SUCCESS OF TRANSFER STUDENTS IN THE COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES AT OKLAHOMA STATE UNIVERSITY FROM 1987-88 TO 1991-92

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THE IMPORTANCE OF SELECTED FACTORS ON THE SUCCESS OF TRANSFER STUDENTS IN THE COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES AT OKLAHOMA STATE UNIVERSITY FROM 1987-88 TO 1991-92

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INTRODUCTION

In 1987-88 first time freshmen enrollment at Oklahoma State University was 3,161, which was down 6.1 percent from the previous years 3,368 (Oklahoma State Regents for Higher Education p. 31). The number of students transferring to Oklahoma State University was 2,119, which included students at all class levels and for all classifications. (Oklahoma State Regents for Higher Education pp. 81, 84). Dr. Ray Bowen, OSU provost and vice president for academic affairs, in 1991 suggests that the transfer student population is larger than many realize in Oklahoma higher education. Undergraduate transfer students have become an important source of students to all colleges in major universities. Enrollment figures for 1990 indicated that 5,157 or 34.1 percent of Oklahoma State University undergraduate students transferred from two-year colleges. Officials expected that number to rise in 1991 ("Conference Here," 1991). Generally, students who transfer to the College of Agricultural Sciences and Natural Resources at Oklahoma State University come from junior colleges, regional four-year colleges/universities, and from other educational

institutions. Cox (1989) stated:

> Even though Associate of Science and Associate of Applied Science degrees were originally designed as "terminal degrees" to train individuals in technical fields and geared toward immediate employment upon completion, today recipients of these degrees often discover that they need more advanced schooling if they are to progress in their chosen fields (p. 1).

The reason students started at other educational institutions and then transferred varied. Many transfer students had attended junior colleges or other educational institutions initially because they were nearer the students' homes, cost less per credit hour, and allowed students to live at home and commute. But these educational institutions did not offer the terminal Bachelor's degree and often did not offer the range of major areas that were offered by the College of Agricultural Sciences and Natural Resources at Oklahoma State University. Thus, many students obtained some of their basic course work at other educational institutions and transferred to this major four-year institution.

There were concerns about the success of transfer students. Grubb (1991) expressed the concern "... that the proportion of community college students successfully transferring to four-year colleges has decreased (p. 194)." Were there factors that could be agreed upon that made

transfer students successful in the College of Agricultural Sciences and Natural Resources at Oklahoma State University? A review of literature suggested some factors such as grade point average at the time of transfer, type of institution (two-year verses four-year), and number of hours transferred had been used to determine transfer student success in other four-year institutions. Sometimes, demographic information such as race, age, sex, employment status, and full- or part-time student status were included in studies. This demographic information seemed to cloud the research in some studies and helped focus other research. Could the success of a transfer student at the College of Agricultural Sciences and Natural Resources be predicted using some of these factors?

Statement of Problem

At the end of academic year 1991-92, using data from the previous five years, can it be shown how successful transfer students had been at the College of Agricultural Sciences and Natural Resources at Oklahoma State University? Could the selected factors of, the type of institution (two- or four-year) from which the student transferred, grade point average from previous institution, and the number of credit hours transferred be used to predict transfer students' success?

Purpose of the Study

The purpose of this study was to determine the importance of selected factors on the success of undergraduate transfer students in the College of Agricultural Sciences and Natural Resources at Oklahoma State University from 1987-88 to 1991-92.

Objectives of the Study

The objectives of this study were to:

1. Determine the type of institution(s) (two-year or four-year) from which students transferred, and degree granted if applicable. (Associate of Arts, Associate of Science, Associates of Applied Science)
2. Determine the transfer students' grade point average and the number of hours transferred from previous institution in relationship to the grade point average upon graduation from the College of Agricultural Sciences and Natural Resources.
3. Determine the success of transfer students at Oklahoma State University in the College of Agricultural Sciences and Natural Resources by comparing grade point average(s) from previous institution(s) to their first semester OSU grade point average, all following semesters' grade point averages and cumulative grade point average.

4. Determine the percentage of transfer students in the College of Agricultural Sciences and Natural Resources that obtained a Bachelor of Science degree, entered graduate school or the College of Veterinary Medicine, or still remained enrolled at Oklahoma State University after five years; and, if the transfer student was not successful, in which semester(s) did this occur.

Assumptions and Limitations of the Study

Assumptions

It was assumed that the data provided identified the transfer students to the College of Agricultural Sciences and Natural Resources. Also assumed was that transfer students had met the requirements of the Oklahoma State University transfer admission policy.

Limitations

The following limitations of the study were recognized by the investigator:

1. To obtain this data, certain restrictions were placed upon it by the Associate Dean of the College of Agricultural Sciences and Natural Resources. These restrictions included: all students were to be anonymous, the specific

educational institution(s) from which students transferred were not to be identified, and all documents were to remain confidential.

2. Because all information gathered did not consistently contain the following characteristics: ACT scores, major, race, full- or part-time student status, employment status, marital status, they were not included into this study.

Definition of Terms

For the purpose of this study some terms had certain meanings. They were as follows:

Transfer student -- student that entered the College of Agricultural Sciences and Natural Resources from another educational institution with 6 or more credit hours.

Success -- did the transfer student obtain a BS degree, enter the Graduate College or College of Veterinary Medicine, or was the student still enrolled (retained) the last semester of this study (summer 1992).

GPA -- Grade point average, which was determined by dividing quality points by hour average (AVE) from the student's grade report.

Quality points -- These are arrived at by multiplying the number of hours for a course by a value given to each letter grade. Usually an A = 4 points, B = 3 points, C = 2

points, D = 1 point and an F or non-credit classes = 0 points.

Type of institution -- Transfer students came from two-year and/or four-year educational institutions.

AA/AS -- Refers to Associate of Arts and Associate of Science degrees.

AAS -- Associate of Applied Science degree. None of the students in this study had such a degree.

OSU -- Oklahoma State University

Retention rate -- Transfer students were considered retained if they had not graduated or entered graduate/veterinary school and were enrolled at the end of this study (summer Semester 1992).

Transfer shock -- A decline in a transfer student's earned grade point average compared to their grade point average(s) at their previous institution(s). Hill (1965), Lum (1989), Small and Valla (1989) and other authors noted this phenomenon.

Transfer admission -- At Oklahoma State University transfer students were admitted into the institution with criteria that differed from incoming freshman students. For the specific transfer admission policies for each academic year covered by this study refer to Chapter II.

Scope

The scope of this study included all 989 of the

transfer students to the College of Agricultural Sciences and Natural Resources in the five academic years of 1987-88 through 1991-92. These were the most current years for which data was available at the time this study was begun. The population was limited by the researcher with the following criteria. To be included in this study students must have: 1) transferred six or more hours from another institution, 2) enrolled and not have withdrawn during the semester, 3) earned at least one hour or obtained points at OSU that were reflected on their official university student record. Students that enrolled and did not attend and did not withdraw are also included. Only undergraduate students were included and maintained in this study. Students transferring to attend the College of Veterinary Medicine, were included through their acceptance into Veterinary School. Students that entered graduate school, or pursued an additional degree were tracked until their first degree was granted.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter was to provide a review of the theoretical literature regarding transfer students and the factors found that relate to the success of transfer students. The emphasis of this review was on books, periodicals, and research studies of the 1980's and 1990. As citations from earlier sources were discovered these materials were reviewed and relevant information included here. To provide a structure for this review the following headings were used:

1. Why students transfer
2. Predictors of transfer student success
    a. GPA
    b. Number of hours transferred
    c. AA/AS degree transfers
    d. Two-year and four-year school transfers
3. Transfer shock
4. Oklahoma State University's statement on transfers
    a. 1986-88
    b. 1988-89
    c. 1989-90
    d. 1990-91
    e. 1991-92

6. Summary

According to figures from an internal count of undergraduate transfer students by the College of Agricultural Sciences and Natural Resources, transfer students represented 7.09 percent of the undergraduate population in 1987-88, 6.77 percent in 1988-89, 7.34 percent in 1989-90, 7.15 percent in 1990-91, 13.13 percent in the fall of 1991, 3.1 percent in the spring of 1992, and 4.85 percent in the summer of 1992 (W. Holley, personal communication, October 1, 1993). A 15-year study of transfer students' enrollment patterns showed that of new undergraduates to California University-Davis, 38 percent were transfers. (California Univ., Davis p. 3). Transfer student enrollment varied from college to college within universities and from university to university, but transfer students at many institutions had an important impact upon the student population.

Why Students Transfer

A Washington State Board for Community College Education study (1989) found that location and cost were the major reasons given for beginning studies at the community college and 70 percent of the community college transfers said the community colleges encouraged them to transfer.

Holahan, Green, Kelley (1983) reported "... transfer students were not taking an unreasonable time to graduate

and most were graduating in a period of time comparable to, or 1 year less than, that of students who came to the university directly from high school. Junior and senior college transfer students graduated in comparable amounts of time" (p. 308).

The community colleges provided access and opportunity for many students to obtain admission and complete bachelor degree programs which would not have been an opportunity open to them at a major four-year institution immediately following high school graduation due to low grade point averages, limited math/english courses taken, low ACT score or low rank in graduating class (Anderson, Campbell 1985, Heiser, Abbed 1989). Similar reasons were reported in a study of transfer students to the University of California-Berkeley. Scherini (1985) stated "Transfers were asked, 'Why did you go to another college instead of coming to Berkeley as a freshman?' (Qu. 32). Thirty percent said that it was because they were not UC-eligible, and another 30% said it was for financial reasons. 'Other' reasons reported more than once are: wanted to stay at home or be near home; wanted to go to school farther from home; was not psychologically prepared for Berkeley; needed more academic preparation; didn't know about major, and wanted to explore at community college; wanted to work and go to school" (p. 22).

Predictors of Transfer Student Success

Grade Point Average

The average GPA of those students with 50 or more transfer credits was slightly higher than those with fewer than 50 credits (2.783 as opposed to 2.649) (Head 1990).

No significant difference or relationship was observed between semester credit hours earned at North Iowa Area Community College and grade point average at graduation from a four-year institution (Phelan, Kirkland 1990).

Wright, Reilly, & Lytle (1990) stated that the success of students from two-year schools was best predicted by their grade point averages at the time of transfer. Thus when decisions about acceptance of transfer students from four-year institutions are being made, the admissions procedure should take both Scholastic Aptitude Test scores and grade point average into account.

