ACADEMIC SUCCESS PATTERNS OF NATIVE AND TRANSFER STUDENTS IN SELECTED ASSOCIATE DEGREE TECHNOLOGY PROGRAMS

By

PERRY REESE MCNEILL

Associate Degree: Electronics Technology
Oklahoma State University
Stillwater, Oklahoma
1962

Bachelor of Science
Oklahoma State University
Stillwater, Oklahoma
1965

Master of Science
Oklahoma State University
Stillwater, Oklahoma
1967

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF EDUCATION
July, 1973

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Thesis Approved:

Thesis Adviser

Dean of the Graduate College

ACKNOWLEDGMENTS

The writer wishes to express his appreciation to all of the people who helped in this study. It would be impossible to list them all, but to each he is deeply indebted for their encouragement and assistance.

Throughout the professional development of the author, Dr. Donald S. Phillips, Chairman of the Advisory Committee, has been a real inspiration and morale booster. Few people could owe one man what the author owes Dr. Phillips. His encouragement, counsel, assistance, and willing contribution of time during the author's total graduate program goes far beyond the call of a professor's duty.

The members of the Advisory Committee have also been extremely helpful: Dr. L. Herbert Bruneau for his moral support throughout the M.S. and Ed.D. programs; Dr. James P. Key for his helpful suggestions on the appropriate statistical techniques; Dr. Cecil W. Dugger for his advice on the content of the study; and Dr. Lloyd L. Wiggins for his guidance in the preparation of the study.

The writer is also indebted to the administration of the School of Technology for their assistance in securing the data for this study. Professor Edwin S. Darby was especially helpful in this regard.

The completion of this investigation could not have been possible without the understanding and consideration of the author's family. To his wife, June, who collected her third "Put Hubby Through" degree by going back to work, a special thanks is extended. The author's children,

Michelle and Tracy, must also be given special consideration for two "fatherless" years.

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INTRODUCTION

In most university undergraduate programs, students may transfer in and out of various curricula at the freshman and sophomore levels with a minimum loss of credit hours. Students are able to do this as most traditional programs use the first two years to lay a foundation of general education for advanced study in a major field and then use the last two years to give the students a more in-depth study of their major.

This type of arrangement is particularly true in colleges of Arts and Sciences, where students are encouraged to use this period to investigate areas of education in which they would like to major during their junior and senior years.

Engineering colleges tend to use the first two years as a common core for all specialties. During this period, the student traditionally completes the mathematics, physical science, social science, and some engineering science requirements. Other colleges on university campuses have similar programs offering foundation subjects during the first two years. In their transfer programs, junior colleges normally attempt to duplicate the first two years of the university or senior college program into which the students will transfer.

Statement of the Problem

Tha author developed an interest in the problems of students transferring into technology programs from other colleges after being a transfer student and then after working as a teacher and administrator in such programs during an eight-year period. It seems that many people have an opinion about the success patterns of technology transfer students, but no one has published any quantitative data on this problem.

The Oklahoma State University School of Technology has degree programs that are structured in a two-plus-two fashion. A two-plus-two program is one which gives the student the opportunity to seek employment with marketable skills and knowledge at the end of two years, or it also gives him the opportunity to complete a baccalaureate degree in two additional years.

Associate degrees are offered in Aeronautical, Construction, Electronics, Fire Protection, Mechanical Design (Design), Mechanical Power (Power), Petroleum, and Radiation and Nuclear (Radiation) Technology. The first two years are devoted to preparing the students to be engineering technicians. At the end of this period, the Associate Degree in Technology is awarded. The last two years then build on this foundation to prepare the student to become an Engineering Technologist. Upon completion of the last two years, the Bachelor of Science Degree in Engineering Technology is awarded to the student.

A student who has been majoring in one of the more traditional disciplines, such as zoology or engineering, and decides to transfer into the School of Technology will face a course sequencing problem. He may have completed most of the social and physical sciences, as well as the mathematics, requirements; however, because of the sequencing and

prerequisite requirements of technology courses, it will more than likely take him the full two years to complete the Associate Degree.

One of the major problems in technical education is a lack of information about the type of students who are served by this kind of education. A sub-area of this problem is whether or not students who have had prior college work do better in technology curricula than students who enter the program directly out of high school.

Purpose of the Study

The purpose of this study is to examine the academic success patterns of two groups of students in the School of Technology: native and transfer. As the first exit of students would theoretically come after the awarding of the Associate Degree at the end of four semesters of work, this is the total length of time the students were studied.

In order to ascertain how the native and transfer students' grade-point averages compare, only those grades actually earned after enrollment in the School of Technology will be used in this part of the study. To ascertain the effect of prior education on both the major courses and all the courses, the grade-point averages of both groups will be compared on courses taken in just the School of Technology and on the grades earned in all courses.

One of the areas of interest to the author, as well as the administration of technology programs, is what happens to the student's academic record when he moves from one program to another. Accordingly, the entering grade-point averages of the transfer students will be compared against the cumulative grade-point averages they achieve during their four semesters in the School of Technology.

Another area that this study is concerned with is the specialty the transfer students major in after entering the program. It was decided that the overall grade-point average was the most common way to evaluate this question. Also, one may wonder if the different colleges and institutions have any effect on the transfer student's academic success after entering the technology program. The grade-point averages accumulated in just technology courses were chosen to measure this point.

A final area that must be investigated if one is to study academic success patterns is in the number of graduates. The Associate Degree was chosen as the means to evaluate success in the program as it is now generally accepted for employment or continuation in the B.S. in technology.

Hypotheses Tested

The following hypotheses, stated in the null form, will be tested on the group of students who were freshmen in the 1971 fall semester in the School of Technology:

1. There will be no significant difference in the cumulative first four semesters' grade-point average between native and transfer students in technology courses completed after entering the School of Technology.

2. There will be no significant difference in the cumulative first four semesters' grade-point average between native and transfer students in all courses completed after entering the School of Technology.

3. There will be no significant difference between the transfer students' entering grade-point average and their final cumulative grade-

point average in all courses completed after four semesters in the School of Technology.

4. There will be no significant differences among the transfer students' cumulative four-semester grade-point average in all courses completed after entering the School of Technology when compared by major.

5. There will be no significant difference among the transfer students' cumulative four-semester grade-point average in technology courses completed after entering the School of Technology when compared by college transferred from.

6. There will be no significant difference between the number of native and transfer students who start the program and those who graduate in four semesters.

Need for the Study

Administrators and counselors working with entering students in the School of Technology have known for some time that a substantial number of them do not come directly from high school. These officials, however, do not have any specific information on the success and progress of these students who enter with different backgrounds. It is often very difficult to advise a transfer student of his potential chances of success in a particular technology program. What is apparently needed are some quantitative figures on the performance of similar transfer students.

Information about success patterns of various types of students who enroll in the School of Technology will be extremely useful in counseling prospective students and in designing future curricula.

The 1971 fall semester figures for this school show that out of a total enrollment of 748 students, only 394 were native students. The other 354 were transfer students from many different types of programs, as shown in Table I.

TABLE I

TOTAL OSU SCHOOL OF TECHNOLOGY TRANSFER ENROLLMENT

Transferred From	Number	Average Hours Transferred
OSU Agriculture	10	42.8
OSU Arts & Sciences	45	39.0
OSU Business	11	36.5
OSU Education	9	61.7
OSU Engineering	127	45.3
OSU Home Economics	1	100.0
Oklahoma Junior Col (Tech.)	32	59.3
Oklahoma Junior Col. (Non-Tech.)	27	42.0
Oklahoma Four-Year College	48	43.6
Out-Of-State Programs	8	54.0
Foreign	7	44.0
Undetermined Origin	29	42.7

Assumptions

It is assumed that:

1. The School of Technology fall, 1971, freshman class is representative of past and future student populations in this school.

2. The students who transfer to the School of Technology are

representative of students who transfer into similar programs at other institutions.

Definition of Terms

Associate Degree is the one awarded after successful completion of a two-year prescribed curriculum. The recipient must maintain a 2.0 grade-point average in all courses required for the degree.

ACT Score is the student's composite score received on the American College Testing Program test.

Class Rolls are a computer listing of all class cards of students enrolled in a particular class.

Drop-In Student is one who transfers into an Associate Degree program after completing one or more semesters in another college.

Dropped Student is one who completes a semester but does not return for the next succeeding semester.

Freshmen Students are those enrolled in the School of Technology for the first time and are also enrolled in the freshman technical courses for their particular major.

Freshmen Technical Courses are those courses found in the first semester of the Associate Degree programs in technology. They will all be 1000 level courses.

Grade-Point Average (G.P.A.) is based on applying the following numerical correlation to the letter grade received in a course: A = 4, B = 3, C = 2, D = 1, F = 0. The following equation is then used in computing averages for the total number of courses attempted:

G.P.A. = (Credit Hours) · (Course Grade) / Total Hours Attempted

Grade Reports are those released by the Registrar's office on students at the end of each semester.

Graduate is a student who receives the Associate Degree in Technology.

Oklahoma Senior College is any four-year college or university in the state of Oklahoma other than Oklahoma State University

OSU is the abbreviation for the Oklahoma State University.

Suspended Students are those whose enrollment has been terminated by the Registrar's office.

Technology Courses are those taught in the School of Technology. They will carry the prefix TEC_ _ on the student's transcript. The two _ _ will vary depending on which department in the school offers the course. An example would be TECET, which denotes electronics courses. These courses will constitute the student's major and related specialty areas for the degree.

Transfer Hours are those college credit hours earned in another OSU college or another institution.

Transfer GPA is the grade-point average the transfer student earned in another program.

Transfer Student is one who enters the School of Technology after attending another college either on or off the OSU campus. If a student has at least one semester's attendance in another program, he will be considered a transfer student.

Withdrawing refers to students who officially leave the university prior to the end of a semester.

CHAPTER II

REVIEW OF LITERATURE

This chapter deals with what appears to be some of the more significant studies in the area of transfer students' academic patterns. After reviewing the literature related to transfer students, it appears that these reviews should be presented according to the type of institution studied. The chapter is therefore divided into the following areas: (1) Background Information, (2) Multi-College, (3) Single College, (4) Junior College, and (5) Summary.

Background Information

Miller (14) conducted a study in 1964 on freshmen in the Oklahoma State University Technical Institute and College of Engineering. He examined the dropouts of both programs to see if there was any difference in the two types of students. He found that engineering students were more theoretically oriented than were the technical institute students. He also found that the dropout group had a greater significant need for nurture and general social needs than the non-dropout. Past experience has shown this author that many of these engineering dropouts will enroll in the School of Technology as transfer freshmen.

