grade point average at the end of the freshman year of college. In his conclusions he indicated that the best predictor of success in college was the grade point average for all subjects taken in high school. The highest correlation was found in the grade point average and the lowest was in the area of science.

In concluding this section of the literature review the writer wishes to quote from an article taken from a popular magazine (6).

Sound preparatory training is essential to all. If a student's fundamentals of English, mathematics, science, foreign languages, and history are weak, however bright the boy may be, he must expect difficulty in the demanding curriculum of a highly competitive college.

Unfortunately there is no magical pattern of course preparation which of itself guarantees that one candidate is better prepared than another. If the quality is there a student may get by with one year of history, one of science, or less than four years of one language. Because of the bright student, colleges recommend in their catalogs preferred courses, but hesitate to set rigid requirements to which no exceptions can be made.

CHAPTER III

PROCEDURES OF THE STUDY

Collecting the Data

The data used in the study were collected by utilizing the available records in the office of the Registrar at Harding College. The high school transcripts of each student plus his college records are on file in this office.

Information collected from the high school transcripts included the following:

1. The total number of units of high school courses on record
2. The number of units in the areas of mathematics, science, social science, and English

Only the courses in which the student received a grade of D or better were recorded. The total number of units of high school work was broken down into two groups of courses entitled college-preparatory and non-college-preparatory courses.

The collection of data revealed that a wide range of courses are offered throughout the high schools of the nation. The number of units on the records of students from different high schools varied considerably.

Data were collected from the college testing bureau to obtain the ACT scores for each student. The scores collected included the scores from specific areas such as mathematics, natural science, social

science, and English plus the composite score. These data were entered on the prepared form.

The college transcripts were used to provide data on the number of hours completed in the freshman year of study. The total number of honor points for the year were figured and this number was divided by the number of hours on record in order to determine the grade point average. The grade point average was carried out to two decimal points. The information collected in this manner was entered on the data form.

Students in the study were assigned numbers suitable for computer programming. The numbers assigned enabled one to identify the year of enrollment and identify the student specifically. As an example, the number 67001 would identify the year of enrollment as 1967, and the student as the first student in that year's population under study.

The sex of each student was also recorded on the data form. In this study no particular use is intended for this variable. It may be used later in an extension of the study.

The simple form on which all data were recorded was designed to be convenient for placing the data on computer punch cards. Each sheet contained space for four students. A sample of the prepared form is found in Appendix A.

Forming the Groups

Three groups of students were formed from the data on the prepared forms. Grouping was done on the basis of the number of units completed by the student in high school that were judged to be college preparatory in nature. The group number of each student was entered upon the form used to record the data.

Group I consisted of those students having less than 50 percent of their high school work in college-preparatory courses. Students in this category had varied curriculum experiences in vocational subjects, business courses, and the general electives from the high school curriculum. This was the smallest group in the sample, containing 51 students. The size of the group probably reflects the emphasis being made in the secondary school today on the college-preparatory curriculum. Practically all school districts provide a minimum program today.

Group II was made up of students having high school curriculum experiences in college-preparatory courses ranging from 50 percent through 74 percent of their total high school credits. This group was the largest in the sample studied. There were 341 students in the group and probably most high school students in college would fall into this category.

Group III was made up of those students having high school curriculum experiences consisting of 75 percent or more in college-preparatory subjects. There were 100 students in this group. This might be the students referred to by Rickover (50) as the really serious students.

The feeling of this writer is that the percentages of each group would vary from college to college and from one region to another. In areas of the country where large high schools are predominant, this would be particularly true. More research would be needed in order to verify this assumption, however.

Definition of Special Terms

The special terms used in this study are defined as follows:

College success - This factor will be expressed in terms of grade

point average only. The scale used is based upon 4.00 as an A. The grade point will be considered a continuum with the degree of success increasing as the grade point average increases.

College-preparatory curriculum - This term includes those high school courses specifically listed in the general catalog of Harding college as requirements for entrance. These are listed in Table I.