Simply put by the Illinois Community College Board report (1984): "students who made good grades before transferring continued to make good grades at the four-year college or university" (p. 14). Academic integration as measured by GPA was by far the best indicator of persistence according to a paper presented by Prather and Hand (1986) to the Annual Meeting of the Southern Association for Institutional Research.

Lum (1989) warned that the first semester achievement

should not be the primary criterion upon which senior institutions assess the academic achievement level of their transfer population. Transfers who were able to continue past the first semester, even if they were unsuccessful academically, were more likely to show an improvement in their overall GPA.

Number of Hours Transferred

The quantity of semester hours earned at the community college had little or no relation to student outcomes. However, the data did prove that the length of community college attendance was beneficial to selected student outcomes according to Phelan (1990).

Head (1990) reported that Piedmont Virginia Community College students transferring 50 or more credits performed slightly better at senior institutions than those transferring less than 50 credits. In a study at Howard Community College, Radcliffe (1984) found that students transferring to University of Maryland-College Park with 50 or more credits from Howard County College were more successful than those who transferred with fewer credits.

Best (1990) indicated that community college students who transferred with 60 or more credits achieved significantly higher GPAs and lower dismissal rates than the students who transferred with fewer than 60 credits, but that there was no significant difference in the graduation

rates of the two groups. Clagett (1987) noted "Nearly 37 percent of the former Prince George Community College students who transferred over 60 credits to University of Maryland- College Park (UMCP) had cumulative grade points above 3.00 at UMCP, compared to less than 23 percent of those who had transferred 30 or fewer credits" (p. 7). House (1989) indicated "The results of this study, however, suggest that the grade decrement is lower when the student transfers later" (p. 146). This also supported the concept that the higher the number of credits transferred, the higher GPA's maintained and earned after transfer.

The number of semester credit hours earned at North Iowa Area Community College had little or no influence on student outcomes after transfer. However, the data did prove that the length of community college attendance was not negatively related to selected student outcomes (Phelan, Kirkland 1990).

Persistence rates and grade point averages tended to increase as the number of two-year college credits transferred increased (Illinois Community College Board, Springfield 1986). Those students with two years of successful experience in the community college outperformed their counterparts with only one year of community college preparation (Richardson, Doucett 1982).

Kulas (1988) identified transfer students with 0-29 transfer hours as a high risk category.

AA/AS Degree Transfers

AA/AS degree recipients, as a group, performed better after transfer than do AAS and non-degree transfer students. AA/AS had a mean cumulative GPA at 2.85; AAS degree recipients had a mean cumulative GPA at 2.79 and non-degree transfer students have the lowest GPA throughout the post-transfer period (Bragg 1982). AA/AS degree students, as a group, had the highest pre-transfer GPA and have consistently maintained that status throughout the study. Consistent with their pre-transfer status, AAS degree students continued to have the second highest GPA (Illinois Community College Board, Springfield 1984).

Lum (1989) noted that when the influence of the number of transfer credits from Harrisburg Area Community College on GPA were analyzed, no significant differences were uncovered. However, while the number of transfer credits did not significantly affect GPA, there was a trend toward an increased GPA by students who transferred with more than 30 hours.

Two-Year and Four-year Institution Transfers

Pounds and Anderson (1989) in a study of the University of Georgia during the 1987-88 fiscal year looked at transfers from two-year colleges to four-year colleges, from two-year colleges to two-year colleges, from senior colleges to senior colleges, and from non-system institutions to

system institutions. They noted that students transferring from two-year colleges to senior colleges had a very slight overall decrease of .08 in GPA after transferring, while students in the other three categories of within-system transfer students achieved an overall higher GPA after transferring. An analysis of final GPA, showed that senior college transfer and non-transfer students performed comparably, with junior college transfer students obtaining lower GPAs (Holahan, Green, Kelley 1983). GPAs at the previous college appear to be a good predictor of later success (Holahan, Kelley 1976).

Anderson and Campbell's study (1985) of the academic progress of community college transfers, senior college transfers and continuing sophomores and juniors (natives) at the University of Illinois at Chicago noted that none of the transfer groups equalled or exceeded their pre-transfer GPA the first term. Community college transfers to University of Illinois at Urbana-Champaign achieved first term grade point averages 0.57 below their pre-transfer GPA, while four-year institution transfers dropped 0.26; the natives achieved an average GPA (3.98) only 0.01 below their previous achievement. Neither community college transfers nor four-year transfers to UIUC equalled or exceeded their mean pre-transfer grade point average during the four terms included in this study (Heiser, Abbed 1989). Webb (1985) noted that overall, the GPA of College of the Sequoias

students dropped from 0.3 to 0.5 grade points after transferring to two four-year institutions in California. Anderson and Polillo (1987) reported that community college transfers achieved first term University of Illinois at Urbana-Champaign grade point averages 0.61 below their pre-transfer GPA, while four-year transfers dropped 0.32.

Transfer Shock

Hills' study (1965) looked at more than twenty studies of the academic performance of the junior college transfer, with 46 sets of data relevant to the question of transfer shock. Of those 46 data sets, 44 revealed shock and two showed no shock. This appeared to be one of the most often used sources for the context that most transfer students suffer from the effect of "transfer shock." As this data appeared dated for this study, a review of more current literature provided the following studies that review "transfer shock."

In a study on the performance of transfer students from Arizona community colleges to two Arizona universities, transfers suffered "transfer shock", a decline in their grade point averages compared to their previous community college grade point averages, to varying degrees, during their first semester at a university, but they recovered and completed their academic careers with grade point averages comparable to those of native university students

(Richardson, Doucette 1982). Nolan and Hall (1978) indicated "..., community college students experienced an average drop in GPA of more than a quarter of a letter grade (differential = -0.26), so that after maintaining an average GPA of 2.48 at the community college, transfers earned an average GPA of 2.22 for their first semester after transfer" (p. 546). House (1989) cited Nolan and Hall's study and found in his own study that the decrease in GPA differed by class level (GPA varied from 0.11 for juniors to 0.30 for sophomores); suggesting that the grade decrement was lower when the student transferred later.

About half of the transfer students from Alberta, Canada maintained their college grade point average, while half experienced a decline of about one grade point. Once established, the new grade levels tended to be maintained. Generally, transferring students reported an average decline after a year at the university of about 0.5 GPA and tended to remain at the new level once it was established. Thus, transfer shock may have been more than a temporary setback caused by a change of scene (Small, Vaala 1989).

In his study of transfer students, Lum (1989) noted one of the key performance variables in any transfer study was the first semester GPA earned at the senior college.

> For Harrisburg Area Community College transfers, the grades ranged from a low of 0.25 to a high of 4.00. Was the so-called first semester "transfer

> shock" found among HACC students given the results from their first semester of courses at State University I(SUI)? The data would support this conclusion. HACC students, who transfer with an average GPA of 2.73, earned only a mean GPA of 2.37 after their first semester at State University I(SUI)(p. 8).

Lum (1989) questioned that after experiencing lower grades overall during their first semester, were HACC transfers able to adapt to their new institution and improve their GPA? In order to assess this, the first semester mean GPA was compared to the cumulative mean GPA for courses taken only at State University I(SUI). The results did show that after the first semester, grades (as measured by GPA) did go up. The GPA rose from 2.37 to 2.55. Transfers who completed an AA degree did even better as they posted a cumulative GPA of 2.80.

In a follow-up report on students transferring from the Cuyahoga Community College to Cleveland State University and Kent State University in 1984, the Cuyahoga Community College reported that their transfer students showed a constant improvement in GPA the longer they attended the four-year school (Cuyahoga Community College 1987).

There did appear to be some differences between transfer students from two-year colleges and those from four-year institutions in regard to transfer shock.

Anderson, McGee and Campbell (1986) noted their findings indicated that community college transfers did not achieve as well after transfer to University of Illinois at Chicago as they did before transfer, while four-year college transfers and continuing sophomores and juniors achieved GPA's similar to those they had achieved prior to selection for this study.

There appeared to be contradiction to this trend from research by Hand and Prather (1984) that noted that, "An analysis of data found that when students transfer, typically their GPA increases"(p. 9). Hand and Prather (1984) continued with "The exception is when transferring to a university level institution from system junior and senior colleges or from outside the system"(p. 9).

Oklahoma State University's Statement on Transfers Admission

The following statements were excerpted from the Oklahoma State University's course catalogs from the University Admissions section.

Academic Years 1986-88:

> Transfer Admission. For the purpose of determining admission, a transfer student is one who has earned a minimum of six or more semester hours of college credit. Students with less than six semester hours of college credit must satisfy the criteria for first-time

entering freshmen. Students may transfer to Oklahoma State University from within the state system according to the following criteria:

1. Students who would have satisfied the admission requirements for the fall or spring semester as first-time freshmen, but chose to enroll at another institution within the state, are eligible to enroll as transfer students. Students with six to 23 hours of credit must have a cumulative GPA of at least a 1.40 (on a 4.00 scale); students with 24 or more earned credits must satisfy the retention standards listed below.
2. Students who would not have satisfied the admission requirements for the fall or spring semester as first-time freshmen are eligible to enroll as transfer students after earning at least 24 semester credit hours according to the retention standards listed below.

Retention Standards. The standards pertaining to the retention of students pursuing study in undergraduate programs at OSU are:

24 to 36 semester hours	1.60
37 to 72 semester hours	1.80
73 or more semester hours	2.00

Nonresidents of Oklahoma: Transfer Admission. For the purpose of determining admission, a transfer

student is one who has earned a minimum of six semester hours of college credit. Students with less than six semester hours of credit must satisfy the criteria for first-time entering freshmen. Students may transfer from outside the state according to the following criteria:

1. Transfer students seeking admission to OSU from colleges or universities accredited by the North Central Association or other regional associations will be given full recognition of their credits earned providing; (a) they are in good standing at the institution from which they are transferring, and (b) they have a cumulative grade-point average of 2.00 or higher (on a 4.00 scale) for all work attempted.

2. Transfer students seeking admission to OSU from colleges or universities not accredited by a regional association may be given full recognition for their credits earned when the credit is appropriate to the student's degree program and after OSU has validated the courses. Applicants must meet the conditions of 1.a. and 1.b. above, as well as demonstrate satisfactory progress (a 2.00 cumulative GPA on a 4.00 scale) during their initial term of enrollment (p. 8-9).

Academic Year 1988-89 Same as above (p. 8-9).