Phillips (15) found in his study of student scholastic aptitudes that students entering Oklahoma junior college technician education programs differed significantly from students at the two Oklahoma State

University technical institutes. The mean reading test scores, as well as the technical test scores, tended to be lower for junior college students.

Anderson (1) concluded in his follow-up study of Phillip's work that no sweeping generalizations can be made about students at the institutions he studied. He recommended that additional studies be conducted to determine characteristics of students in technical programs.

Multi-College

In a recent study conducted in 1970, Dension and Jones (4) compared the relative success of junior college students who transferred to the University of British Columbia after one and two years in the Vancouver City College. They found that the students who transferred after two years were more likely to graduate on schedule than the other group. The students who transferred after one year, however, attained a higher scholastic average than the other group. They also found that whether a student was full-time or part-time had little bearing on his completion of the program.

Eells (5) was one of the early researchers to conclude that the transfer student's GPA dropped after his first semester. His study, done in 1927 at Stanford University, found that the transfer's GPA was higher than the native's for every semester after the initial upper division semester.

In 1960, Medsker (12) reported the results of analyzing over 2,500 transfer students' academic progress. The students were enrolled in 16 different four-year colleges located in eight different states. He reported that in 12 of the 16 colleges, the native students attained a

higher GPA than the transfer. Medsker infers that transfer students are slower at completing their degrees than the natives.

Cowley (3) made a study of 52 transfer and 188 native students at Oklahoma A and M College. He studied students in all six schools of this college. This study, completed in 1938, showed that the native students' GPA was .08 points better than that of the transfer students for the two years of upper division work. The author found that transfer students in the School of Engineering entered with a .55 GPA advantage over the native, but were .01 points inferior to the native students in upper division work. His study further demonstrated that in every semester except the seventh the native students in Engineering had a higher GPA in the upper division than did the transfer students.

Hartmann (7) conducted a study in 1968 at the University of Missouri on a matched group of transfer and native students. He matched the two groups according to (1) high school size, (2) sex, (3) high school rank, (4) age at college entrance, and (5) major chosen after entering the university. The three majors were business, arts and sciences, and education. He only studied the students during their junior year. He concluded that transfer students from private junior colleges had a more difficult time earning grades than native students. In splitting the transfer students into three groups, he found the following to be true: (1) The GPA for transfer students from rural junior colleges was equal to that of the natives for both semesters; (2) the GPA of transfers from private schools was lower than the natives' for both semesters; and (3) the GPA of transfer from urban junior colleges was lower the first semester but equal to the natives' the second semester.

Walker (22) studied the success of students who transferred into the upper division of the University of Florida. He found a distinct difference between native and transfer students' academic records. His study demonstrated that the native student seemed to be the better student of the two. It was his contention that native students have higher grades in upper division courses because they are better students to begin with than the transfer students.

Mortorana and Williams (11) conducted a study at the State College of Washington covering a period from 1947 to 1949. They matched 251 native and transfer students on several variables. They concluded in their study that transfer students did at least as well academically as did the native students.

Grossman (6) conducted a study in 1934 on the performance and persistency to graduate of transfer students at the University of Illinois. He found no significant difference between native and transfer female GPA's; however, the male differential was .10 in favor of the transfers. His study concluded that transfer students from junior colleges had a better chance of graduating than transfer students from other universities or liberal arts colleges.

Single College

In a recent study conducted in 1967 at OSU, Hoemann (8) compared native and junior college transfers in the College of Arts and Sciences. He used the "t" test, Chi square, and Analysis of Variance in testing 90 matched pairs of students. He concluded that the first two years' GPA of the transfer students was higher than the native students' but that this average dropped the first semester after transferring. He

further concluded that the male transfer student had a higher GPA than the native after two years on the OSU campus. He also found that there was no significant difference between the two groups in their ability to graduate in two additional years. He found that it made no difference which junior college the students transferred from in terms of their GPA at OSU. Hoemann recommended that similar studies be conducted on other colleges on the OSU campus to ascertain if his findings are true for these types of students also.

Rodes (18) did a study in 1950 of junior college transfers in the College of Engineering at the University of California at Berkeley. He found that the transfer students performed as well as the natives on both the entrance examination and in actual upper division courses. He further found that the upper division averages of transfer students from technical institute-type curricula did not differ significantly from transfer students who had a normal pattern of lower division engineering subject matter.

Russell's (19) dissertation, done at the University of Georgia in 1963, examined native and transfer students in the College of Arts and Sciences. His study, which included 120 transfer and 178 native students, found that the transfers had a higher GPA for the first two years of college work. He found, however, that there was no significant difference in their upper division averages.

The most recent study done at OSU was accomplished by Zweiacker (24) in 1970. He studied the academic achievements of 240 native and 164 transfer students in the College of Agriculture. His work confirmed previous studies in that he found the first two years' GPA of the transfer students was significantly higher than the natives'--2.505 compared

to 2.332. He found no difference in the final total cumulative average of the two groups. He also found that the native students showed the greatest persistency to graduate in four years.

A 1969 study done in California (20) showed that students transferring to engineering programs from junior colleges encountered difficulties in meeting lower division requirements of the four-year program. Students who transferred from curricula with a strong occupational emphasis had a particularly difficult time in meeting the university requirements. Other areas of difficulty were in finding exact course equivalencies and in providing for differences in school calendars.

Carson (2) reported that good transfer students do as well as native students. He further concluded that poor transfer students continue to have academic trouble in their upper division work. The author felt that the first two years of the native and transfer students were a good predictor of success in upper division work.

Killen (9) did a study that showed there was no significant difference in the student's GPA and the type of institution transferred from. He found that transfer students from junior colleges were closer to academic trouble than those from private liberal arts institutions.

Junior Colleges

The greatest dearth of literature seemed to occur in the area of comparisons of transfer and native students in two-year programs. Only two studies were found in this area.

Lembke (10) conducted a study at Iowa Lake Community College and Jefferson College concerning the attitudes of students who had previous course work in a four-year institution and then enrolled in a two-year

program. The author defined these dropout students as "drop-in students," i.e., one who leaves a four-year program for a two-year program. The study covered 72 students who were enrolled for the fall term 1967-1968. The author found that the drop-ins rated (1) instruction, (2) faculty-student relationship, (3) individual attention, and (4) counseling service in support of the junior college. These students felt the junior college lacked in (1) college atmosphere and (2) social and cultural activities. Lembke found that 68 percent of these students would have started in a two-year program if they could start all over again.

The only other study found which dealt with transfer students in a two-year program was the one done by Muck and Unden (13) at El Camino in California. This study, published in 1965, covered 351 students admitted on probation due to unsatisfactory grades during the period 1959 through 1961. The authors found that 55 percent were successful in removing themselves from probation. They reported that relatively few actually received the Associate Degree. Their figures showed that 70 percent of the students were from four-year institutions and 33 percent were from other two-year programs. It was their conclusion that the junior college was providing an important salvage function for this type of student.

Summary

After reviewing the literature in this area, the one item that seems to be common to all of these studies is the non-uniformity of the types of research conducted. Hoemann (8) concluded that:

> It would seem that these inconclusive reports would make it imperative that each institution conduct its own research

concerning the academic achievement and persistence of the transfer student, for the data collected appears meaningful only for that particular school.

In view of this review, it seems appropriate to investigate the hypotheses previously stated in Chapter I.

CHAPTER III

METHODOLOGY

Introduction

As the major objective of this study was to compare the academic success patterns of native and transfer students in the School of Technology, the first problem was to identify the students to be studied. Once this group had been identified, a technique for checking on their semester-by-semester progress had to be devised. Lastly, the correct statistical analysis of the cumulative records had to be performed to test the six hypotheses.

Selection of the Population

After the official drop and add period was over for the 1971 fall semester, class cards from each of the first-semester technology courses in all eight specialties were collected from the appropriate instructors. A computer listing was then made of all these students. The individual student records were then analyzed to determine which of these students were eligible to be included in the study.

Students who were taking these courses as an elective and were not enrolled in the School of Technology were dropped from the list. Students who had already completed one or more semesters in the School of Technology were also dropped. The final list of students then was composed of students who had either (1) entered the School of Technology

as their first enrollment in an institution of higher education or (2) attended one or more other institutions of higher education but this was their first semester in this particular technology program. The first group are identified as native students and the second as transfer students. After the students had been identified, the list was then verified by the department head of the student's particular specialty as a personal check that each of these students were first-semester majors in his department. He also helped in verifying their status as a native or transfer student.

Table II shows the original and final totals of the population to be studied. One hundred forty-six of the original group were not first-time technology enrollees.

TABLE II

POPULATION BREAKDOWN

Original Group Total	Final Group		
	Native	Transfer	Total
357	120	91	211

Analysis Techniques

The next step in this study was to collect composite ACT scores on both native and transfer students. The transfer history of each of the

transfer students was also collected. This included type of institution, or institutions, transferred from, number of hours, and grade-point average. A computer card was then punched on each student. The information on the card and the corresponding columns are shown in Table III.

TABLE III

CARD COLUMN RESERVATION FOR DATA

Item	Column Numbers
Student ID Number	1 - 6
Name	7 - 24
Specialty	25
Native or Transfer	26
Origin (if transfer)*	27 - 28
Composite ACT Score	29 - 30
Transfer Hours	31 - 33
Transfer GPA	34 - 37
Semester 1 GPA, all courses	38 - 41
Semester 1 GPA, technical courses	42 - 45
Semester 2 GPA, all courses	46 - 49
Semester 2 GPA, technical courses	50 - 53
Semester 3 GPA, all courses	54 - 57
Semester 3 GPA, technical courses	58 - 61
Semester 4 GPA, all courses	62 - 65
Semester 4 GPA, technical courses	66 - 69
Cumulative GPA, all courses taken after entering the School of Technology	70 - 73
Cumulative GPA, technical courses	74 - 77

*Columns 27 and 28 were punched according to the following breakdown:

01 - OSU College of Agriculture
02 - OSU College of Arts & Sciences
03 - OSU College of Business
04 - OSU College of Education
05 - OSU College of Engineering
06 - OSU College of Home Economics
07 - Okla. Junior College - tech.
08 - Okla. Junior College - non-tech.
09 - Okla. Senior College
10 - Out-of-State
11 - Foreign
12 - Attended more than one institution

In order to facilitate each semester's analysis of the two groups' progress in a more accurate and dependable fashion, a FORTRAN IV computer program was written to be used on the WATIV terminal of the OSU Computer Center. A copy of this program is included in the appendixes.

