

1985

# A study of the performance, progress, and degree achievement of Iowa community college transfer students at Iowa's state universities

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**Giddings, William G.**

A STUDY OF THE PERFORMANCE, PROGRESS, AND DEGREE  
ACHIEVEMENT OF IOWA COMMUNITY COLLEGE TRANSFER STUDENTS AT  
IOWA'S STATE UNIVERSITIES

*Iowa State University*

Ph.D. 1985

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A study of the performance, progress and degree achievement  
of Iowa community college transfer students  
at Iowa's state universities

by

William G. Giddings

A Dissertation Submitted to the  
Graduate Faculty in Partial Fulfillment of the  
Requirements for the Degree of  
DOCTOR OF PHILOSOPHY

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## CHAPTER I. INTRODUCTION

The origin of the two-year college and the associate degree in the United States is commonly traced to the University of Chicago. However, the associate degree was referred to in Great Britain almost 35 years before its introduction at the University of Chicago (Eells, 1943). The two-year college movement had begun in the United States by 1896 with the support of William Rainey Harper, the first president of the University of Chicago. Through his endorsement and acceptance of transfer credits, a junior college was established, drawing upon the ideas of both William Folwell of the University of Minnesota and Henry Tappan of the University of Michigan. Harper's support at the University of Chicago helped influence Joliet, Illinois Township School to establish Joliet Junior College in 1901, the first public junior college.

President Harry Truman may have provided the two-year college its manifesto. In July 1946, President Truman created the President's Commission on Higher Education, which became known as the Truman Commission. This commission issued its report on December 11, 1947, entitled "Higher Education for American Democracy." The Truman Commission Report placed a significant importance on the role the two-year college should play. The Truman Commission's definition of the community college included the providing of the first two years of a four-year degree or professional study, as well as providing vocational-technical and adult education.

The number of two-year colleges and the number of students enrolled in these colleges greatly increased in the years since the Truman

Commission Report. While 593 two-year colleges with a total enrollment of 560,732 students were reported by the American Association of Junior Colleges for fall 1950, the number had risen to 1,219 two-year colleges enrolling 4,964,379 students by fall 1982 (AACJC, 1983). These data indicated the growth of the transfer function of the two-year college during this period. A 1982 Gallup poll found half of its sample to believe that the community college's main job was to give preliminary training to students transferring to four-year institutions (Chronicle of Higher Education, 1982b), illustrating the significance of the transfer function of community colleges. The National Center for Education Statistics reported that 30 percent of high school seniors planned to attend a two-year college and then transfer to a four-year college. This compared to 22 percent planning to attend a four-year college initially (Cohen & Brawer, 1982). A Chronicle of Higher Education (1982a) report indicated that by Fall 1981, 1,422,157 new freshmen were enrolled in two-year colleges, which represented 54.7 percent of the total new freshmen enrolled in all institutions of higher education that year. Also, the number of college transfer associate degrees conferred increased from 145,473 in 1970-71 to 168,052 in 1977-78 (Cohen & Brawer, 1982).

Table 1 showed the trend of the increasing number of college transfer students enrolled in Iowa community colleges from 1966 through 1983. The number of students enrolled in the college parallel programs increased from 11,875 in fall 1970 to 19,106 in fall 1983. Also, the number of new freshmen enrolled at community colleges increased during this period, from 12,082 to 18,004. This represented an increase in the percent of total

Table 1. Iowa public community college and university enrollment, 1966-1983 (Cox, 1970-1983; Rhodes, 1967)