Academic Year 1989-90 Same as above (p. 9).

Academic Year 1990-91 Same as above. (p. 9).

Academic Year 1991-92

Transfer Admission. For the purpose of determining admission, a transfer student is one who has earned a minimum of seven or more semester hours of college credit. Students with less than seven semester hours of college credit must satisfy the criteria for first-time entering freshmen. Students may transfer to Oklahoma State University from within the state system according to the following criteria:

1. Students who have satisfied the admission requirements for the fall or spring semester as first-time freshmen, but chose to enroll at another institution within the state, are eligible to enroll as transfer students. Students with seven to 23 hours of credit must have a cumulative GPA of at least 1.7 (on a 4.00 scale); students with 24 or more earned credits must satisfy the retention standards listed below.
2. Students who would not have satisfied the admission requirements for the fall or spring semester as first-time freshmen are eligible to

enroll as transfer students after earning at least 24 semester credit hours according to the retention standards listed below.

Retention Standards. The standards pertaining to the retention of students pursuing study in undergraduate programs at OSU are:

12 through 60 semester hours	1.70
61 or more semester hours	2.00

Nonresidents of Oklahoma: Transfer Admission. For the purpose of determining admission, a transfer student is one who has earned a minimum of seven semester hours of college credit. Students with less than seven semester hours of credit must satisfy the criteria for first-time freshmen. Students may transfer to Oklahoma State University from outside the state according to the following criteria:

1. Transfer students seeking admission to OSU from colleges or universities accredited by the North Central Association or other regional associations will be given full recognition of their credits earned providing:

(a) they are in good standing at the institution from which they are transferring, and

(b) they have a cumulative grade-point average of 2.00 or higher (on a 4.00 scale) for all work

attempted.

2. Transfer students seeking admission to OSU from colleges or universities not accredited by a regional association may be given full recognition for their credits earned when the credit is appropriate to the student's degree programs and after OSU has validated the courses. Applicants must meet the conditions of (1-a) and (1-b) above, as well as demonstrate satisfactory progress (a 2.00 cumulative GPA on a 4.00 scale) during their initial term of enrollment (p. 9).

Summary

Transfer students and their success were important aspects of many colleges and universities. Transfer students were defined for this study as a student that entered the College of Agricultural Sciences and Natural Resources from another educational institution with six or more credit hours. These students started at other institutions for a number of different reasons. The ability to live at home, to be able to continue to work at an existing job (either full or part-time), lower costs per credit hour at the institution, wanting to be near friends, and the ability to complete some general education requirements are some factors that have been given for starting at one institution before transferring to another

institution.

Students transferred to obtain a degree from a major or more well-known institution, to obtain a major or area of emphasis not available at a previous institution, and/or they have been successful at a previous institution and feel they can be successful at another institution. When these students transferred their GPA often decreased the first semester or so after transfer due to transfer shock, but they began to raise their grade point average as time went on. Most transfer students did not obtain a grade point average equal to or higher than their original transfer grade point average, thus their cumulative grade point average was often lower than the original transfer grade point average.

Students transferring from two- and four-year institutions differed in their response to a major four-year institution. Thus some transfer students showed improvement while others showed declines in aspects of their college academic records.

CHAPTER III

METHODOLOGY

Introduction

Included in this chapter were the Oklahoma State University's required Human Subjects and Research review, the description of the population used for this study, the description of the conduct of the study, and a review of the methods used in the analysis of the data gathered for this study.

Institutional Review Board (IRB) Statement

Federal regulations and Oklahoma State University policy required review and approval of all research studies that involve human subjects before investigators could begin their research. The Oklahoma State University Office of University Research Services and the IRB conducted this review to protect the rights and welfare of human subjects involved in biomedical and behavioral research. In compliance with the aforementioned policy, this study received the proper surveillance and was granted permission to continue.

This study was granted the IRB# AG-93-006 as of October 6, 1992. Refer to Appendix A for IRB approval.

Objectives

The objectives for this study were to:

1. Determine the type of institution(s) (two-year or four-year) from which students transferred, and degree granted if applicable. (Associate of Arts, Associate of Science, Associates of Applied Science)
2. Determine the transfer students' grade point average and the number of hours transferred from previous institution in relationship to the grade point average upon graduation from the College of Agricultural Sciences and Natural Resources.
3. Determine the success of transfer students at Oklahoma State University in the College of Agricultural Sciences and Natural Resources by comparing grade point average(s) from previous institution(s) to their first semester OSU grade point average, all following semesters' grade point averages and cumulative grade point average.
4. Determine the percentage of transfer students in the College of Agricultural Sciences and Natural Resources that obtained a Bachelor of Science degree, entered graduate school or the

College of Veterinary Medicine, or still remained enrolled at Oklahoma State University after five years; and, if the transfer student was not successful, in which semester(s) did this occur.

Scope of Study

The scope of this study included all 989 of the transfer students to the College of Agricultural Sciences and Natural Resources in the five academic years of 1987-88 through 1991-92. These were the most current years for which data was available at the time this study was begun. The population was limited by the researcher with the following criteria. To be included in this study students must have: 1) transferred six or more hours from another institution, 2) enrolled and not have withdrawn during the semester, 3) earned at least one hour or obtained points at OSU that were reflected on their official university student record. Students that enrolled and did not attend and did not withdraw are also included. Only undergraduate students were included and maintained in this study. Students transferring to attend the College of Veterinary Medicine, were included through their acceptance into Veterinary School. Students that entered graduate school, or pursued an additional degree were tracked until their first degree was granted.

Conduct of Study

This study began with the development of a series of questions concerning undergraduate student success in conjunction with a review of literature. A literature review was done to help find areas used to determine success of transfer students. Then a series of questions on how these areas could affect the success of undergraduate students in the College of Agricultural Sciences and Natural Resources was developed. These questions were reviewed with members of the researcher's committee, and were included in the mini-proposal for this research. Originally, additional areas were included for research, specifically, the ACT scores of students. With the help of a professor in the Department of Agricultural Education, the researcher met with a representative from Oklahoma State University's Institutional Research department. A preliminary computer run was made of the data files available to Institutional Research. The results were not promising. Much of the information requested was not currently available as separate information. It should be noted that current student information was to be entered into the computer with other information as separate items. With this setback, the list of questions was again reviewed. The literature was again reviewed, and it was decided that the questions still had merit, but another source of information was necessary. Several sources were checked, and the sources did not

contain certain information, or it was not available as separate data. Finally, a professor in Agricultural Education attended a campus meeting regarding research being done for certain state authorities and met with a representative of the Administrative Systems Development Data Base.

This data base did contain much of the information necessary for answering the questions asked in this research. But the information was composite information, meaning the information was available on individual undergraduate transfer students, but not as separate information. The information requested was protected under the privacy of information act; thus its use required authorization from the then Interim Director of Admissions. To obtain the data required, a request from the Associate Dean of the College of Agricultural Sciences and Natural Resources was necessary. To use the data in this study, certain restrictions were placed upon it by the College of Agricultural Sciences and Natural Resources Associate Dean's office. These restrictions included: 1) all students were to be anonymous, 2) no identification of transfer schools was to be made, and 3) all documents were to remain confidential. Once this was agreed upon, authorization was obtained for a computer run that included all undergraduate transfer students to the College of Agricultural Sciences and Natural Resources from the fall semester of 1987 through

the summer semester of 1992. This computer run revealed over one thousand individual students that had transferred to the College of Agricultural Sciences and Natural Resources, and noted some area of Agriculture as their major area. This number was reduced after the computer run, by the computer office which eliminated duplicates and checking student enrollment dates to meet requirements. This left less than one thousand individual student records that were released to the researcher.

Analysis of Data

Starting with the fall 1987 student information, the student records were entered into a Microsoft Works Spreadsheet program as individual items of information from the composite hard copy information from the Oklahoma State University computer. Each semester's information was entered as separate data. These individual items included transfer school type (two- or four-year), dates of attendance, hours attempted, hours earned, hour averages, quality points, and GPA for each transfer institution. Also included was OSU information such as date of first OSU enrollment, hours attempted, hours earned, hour averages, points, other hours earned for each semester attended, and GPA for OSU as well as cumulative undergraduate hours attempted, hours earned, hour averages, points and GPA. In addition, graduation status was included, if appropriate.

Duplicate students, students that had enrolled but not earned credit hours or points at OSU, and other students that did not fit the transfer student profile set for this study were eliminated during this data entry period.

After this data was entered, it was reviewed for entry errors. Several problems were encountered. Some student information was not entered, but their data sheets had been marked because of questions of eligibility. As these individual students' information sheets were reviewed; their data was entered, or if the student did not fit the, profile information was not entered. Some transfer institutions were entered by name because their status as two- or four-year schools had to be researched. Using Peterson's guide to two-year colleges 1993 (23rd ed.) and Peterson's guide to four-year colleges 1993 (23rd ed.) as resource guides, determination of each institution's status was determined and recorded as a '2' or '4' in the spreadsheet program. For those few institutions not listed in the Peterson's Guides, a phone call to Zoe DuRant, the Director of Admissions at Cameron University, was made. Ms. DuRant checked Transfer Credit Practices of Designated Educational Institutions, An Information Exchange 1992-1994 for the status of the two institutions not listed in the Peterson's Guides. One institution was listed and the information about the other institution was known personally by Ms. DuRant.

Other decisions on how data was to be recorded were also made. If students attended more than one two- or four-year institution or combinations of two- or four-year institutions before transferring to OSU, then the two-year data were averaged and four-year data were averaged. For example, if a student had attended 3 two-year institutions and 1 four-year institution then the two-year information was averaged together and the four-year information entered as presented.

Each semester's cohort of students was entered into the computer program with each student's information for the fifteen semesters covered in the study on a single row, followed by all other students for that semester on an individual row. The information for each semester's cohort was then stored in a file for that semester. It should be noted that each semester's cohort of students was not static; that is, students came and went through out the fifteen semesters of the study. Specifically, many students maintained continuous enrollment for fall and spring semesters, but did not attend any summer semesters. Thus, the number of students in a cohort for the first semester is known and they each were tracked for the total fifteen semesters, but individual students may not appear for all fifteen semesters.

In determining the GPA averages, it was necessary to enter data separately on average hours and quality points,

so that GPA data could be generated and manipulation could be done for the various tables. Averaging totals of student's GPA did not reflect accurate data. In the spreadsheet, the GPA columns were set at a column width of 6 characters so as not to have rounding create an inflation effect on the GPA and/or GPA averages. The GPA information was not rounded and, for most calculations, was carried out to four decimal places.