Once the population was identified and categorized, each individual student's grade slip was examined at the end of each semester to determine his semester grade-point average in all courses and in technology courses. This information was recorded on the student's computer card, and that semester's averages were then computed with the program previously mentioned. At the end of each semester, those students who had transferred, dropped, withdrawn, or been suspended from the institution were removed from the study. This information was obtained from the student's file and then verified by personal conversation with his department head. A running total of cumulative credit hours and grade-points earned in the School of Technology was maintained on each student so that a final total average could be calculated for each of the various groups and individuals.

At the end of the fourth semester, the list of students still in the study was examined by the Director of Student Personnel for the School of Technology. At that time, based on his records, he was able to indicate which of these students had graduated. Based on this information, the remaining group was then divided into graduates and non-graduates.

Statistical Procedures

The *t*-test was used to test hypotheses 1, 2, and 3; the analysis of variance was used to test hypotheses 4 and 5; and the Chi square technique was used to test hypothesis 6.

In selecting an appropriate test of the grade-point averages of native and transfer students, one must consider certain facts about the data. The two groups are of different size in the first two hypotheses; furthermore, the data is interval, parametric, and compiled on two groups with different academic backgrounds, which would imply that these are independent samples. The *t*-test of significance for differences between means was selected as it allows the researcher to analyze the difference between arithmetic means. The uncorrelated *t*-test was used, as when "a researcher is not dealing with matched pairs or with two measures for the same individuals . . . he assumes no relationship between data in the two groups" (16). The uncorrelated design was evaluated for a significant difference between the two means at the .05 level of significance.

The data collected on the beginning and ending grade-point averages of the transfer students are also interval and parametric; however, it is not independent, as it is compiled on the same group of students. The size of the two groups is, of course, the same. The correlated *t*-test was, therefore, used to test the significant difference between the beginning and ending means at the .05 level of significance.

To determine the significance of difference among the transfer students' grade-point averages when comparing their origin or their major, one could perform 12 and 8 separate *t*-tests, respectively, on the data; however, Siegel (17) and Wert (23) both warn of the danger in using the *t*-test to perform such an evaluation. The analysis of variance procedure allows one to test for difference in means among several groups simultaneously.

The data collected from the native and transfer groups on number of

graduates indicates that this data is nominal or non-parametric. The data is also independent, as the two groups have different academic backgrounds. This data could be put into a simple frequency tabulation system. A statistical instrument was needed that would measure the difference between numbers of cases falling into the graduated or did-not-graduate category. It was decided that the chi-square test would correctly analyze such differences. The .05 level was chosen as the minimum level at which the results would be considered significant.

The computer facilities and canned statistical programs of the OSU Computer Center were used to facilitate the data analysis. The specific names of the two programs used were "BMDOIV - Analysis of Variance" and "T-Statistic."

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

This chapter is devoted to presenting and analyzing the data collected in the study. The first section presents the background and peripheral data collected during the four semesters of the study. The second section then uses the appropriate parts of this data to test the six hypotheses stated in Chapter I.

Background and Peripheral Data

Table IV shows what the population looked like at the start of the first semester. It should be noted at this point that Electronics was the largest department and Petroleum was the smallest. The original group was fairly well divided between transfer and native students: 57 percent were native and 43 percent were transfer. The Power and Petroleum departments attracted the largest percentage of transfer students; both were in excess of 60 percent. That is to say that a majority of the students in these two departments came in with prior work.

A further analysis of this data reveals that the average entering grade-point of the transfer students was slightly better than a "C"--2.038. These students entered with an average of 49.87 credit hours, which can be translated to mean about three semesters of college work. The lowest initial grade-point average was recorded in the Design

Department, while the Aeronautical Department had the highest initial grade-point average.

TABLE IV

BREAKDOWN OF THE TWO ORIGINAL STUDENT GROUPS BY SPECIALTY

Specialty	Students			Transfer Hours	Transfer GPA
	Total	Native	Transfer		
Aeronautical	26	17	9	57.78	2.431
Construction	15	5	10	52.50	1.987
Electronics	63	35	28	49.14	2.015
Fire Protection	24	16	8	57.63	2.235
Design	17	9	8	48.75	1.800
Power	34	13	21	47.10	1.981
Petroleum	6	2	4	39.00	1.810
Radiation	26	23	3	40.33	2.052
Total and Averages	211	120	91	49.87	2.038

One of the first items to be considered when discussing student success patterns is how many students started and finished the program. Table V presents a very graphic picture of the drop-out rate of the two groups. The original group of 211 students decreased to a total of 123 by the end of the fourth semester. This is a total attrition of 41.7

percent. On further analysis of this data, it can be seen that 47.5 percent of these dropouts were native students, while only 31.9 percent were transfer students. The largest drop-out rate occurred between the second and third semesters, when a total group loss of 29.5 percent was recorded.

TABLE V

STUDENT ENROLLMENT BY SEMESTER

Status	Initial	First	Second	Third	Fourth	Graduated
Native	120	114	89	66	63	21
Transfer	91	89	78	63	60	21
Total	211	203	167	129	123	42

The total loss of 88 students is a little misleading, as two of these were actually early graduates. One of the transfer students completed the degree at the end of the summer session between the second and third semesters. One additional transfer student completed his degree at the end of the third semester. None of the native students completed their degrees prior to the end of the fourth semester.

The data presented in Table VI shows how well each of the eight specialties were able to retain the two types of students. The electronics curriculum lost the largest number of students--27--which was

42.9 percent of their total. Petroleum had the smallest loss--one student, or 16.6 percent.

The Aeronautical specialty was able to retain the transfer students in the program better than any of the other seven specialties. The Design Department had the greatest loss of transfer students. The greatest loss of native students was recorded in the Power Department, while the Petroleum Department recorded the lowest loss of native students.

Based on past experience with this particular school, the graduation rates of both types of students were much lower than originally anticipated. Data presented in Tables V, VI, and VII indicate that 42 students received the Associate Degree by the end of the fourth semester. This is only 19.9 percent of the original population and only 34.2 percent of those students who completed the fourth semester. Using the students who completed the fourth semester as a base, Radiation had the highest percentage of graduates, 83.4 percent, while Design had the lowest, zero percent. It is worth noting that the Aeronautical Department, which had a very good retention rate, graduated only two students, or 10 percent.

The data presented in Table VII demonstrates how the graduation rate was different for those students who came from the various colleges. The transfer graduation group was composed of all nine groups except those who came from a junior college. Only one out of the 14 students who completed the fourth semester from the more than one institution group graduated. Students who transferred from other Oklahoma senior colleges did not have a very high graduation rate either--only 14.3 percent of those who completed the fourth semester were granted the degree.

TABLE VI

STUDENT ENROLLMENT PER SEMESTER COMPLETED BY SPECIALTY

Specialty	Initial		First		Second		Third		Fourth		Graduated	
	Nat.	Trs.	Nat.	Trs.	Nat.	Trs.	Nat.	Trs.	Nat.	Trs.	Nat.	Trs.
Aeronautical	17	9	16	9	12	9	11	9	11	9	0	2
Construction	5	10	5	10	4	7	2	6	2	6	0	1
Electronics	35	28	33	27	24	23	17	19	17	19	8	8
Fire Protection	16	8	16	8	14	8	11	5*	9	4	0	2
Design	9	8	8	8	5	6	3	2	2	2	0	0
Power	13	21	11	20	9	19	4	16	4	15	1	4
Petroleum	2	4	2	4	2	3	2	3	2	3	0	1
Radiation	23	3	23	3	19	3	16	3	16	2**	12	3
Total	120	91	114	89	89	78	66	63	63	60	21	21

*One Fire Protection student graduated between the second and third semesters.

**One Radiation student graduated between the third and fourth semesters.

TABLE VII

TRANSFER STUDENT ENROLLMENT PER SEMESTER BY ORIGIN

Origin	Initial	First	Second	Third	Fourth	Graduated
OSU Agriculture	0	0	0	0	0	0
OSU Arts & Sciences	4	4	4	4	3*	2
OSU Business	2	2	2	1*	1	1
OSU Education	0	0	0	0	0	0
OSU Engineering	29	28	25	24	24	11
OSU Home Economics	0	0	0	0	0	0
Okla. Jr. College, Tech.	2	2	2	1	1	0
Okla. Jr. College, Non-Tech.	6	6	6	2	1	0
Okla. Senior College	13	12	10	9	7	1
Out-of-State	9	9	9	8	7	4
Foreign	2	2	2	2	2	1
Attended More Than One Institution	24	24	18	14	14	1

*One student graduated from this group prior to the end of the fourth semester.

The data presented in Table VII demonstrates the drop-out rate of the transfer students by place of origin. The original proposal had anticipated transfer students from all six colleges on the OSU campus; however, when the original sample was analyzed, it was observed that there were no transfer students from the OSU Colleges of Agriculture,

Education, or Home Economics.

One can see that the transfer students from the OSU College of Arts and Sciences and the College of Engineering had the greatest persistency of all the transfers. The junior college transfer students had one of the highest attrition rates in the sample. The small group classified as "out-of-state students" had a very good rate of persistency.

The data presented in Tables VIII and IX was collected so that a measure of the cognitive ability of the two groups would be available. It can be seen from Table VIII that the composite ACT score of the two groups is very similar. The standard deviation was also very close for the native and transfer students.

TABLE VIII

MEAN COMPOSITE ACT SCORES BY SEMESTER

	Initial		First		Second		Third		Fourth	
Status	ACT	S.D.*	ACT	S.D.	ACT	S.D.	ACT	S.D.	ACT	S.D.
Native	21.25	3.969	21.28	4.010	21.49	3.949	21.91	3.866	22.02	3.916
Transfer	21.57	4.212	21.53	4.256	21.51	3.948	21.66	4.014	21.56	4.032

*S.D. = Standard Deviation.

The data presented in Table IX is a further breakdown of the data shown in Table VIII. It can be seen that the Radiation Program

attracted both native and transfer students with the highest ACT scores. The native students with the lowest ACT scores chose to major in Construction, while Fire Protection and Petroleum programs attracted the transfer students with the lowest ACT scores. The last items in this table demonstrate that both the native and transfer students had similar maximum and minimum ACT scores.