Fall statistics	Total state university enrollment and percent of state total enrollment	Undergraduate university transfers	University new freshmen and percent of total new freshmen	Total area community college enrollment and percent of state total	Community college parallel enrollment	Community college new freshmen and percent of total new freshmen
1983	66,823 (44.66%)	3,818	10,032 (26.67%)	40,394 (27.00%)	19,106	18,004 (47.86%)
1982	64,034 (43.50%)	4,237	10,276 (27.10%)	39,086 (26.55%)	17,643	18,500 (48.78%)
1981	61,620 (42.95%)	4,159	9,961 (26.49%)	37,596 (26.20%)	18,487	17,999 (47.86%)
1980	60,388 (43.27%)	4,099	9,825 (26.39%)	35,483 (25.42%)	17,070	17,266 (46.39%)
1979	57,216 (43.38%)	3,875	9,080 (25.66%)	31,754 (24.07%)	15,021	16,022 (45.28%)
1978	56,497 (43.24%)	3,951	9,158 (27.60%)	31,821 (24.35%)	14,745	13,971 (42.10%)
1977	55,911 (44.39%)	4,114	9,078 (28.33%)	30,453 (24.18%)	13,696	13,509 (42.16%)
1976	53,923 (43.93%)	4,071	8,386 (27.91%)	30,485 (24.84%)	13,268	12,610 (41.97%)
1975	53,004 (43.4%)	4,158	8,367 (27.4%)	30,407 (24.9%)	13,673	13,281 (43.4%)
1974	49,875 (43.9%)	4,072	8,312 (30.5%)	25,390 (22.4%)	11,397	10,669 (39.2%)



Table 1. Continued

Fall statistics	Total state university enrollment and percent of state total enrollment	Undergraduate university transfers	University new freshmen and percent of total new freshmen	Total area community college enrollment and percent of state total	Community college parallel enrollment	Community college new freshmen and percent of total new freshmen
1973	48,653 (45.0%)	4,010	8,055 (29.5%)	22,821 (21.1%)	11,153	10,641 (40.0%)
1972	48,103 (44.4%)	3,632	7,387 (25.8%)	21,328 (19.7%)	11,231	11,619 (40.5%)
1971	49,266 (44.5%)	3,691	7,579 (24.5%)	21,563 (19.5%)	11,376	13,034 (42.2%)
1970	49,291 (44.7%)	4,412	8,170 (26.2%)	20,518 (18.6%)	11,875	12,082 (38.7%)
1966	40,356 (43.2%)	3,228	7,808 (30.1%)	10,608 (11.4%)	6,000	6,230 (24.1%)

new freshmen in post-secondary education in Iowa from 38 percent in 1970 to approximately 48 percent in 1983. During this same period of time, the percent of the total new freshmen remained approximately the same at the three state universities.

Since the beginning of community or junior college existence, researchers questioned the quality of performance of community college students. In a 1924 study, Leonard V. Koos addressed the question of how junior college students compared to four-year college students with regard to grade performance and student characteristics. Koos (1924) compared graduates of junior colleges who transferred to four-year colleges or universities with juniors at the University of Minnesota who completed all of their college work at that institution. When comparing the average grade percentage for the junior year, Koos found that junior college transfers averaged 80.6 percent and the University of Minnesota juniors averaged 79.8 percent, with no statistical significance between the two.

The question of how community college transfer students compare to students who begin their work at a four-year college or university is still being asked, not only with respect to grade performance, but with respect to progress, persistence, and degree achievement as well. Richardson and Doucette (1980) compared students from Arizona community colleges who transferred to the three Arizona state universities with students who had begun their college work at the three universities. This study compared grade point averages, progress rates, persistence rates, and degree achievement, and found both differences and similarities,

depending upon the variable and the methodology used to compare the students.

Koos (1925) also compared results of mental tests of junior college freshmen and freshmen at colleges and universities. The distribution of scores of the Army Alpha Test was the same for 581 junior college freshmen as for 463 University of Minnesota and 2,545 Ohio State University freshmen. He also found the results of the Thurstone Test for College Freshmen to be the same for both groups. The mean for junior college students was 86.5 percent and a mean for four-year college students was 86.6 percent. These findings indicated that junior college students were similar to four-year college students in distribution of these characteristics at that time.