The data was entered into both a 386 and a 486 IBM compatible computer depending upon equipment and time availability. The Microsoft Works 2.0 software program used was run under a Windows format. The statistical procedures used on the data for this study was performed using the formula functions of the spreadsheet. As the total population of transfer students was used for this study, descriptive statistics and frequency distribution were used. As described by Key (Summer 1991):

> The primary use of descriptive statistics is to describe information or data through the use of numbers. The characteristics of groups of numbers representing information or data is called descriptive statistics. Descriptive statistics are used to describe groups of numerical data ... (p. 183).

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

The purpose of this chapter was to analyze the importance of selected factors on the success of undergraduate transfer students in the College of Agricultural Sciences and Natural Resources at Oklahoma State University from 1987-88 to 1991-92 and to present the findings. The population of the study included all 989 of the transfer students to the College of Agricultural Sciences and Natural Resources in the five academic years of 1987-88 through 1991-92. That population was limited by the researcher with the following criteria. To be included in this study students must have 1) transferred six or more hours from another institution, 2) enrolled and not have withdrawn during the semester and 3) earned at least one hour or obtained points at OSU that were reflected on their official university student record. Students that enrolled and did not attend and did not withdraw were also included. Only undergraduate students were included and maintained in this study. Students transferring to attend the College of Veterinary Medicine were included through their acceptance

into Veterinary School. Students that entered graduate school, or pursued an additional degree were tracked until their first degree was granted. Computer generated student grade reports made available from the Administrative Systems Development Data Base, with the approval and assistance of the Associate Dean of the College of Agricultural Sciences and Natural Resources, were used to gather composite information on transfer students to the College of Agricultural Sciences and Natural Resources for the academic years 1987-88 through 1991-92.

Findings of the Study

The following section was included to present an analysis of the data collected relative to the objectives of the study.

Two-year and Four-year Institution Review

Presented in Table I is a frequency distribution of transfer students' graduation/retention rate and average number of hours transferred from two-year and four-year institutions. Students that transferred to the College of Agricultural Sciences and Natural Resources fit into four category descriptions. Transfer students came to Oklahoma State University from either two-year or four-year institution(s). Some students transferred from two-year institution(s) to a four-year institution to OSU or from

four-year institution(s) to two-year institution to OSU.

TABLE I

FREQUENCY DISTRIBUTION OF TRANSFER STUDENTS' GRADUATION/RETENTION RATE AND NUMBER OF AVERAGE HOURS TRANSFERRED.

Description	N= 989	Graduated or Retained	Percent Graduated or Retained	Average Hours Transferred
Four-year to OSU	210	95	45.24%	55.90
Four-year to 2-year to OSU	77	34	44.16%	70.40
Two-year to OSU	610	245	40.16%	59.47
Two-year to 4-year to OSU	92	43	46.74%	76.34

The majority of transfer students came to OSU directly from two-year institutions (N=610). Of these, 245 either graduated or were retained at the end of the study (summer 1992) for a 40 percent graduation/retention rate. They transferred an average of 59.47 hours.

The next largest group of transfer students was from four-year institutions to OSU's College of Agricultural Sciences and Natural Resources (N=210). Of these, 95 either graduated or were retained at the end of the study for a 45 percent graduation/retention rate. They transferred an

average of 55.9 hours.

The two combination groups (two-year to four-year to OSU / four-year to two-year to OSU) contained a much smaller number of students. The largest was the two-year to four-year to OSU group with an N=92. Of these, 43 either graduated or were retained at the end of the study for a 47 percent graduation/retention rate. They transferred an average of 76.34 hours.

The smallest group of transfer students was made up of students that transferred from four-year to two-year to OSU (N=77). Of these, 34 either graduated or were retained at the end of the study for a 44 percent graduation/retention rate. They transferred an average of 70.4 hours.

Table II shows the average of transfer students' grade point and percent decrease/increase after transferring to College of Agricultural Sciences and Natural Resources. The transfer students that came to OSU directly from two-year institutions (N=610) had an average transfer GPA of 2.83. These students earned an average OSU GPA of 2.1 for an average GPA decrease of 0.73. These same students earned an average cumulative GPA of 2.55 for an average GPA decrease of 0.28.

TABLE II

TRANSFER STUDENT'S AVERAGE TRANSFER GRADE POINT AND AMOUNT OF DECREASE AFTER TRANSFERRING TO COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES.

Description	Average Transfer GPA	OSU GPA	Decrease	Cumulative GPA	Decrease
Four-year to OSU	2.67	2.45	.22	2.59	.08
Four-year to 2-year to OSU	2.59	2.41	.18	2.56	.03
Two-year to OSU	2.83	2.10	.73	2.55	.28
Two-year to 4-year to OSU	2.77	2.21	.56	2.60	.17

Transfer students from four-year institutions to OSU's College of Agricultural Sciences and Natural Resources (N=210) had an average transfer GPA of 2.67. These students earned an average OSU GPA of 2.45 for an average GPA decrease of 0.22. These same students earned an average cumulative GPA of 2.59 for an average GPA decrease of 0.08 from the average transfer GPA of 2.67.

Students that transferred from two-year to four-year institutions to OSU (N=92) had an average transfer GPA of 2.77. These students earned an average OSU GPA of 2.21 for

an average GPA decrease of 0.56. These same students earned an average cumulative GPA of 2.5 for an average GPA decrease of 0.17.

The group that transferred from four-year to two-year to OSU (N=77) transferred an average transfer GPA of 2.59. These students earned an average OSU GPA of 2.41 for an average GPA decrease of 0.18. These same students earned an average cumulative GPA of 2.56 for an average GPA decrease of 0.03.

AA/AS Degree versus Non-AA/AS Degree Transfer Students

Presented in Table III are the numbers of transfer students with either an Associate of Arts or Associate of Science Degree by academic year and semester. The first thing noticed was the limited number of AA/AS degree transfers that transferred into the College of Agricultural Sciences and Natural Resources. There were only 91 AA/AS degree transfers out of a total of 989 transfer students, or less than 10 percent of the total number of transfers that had either an AA or AS degree. There had been an increase in AA and AS degree transfers each of the five academic years included in the study. In academic school year 1987-88, there were 4 degree transfers. In 1988-89, there were 10 transfers, 1989-90 had 24 transfers, 1990-91 had 26 transfers, and in 1991-92, the number rose to 27 AA/AS degree transfer students to the College of Agricultural Sciences

and Natural Resources. One student transferred to OSU with both an AA and an AS degree. There were no AAS degree transfers in the years covered in this study.

TABLE III

NUMBER OF TRANSFER STUDENTS WITH EITHER AN ASSOCIATE OF SCIENCE OR ASSOCIATE OF ARTS DEGREE BY ACADEMIC YEAR AND SEMESTER.

Academic Year	Semester	Number of Students	Sub-totals per year
1987-88	87 Fall	2	
	88 Spring	2	
	88 Summer	0	4
1988-89	88 Fall	7	
	89 Spring	3	
	89 Summer	0	10
1989-90	89 Fall	23	
	90 Spring	0	
	90 Summer	1	24
1990-91	90 Fall	20	
	91 Spring	4	
	91 Summer	2	26
1991-92	91 Fall	24*	
	92 Spring	2	
	92 Summer	1	27
		TOTAL	91

* One transfer had both AA and AS Degree

Presented in Table IV are the comparisons of average hours and grade point averages of transfer students who obtained an Associate of Arts or Science Degree with those transferring without a degree. Of the 91 transfers with either an AA or AS degree, 46 students or 51 percent either graduated or were still retained as of the summer of 1992. These students had transferred an average of 71.8 hours to OSU with an average transfer GPA of 3.21. They earned an average OSU GPA of 2.66 for an average decrease of 0.55. These same students earned an average cumulative GPA of 2.97 for an average GPA decrease of 0.24.

Forty-five of the AA/AS degree transfers were non-graduates or were not retained by the end of this study. These students had transferred an average of 75.8 hours to OSU with an average transfer GPA of 2.88. They earned an average OSU GPA prior to dropping out of 2.08 for an average decrease of 0.80. These students had an average cumulative GPA of 2.6 for an average decrease of 0.28.

Eight hundred ninety-eight transfer students did not have either an AA or AS degree when they transferred to the College of Agricultural Sciences and Natural Resources. Of these non-degree transfers, 380 students or 42 percent either graduated or were still retained at the close of this study. These students had transferred an average of 64.3 hours to OSU with an average transfer GPA of 2.89. They earned an average OSU GPA of 2.7 for an average decrease of

TABLE IV

COMPARISON OF AVERAGE HOURS AND GRADE POINT AVERAGES OF TRANSFER STUDENTS WHO OBTAINED AN ASSOCIATE OF SCIENCES OR ARTS DEGREE WITH THOSE TRANSFER STUDENTS TRANSFERRING WITHOUT A DEGREE.

	N= 989	Avg. Hours Trans-ferred	Avg. GPA Trans-ferred	Avg. OSU GPA	De-crease	Avg. Cumu-lative GPA	De-crease
AA/AS Degree	n= 91						
Grad/ Retained	46	71.8	3.21	2.66	.55	2.97	.24
Non-grad/ Retained	45	75.8	2.88	2.08	.8	2.60	.28
Non-AA/AS Degree	n=898						
Grad/ Retained	380	64.3	2.89	2.70	.19	2.81	.08
Non-grad/ Retained	518	56.6	2.64	1.82	.82	2.35	.29

0.19. These same students earned an average cumulative GPA of 2.81 for an average GPA decrease of 0.8.

Of the non-AA/AS degree transfer students, 518 students or 58 percent had not graduated or were not retained by the end of the study. These students had transferred an average

of 56.6 hours to OSU with an average transfer GPA of 2.64. Prior to dropping out they earned an average OSU GPA of 1.82 for an average decrease of 0.82. These students had an average cumulative GPA of 2.35 for an average decrease of 0.29.

Number of Hours Transferred Affects on GPA

The hour divisions listed below correspond with the OSU catalog listing for classifying students. To be classed as a freshman a student would have less than 27 hours, a sophomore would have 28 to 59 hours, a junior would have 60 to 93 hours and to be classed as a senior students would have more than 94 hours. In this study, if a student did not transfer 6 or more hours they were not included in the data.