TABLE IX

BEGINNING AND ENDING COMPOSITE ACT SCORES BY SPECIALTY

	Initial		Final	
Specialty	Native	Transfer	Native	Transfer
Aeronautical	20.29	22.40	21.36	22.40
Construction	17.00	20.56	19.00	20.67
Electronics	20.89	21.79	22.82	21.85
Fire Protection	20.13	20.00	19.11	20.00
Design	20.00	21.00	18.50	21.00
Power	21.62	21.40	23.00	21.40
Petroleum	21.00	20.00	21.00	20.00
Radiation	23.61	23.33	23.94	22.50
Total Mean	21.25	21.57	22.02	21.56
N	120	91	63	60
Minimum	10.00	11.00	12.00	13.00
Maximum	30.00	29.00	30.00	29.00
Standard Deviation	3.969	4.212	3.916	4.032

As this data is examined on a continuing basis, it can be seen that both the native and transfer student groups were losing students with both high and low ACT scores. The ACT scores and standard deviations are essentially the same at the end of each semester as they were at the beginning of the program. Radiation started with the highest ACT score in both groups and ended with the highest scores.

The data presented in Table X illustrates the fact that both groups of students tended to make the same grades on a semester-by-semester basis in all courses taken. The semester averages are not cumulative, but are the averages for that particular semester. The four-semester cumulative is, of course, the average of those students who persisted for the full length of the study. The second semester was evidently the most difficult for both groups, as the natives fell .065 of a grade-point while the transfers just maintained their first semester average of 2.510. The final cumulative average for both groups was very close: 2.759 for the natives as compared to 2.865 for the transfers.

TABLE X

GRADE-POINT AVERAGES IN ALL COURSES

Status	First	Second	Third	Fourth	Cumulative Four-Semester
Native	2.319	2.254	2.706	2.877	2.759
Transfer	2.510	2.510	2.805	2.901	2.865

The data presented in Table XI was computed the same way as that of Table X except that just the grades made in technology courses were used. One can again see a very similar pattern between the two groups. Again, the second-semester change was the least for both groups. In comparing the data of Tables X and XI, it will be observed that both groups made higher grades in just technology courses than in all courses. It is worth noting that the transfer student's average actually went down in technology courses, while the native's went up during the second semester.

TABLE XI

GRADE-POINT AVERAGES IN TECHNOLOGY COURSES

Status	First	Second	Third	Fourth	Cumulative Four-Semester
Native	2.533	2.619	3.056	3.058	2.970
Transfer	2.779	2.717	2.995	3.132	3.054

Data was collected to see how the transfer students in the eight specialties compared in terms of grades received in all courses. Data was collected for each semester and then a four-semester cumulative average was computed. This data is presented in Table XII.

TABLE XII

TRANSFER STUDENT GRADE-POINT AVERAGE BY SPECIALTY IN ALL COURSES

Specialty	Initial	First	Second	Third	Fourth	Four-Semester Cumulative
Aeronautical	2.431	2.654	2.859	2.615	2.660	2.738
Construction	1.987	2.112	2.229	2.668	2.628	2.822
Electronics	2.015	2.684	2.955	3.181	3.287	3.114
Fire Protection	2.235	2.502	2.512	2.070	2.540	2.768
Design	1.800	2.117	1.352	2.560	2.750	2.460
Power	1.981	2.676	2.237	2.629	2.764	2.772
Petroleum	1.810	2.137	2.340	3.167	3.200	2.767
Radiation	2.052	2.300	2.910	3.190	2.600	2.757
Group Mean	2.038	2.510	2.510	2.805	2.901	2.865

One point that needs to be considered in analyzing the data in Tables X through XIII is the new OSU course withdrawal policy that went into effect during the third semester of this study. This new policy permits a student to withdraw from a course by his own choice up through the eighth week and with the instructor's permission through the fifteenth week. No record of this course will appear on a student's transcript. This essentially eliminated the "D" and "F" grade from the students' records in this particular study. A dramatic reduction in the number of hours completed per smester, particularly in the case of the

native student, was observed after this policy was instigated. One can also see in Tables XII and XIII a rather sharp jump in the grade-point average of the whole group of native and transfer students between the second and third semesters.

In Table XII one can see that the transfer students in the Aeronautical specialty started with the highest average in their previous work, while the Design transfer students started the program with the lowest initial average. The group as a whole continued to improve their grade-point average through the total four semesters. The Petroleum students demonstrated one of the more dramatic changes from their initial average of 1.810 to a final cumulative of 2.767. The cumulative high grade-point average was recorded by the Electronics students, and the lowest cumulative average was recorded by the Design students.

The data presented in Table XIII was collected in the same manner as that of Table XII, except this data is for native students. In comparing these two sets of data, one can see a very similar pattern for the two groups of students in each of the specialties. The native Electronics students also had the highest cumulative average, but the lowest native cumulative average was recorded by the Petroleum students. The native Design students, however, had one of the lowest cumulative averages.

Data was collected on transfer students in such a manner that the effect of their origin could be compared on their grades made in the School of Technology courses. The data presented in Table XIV demonstrates the initial grade-point average and then the semester grades, ending in a four-semester cumulative average. One can see that, with

TABLE XIII

NATIVE STUDENT GRADE-POINT AVERAGE BY SPECIALTY IN ALL COURSES

Specialty	First	Second	Third	Fourth	Four-Semester Cumulative
Aeronautical	2.177	2.453	2.054	2.522	2.454
Construction	2.316	1.837	2.055	2.235	2.265
Electronics	2.412	2.599	3.256	3.306	3.216
Fire Protection	2.339	1.940	2.526	2.486	2.361
Design	1.832	2.226	2.053	2.530	2.365
Power	2.508	1.313	2.732	3.148	2.962
Petroleum	2.215	2.075	2.310	2.090	2.195
Radiation	2.358	2.481	2.939	3.041	2.837
Group Mean	2.319	2.254	2.706	2.877	2.759

the exception of the junior college transfer students, every group did better in their technology courses than in their previous work. The Engineering transfer students made the most dramatic improvement in their grades. They had in excess of a full letter grade improvement over their entering average every semester. The Business transfer students group is a little unique in that only two students were involved, and one of them had a B.S. degree in Business when he entered the Fire Protection program. He graduated after two semesters; so the last two semesters of this group is represented by only one student. In the main, all of these transfer students did better in technology

TABLE XIV

TRANSFER STUDENTS' GRADE-POINT AVERAGE BY ORIGIN IN TECHNOLOGY COURSES

Origin	Initial	First	Second	Third	Fourth	Four-Semester Cumulative
OSU Arts & Sciences	2.281	2.667	2.938	3.052	2.493	2.915
OSU Business	2.550	3.270	2.875	2.390	2.730	2.995
OSU Engineering	1.863	3.065	3.127	3.252	3.272	3.210
Okla. Jr. Colleges, Technical	2.600	1.610	0.820	2.000	1.810	1.610
Okla. Jr. Colleges, Non-Technical	2.333	1.960	1.682	1.250	2.460	2.440
Okla. Senior Colleges	1.790	2.596	2.239	3.053	3.530	3.179
Out-of-State	2.396	2.986	2.737	2.920	3.130	3.073
Foreign	2.188	3.000	3.150	3.625	3.870	3.525
More Than One Institution	2.034	2.719	2.844	2.828	2.897	2.843
Transfer Group Mean	2.038	2.779	2.717	2.995	3.132	3.054

courses than in the academic subjects they had been studying prior to entering the School of Technology. This data does counter somewhat the contention that students come into technology programs only after they have flunked out of other programs.

Testing of the Hypotheses

The hypotheses tested were stated in the null form and listed in Chapter I. The 0.05 level of probability was used in testing these hypotheses. Each of the six hypotheses are repeated and the data from the appropriate statistical test are then presented.

Hypothesis number one was concerned with native and transfer students' cumulative grade-points recorded in technology courses after enrolling in the School of Technology. It was tested using the t-test. The hypothesis from Chapter I is repeated here:

1. There will be no significant difference in the cumulative first four semesters' grade-point averages between native and transfer students in technology courses completed after entering the School of Technology.

The results of this test are shown in Table XV.

TABLE XV

NATIVE AND TRANSFER STUDENTS' TECHNOLOGY GRADE-POINT MEANS

Students	Number	Mean Technology Grade-Points	Standard Deviation	Degrees of Freedom	t
Native	63	2.96983	0.564352	123	0.85542*
Transfer	62	3.05386	0.533205		

*Not significant at the 0.05 level of probability.

The difference in the four-semester cumulative technology grade-point average between native and transfer students was only 0.08403. This was not significant at the 0.05 level; therefore, hypothesis number one must be accepted.

Hypothesis number two was very similar to number one except it was concerned with the grade-point average in all courses. It was tested using the t-test. The hypothesis from Chapter I is repeated here:

> 2. There will be no significant difference in the cumulative first four semesters' grade-point average between native and transfer students in all courses completed after entering the School of Technology.

The results of this test are shown in Table XVI.

TABLE XVI

NATIVE AND TRANSFER STUDENTS' GRADE-POINT MEANS IN ALL COURSES

Students	Number	Mean Grade-Point	Standard Deviation	Degrees of Freedom	t
Native	63	2.75888	0.595525	123	0.98719*
Transfer	62	2.86532	0.609867		

*Not significant at the 0.05 level of probability.

The difference in the mean grade-points in all courses between the two groups was only 0.10644. This was not significant at the 0.05 level; therefore, hypothesis number two must be accepted.

Hypothesis number three was concerned with the change in the transfer students' entering grade-point averages and their cumulative grade-point averages in the four semesters after entering the School of Technology. It was also tested with the t-test. The hypothesis from Chapter I is repeated here:

> 3. There will be no significant difference between the transfer students' entering grade-point average and their final cumulative grade-point average in all courses completed after four semesters in the School of Technology.

The results of this test are shown in Table XVII.

TABLE XVII

TRANSFER STUDENTS' ENTERING AND FOUR-SEMESTER CUMULATIVE GRADE-POINT AVERAGES IN ALL COURSES

Semester	Number	Mean GPA	Standard Deviation	Degrees of Freedom	t
Initial	62	2.12736	0.586725	61	7.60749*
Four-Semester Cumulative	62	2.86532	0.609867		

*Significant at the 0.05 level of probability.

The difference in the initial and final grade-point averages was 0.73796. This was significant at the 0.05 level; therefore, hypothesis number three must be rejected.

Hypothesis number four was concerned with the transfer students'

grade-point averages in all courses when compared by major. It was tested with the analysis of variance. The hypothesis from Chapter I is repeated here:

> 4. There will be no significant difference among the transfer students' cumulative four-semester grade-point average in all courses completed after entering the School of Technology when compared by major.

The results of this test are shown in Table XVIII.

TABLE XVIII

ANALYSIS OF VARIANCE OF TRANSFER STUDENTS' GRADE-POINT AVERAGE IN ALL COURSES BY MAJOR

Sources of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F Ratio
Between Groups	7	1.9060	0.2723	0.7074*
Within Groups	54	20.7841	0.3849	
Total	61	22.6901		

*Not significant at the 0.05 level of probability.