Non-college-preparatory curriculum - Useage of this term will include the courses of the high school curriculum not specifically listed in the general catalog of Harding College as being required for entrance. These courses are generally electives in the high school curriculum. Examples are listed in Table II.

TABLE I

COLLEGE-PREPARATORY SUBJECTS REQUIRED AT HARDING COLLEGE

Course Name

English
 Algebra I
 Algebra II
 Plane Geometry
 Foreign languages
 Science
 Social studies

TABLE II
 EXAMPLES OF COURSES NOT SPECIFICALLY REQUIRED FOR
 ENTRANCE TO HARDING COLLEGE

Course Name	Course Name
Vocational agriculture	Vocal music
Home economics	Band
Typewriting	Music theory
Business mathematics	Speech
Composite mathematics	Office practice
Physical education	

Statistical Procedures

One of the basic underlying assumptions in the statistical treatment of the data, is that the variances due to experimental error within each of the groups be homogenous.

To test for the homogeneity of group variance Bartlett's test (55) was used. This test was used because the groups had an uneven number of cases in the three groups. According to Winer (65), no number of cases in the groups under study should be less than three and most of them should have over five. Bartlett's test for homogeneity of group variance is the most widely used test for this purpose.

Winer (65) states that Bartlett's test uses what is equivalent to the ratio of the arithmetic mean to the geometric mean of the variances. The sampling distribution of Bartlett's test has a smaller standard error than other tests for this purpose. It provides a more powerful test of the hypothesis being tested than other tests for homogeneity of

variances.

The application of Bartlett's test yields a chi-square value for the variances of the groups. The computed value of this chi-square can be compared with the table value of chi-square (55) to indicate significance or insignificant of the value. The level of confidence at which the results of the test will be checked was set at the .05 level. A computed value greater than the table value indicates that the experimental error within the groups is due the design of the study and that the groups are not similar in design.

The statistic used in Bartlett's test is as follows:

$$x^2 = \frac{2.303}{c} (f \log MS \text{ error} - \sum f_j \log s_j^2)$$

where $f_j = n_j - 1 = \text{degrees of freedom for } s_j^2$

$f = \sum f_j = \text{degrees of freedom for MS error}$

$$c = 1 + \frac{1}{3(K-1)} \left(\sum \frac{1}{f_j} - \frac{1}{f} \right)$$

$$MS \text{ error} = \frac{\sum ss_j}{\sum f_j}$$

An analysis of variance was run to determine the significance of the sample means of the homogenous groups. This was performed upon the data for the college grade point average after it had been determined that the groups were not significantly different by the application of Bartlett's test. The F test was used because the groups had proved to be homogenous. The computed value of F was checked against the table value at the .05 level of confidence.

Data from the statistical treatment of the study are found in Tables III - VIII.

CHAPTER IV

ANALYSIS OF THE DATA

Test for Homogeneity of the Groups

The following variables were checked for homogeneity of variance by using Bartlett's test.

Variable I - ACT scores for natural science

Variable II - ACT scores for mathematics

Variable III - ACT scores for social studies

Variable IV - ACT scores for English

Variable V - ACT composite scores

Variable VI - grade point averages at the end of the freshman year at Harding College

The results of Bartlett's test are shown for each of the variables in Tables III through VIII. In using the chi-square table value, two degrees of freedom were used to establish significance of chi-square at the .05 level of confidence. The table value of chi-square under the conditions listed was found to be 5.99. Values higher than the table value will indicate heterogeneity within the group variances. The critical variables involved in the study are the ones pertaining to the ACT scores and the college grade point average at the end of the freshman year of study at Harding College. When the computed value approximates the table value this indicates significance.