Shown in Table V are the figures for an analysis of freshmen transfer students' transfer grade point average compared to earned grade point average by academic year and semester (N=88). The number of hours transferred ranged from 6 to 27 hours, with an average of 20 hours transferred. The transfer average GPA was 2.67. During three semesters, summers of 1988, 1989, and 1991, these students met or exceeded their transfer average GPA. The first semester earned average GPA showed a decrease of 1.17, with no other semesters having as large a decrease. The OSU average GPA of 1.80 was a decrease of 0.87, while the cumulative average of 2.30 was a decrease of 0.37 from the transferred average GPA.

TABLE V

AN ANALYSIS OF FRESHMEN TRANSFER STUDENTS' TRANSFER GRADE POINT AVERAGE COMPARED TO EARNED GRADE POINT AVERAGE BY ACADEMIC YEAR AND SEMESTER.

Year (N=88)	Semester	Grade Point Average	Amount Decreased Increased
1987-88	Fall	1.50	-1.17
	Spring	1.70	-.97
	Summer	3.00	+.33
1988-89	Fall	1.70	-.97
	Spring	1.70	-.97
	Summer	3.30	+.63
1989-90	Fall	1.90	-.77
	Spring	2.00	-.67
	Summer	1.70	-.97
1990-91	Fall	2.20	-.47
	Spring	2.20	-.47
	Summer	3.30	+.63
1991-92	Fall	2.40	-.27
	Spring	2.20	-.47
	Summer	1.60	-1.07
Averages	OSU GPA	1.80	-.87
	Cumulative GPA	2.30	-.37

Note: Freshmen= less than 28 accumulated hours.
Range = 6 to 27 accumulated hours.
Average number of transfer hours = 20.
Transfer grade point average = 2.67

Presented in Table VI are the figures of the sophomore classification (N=307). The number of hours transferred corresponded with the classification of 28 to 59 hours, with an average of 44.40 hours transferred. The transfer average GPA was 2.63. In only one semester, summer 1988, these students met or exceeded their transfer average GPA. The first semester earned average GPA showed a decrease of 0.83, with the second semester having a decrease of 0.73. In the rest of the semesters, the earned average GPA did not have as severe a decrease as the first two semesters. The OSU average GPA of 2.00 was a decrease of 0.63, while the cumulative average of 2.40 was a decrease of 0.23 from the transferred average GPA.

Presented in Table VII are the figures for the junior classification (N=519). The number of hours transferred again corresponded with the classification of 60 to 93 hours, with an average of 69.30 hours transferred. The transfer average GPA was 2.88. In no semester did these students meet or exceed their transfer average GPA. The first and second semester earned average GPA showed a decrease of 0.68. In no other semesters was the earned average GPA decrease as severe as the first two semesters. The OSU average GPA of 2.30 was a decrease of 0.58, while the cumulative average GPA of 2.70 was a decrease of 0.18 from the transfer average GPA.

TABLE VI

AN ANALYSIS OF SOPHOMORE TRANSFER STUDENTS' TRANSFER GRADE POINT AVERAGE COMPARED TO EARNED GRADE POINT AVERAGE BY ACADEMIC YEAR AND SEMESTER.

Year (N=307)	Semester	Grade Point Average	Amount Decrease Increase
1987-88	Fall	1.80	-.83
	Spring	1.90	-.73
	Summer	2.70	+.7
1988-89	Fall	2.30	-.33
	Spring	2.20	-.43
	Summer	2.40	-.23
1989-90	Fall	2.20	-.43
	Spring	2.20	-.43
	Summer	2.40	-.23
1990-91	Fall	2.40	-.43
	Spring	2.40	-.43
	Summer	2.50	-.13
1991-92	Fall	2.40	-.23
	Spring	2.30	-.33
	Summer	2.10	-.53
Averages	OSU GPA	2.00	-.63
	Cumulative GPA	2.40	-.43

Note: Sophomores = 28 to 59 accumulated hours.
Range = 28 to 59 accumulated hours.
Average number of transfer hours = 44.40
Transfer grade point average = 2.63

TABLE VII

AN ANALYSIS OF JUNIOR TRANSFER STUDENTS' TRANSFER GRADE POINT AVERAGE COMPARED TO EARNED GRADE POINT AVERAGE BY ACADEMIC YEAR AND SEMESTER.

Year (N=519)	Semester	Grade Point Average	Amount Decreased Increased
1987-88	Fall	2.20	-.68
	Spring	2.20	-.68
	Summer	2.30	-.58
1988-89	Fall	2.40	-.48
	Spring	2.40	-.48
	Summer	2.60	-.28
1989-90	Fall	2.40	-.48
	Spring	2.40	-.48
	Summer	2.50	-.38
1990-91	Fall	2.40	-.48
	Spring	2.40	-.48
	Summer	2.60	-.28
1991-92	Fall	2.40	-.48
	Spring	2.30	-.58
	Summer	2.30	-.58
Averages	OSU GPA	2.30	-.58
	Cumulative GPA	2.70	-.18

Note: Juniors = 60 to 93 accumulated hours.
Range = 60 to 93 accumulated hours.
Average number of transfer hours = 69.30
Transfer grade point average = 2.88

Presented in Table VIII are the figures for the senior classification (N=75). The number of hours transferred ranged from 94 to 205, with the classification being 94 or more hours. The average number of hours transferred was 122. The transfer average GPA was 2.73. These students met or exceeded the transfer average GPA in 12 of the 15 semesters. The first semester earned average GPA of 2.80 was an increase of 0.7. This trend continued until the fall of 1990 when the earned average GPA fell to 2.20 for a decrease of 0.53, which was the largest decrease for this group. The OSU average GPA of 2.70 compared favorably with the transferred average GPA, while the cumulative average GPA of 2.80 exceeded the transferred average GPA by 0.7.

TABLE VIII

AN ANALYSIS OF SENIOR TRANSFER STUDENTS' TRANSFER GRADE POINT AVERAGE COMPARED TO EARNED GRADE POINT AVERAGE BY ACADEMIC YEAR AND SEMESTER.

Year (N=75)	Semester	Grade Point Average	Amount Decreased Increased
1987-88	Fall	2.80	+.7
	Spring	3.00	+.27
	Summer	2.90	+.17
1988-89	Fall	3.20	+.47
	Spring	2.90	+.17
	Summer	3.20	+.47
1989-90	Fall	2.90	+.17
	Spring	3.00	+.27
	Summer	2.80	+.7
1990-91	Fall	2.20	-.53
	Spring	2.90	+.17
	Summer	2.70	-.3
1991-92	Fall	2.70	-.3
	Spring	2.30	-.43
	Summer	2.50	-.23
Averages	OSU GPA	2.70	-.3
	Cumulative GPA	2.80	+.7

Note: Seniors = 94 or More accumulated hours
Range = 94 to 205 accumulated hours
Average number of transfer hours = 122.00
Transfer grade point average = 2.73

Transfer Average GPAs Per Semester

Presented in Table IX are the figures for a chronological comparison of the grade point averages of all transfer students by semester. This table included the average GPAs per semester for the 15 semesters included in this study and the earned average GPA after transfer per semester for all students that transferred more than six hours (N=989) to the College of Agricultural Sciences and Natural Resources at OSU. The transfer average GPA included a GPA transferred from either two- or four-year institutions or grade point averages combined from two and four-year institutions.

Of the students that enrolled in the fall of 1987 (n=176), they met or exceeded their transfer average GPA of 2.86 only in the summer of 1991. In the first semester after transfer, the earned average GPA of these students decreased by 0.78. In the rest of the semesters, except for the spring 1992, the earned average GPA decrease was not as severe as the decrease in the first semester. Neither the OSU average GPA nor cumulative average GPA equalled or exceeded the transfer average GPA. The OSU average GPA showed a decrease of 0.74, with the cumulative average GPA decreasing by 0.34.

TABLE IX

CHRONOLOGICAL COMPARISON OF GRADE POINT AVERAGES
OF TRANSFER STUDENTS BY SEMESTER.

Cohort Year and Semester	n	Ave* Transfer GPA	Semester and Year fall 87 GPA	sp 88 GPA	su 88 GPA	fall 88 GPA	sp 89 GPA	su 89 GPA	fall 89 GPA	sp 90 GPA	su 90 GPA	fall 90 GPA	sp 91 GPA	su 91 GPA	fall91 GPA	sp 92 GPA	su 92 GPA	OSU AVG GPA	CUM AVG GPA
87 Fall	n=176	2.86	2.08	2.08	2.55	2.44	2.49	2.82	2.58	2.73	2.79	2.54	2.49	2.98	2.2	1.85	**	2.12	2.52
88 Spring	n=36	2.83		2.29	2.50	2.42	2.48	2.60	2.39	2.50	2.85	2.56	2.32	3.00	2.46	2.08	3.00	2.33	2.59
88 Summer	n=8	3.07			2.27	2.29	2.51	2.83	2.41	2.34	2.83	2.90	2.27	1.00	2.45	3.26	**	2.52	2.72
88 Fall	n=154	2.82				2.25	2.24	2.43	2.34	2.35	2.58	2.54	2.57	2.59	2.67	2.67	2.90	2.21	2.56
89 Spring	n=36	2.44					1.94	2.26	2.01	2.23	2.42	2.55	2.65	2.13	2.39	2.27	1.89	2.09	2.27
89 Summer	n=14	3.15						2.81	2.31	1.92	2.00	1.76	2.34	2.67	2.58	2.71	**	2.65	2.82
89 Fall	n=132	2.78							2.30	2.26	2.21	2.50	2.71	2.79	2.67	2.44	2.64	2.28	2.62
90 Spring	n=20	2.75								2.12	2.53	2.52	2.57	2.80	2.55	2.55	0.43	2.06	2.47
90 Summer	n=6	2.08									2.13	1.89	1.99	4.00	2.90	2.55	**	1.95	2.36
90 Fall	n=135	2.69										2.15	2.12	2.76	2.33	2.38	2.22	2.14	2.54
91 Spring	n=35	2.73											2.14	3.08	2.36	2.12	1.98	2.18	2.49
91 Summer	n=19	2.98												2.21	2.49	2.65	1.72	2.44	2.90
91 Fall	n=168	2.86													2.34	2.24	2.39	2.30	2.65
92 Spring	n=37	2.54														2.00	2.36	2.05	2.54
92 Summer	n=13	2.69															2.28	2.28	2.59
	N=989																		

* This column contains GPA averages from both 2 and 4 year schools in a number of combinations.
** No students of the semester cohort were enrolled during these semesters.