The means for each of the eight specialties are shown in Table XII. An F value greater than 2.11 had to be obtained in order to reject the hypothesis; therefore, hypothesis number four must be accepted.

Hypothesis number five was concerned with the transfer students' grade-point averages in technology courses when compared by college

transferred from. It was also tested with the analysis of variance.

The hypothesis from Chapter I is repeated here:

> 5. There will be no significant difference among the transfer students' cumulative four-semester grade-point averages in technology courses completed after entering the School of Technology when compared by college transferred from.

The results of this test are shown in Table XIX.

TABLE XIX

ANALYSIS OF VARIANCE OF TRANSFER STUDENTS' GRADE-POINT AVERAGES IN TECHNOLOGY COURSES BY ORIGIN

Sources of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F Ratio
Between Groups	8	4.3062	0.5383	2.1882*
Within Groups	53	13.0378	0.2460	
Total	61	17.3440		

*Significant at the 0.05 level of probability.

The mean grade-point average for these groups is shown in Table XIV. The F value of 2.1882 was greater than the value of 2.11 required to reject this hypothesis; therefore, hypothesis number five must be rejected.

The last hypothesis, number six, was concerned with how many students graduated from each group. It was tested with the chi square

technique. The hypothesis from Chapter I is repeated here:

> 6. There will be no significant difference between the number of native and transfer students who start the program and those who graduate in four semesters.

The results of this test are shown in Table XX.

TABLE XX

CHI SQUARE ANALYSIS OF NATIVE AND TRANSFER STUDENTS' PERSISTENCY TO GRADUATE

Classification	Native	Transfer	Total	Chi Square
Graduated	21	21	42	
Not Graduated	99	70	169	0.451763
Total	120	91	211	

*Not significant at the 0.05 level of probability. Yates correction was used in calculating this value.

The raw data for this analysis is presented in Table V. The calculated chi square value of 0.451763 was not greater than the table value of 3.841; therefore, hypothesis number six was accepted at the 0.05 level.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to analyze the academic success patterns of native and transfer students in the Oklahoma State University School of Technology in regard to the Associate Degree.

The objective of the study was to determine if the students who transfer into these technology programs from many different colleges on and off the Oklahoma State University campus perform as well scholastically as native students and whether their persistency to graduate is equal to that of the natives.

The original group consisted of 211 students who were first-time enrollees in the Oklahoma State University School of Technology for the fall 1971 semester. These students were then classified as either native or transfer students on the basis of prior college work. Those with previous hours were classified as transfer students, and those without hours were classified as native students. Using this determination, 120 of them were classified as native students and 91 as transfer students. Six hypotheses were formulated and tested that concerned the students' academic achievements and ability to graduate in four semesters. These hypotheses are listed in Chapter I, pages 4 and 5.

The data collected revealed that of the native and transfer students who persisted for the total four semesters neither group achieved

a grade-point average in either technology or all courses significantly different from the other group. The transfer students achieved the highest cumulative four-semester grade-point average in all courses and in technology courses alone.

The transfer students did significantly better academically in the School of Technology than they had been doing in their previous college work. As a group, their four-semester cumulative average was almost a full letter grade higher than their entering grade-point average.

There was a significant difference in the cumulative grade-point average in technology courses of the transfer students when compared to their place of origin; e.g., the transfer students from the four-year colleges did better than those from two-year colleges.

There was no significant difference in the transfer students' grade-point averages in all courses and their choice of major; e.g., transfer students in Electronics performed as well as transfer students in Mechanical Power.

There was no significant difference between the number of native and transfer students who graduated in four semesters. The transfer group had the highest percentage of graduates: 23.1 percent as compared to 17.4 percent for the natives.

Conclusions

This section is devoted to reporting conclusions that can be made on the basis of the data collected in this study. These conclusions are primarily centered around the six hypotheses stated in Chapter I.

1. The fact that native and transfer students do equally well in technology courses would seem to lead to the conclusion that

these courses are flexible enough for different levels of student maturity and experience.

2. The data showing native and transfer students making essentially the same GPA in all courses could lead to the conclusion that these curricula can serve both groups of students equally well if they persist for four semesters.
3. The attrition rate was quite high for these two groups of students: 48 percent for the natives and 31 percent for the transfers. This would lead one to conclude that the transfer student is served better by these curricula than are the native students.
4. The fairly large drop in the number of students and the associated decrease in the GPA during the second semester leads to the conclusion that this is the problem semester for these students.
5. The fact that the transfer students entered the various technology programs with an average GPA of 2.13 must counter the often-held conclusion that students transfer into technology only after flunking out of other programs. Their significant increase to a GPA of 2.87 would further lead to the conclusion that these transfer students were majoring in a curriculum in which they were interested.
6. The data showing that transfer students make essentially the same grades in all courses, regardless of their technology major, would lead to the conclusion that grading is very consistent throughout the School of Technology.
7. The variance that existed in the cumulative GPA of the transfer

students' technology courses leads to the conclusion that a transfer student's origin will affect his grades. The greatest variance existed between the junior college and the other colleges.

8. It can be concluded on the basis of the graduation rate of the native and transfer students that prior college work will not help students complete an Associate Degree any sooner than students who have no prior college experience.

Implications

This section is devoted to reporting subjective implications related to the information presented in this study. These implications are based on the data reported in this study, data reported in related studies, and the author's 12 years of experience in the School of Technology. As the data was collected each semester, some patterns and trends seemed to develop that seemed appropriate for this section.

On the basis of the result of testing hypotheses one and two, it could be concluded that the design of the curricula in the School of Technology will serve either the native or transfer student equally well. This, of course, is documented for only those students who lasted the full four semesters. This conclusion ignores approximately 48 percent of the native and 31 percent of the transfer students who dropped out, withdrew, or transferred before the end of the study. There may be many reasons for this attrition; however, Miller (14) found that technology students showed a great need for nuture and social assistance. It may be that these dropouts just needed more assistance than they were receiving.

The large drop in student numbers during the second semester and the decrease in the grade-point averages during the same semester would seem to indicate that the problem occurred during this period. The percentage drop in the number of native students was almost twice that of the transfers during the second semester. If one examines the various curricula, it can be seen that this is the semester when most students take their trigonometry and first physics course. These two courses constitute approximately 50 percent of the credit-hour load in this semester. One could conclude that the natives had a higher drop-out rate than the transfer students because the transfer students had already completed their mathematics and science courses prior to transferring into the Technology program. Since about 1970, the School of Technology has not taught its own physics and mathematics courses. It is the conclusion of the author that this is one of the contributing factors to the large dropout rate. The kind of student who chooses to major in technology does not relate well to the traditional abstract mathematics and science courses. One wonders if the mathematics and science departments should be determining which students will become technicians.

The change in the grade-point averages of the transfer students from their initial 2.127 to a final four-semester cumulative of 2.865 speaks well for the School of Technology. One can conclude that the faculty and staff were able to motivate these students to do better work. This change was especially apparent in the case of students who transferred from Engineering with a 1.863 and then achieved a four-semester cumulative of 3.210. One might say that those students had been counseled into engineering when what they really desired was

technology. Many students have a misconception about engineering. What they visualize as engineering is really technology.

The conclusions to be drawn from the testing of the effect of the origin and major on transfer students' grade-point averages are many. One of the items that is somewhat disturbing is the large percentage loss of junior college transfer students. The original number of eight junior college transfer students dropped to only two in the final semester. While these are admittedly small numbers, the percentage of loss is too great to be ignored.

One could conclude that the pre-engineering program at Oklahoma State University is a very good preparatory program for a student desiring to major in technology. This may be true, but it is such a waste of time and resources. A student should not have to spend three semesters getting ready for a four-semester Associate Degree program.

One of the specialty areas that caused concern was the Mechanical Design curriculum. Their student loss from an original enrollment of 17 to a final of 4 students is quite high. It may be that students are enrolling in this area thinking it is a drafting program and then becoming frustrated when they encounter a lot of design work.

Electronics also had a very high student loss that needs to be investigated. An approximate 50 percent loss should be cause for concern in a four-semester program. Since this program depends so heavily on mathematics, it may be that this is where students are lost.

In terms of the type of student who left the technology programs, some insight can be gained by looking at the ACT score depicted in Tables VIII and IX. It can be seen that the range and mean of both groups continued to change in the same direction. This would imply that

the same type of student was leaving both groups. Phillips (15) reported that the composite ACT score of entering students in these same programs was 18.6 in 1967. Compared to the average reported for this group (21.4), the institution has seen an increase of 2.8 points in a four-year period. Phillips predicted after his study that the increase in ACT scores would occur when the School of Technology went to a four-year B.S. program. A school tends to attract a different type of student when it moves from a two-year to a four-year program. One wonders where the students with the lower ACT scores are now going to school. Hopefully the junior college programs that have come into existence recently are now attracting these students.

One grade-point average pattern observed that was significantly different from the others was in the Fire Protection Department. The students had about a 2.4 average in all their courses but a 3.1 average in their technology courses during the first semester. It appears that they are more highly motivated in their technology courses. One contributing factor to this is the extremely high morale these students have. One can almost say they literally live, breathe, and eat fire protection. Many of them actually sleep, study, and eat as a group at the campus fire station. This esprit de corps is a very important factor in the success of these students. They mutally support one another through the problems and difficulties of the program, fire protection courses being ones on which they can all work together.

One may wonder why the ACT scores of the radiation and nuclear technology students are so much higher than those of the rest of the school. Their average was six points higher than the lowest and two points above the mean. This may be the reflection of an intellectual

mystic syndrome. The idea exists in the minds of potential students that only the very intelligent can succeed in the nuclear field; so only those types actually enroll. That may not necessarily be the case, as it appears that students with lower ACT scores could succeed as technicians in this field.

A trend which has greater significance than the figures would indicate is the evident decrease of interest in the Associate Degree. Some departments graduated less than 15 percent of the students who completed the fourth semester. Anderson (1) found that this particular school (in 1969) graduated 62.6 percent of those students who lasted at least four semesters. That is considerably greater than the 33.6 percent that was recorded in this study. Anderson's study was, of course, conducted prior to the time that the school offered the B.S. in technology. Coupled with this may be a student attitude that they are going for the B.S. degree anyway; so why bother with the Associate Degree. Very likely, the new "W" policy is also having some effect on the number of students who complete all of the requirements in four semesters.

One can only wonder why the Department of Radiation had a graduation rate of 79 percent and most others were less than 20 percent. It could be that that particular department is still stressing the value of the Associate Degree more heavily than the others. One faculty member in the Radiation Department informed this author that he still stresses the importance of this degree to the students in a very positive way.