TABLE III
ACT SCORES FOR NATURAL SCIENCES

Group	Mean	Standard Deviation
1.	20.84	2.87
2.	21.10	2.89
3.	21.85	2.94
chi-square for 2df		.055
correction factor		.010
corrected chi-square		.054

TABLE IV
ACT SCORES FOR MATHEMATICS

Group	Mean	Standard Deviation
1.	19.21	3.52
2.	20.94	4.01
3.	22.81	3.59
chi-square for 2df		2.86
correction factor		1.00
corrected chi-square		2.85

TABLE V
ACT SCORES FOR SOCIAL STUDIES

Group	Mean	Standard Deviation
1.	22.16	3.09
2.	22.92	3.03
3.	24.50	3.17
chi-square for 2df		.342
correction factor		.100
corrected chi-square		.340

TABLE VI
ACT SCORES FOR ENGLISH

Group	Mean	Standard Deviation
1.	23.25	2.88
2.	23.13	3.17
3.	24.14	3.16
chi-square for 2df		4.23
correction factor		1.00
corrected chi-square		4.21

TABLE VII
ACT COMPOSITE SCORES

Group	Mean	Standard Deviation
1.	21.37	1.39
2.	22.09	1.59
3.	23.40	1.51
chi-square for 2df		1.56
correction factor		1.00
corrected chi-square		1.55

TABLE VIII
GRADE POINT AVERAGE AT THE END OF THE
FRESHMAN YEAR IN COLLEGE

Group	Mean	Standard Deviation
1.	2.3880	5.694
2.	2.3605	7.086
3.	2.5411	7.201
chi-square for 2df		3.99
correction factor		1.00
corrected chi-square		3.97

Bartlett's test yields a chi-square value that is large when the sample variances due to experimental error are very much different from each other. When the computed value of chi-square equals or exceeds the table value the conclusion must be reached that the variances are not equal. In all of the variables subjected to the test an insignificant chi-square value was in the area of ACT English scores. This was well within the limits of the table value of chi-square. The lowest computed value of chi-square was found in the ACT scores for natural science.

The homogeneity of variances in the three groups tested in regards to the ACT scores indicates that the number of high school courses taken in the disciplines tested are not necessarily the determining factor of achievement in the ACT program. This would appear to be true for the sample of this study and may not apply for the total population. More research would be required in order to verify this assumption, however.

Analysis of Variance

The F test or analysis of variance is the parametric technique for testing whether several samples have come from identical populations. After homogeneity of variances of the three groups was established, the F test was applied to the data. The variable relative to the grade point average at the end of the freshman year was analyzed by using this statistic.

The value of $F_{(2,494)}$ equals 3.00 at the .05 level of confidence. This value was obtained from Table A.6 of Steel and Torrie (55). The table value of F establishes the limit for the computed value of F. Any value higher than the table value means that the sample differences are

significant.

The data from the prepared form relative to the grade point averages at the end of the freshman year of study at Harding College were entered on the computer at the computer center at Oklahoma State University. The results obtained from the F test are summarized in Table IX.

TABLE IX
ANALYSIS OF VARIANCE

Source	DF	Sum of Squares	Mean Squares
Total	496	243.496	
Groups	2	2.629	1.3146
Students	494	240.867	.4876
$F = \frac{1.3146}{.4876} = 2.696$			
Group	N	Mean	
1	51	2.388	
2	341	2.360	
3	105	2.541	

The value of F was calculated from the data by dividing the mean square of the groups by the mean square of the students. The calculated value of F proved to be lower than the table value. The differences in grade point averages at the end of the freshman year in college may be regarded as insignificant.

The null hypothesis is: H_0 : There is no significant difference in

the college success of those students having 75 percent or more of their high school work in college-preparatory subjects and those students having a smaller percentage of college-preparatory work in high school.

Upon the basis of the statistical evidence presented in the data there is no basis for rejecting the null hypothesis. The failure to reject the null hypothesis does not necessarily imply that this is the only possible solution. The decision is acceptable only for the sample tested in the study and is based upon the data available in this study.

CHAPTER V

CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

Conclusions

The analysis of data implies that the curricular background of the students at Harding College has very little to do with college success. This conclusion is possible because the results of the statistical analysis revealed that the differences in grade point averages at the end of the freshman year of college were insignificant.

There is an indication in the results of the study that diverse curricular experiences in high school are of some value in successfully completing the first year of study at Harding College. The students having a high percentage of courses rated college-preparatory in nature failed to achieve significantly higher than the students with less regulated curricular backgrounds.