During the three summer semesters of 1990, 1991, 1992, the students that enrolled in the spring of 1988 (n=36), met or exceeded their transfer average GPA of 2.83. In the first semester after transfer, these students' earned average GPA was decreased by 0.56. In the rest of the semesters, except for the spring 1992, the earned average decrease was not as severe as the decrease in the first semester. Neither the OSU average GPA nor the cumulative average GPA equalled or exceeded the transfer average GPA. The OSU average GPA showed a decrease of 0.5, with the cumulative average GPA decreasing by 0.24.

Of the students that enrolled in the summer of 1988 (n=8), they met or exceeded their transfer average GPA of 3.07 only one semester, spring 1992. In the first semester after transfer these students had their earned average GPA decreased by .54. In the rest of the semesters except for the spring 1992 their earned average GPA decrease was not as severe as the decrease in the first semester. Neither the OSU average GPA or cumulative average GPA equaled or exceeded the transfer average GPA. The OSU average GPA showed a decrease of 0.5, with the cumulative average GPA decreasing by 0.24.

Of the students that enrolled in the fall of 1988 (n=154), they met or exceeded their transfer average GPA of 2.82 in only one semester, summer 1992. In the first semester after transfer these students had their earned

average GPA decreased by 0.55. In the second semester after transfer these students had their earned average GPA decreased by 0.56. In the rest of the semesters the earned average GPA decrease was not as severe as the decrease in the first and second semesters. Neither the OSU average GPA or cumulative average GPA equaled or exceeded the transfer average GPA. The OSU average GPA showed a decrease of 0.61, with the cumulative average GPA decreasing by 0.26.

Of the students that enrolled in the spring of 1989 (n=36), they met or exceeded their transfer average GPA of 2.44 during two semesters, fall 1992 and spring 1991. In the first semester after transfer these students had their earned average GPA decreased by 0.5. In the rest of the semesters the earned average GPA decrease was not as severe as the decrease in the first semester except for the summer 1992. Neither the OSU average GPA or cumulative average GPA equalled or exceeded the transfer average GPA. The OSU average GPA showed a decrease of 0.35, with the cumulative average GPA decreasing by 0.17.

Of the students that enrolled in the summer of 1989 (n=14), they met or exceeded their transfer average GPA of 3.15 during no semester. In the first semester after transfer these students had their earned average GPA decreased by 0.34. In no semester after the first semester did their earned average GPA equal the first semester. The decrease maximum in earned average GPA was in the fall of

1990 with an average drop of 1.39. Neither the OSU average GPA or cumulative average GPA equalled or exceeded the transfer average GPA. The OSU average GPA showed a decrease of 0.5, with the cumulative average GPA decreasing by 0.33.

Of the students that enrolled in the fall of 1989 (n=132), they met or exceeded their transfer average GPA of 2.78 during only one semester, summer 1991. In the first semester after transfer these students had their earned average GPA decreased by 0.48. In the second semester after transfer these students had their earned average GPA decreased by 0.52 and in the third semester after transfer the earned average GPA dropped by 0.57. In the rest of the semesters the earned average GPA decrease was not as severe as the decrease in the first, second and third semesters. Neither the OSU average GPA or cumulative average GPA equalled or exceeded the transfer GPA. The OSU average GPA showed a decrease of 0.5, with the cumulative average GPA decreasing by 0.16.

Of the students that enrolled in the spring of 1990 (n=20), they met or exceeded their transfer average GPA of 2.75 during only one semester, summer 1991. In the first semester after transfer these students had their earned average GPA decreased by 0.63, in the summer of 1992 the decrease was 2.32. In the rest of the semesters the earned average GPA equalled or exceeded the first semester and last semester of the study. Neither the OSU average GPA or

cumulative average GPA equalled or exceeded the transfer average GPA. The OSU average GPA showed a decrease of 0.69, with the cumulative average GPA decreasing by 0.28.

Of the students that transferred in the summer of 1990 (n=6), during four semesters, summer's of 1990 and 1991, fall 1991 and spring 1992, did these students met or exceed their transfer average GPA of 2.08. In only the second and third semesters did the earned average GPA drop below the transferred average GPA. The OSU average GPA did not equal or exceed the transfer average GPA. The OSU average GPA showed a decrease of 0.13. The cumulative average GPA did exceed the transfer average GPA; it showed an increase of 0.28.

Of the students that enrolled in the fall of 1990 (n=135), they met or exceeded their transfer average GPA of 2.69 during only one semester, summer 1991. In the first semester after transfer these students had their earned average GPA decreased by 0.54. In the second semester after transfer these students had their earned average GPA decreased by 0.57. In the rest of the semesters the earned average GPA decrease was not as severe as the decrease in the first and second semesters. Neither the OSU average GPA or cumulative average GPA equalled or exceeded the transfer average GPA. The OSU average GPA showed a decrease of 0.55, with the cumulative average GPA decreasing by 0.15.

Of the students that enrolled in the spring of 1991

(n=35), they met or exceeded their transfer average GPA of 2.73 during only one semester, summer 1991. In the first semester after transfer these students had their earned average GPA decreased by 0.59. In the fourth and fifth semesters after transfer these students had their earned average GPA decreased respectively by 0.61 and 0.75. In the third semester the earned average GPA decrease was not as severe as the decrease in the first, fourth and fifth semesters. Neither the OSU average GPA or cumulative average GPA equalled or exceeded the transfer GPA. The OSU average GPA showed a decrease of 0.55, with the cumulative average GPA decreasing by 0.24.

Of the students that enrolled in the summer of 1991 (n=19), they met or exceeded their transfer average GPA of 2.98 during no semester. In the first semester after transfer these students had their earned average GPA decreased by 0.77. In the fourth semester after transfer these students had their earned average GPA decrease by 1.26. In the second and third semesters the earned average GPA decrease was not as severe as the decrease in the first and fourth semesters. Neither the OSU average GPA or cumulative average GPA equalled or exceeded the transfer average GPA. The OSU average GPA showed a decrease of 0.54, with the cumulative average GPA decreasing by 0.8.

Of the students that enrolled in the fall of 1991 (n=168), they met or exceed their transfer average GPA of

2.86 during no semester. In the first semester after transfer these students had their earned average GPA decreased by 0.52. In the second semester after transfer these students had their earned average GPA decrease by 0.62. In the third semester the earned average GPA decrease was not as severe as the decrease in the first and second semesters. Neither the OSU average GPA or cumulative average GPA equalled or exceeded the transfer GPA. The OSU average GPA showed a decrease of 0.56, with the cumulative average GPA decreasing by 0.21.

Of the students that enrolled in the spring of 1992 (n=37), they met or exceeded their transfer average GPA of 2.54 during no semester. In the first semester after transfer these students had their earned average GPA decreased by 0.54. In the second semester the earned average GPA decrease was not as severe as the decrease in the first and second semesters. The OSU average GPA showed a decrease of 0.49, with the cumulative average GPA equaling the average transfer GPA.

The students that enrolled in the summer of 1992 (n=13) were reviewed for only one semester. They neither equalled or exceeded their transfer average GPA of 2.69 during this study. In the first semester after transfer these students had their earned average GPA decreased by 0.41. The OSU average GPA was the same as the first semester earned GPA, with the cumulative average GPA decreasing by 0.10.

Semester of Dropout

Presented in Table X are the semesters of this study and the number of students that dropped out after that semester. Overall, with a total number of 989 students in the study, 57.53 percent of the transfer students to the College of Agricultural Sciences and Natural Resources had left within the fifteen semesters of this study (summer 1992). Of the 1987-88 group, 42 percent did not return. Of the 1988-89 academic year, 48 percent did not return. For 1989-90, 56 percent were no longer enrolled by the summer of 1992. The percentages rise to 63 percent for 1990-91 and to 78 percent for 1991-92 academic years. Note that the 1987-88 group was followed for a total of 15 semesters. The rest were followed for a shorter length of time. This could account somewhat for the increasing percentage rates of non-returning students.

TABLE X

FREQUENCY DISTRIBUTION OF STUDENTS THAT DROPPED OR WERE RETAINED AS OF THE SUMMER OF 1992.

Academic Year	Semester	n by Semester	n Dropped	n Retained*	Percent Dropped	Percent Retained
1987-88	87 Fall	176	72	104	40.91%	59.09%
	88 Spring	36	16	20	44.44%	55.56%
	88 Summer	8	5	3	62.50%	37.50%
	Sub-total	**220**	**93**	**127**		
1988-89	88 Fall	154	68	86	44.16%	55.84%
	89 Spring	36	22	14	61.11%	38.89%
	89 Summer	14	10	4	71.43%	28.57%
	Sub-total	**204**	**100**	**104**		
1989-90	89 Fall	132	63	69	47.73%	52.27%
	90 Spring	20	9	11	45.00%	55.00%
	90 Summer	6	5	1	83.33%	16.67%
	Sub-total	**158**	**77**	**81**		
1990-91	90 Fall	135	83	52	61.48%	38.52%
	91 Spring	35	23	12	65.71%	34.29%
	91 Summer	19	16	3	84.21%	15.79%
	Sub-total	**189**	**122**	**67**		
1991-92	91 Fall	168	129	39	76.79%	23.21%
	92 Spring	37	30	7	81.08%	18.92%
	92 Summer	13	0	13	0.00%	100.00%
	Sub-total	**218**	**159**	**59**		
	Totals	**N=989**	**n=551**	**n=438**	**55.71%**	**44.29%**