The complete lack of graduates in the Design Department is very unusual. Again, though, they may be going for the B.S. degree.

Hoemann (8) found that native and transfer students both graduate with equal ease. This study also found the same thing to be true. It

must be pointed out that the Radiation Department, which was composed almost wholly of native students, is what caused this to hold true. Twelve of the 21 native graduates were Radiation students. Medsker (12), on the other hand, found transfer students were slower to graduate than the native students. Both of these studies were dealing with baccalaureate degrees and not associate degrees.

The transfer students with the lowest rate of graduation (those who had attended more than one institution) were probably attracted to the technology program because it now offers the B.S. degree. If this degree were not available, they might never have enrolled in Oklahoma State University.

Recommendations

After concluding this study, the author felt that certain additional questions about these types of students need to be studied. These recommendations are based on the findings of this study and on the author's experience in the School of Technology:

1. The students from this study who actually enroll in the fifth semester of the technology programs should be studied, and the same six original hypotheses then tested on the junior and senior years with respect to the B.S. in Technology degree. The question to be answered here is, "If they are not getting the Associate Degree, are they getting the B.S. degree?"
2. One of the unanswered questions uncovered in this study concerns the 86 students who did not complete the program. A study should be conducted to ascertain why they dropped out. If they transferred to another program, their success in those

programs should be studied. In short, the pattern of the non-successful students should be investigated to determine whether their technology experience had any salvageable value.

3. It is further recommended that an investigation be conducted into the counseling practices used with entering OSU freshmen. It seems that many students are entering other programs when what they really desire is a Technology degree. The entire orientation and career guidance system at OSU should be examined to ascertain whether new students, native and transfer, are being fully informed of all the various degree programs available on the Stillwater campus.
4. It is recommended that during the extremely crucial first and second semesters the technology students' advisors and professors make every effort to be available for assistance and counseling of first-year students who may be potential dropouts. Each department should build as close a student-faculty relationship during this first year as faculty time and institutional finances will permit.
5. Based on the data collected on graduation rates, it is recommended that the School of Technology re-examine the two-plus-two concept to determine whether it is really a viable, workable educational concept.

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APPENDIXES

APPENDIX A

LISTING OF COMPUTER PROGRAM

```
$JOB 12347,563-42-4388,TIME=20,NOSUBCHK
/*PASSWORD KEY
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CTHE NAME OF THIS PROGRAM IS SNATCH. SNATCH WILL TAKE A LARGE GROUP OF STUDENTS
C AND DIVIDE THEM INTO 2 SMALLER GROUPS, NATIVE AND TRANSFER. EACH OF THE 2
C SUBGROUPS ARE THEN ANALYZED ON THE BASIS OF WHERE THE STUDENTS TRANSFERRED
C FROM. SNATCH STANDS FOR SEPERATE NATIVE AND TRANSFER BY COLLEGE HOURS.
C THE TOTALS OF THE LARGER SUBGROUPS ARE SAVED AND THE PROCESS REPEATED FOR AS
C MANY GROUPS AS DESIRED. ONCE THE LAST GROUP HAS BEEN ANALYZED, AVERAGES FOR
C THE ENTIRE GROUP ARE THEN COMPUTED. THE USER MUST SUPPLY THE FOLLOWING
C INFORMATION ON EACH CARD WITH NO DECIMAL POINTS-
C COLUMN                DATA
C25                     SPECALITY-1 2 3 ..........9-SPS
C26                     NATIVE=0,OR TRANSFER=1-T
C27-28                  ORIGIN-IORG
C                        1=AGR-OSU
C                        2=A&S-OSU
C                        3=BUS-OSU
C                        4=EDUC-OSU
C                        5=ENGR-OSU
C                        6=HOMEC-OSU
C                        7=JR COL TEC OKLA
C                        8=JR COL NONTEC OKLA
C                        9=SR COL OKLA
C                       10=OUT OF STATE
C                       11=FOREIGN
C                       12=MORE THAN ONE INSTITUTION
C29-30                  COMPOSITE ACT SCORE-ACT
C31-33                  TRANSFER HOURS-THR
C34-37                  TRANSFER GPA-TGPA
C38-41                  SEMESTER GPA ALL COURSES-GP1T
C42-45                  SEMESTER GPA TECHNICAL COURSES-GP1S
C THE END OF EACH SUBGROUP MUST BE SIGNIFIED WITH THE APPROPRIATE SPECALITY IN
C COLUMN 25 AND A 2 IN COLUMN 26.
C THE END OF ALL GROUPS ARE SIGNIFIED BY A 3 IN COLUMN 26.
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      DIMENSION AN(120,1),SN(120),AT(91,1),ST(91)
      DATA IT,IN,NVN,NVT,IS/5*1/
      DATA OGP1T,OGP1S,TGP1T,TGP1S,TOGP1T,TOGP1S,TTGP1T,TTGP1S/8*0./
      DIMENSION NRST(8),NNS(8),NTS(8),ACTN(8),ACTT(8),SHR(8),TGPA(8)
      DIMENSION GP1TN(8),GP1SN(8),GP1TT(8),GP1ST(8)
      DIMENSION TOTAN(1),TENACT(1),SDN(1),ACMINN(1),ACMAXN(1)
      DIMENSION TOTAT(1),TETACT(1),SDT(1),ACMINT(1),ACMAXT(1)
      DIMENSION TG1SO(12),TG1TO(12),TTG1SO(12),TTG1TO(12)
      DIMENSION TTHRO(12),TTGPO(12),TTSTUO(12)
      DATA OACT,OSTUD,TACT,ACTSTU,THRT,TGPT,TSTUD/7*0./
      DATA AVNAC,AVTAC,TOTSTU,AVHRT,AVGPT,AVHRO,AVGPO /7*0./
      DIMENSION THRO(12),TGPO(12),TSTUO(12)
      DATA TOACT,TOSTUD,TTACT,TACSTU,TTHR,TTGPA,TTSTUD/7*0./
      DATA TAVNAC,TAVTAC,TTNSTU,TAVHRT,TAVGPT,TAVHRO,TAVGPO/7*0./
  100 FORMAT (24X,2F1.0,I2,F2.0,F3.0,F4.3,32X,2F4.3)
  101 FORMAT('1','SPECALITY  NR STUDS  NATIVE  TRANSFER  NAT ACT  TRS AC
     1T  TRS HRS  TRS GPA  NAT GPA ALL  NAT GPA TEC  TRS GPA ALL  TRS GP
     1A TEC')
  102 FORMAT(' ',3X,I2,9X,I3,6X,I3,6X,I3,6X,F5.2,3X,F5.2,5X,F5.2,3X,F5.3
     1,8X,F5.3,6X,F5.3,8X,F5.3,9X,F5.3)
  103 FORMAT ('0','TRANSFER  ORIGIN  NUMBER OF STUDENTS  TRS GPA TRS HRS
     1  SEM GPA ALL  SEM GPA TEC')
  104 FORMAT (' ',4X,I2,16X,I3,13X,F5.3,3X,F5.1,6X,F5.3,8X,F5.3)
```

```
  105 FORMAT(' ','TOTAL',9X,I3,6X,I3,6X,I3,6X,F5.2,3X,F5.2,5X,F5.2,3X,F5
     1.3,8X,F5.3,6X,F5.3,8X,F5.3,9X,F5.3)
  106 FORMAT ('0',8X,'MINIMUM ACT MAXIMUM ACT  STANDARD DEVATION  ERROR'
     1)
  107 FORMAT(' ',2X,'NATIVE',F8.2,8X,F5.2,10X,F5.3,9X,I1)
  108 FORMAT(' ',2X,'TRANSF',F8.2,8X,F5.2,10X,F5.3,9X,I1)
  109 FORMAT('1')
C CLEAR OUT THE HOUR AND GPA VARIABLES.
      IERT=0
      IERN=0
      DO 12 K=1,12
      TTHRO(K)=0.
      TTGPO(K)=0.
      TTG1SO(K)=0.
      TTG1TO(K)=0.
   12 TTSTUO(K)=0.
   10 DO 11 I=1,12
      THRO(I)=0.
      TGPO(I)=0.
      TG1SO(I)=0.
      TG1TO(I)=0.
   11 TSTUO(I)=0.
    1 READ (5,100) SPS,T,IORG,ACT,THR,TGP,GP1T,GP1S
      IF (T-1.) 2,3,5
C SUM UP ACT AND GPA FOR NATIVE STUDENTS. SAVE TOTAL FOR SUMMARY.
    2 OACT=OACT+ACT
      OSTUO=OSTUO+1.
      TOACT=TOACT+ACT
      TOSTUO=TOSTUO+1.
      OGP1S=OGP1S+GP1S
      OGP1T=OGP1T+GP1T
      TOGP1T=TOGP1T+GP1T
      TOGP1S=TOGP1S+GP1S
      AN(IN,1)=ACT
      SN(IN)=ACT
      IN=IN+1
      GO TO 1
C SUM UP ACT AND GPA FOR TRANSFER STUDENTS. SAVE TOTAL FOR SUMMARY.
    3 AT(IT,1)=ACT
      ST(IT)=ACT
      IT =IT+1
      IF (ACT.EQ.00.) GO TO 4
      TACT=TACT+ACT
      ACTSTU=ACTSTU+ 1.
      TTACT=TTACT+ACT
      TACSTU=TACSTU+1.
    4 THRT=THRT + THR
      TGPT=TGPT+TGP
      TSTUO=TSTUO+ 1.
      TTHR=TTHR+THR
      TTGPA=TTGPA+TGP
      TTSTUO=TTSTUO+1.
      TGP1S=TGP1S+GP1S
      TGP1T=TGP1T+GP1T
      TTGP1T=TTGP1T+GP1T
      TTGP1S=TTGP1S+GP1S
C SUM HOURS AND GPA BY ORIGIN. SAVE TOTALS FOR SUMMARY.
      THRO(IORG) = THRO(IORG) + THR
      TGPO(IORG) = TGPO(IORG) + TGP
```

```
      TSTUO(IORG)=TSTUO(IORG) + 1.
      TG1SO(IORG)=TG1SO(IORG)+GP1S
      TG1TO(IORG)=TG1TO(IORG)+GP1T
      TTHRO(IORG)=TTHRO(IORG)+THR
      TTGPO(IORG)=TTGPO(IORG)+TGP
      TTSTUO(IORG)=TTSTUO(IORG)+1.
      TTG1SO(IORG)=TTG1SO(IORG)+GP1S
      TTG1TO(IORG)=TTG1TO(IORG)+GP1T
      GO TO 1
    5 IF (T.EQ.3.) GO TO 20
C COMPUTE AVERAGES  FOR BOTH GROUPS.
    6 AVNAC=OACT/OSTUD
      AVTAC= TACT/ACTSTU
      AVNG1T=OGP1T/OSTUD
      AVNG1S=OGP1S/OSTUD
      TOTSTU=OSTUD + TSTUD
      AVHRT=THRT/TSTUD
      AVGPT = TGPT/TSTUD
      AVTG1T=TGP1T/TSTUD
      AVTG1S=TGP1S/TSTUD
      ITOTST=TOTSTU
      ISPS=SPS
      IOSTUD=OSTUD
      ITSTUD=TSTUD
      WRITE(6,101)
      WRITE(6,102)ISPS,ITOTST,IOSTUD,ITSTUD,AVNAC,AVTAC,AVHRT,AVGPT,
     1 AVNG1T,AVNG1S,AVTG1T,AVTG1S
      NRST(IS)=ITOTST
      NNS(IS)=IOSTUD
      NTS(IS)=ITSTUD
      ACTN(IS)=AVNAC
      ACTT(IS)=AVTAC
      SHR(IS)=AVHRT
      TGPA(IS)=AVGPT
      GP1TN(IS)=AVNG1T
      GP1SN(IS)=AVNG1S
      GP1TT(IS)=AVTG1T
      GP1ST(IS)=AVTG1S
      IS=IS+1
      WRITE(6,103)
      DO 8 I=1,12
      ITSTUO=TSTUO(I)
      IF (TSTUO(I).EQ.0.) GO TO 7
      AVHRO=THRO(I)/TSTUO(I)
      AVGPO=TGPO(I)/TSTUO(I)
      AVG1TO=TG1TO(I)/TSTUO(I)
      AVG1SO=TG1SO(I)/TSTUO(I)
      GO TO 8
    7 AVHRO=0.
      AVGPO=0.
      AVG1SO=0.
      AVG1TO=0.
    8 WRITE(6,104) I,ITSTUO,AVGPO,AVHRO,AVG1TO,AVG1SO
      CACT  = 0.
      OSTUD = 0.
      TACT  = 0.
      ACTSTU= 0.
      THRT  = 0.
      TGPT  = 0.
```

```
      TSTUD = 0.
      AVNAC = 0.
      AVTAC = 0.
      TOTSTU= 0.
      AVHRT = 0.
      AVGPT = 0.
      AVHRO = 0.
      AVGPO = 0.
      OGP1T=0.
      OGP1S=0.
      TGP1T=0.
      TGP1S=0.
      GO TO 10
   20 IN=IN-1
      IT=IT-1
C TELLY COMPUTES AVERAGE ACT,STANDARD DEVIATION,MINIMUM AND MAXIMUM ACT AND
C ERROR IF ALL SCORES ARE ZERO.  0= NO ERROR. 1= ALL SCORES ZERO. 2= ONLY ONE
C NONZERO SCORE.
      CALL TELLY (AN,SN,TOTAN,TENACT,SDN,ACMINN,ACMAXN,IN    ,NVN,IERN)
      CALL TELLY (AT,ST,TOTAT,TETACT,SDT,ACMINT,ACMAXT,IT    ,NVT,IERT)
C COMPLTE AVERAGES FOR ENTIRE GROUP.
      AGP1TN=TOGP1T/TOSTUD
      AGP1SN=TOGP1S/TOSTUD
      AGP1TT=TTGP1T/TTSTUD
      AGP1ST=TTGP1S/TTSTUD
      TTNSTU=TOSTUD+TTSTUD
      TAVHRT=TTHR/TTSTUD
      TAVGPT=TTGPA/TTSTUD
      ITTNST=TTNSTU
      ITOSTU=TOSTUD
      ITTSTU=TTSTUD
      WRITE(6,101)
      DO 23 I=1,8
   23 WRITE(6,102) I,NRST(I),NNS(I),NTS(I),ACTN(I),ACTT(I),SHR(I),TGPA(I
     1),GP1TN(I),GP1SN(I),GP1TT(I),GP1ST(I)
      WRITE (6,105) ITTNST,ITOSTU,ITTSTU,TENACT,TETACT,TAVHRT,TAVGPT,
     1AGP1TN,AGP1SN,AGP1TT,AGP1ST
      WRITE(6,106)
      WRITE (6,107) ACMINN,ACMAXN,SDN,IERN
      WRITE(6,108) ACMINT,ACMAXT,SDT,IERT
      WRITE(6,103)
      DO 22 J=1,12
      ITTSTO=TTSTUO(J)
      IF(TTSTUO(J).EQ.0.) GO TO 21
      TAVHRO=TTHRO(J)/TTSTUO(J)
      TAVGPO=TTGPO(J)/TTSTUO(J)
      TAVGPT=TTG1TO(J)/TTSTUO(J)
      TAVGPS=TTG1SO(J)/TTSTUO(J)
      GO TO 22
   21 TAVHRO=0.
      TAVGPO=0.
      TAVGPT=0.
      TAVGPS=0.
   22 WRITE(6,104) J,ITTSTO,TAVGPO,TAVHRO,TAVGPT,TAVGPS
      WRITE(6,109)
      STOP
      END
      SUBROUTINE TELLY(A,S,TOTAL,AVER,SD,VMIN,VMAX,NO,NV,IER)
      DIMENSION A(1),S(1),TOTAL(1),AVER(1),SD(1),VMIN(1),VMAX(1)
```

```
      IER=0
      DO 1 K=1,NV
      TOTAL(K)=0.0
      AVER(K)=1.0E75
      SD(K)=0.0
      VMIN(K)=1.0E75
    1 VMAX(K)=-1.0E75
      SCNT=0.0
      DO 7 J=1,NO
      IJ=J-NO
      IF(S(J)) 2,7,2
    2 SCNT=SCNT+1.0
      DO 6 I=1,NV
      IJ=IJ+NO
      TOTAL(I)=TOTAL(I)+A(IJ)
      IF(A(IJ)-VMIN(I)) 3,4,4
    3 VMIN(I)=A(IJ)
    4 IF(A(IJ)-VMAX(I)) 6,6,5
    5 VMAX(I)=A(IJ)
    6 SD(I)=SD(I)+A(IJ)*A(IJ)
    7 CONTINUE
      IF (SCNT) 8,8,9
    8 IER=1
      GO TO 15
    9 DO 10 I=1,NV
   10 AVER(I)=TOTAL(I)/SCNT
      IF (SCNT-1.0) 13,11,13
   11 IER=2
      DO 12 I=1,NV
   12 SD(I)=0.0
      GO TO 15
   13 DO 14 I=1,NV
   14 SD(I)=SQRT(ABS((SD(I)-TOTAL(I)*TOTAL(I)/SCNT)/(SCNT-1.0)))
   15 RETURN
      END
```