The failure to reject the null hypothesis does not indicate that a college-preparatory curriculum background is of no value in study at Harding College, but does imply that factors such as study habits, motivation, and native ability probably play a big part in achievement of students at Harding College.

The writer recognizes that the groups with more college-preparatory courses in high school had means in the analysis of variance that were higher than the groups with less college-preparatory work in

high school. The feeling of this writer is that the motivation of the students with less preparation plus their native ability enabled them to achieve success that is statistically comparable to those better prepared.

The data do not support the feeling of this writer that the close personal faculty-student relationship and the religious homogeneity of the college influences student achievement. More research would be needed to verify this assumption but the realization by the students that someone cares is probably influential in motivating the student.

Limitations

Generalizations that would relate the findings of this study to other colleges should be undertaken with caution. The data used in the study and the results obtained in the statistical treatment of the data apply specifically only to the sample of the population studied.

Results of the study are based upon a particular sample of the student population at Harding College. If the total population were considered, significant differences might appear.

The writer is concerned with the possibility of the influence of other variables not specifically studied.

The definition of terms used in the study apply only to Harding College. These may not apply at other institutions of higher learning. Harding College is a religiously oriented, liberal arts college which would be expected to differ from the large multi-versity of today.

Recommendations

The recommendation is made that investigation be conducted upon the

role of motivation in college success.

A study should be made involving the total population of the college. This would possibly identify specific areas that influence college success.

A study should be made of the effects of specific college-preparatory work in high school upon a specific course of study in college.

Prolonging a study to find the continued achievement of the sample used in this study is recommended. Significant differences might appear over a complete degree program.

The recommendation is made that specific areas of non-college-preparatory work be studied to identify more specifically areas exerting an influence upon college success.

The recommendation is made that high schools attempt to correlate the success of their students that go on to college with their curriculum experiences in high school. This could give the secondary school some indication of the efficiency of their academic programs.

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APPENDIX A

SAMPLE FORM FOR RECORDING DATA

Student Number _____ Group _____

Sex _____

ACT Raw Scores NS _____ M _____ SS _____ E _____ C _____

Number of Units of High School Science _____

Number of Units of High School Mathematics _____

Number of Units of High School Social Studies _____

Number of Units of High School English _____

Number of College-Preparatory Courses _____

Number of Non-College-Preparatory Courses _____

Grade Point Average at End of Freshman Year _____

VITA

3

George Wilbur Woodruff

Candidate for the Degree of

Doctor of Education

Thesis: FACTORS IN THE HIGH SCHOOL CURRICULUM PERTAINING TO SUCCESS IN
THE FRESHMAN YEAR AT HARDING COLLEGE

Major Field: Higher Education

Biographical:

Personal Data: Born in Paris, Texas, February 6, 1921, the son of
Mr. and Mrs. George N. Woodruff; married in 1944 to Dorothy
Seitter; father of four children.

Education: Graduated from Geary High School, Geary, Oklahoma in
May, 1941; received the Bachelor of Science degree from
Southwestern State College, Weatherford, Oklahoma in August,
1948, with a major in Biology; received the Master of Education
degree from the University of Oklahoma, Norman, Oklahoma in
August, 1952, with a major in School Administration; received
the Master of Science degree from Oklahoma State University,
Stillwater, Oklahoma in August, 1960, with a major in Natural
Science; attended National Science Foundation Institutes at
Baylor University, Waco, Texas in 1958, University of Oklahoma,
Norman, Oklahoma in 1959, Oklahoma State University,
Stillwater, Oklahoma in 1959, 60, 62, 63, 64, University of
Washington, Seattle, Washington in 1961; completed requirements
for the Doctor of Education degree at Oklahoma State University,
Stillwater, Oklahoma in May, 1969.

Professional Experience: Taught in the public schools in Temple,
Oklahoma one year, Rush Springs, Oklahoma eight years, Zook,
Kansas two years, Stillwater, Oklahoma six years, became
Assistant Professor of Biology at Harding College, Searcy,
Arkansas in 1966 until the present.