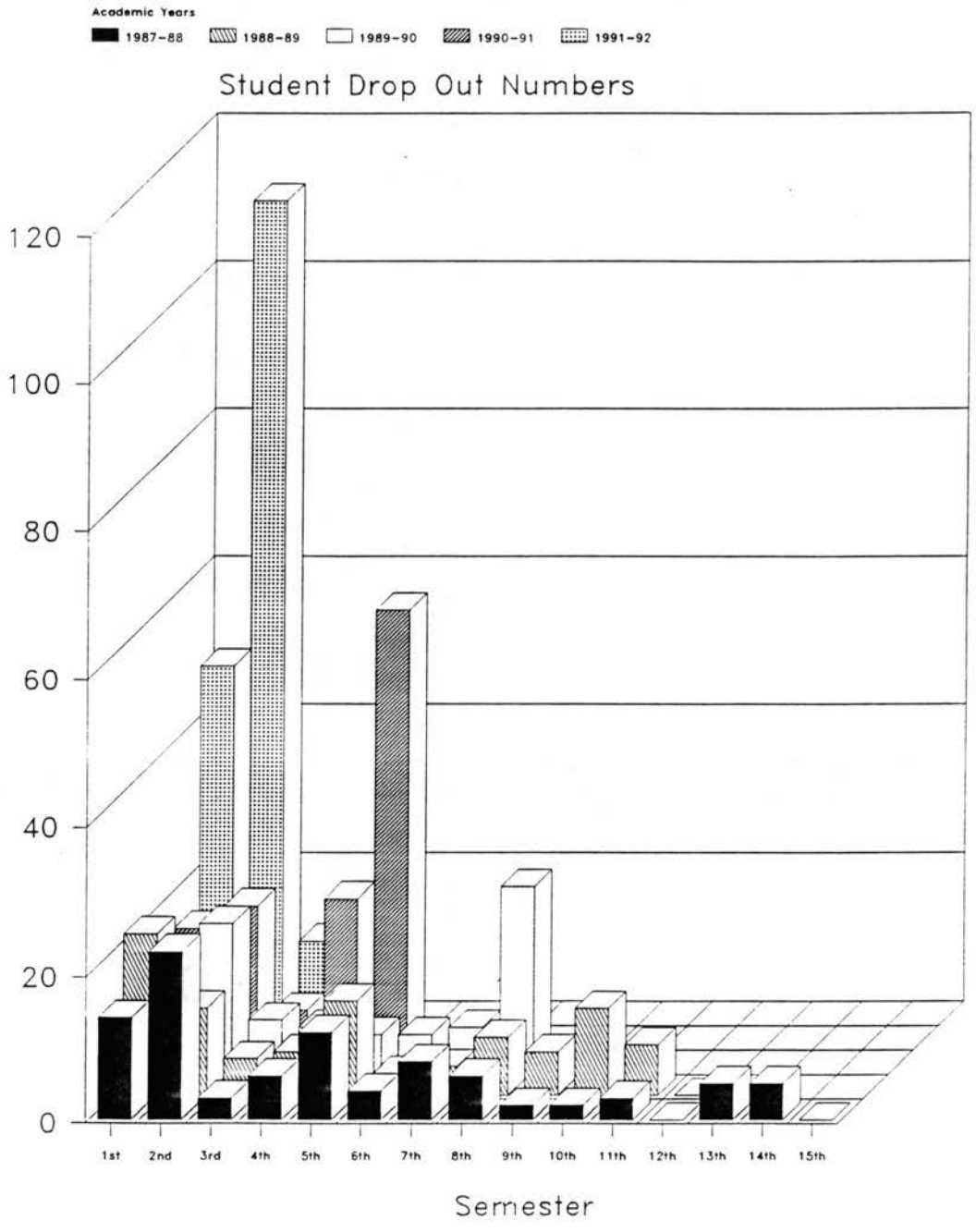
* This heading included students that graduated, were accepted in veterinary or grad school, or were enrolled Summer 1992.

Figure 1 showed that the majority of transfer students that did not return to the College of Agricultural Sciences and Natural Resources did so mainly after their second semester. Of the five academic years included in this study, the years of 1987-88, 1989-90, and 1991-92 followed this trend. In 1988-89, there were more students that did not return the first semester after transfer followed by the second and fifth semesters after transfer. In 1990-91, the fourth semester after transfer had the highest non-return rate, followed closely by the second semester and then the first semester after transfer.

Of note is the 5th semester after transfer. In 1988-89, 1989-90 and 1991-92, this semester had the third highest percentage of non-returning students, followed by either the first or second semester after transfer as highest or second highest drop-out semester.

FIGURE 1

THE NUMBER OF STUDENTS THAT DROPPED BY SEMESTER FOR ACADEMIC YEARS 1987-88 THROUGH 1991-92.



CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

At the end of academic year 1991-92, using data from the previous five years, can it be shown how successful transfer students had been at the College of Agricultural Sciences and Natural Resources at Oklahoma State University? Could the selected factors of, the type of institution (two- or four-year) from which the student transferred, grade point average from previous institution, and the number of credit hours transferred be used to predict transfer students' success?

The focus of this study was to determine the importance of selected factors on the success of undergraduate transfer students in the College of Agricultural Sciences and Natural Resources at Oklahoma State University from 1987-88 to 1991-92. This chapter is intended to review the purpose and objectives of this study, to summarize the procedures and findings of this study, and finally, to present the conclusions, recommendations and implications of the study.

Purpose of the Study

The purpose of this study was to determine the importance of selected factors on the success of undergraduate transfer students in the College of Agricultural Sciences and Natural Resources at Oklahoma State University from 1987-88 to 1991-92.

Objectives of the Study

The objectives of this study were to:

1. Determine the type of institution(s) (two-year or four-year) from which students transferred, and degree granted if applicable. (Associate of Arts, Associate of Science, Associates of Applied Science)
2. Determine the transfer students' grade point average and the number of hours transferred from previous institution in relationship to the grade point average upon graduation from the College of Agricultural Sciences and Natural Resources.
3. Determine the success of transfer students at Oklahoma State University in the College of Agricultural Sciences and Natural Resources by comparing grade point average(s) from previous institution(s) to their first semester OSU grade point average, all following semesters' grade point averages and cumulative grade point average.

4. Determine the percentage of transfer students in the College of Agricultural Sciences and Natural Resources that obtained a Bachelor of Science degree, entered graduate school or the College of Veterinary Medicine, or still remained enrolled at Oklahoma State University after five years; and, if the transfer student was not successful, in which semester(s) did this occur.

Procedures

This study began with the development of a series of questions concerning undergraduate student success in conjunction with a review of literature. A literature review was done to help find areas used to determine success of transfer students. Then a series of questions on how these areas could affect the success of undergraduate students in the College of Agricultural Sciences and Natural Resources was developed. These questions were reviewed with members of the researcher's committee, and were included in the mini-proposal for this research. Originally, additional areas were included for research, specifically, the ACT scores of students. With the help of a professor in the Department of Agricultural Education, the researcher met with a representative from Oklahoma State University's Institutional Research department. A preliminary computer run was made of the data files available to Institutional

Research. The results were not promising. Much of the information requested was not currently available as separate information. It should be noted that current student information was to be entered into the computer with other information as separate items. With this setback, the list of questions was again reviewed. The literature was again reviewed, and it was decided that the questions still had merit, but another source of information was necessary. Several sources were checked, and the sources did not contain certain information, or it was not available as separate data. Finally, a professor in Agricultural Education attended a campus meeting regarding research being done for certain state authorities and met with a representative of the Administrative Systems Development Data Base.

This data base did contain much of the information necessary for answering the questions asked in this research. But the information was composite information, meaning the information was available on individual undergraduate transfer students, but not as separate information. The information requested was protected under the privacy of information act; thus its use required authorization from the then Interim Director of Admissions. To obtain the data required, a request from the Associate Dean of the College of Agricultural Sciences and Natural Resources was necessary. To use the data in this study,

certain restrictions were placed upon it by the College of Agricultural Sciences and Natural Resources Associate Dean's office. These restrictions included: 1) all students were to be anonymous, 2) no identification of transfer schools was to be made, and 3) all documents were to remain confidential. Once this was agreed upon, authorization was obtained for a computer run that included all undergraduate transfer students to the College of Agricultural Sciences and Natural Resources from the fall semester of 1987 through the summer semester of 1992. This computer run revealed over one thousand individual students that had transferred to the College of Agricultural Sciences and Natural Resources, and noted some area of Agriculture as their major area. This number was reduced after the computer run, by the computer office which eliminated duplicates and checking student enrollment dates to meet requirements. This left less than one thousand individual student records that were released to the researcher.

Summary of Findings

Shown in Table XI are those students that transferred to Oklahoma State University College of Agricultural Sciences and Natural Resources from fall 1987 through summer 1992. The transfer students from two-year institutions had a grade point average decrease of 0.28 percent from their average transfer grade point average. This group was also

the largest group (n=610) of the four groups that transferred to Oklahoma State University College of Agricultural Sciences and Natural Resources from fall 1987 through summer 1992.

TABLE XI

DISTRIBUTION OF TRANSFER STUDENTS BY NUMBER OF HOURS TRANSFERRED AND AMOUNT OF DECREASE IN GRADE POINT AVERAGE.

Description	N = 989	Average Hours Transferred	Amount Decrease
Four-year to OSU	210	55.90	.8
Four-year to 2-year to OSU	77	70.40	.3
Two-year to OSU	610	59.47	.28
Two-year to 4-year to OSU	92	76.34	.17

As shown in Table XII, those students that transferred with either an Associate of Arts or Associate of Science degree have less of a decrease in their grade point average than those students that transferred without either an Associate of Arts or Associate of Science degree. Of those students with either an Associate of Arts or Associate of Science degree, those that graduated or were retained at the end of this study had transferred on average slightly fewer hours than those that did not graduate or not retained at the end of this study.

TABLE XII

DISTRIBUTION OF TRANSFER STUDENTS WHO OBTAINED AN ASSOCIATE OF ARTS OR ASSOCIATE OF SCIENCE DEGREE WITH THOSE TRANSFER STUDENTS THAT DID NOT BY NUMBER OF HOURS TRANSFERRED AND AMOUNT OF DECREASE IN GRADE POINT AVERAGE.

Description	N = 989	Average Hours Transferred	Percent GPA Decrease/ Increase
AA/AS Degree	n = 91		
Grad/Retained	46	71.80	0.8
Non-grad/Retained	45	75.80	0.3
Non-AA/AS Degree	n = 898		
Grad/Retained	380	64.30	0.28
Non-grad/Retained	518	56.60	0.17

Table XIII shows the data related to transfer student classification and the decrease/increase of grade point average and the cumulative grade point average. Those students that transferred as seniors (94 hours and above) had the least decrease in their Oklahoma State University grade point average compared to their transfer grade point average and had an increase in their cumulative grade point average compared to their transfer grade point average.

Those students that transferred as freshmen (6-27 hours) had the largest decrease in both Oklahoma State University grade point average and cumulative grade point average compared to transfer grade point average.

TABLE XIII

DISTRIBUTION OF TRANSFER STUDENTS BY CLASSIFICATION BASED ON AVERAGE HOURS TRANSFERRED, OSU GPA AND CUMULATIVE GPA.