APPENDIX B

COMPUTER OUTPUT,

BEGINNING OF FIRST SEMESTER

Specialty	No. of Students	Native	Trans-fer	Nat Act	Trs Act	Trs Hrs	Trs GPA	Nat GPA All	Nat GPA Tec	Trs GPA All	Trs GPA Tec
1	26	17	9	20.29	22.40	57.78	2.431	0.000	0.000	0.000	0.000
2	15	5	10	17.00	20.56	52.50	1.987	0.000	0.000	0.000	0.000
3	63	35	28	20.89	21.79	49.14	2.015	0.000	0.000	0.000	0.000
4	24	16	8	20.13	20.00	57.63	2.235	0.000	0.000	0.000	0.000
5	17	9	8	20.00	21.00	48.75	1.800	0.000	0.000	0.000	0.000
6	34	13	21	21.62	21.40	47.10	1.981	0.000	0.000	0.000	0.000
7	6	2	4	21.00	20.00	39.00	1.810	0.000	0.000	0.000	0.000
8	26	23	3	23.61	23.33	40.33	2.052	0.000	0.000	0.000	0.000
TOTAL	211	120	91	21.25	21.57	49.87	2.038	0.000	0.000	0.000	0.000

	Minimum Act	Maximum Act	Standard Deviation	Error
Native	10.00	30.00	3.969	0
Transfer	11.00	29.00	4.212	0

Transfer Origin	No. of Students	Trs GPA	Trs Hrs	Sem GPA All	Sem GPA Tec
1	0	0.000	0.0	0.000	0.000
2	4	2.281	47.0	0.000	0.000
3	2	2.550	78.0	0.000	0.000
4	0	0.000	0.0	0.000	0.000
5	29	1.863	46.4	0.000	0.000
6	0	0.000	0.0	0.000	0.000
7	2	2.600	49.0	0.000	0.000
8	6	2.333	37.3	0.000	0.000
9	13	1.790	36.9	0.000	0.000
10	9	2.396	41.0	0.000	0.000
11	2	2.188	26.5	0.000	0.000
12	24	2.034	67.7	0.000	0.000

APPENDIX C

COMPUTER OUTPUT,

END OF FIRST SEMESTER

Specialty	No. of Students	Native	Trans-fer	Nat Act	Trs Act	Trs Hrs	Trs GPA	Nat GPA All	Nat GPA Tec	Trs GPA All	Trs GPA Tec
1	25	16	9	20.56	22.40	57.78	2.431	2.177	2.172	2.654	2.821
2	15	5	10	17.00	20.56	52.50	1.987	2.316	2.514	2.112	2.280
3	60	33	27	20.94	21.72	49.37	2.040	2.412	2.495	2.684	3.058
4	24	16	8	20.13	20.00	57.63	2.235	2.339	3.141	2.502	2.885
5	16	8	8	19.63	21.00	48.75	1.800	1.832	2.312	2.117	2.440
6	31	11	20	21.45	21.40	48.45	2.010	2.508	2.531	2.676	2.896
7	6	2	4	21.00	20.00	39.00	1.810	2.215	2.665	2.137	2.255
8	26	23	3	23.61	23.33	40.33	2.052	2.358	2.486	2.300	2.333
TOTAL	203	114	89	21.28	21.53	50.28	2.053	2.319	2.533	2.510	2.779

	Minimum Act	Maximum Act	Standard Deviation	Error
Native	10.00	30.00	4.010	0
Transfer	11.00	29.00	4.256	0

Transfer Origin	No. of Students	Trs GPA	Trs Hrs	Sem GPA All	Sem GPA Tec
1	0	0.000	0.0	0.000	0.000
2	4	2.281	47.0	2.517	2.667
3	2	2.550	78.0	2.650	3.270
4	0	0.000	0.0	0.000	0.000
5	28	1.881	46.5	2.817	3.065
6	0	0.000	0.0	0.000	0.000
7	2	2.600	49.0	1.440	1.610
8	6	2.333	37.3	1.653	1.960
9	12	1.822	38.3	2.281	2.596
10	9	2.396	41.0	2.800	2.986
11	2	2.188	26.5	2.475	3.000
12	24	2.034	67.7	2.452	2.719

APPENDIX D

COMPUTER OUTPUT,

END OF SECOND SEMESTER

Specialty	No. of Students	Native	Trans-fer	Nat Act	Trs Act	Trs Hrs	Trs GPA	Nat GPA All	Nat GPA Tec	Trs GPA All	Trs GPA Tec
1	21	12	9	20.42	22.40	57.78	2.431	2.453	2.480	2.859	2.897
2	11	4	7	17.75	20.67	42.57	1.917	1.837	2.642	2.229	2.683
3	47	24	23	22.00	21.47	49.17	2.067	2.599	2.977	2.955	3.179
4	22	14	8	19.86	20.00	57.63	2.235	1.940	2.674	2.512	2.961
5	11	5	6	20.80	21.00	42.33	1.742	2.226	2.784	1.352	1.654
6	28	9	19	21.44	21.40	49.00	2.053	1.313	1.483	2.237	2.321
7	5	2	3	21.00	20.00	41.67	1.880	2.075	2.500	2.340	2.347
8	22	19	3	23.79	23.33	40.33	2.052	2.481	2.718	2.910	3.063
TOTAL	167	89	78	21.49	21.51	49.24	2.076	2.254	2.619	2.510	2.717

	Minimum Act	Maximum Act	Standard Deviation	Error
Native	10.00	30.00	3.949	0
Transfer	13.00	29.00	3.948	0

Transfer Origin	No. of Students	Trs GPA	Trs Hrs	Sem GPA All	Sem GPA Tec
1	0	0.000	0.0	0.000	0.000
2	4	2.281	47.0	2.947	2.938
3	2	2.550	78.0	2.660	2.875
4	0	0.000	0.0	0.000	0.000
5	25	1.909	47.1	2.821	3.127
6	0	0.000	0.0	0.000	0.000
7	2	2.600	49.0	0.820	0.820
8	6	2.333	37.3	1.525	1.682
9	10	1.906	39.1	2.100	2.239
10	9	2.396	41.0	2.543	2.737
11	2	2.188	26.5	2.970	3.150
12	18	1.989	65.8	2.640	2.844

APPENDIX E

COMPUTER OUTPUT,

END OF THIRD SEMESTER

Specialty	No. of Students	Native	Trans-fer	Nat Act	Trs Act	Trs Hrs	Trs GPA	Nat GPA All	Nat GPA Tec	Trs GPA All	Trs GPA Tec
1	20	11	9	21.36	22.40	57.78	2.431	2.054	2.284	2.615	2.788
2	8	2	6	19.00	20.67	39.83	1.970	2.055	3.285	2.688	3.318
3	36	17	19	22.82	21.85	46.53	2.142	3.256	3.559	3.181	3.311
4	16	11	5	19.36	20.00	45.40	1.960	2.526	3.409	2.070	2.746
5	5	3	2	18.33	21.00	60.00	2.175	2.053	2.333	2.560	2.955
6	20	4	16	23.00	21.40	50.25	2.067	2.732	3.108	2.629	2.684
7	5	2	3	21.00	20.00	41.67	1.880	2.310	2.585	3.167	2.940
8	19	16	3	23.94	23.33	40.33	2.052	2.939	2.962	3.190	3.130
TOTAL	129	66	63	21.91	21.66	48.25	2.118	2.706	3.056	2.805	2.995

	Minimum Act	Maximum Act	Standard Deviation	Error
Native	12.00	30.00	3.866	0
Transfer	13.00	29.00	4.014	0

Transfer Origin	No. of Students	Trs GPA	Trs Hrs	Sem GPA All	Sem GPA Tec
1	0	0.000	0.0	0.000	0.000
2	4	2.281	47.0	3.055	3.052
3	1	2.320	28.0	2.150	2.390
4	0	0.000	0.0	0.000	0.000
5	24	1.933	46.2	2.969	3.252
6	0	0.000	0.0	0.000	0.000
7	1	2.700	32.0	2.000	2.000
8	2	2.950	36.5	1.250	1.250
9	7	2.294	48.1	2.829	3.053
10	8	2.321	42.9	2.742	2.920
11	2	2.188	26.5	3.420	3.625
12	14	1.999	62.6	2.715	2.828

APPENDIX F

COMPUTER OUTPUT,

END OF FOURTH SEMESTER

Specialty	No. of Students	Native	Trans-fer	Nat Act	Trs Act	Trs Hrs	Trs GPA	Nat GPA All	Nat GPA Tec	Trs GPA All	Trs GPA Tec
1	20	11	9	21.36	22.40	57.78	2.431	2.522	2.473	2.660	2.953
2	8	2	6	19.00	20.67	39.83	1.970	2.235	2.360	2.628	2.988
3	36	17	19	22.82	21.85	46.53	2.142	3.306	3.506	3.287	3.418
4	13	9	4	19.11	20.00	50.00	1.775	2.486	3.134	2.540	3.250
5	4	2	2	18.50	21.00	60.00	2.175	2.530	2.560	2.750	3.750
6	19	4	15	23.00	21.40	50.60	2.099	3.148	3.227	2.764	2.820
7	5	2	3	21.00	20.00	41.67	1.880	2.090	2.500	3.200	3.493
8	18	16	2	23.94	22.50	44.50	1.804	3.041	3.119	2.600	2.595
TOTAL	123	63	60	22.02	21.56	48.93	2.109	2.877	3.058	2.901	3.132

	Minimum Act	Maximum Act	Standard Deviation	Error
Native	12.00	30.00	3.916	0
Transfer	13.00	29.00	4.032	0

Transfer Origin	No. of Students	Trs GPA	Trs Hrs	Sem GPA All	Sem GPA Tec
1	0	0.000	0.0	0.000	0.000
2	3	2.192	52.0	2.460	2.493
3	1	2.320	28.0	2.730	2.730
4	0	0.000	0.0	0.000	0.000
5	24	1.933	46.2	3.109	3.272
6	0	0.000	0.0	0.000	0.000
7	1	2.700	32.0	1.810	1.810
8	1	3.200	46.0	2.460	2.460
9	7	2.294	48.1	3.016	3.530
10	7	2.424	42.6	2.779	3.130
11	2	2.188	26.5	3.455	3.870
12	14	1.999	62.6	2.687	2.897

APPENDIX G

COMPUTER OUTPUT,

CUMULATIVE FOUR SEMESTERS

Specialty	No. of Students	Native	Trans-fer	Nat Act	Trs Act	Trs Hrs	Trs GPA	Nat GPA All	Nat GPA Tec	Trs GPA All	Trs GPA Tec
1	20	11	9	21.36	22.40	57.78	2.431	2.454	2.489	2.738	2.813
2	8	2	6	19.00	20.67	39.83	1.970	2.265	2.700	2.822	3.087
3	36	17	19	22.82	21.85	46.53	2.142	3.216	3.384	3.114	3.321
4	14	9	5	19.11	20.00	65.60	1.976	2.361	3.078	2.768	3.112
5	4	2	2	18.50	21.00	60.00	2.175	2.365	2.680	2.460	3.070
6	19	4	15	23.00	21.40	50.60	2.099	2.962	3.075	2.772	2.847
7	5	2	3	21.00	20.00	41.67	1.880	2.195	2.495	2.767	3.037
8	19	16	3	23.94	23.33	40.33	2.052	2.837	2.903	2.757	2.963
TOTAL	125	63	62	22.02	21.66	49.94	2.127	2.759	2.970	2.865	3.054

	Minimum Act	Maximum Act	Standard Deviation	Error
Native	12.00	30.00	3.916	0
Transfer	13.00	29.00	4.014	0

Transfer Origin	No. of Students	Trs GPA	Trs Hrs	Sem GPA All	Sem GPA Tec
1	0	0.000	0.0	0.000	0.000
2	4	2.281	47.0	2.767	2.915
3	2	2.550	78.0	2.640	2.995
4	0	0.000	0.0	0.000	0.000
5	24	1.933	46.2	3.027	3.210
6	0	0.000	0.0	0.000	0.000
7	1	2.700	32.0	1.700	1.610
8	1	3.200	46.0	2.460	2.440
9	7	2.294	48.1	2.696	3.179
10	7	2.424	42.6	2.911	3.073
11	2	2.188	26.5	3.045	3.525
12	14	1.999	62.6	2.796	2.843

APPENDIX H

LISTING OF STUDENTS COMPLETING

FOUR SEMESTERS

80/80 LIST PAGE 001

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APPENDIX I

LISTING OF STUDENTS NOT COMPLETING

FOUR SEMESTERS

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VITA

Perry Reese McNeill

Candidate for the Degree of

Doctor of Education

Thesis: ACADEMIC SUCCESS PATTERNS OF NATIVE AND TRANSFER STUDENTS IN SELECTED ASSOCIATE DEGREE TECHNOLOGY PROGRAMS

Major Field: Higher Education

Biographical:

Personal Data: Born at Princeton, West Virginia, May 3, 1936, the son of Mr. and Mrs. Stowe Park McNeill.

Education: Graduated from Roosevelt High School, Honolulu, Hawaii, in 1954; received the Associate Degree in Electronics Technology from Oklahoma State University in 1962; attended St. Mary's University, San Antonio, Texas, 1962-1963; received the Bachelor of Science degree from Oklahoma State University with a major in mathematics in August, 1965; received the Master of Science degree with a major in natural science in July, 1967, from Oklahoma State University; completed requirements for the Doctor of Education degree at Oklahoma State University in July, 1973.

Professional Experience: Staff assistant in electronics, Sandia Corporation, Albuquerque, New Mexico, 1962-1963; electronics instructor, Technical Institute, Oklahoma State University, 1963-1965; staff member (engineer), Los Alamos Scientific Laboratory, New Mexico, 1967-1968; Assistant Professor, Technical Education, Oklahoma State University, 1968; senior project advisor, Oklahoma State University Brazil Project, Rio de Janeiro, Brazil, 1968-1970; Assistant Professor and Head, General Engineering Technology, Oklahoma State University, 1970; Associate Professor and Director of Student Personnel, School of Technology, Oklahoma State University, 1971.

Professional Organizations: Phi Kappa Phi, Oklahoma Technical Society, Phi Delta Kappa, and American Society of Certified Engineering Technicians.