Classification	n	Average Hours Transferred	Transfer Average GPA	OSU GPA	Amount Decrease/ Increase	Cumulative GPA	Amount Decrease/ Increase
Freshman (6 - 27 hours)	88	20.0	2.67	1.80	-.87	2.30	-.37
Sophomore (28 - 59 hours)	307	44.4	2.63	2.00	-.63	2.40	-.23
Junior (60 - 93 hours)	519	69.3	2.88	2.30	-.58	2.70	-.18
Seniors (94 hours and above)	75	122.0	2.73	2.70	-.3	2.80	+.7
N = 989							

As shown in Table XIV, of the 989 transfer students in this study, 55.71 percent or 551 students either had not graduated or were no longer enrolled at the end of this study. Only 44.29 percent or 438 transfer students either had graduated or were still retained at the end of this study.

TABLE XIV

DISTRIBUTION OF TRANSFER STUDENTS THAT DROPPED OR WERE RETAINED BASED ON ACADEMIC YEAR.

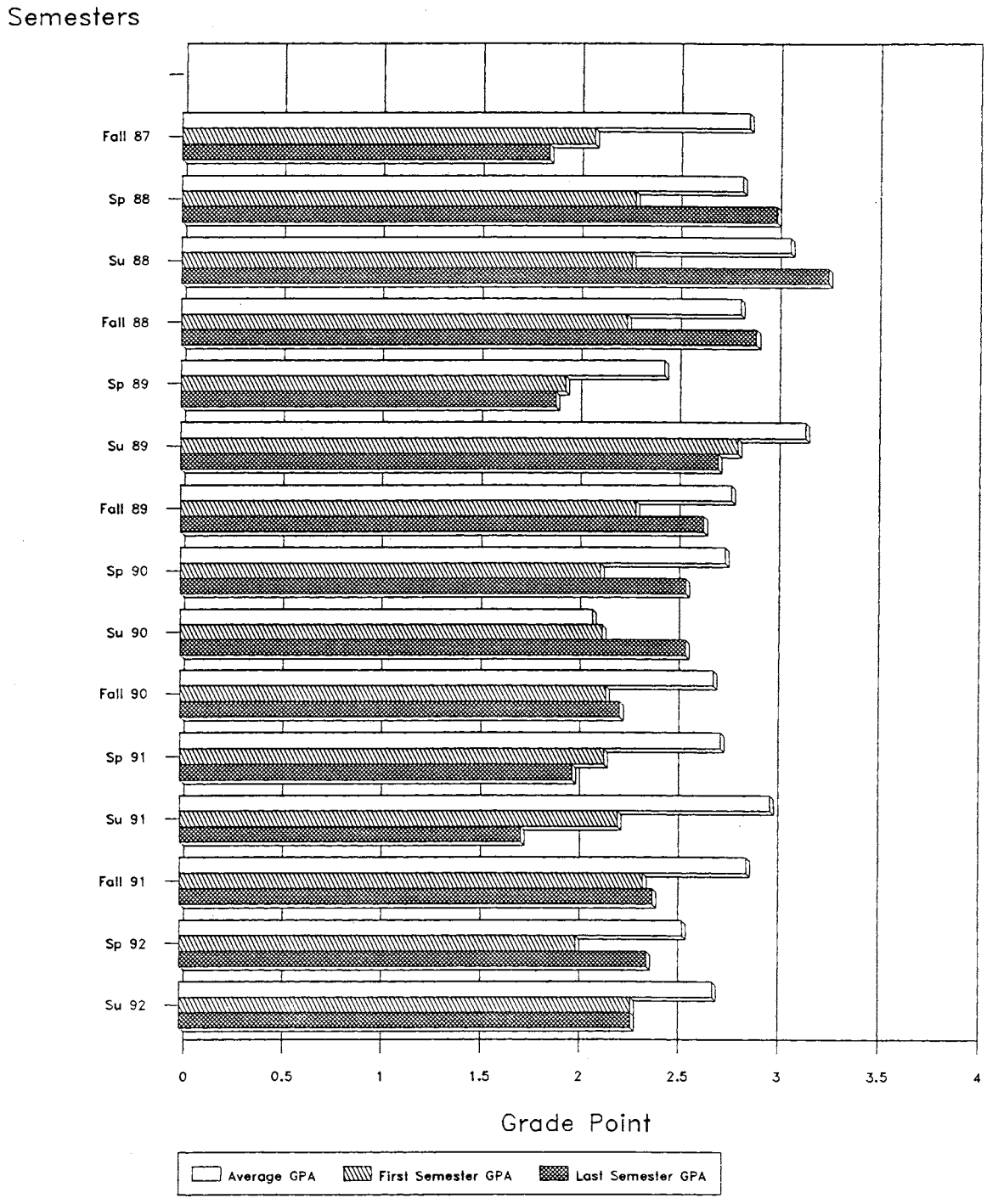
Academic Year	N	Dropped	Retained	Total Percent Dropped - Retained	
1987 - 88	220	93	127		
1988 - 89	204	100	104		
1989 - 90	158	77	81		
1990 - 91	189	122	67		
1991 - 92	218	159	59		
Totals	989	551	438	55.71%	44.29%

Figure 2 shows that transfer shock occurred with the transfer students in this study. Transfer shock was evident the first semester after transfer. In no first semester after transfer did that semester's grade point average equal or exceed the average transfer grade point average.

It should be noted that the cohort of students that transferred in spring 1988, summer 1988, fall 1988, and summer 1990 exceeded their average transfer grade point average. The cohort of students that transferred in fall 1989, spring 1990, fall 1990, fall 1991, and spring 1992 exceeded their first semester after transfer grade point average. (Note: The first semester and last semester for the summer 1992 are the same figures. This is why both first semester grade point average and last semester grade point averages are equal).

FIGURE 2

COMPARISON OF GRADE POINT AVERAGES OF TRANSFER STUDENTS BY SEMESTER.



Recommendations

The purpose of this study was to determine the importance of selected factors on the success of undergraduate transfer students in the College of Agricultural Sciences and Natural Resources at Oklahoma State University from 1987-88 to 1991-92. It was not intended to review the retention policies, articulation agreements, or existing programs designed to help transfer students do well at the College of Agricultural Sciences and Natural Resources. Thus some of the following recommendations may be already in place or planned to be put into place.

Recommendation 1: Transfer students from two-year institutions had the largest decrease in their grade point average after transfer. Grade inflation at the two-year institutions should be reviewed.

Recommendation 2: If grade inflation is not a problem, then the College of Agricultural Sciences and Natural Resources needs to develop and institute a program to identify transfer students from two-year institutions and work with these students to help acclimate them to a four-year institution. This could include teaming transfer students with native students and/or developing a system to review transfer student educational progress early in the first semester and each following semesters.

Recommendation 3: As students that transfer with

either an Associate of Arts or Associate of Science degree had less decrease in their grade point averages than those transfer students that did not have a degree, it is recommended that the College of Agricultural Sciences and Natural Resources work with two-year and other institutions to recommend that students obtain a degree prior to transferring.

Recommendation 4: As those students that transferred with the least number of hours had the largest decrease in both Oklahoma State University grade point average and cumulative grade point average compared to transfer grade point average, then the College of Agricultural Sciences and Natural Resources needs to develop and institute a program to identify transfer students with limited transfer hours and work with these students to help acclimate them to a major four-year institution. This could include teaming transfer students with native students and/or developing a system to review transfer student educational progress early in the first semester and each following semesters.

Recommendation 5: Transfer student numbers have been increasing each year of this study. Transfer student retention and graduation numbers average 44.29 percent. It is suggested that the above four recommendations should be implemented with a review of retention and graduation percent. Additional activities may be needed to lower the loss of transfer students. (A review of native students

retention rates could show if the 44.29 percent rate is low, average or high)

Recommendation 6: Transfer shock evident in this study follows a national trend. Transfer shock is to be expected but if transfer students are counseled and helped during their first semester and additional semesters, transfer students' grade point averages should improve in following semesters.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

[redacted] STATE UNIVERSITY
[redacted] REVIEW BOARD
FOR HUMAN SUBJECTS RESEARCH

Proposal Title: THE IMPORTANCE OF SELECTED FACTORS ON THE SUCCESS OF UNDER-GRADUATE TRANSFER STUDENTS IN THE COLLEGE OF AGRICULTURE AND NATURAL RESOURCES AT OKLAHOMA STATE UNIVERSITY FROM 1986-87 to 1990-91

Principal Investigator: Dr. EDDY FINLEY/ CHARLES L. GROTE

Date: 10-5-92 IRB # AG-93-006

This application has been reviewed by the IRB and

Processed as: Exempt [xx] Expedite [ ] Full Board Review [ ]

Renewal or Continuation [ ]

Approval Status Recommended by Reviewer(s):

Approved [xx] Deferred for Revision [ ]

Approved with Provision [ ] Disapproved [ ]

Approval status subject to review by full Institutional Review Board at next meeting, 2nd and 4th Thursday of each month.

Comments, Modifications/Conditions for Approval or Reason for Deferral or Disapproval:

Signature: Marcia S. Tilley Date: 10-6-92

Chair of Institutional Review Board

VITA 2

Charles Lewis Grote

Candidate for the Degree of

Doctor of Education

Thesis:

THE IMPORTANCE OF SELECTED FACTORS ON THE SUCCESS OF TRANSFER STUDENTS IN THE COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES AT OKLAHOMA STATE UNIVERSITY FROM 1987-88 TO 1991-92

Major Field: Agricultural Education

Biographical:

Personal Data:

Born on a farm near Shickley, Nebraska, December 13, 1946, the son of Bernard Charles and Florence Mary Grote.

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Vocational Horticulture Instructor at Columbia Public Schools, Columbia, Missouri, from August, 1971 to May, 1972; and at Shawnee Mission Northwest High School, Shawnee, Kansas, from June, 1972 to May, 1979; owned Landscape Design and Horticultural Consulting business in Shawnee, Kansas, 1980 to 1987; Instructor at Johnson County Community College, Overland Park, Kansas, from August 1983 to May 1984; Instructor at Cameron University, Lawton, Oklahoma, from August, 1987 to June, 1991; Graduate Teaching Assistant, Agricultural Education Department, Oklahoma State University, from September, 1991 to May, 1992; Instructor at Cameron University, Lawton, Oklahoma, from August 1992 to present.

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