The growth in enrollment of community colleges during the 1960s and 1970s has also been characterized by a vast increase in the heterogeneity of the student body with respect to age, ethnicity, readiness or ability to do college work, and previous educational attainment. Knoell (1982) indicated the affirmative action program and open-door policies of community colleges in the 1970s increased enrollments of disadvantaged students from ethnic minorities, from low-income families, and students with physical and developmental disabilities. Astin (1983) reported that whereas community colleges enroll 33 percent of white freshmen, they enroll 39 percent of black and 53 percent of Hispanic and American-Indian freshmen. Knoell also noted that this widely diverse student body has much more diverse selection of baccalaureate programs to transfer into if they desired.

Kissler (1982) pointed out the following potential problems for the community college transfer function:

1. A decline in the number of high school graduates, which would increase the competition among higher education institutions for students.
2. An increase in the number of under-represented ethnic minority students in the public schools.
3. A serious decline in the level of academic preparation of students entering colleges and universities, which continued to have the greatest impact on the open-access community colleges.
4. Continued economic difficulties and budget cuts.

Koos (1924) compared the performance of junior college students to that of university natives with similar student characteristics (Koos, 1925) and found the performance of the two equivalent.

Since the time of Koos' study, the number of students enrolled in community college transfer programs has increased and student characteristics changed (Knoell, 1982; Astin, 1983). A review of the literature has failed to determine if the performance of community college students is still equivalent to the performance of students who enroll directly from secondary schools to the four-year university or students who transfer from one four-year institution to another. If there are differences in upper division grade point averages, progress toward a degree, or degree achievement, further investigation is needed to determine causes of these differences and whether these causes are related to community college attendance or to the students themselves. If raw comparisons of community college students to other students are not

accurate, investigation to determine a model of methodology for comparison is needed.

Both the community college and the senior college receiving transfer students can utilize current data regarding the success of community college transfer students. If there are differences among the community colleges in the success of their students, or among different types of transfer students, this information should be available to the universities. On the other hand, if there are differences in the success of transfers among the universities, or among students with different number of hours earned prior to transfer, this information should be available to the community colleges for the purpose of counseling with students who plan to transfer.

#### Statement of the Problem

Numerous studies in the literature reviewed (see Chapter II) pointed out difficulties experienced by community college students who transfer to four-year institutions. Problems identified include a drop in grade point average at the transfer institution as compared to the community college (Kissler, 1980), lower grade point averages at the transfer institution than students who enrolled directly from secondary schools (Anderson, 1977; Kissler, Lara, & Cardinal, 1981), slower progress at the transfer institution than students enrolling directly from secondary schools (Echternacht, 1968), and a lower persistence rate and rate of graduation at the transfer institution than students enrolling directly from secondary schools (Anderson, 1977; Kissler, Lara, & Cardinal, 1981). When comparing students who transfer from a community college to a four-year

college or university, a review of the literature presented conflicting reports. Some studies indicated that transfer students perform less well (Anderson, 1977; Kissler, Lara, & Cardinal, 1981), while other studies indicated no difference in the performance of the two groups (Richardson & Doucette, 1980; Atherton, 1981).

The method of these studies varied as much as the results. The review of the literature showed that some studies which compared community college transfer students to students native to a university without consideration of student achievement characteristics found differences between the two groups (Knoell & Medsker, 1965; Hodgson & Dickinson, 1974; Anderson, 1977). Studies that did take into consideration student characteristics such as high school rank, college placement test scores of the American College Testing Service (ACT), or College Entrance Examination Board (SAT), number of hours earned prior to transfer, or undergraduate grade point average, found no differences (Nickens, 1975; Thompson, 1978; Richardson & Doucette, 1980; Atherton, 1981).

This study compared students from Iowa community colleges who had transferred to one of the three Iowa state universities with students who had enrolled directly at the three state universities from secondary schools, and students who had transferred to one of the universities from another four-year college or university. Comparisons were made with regard to performance as measured by upper-division grade point average, progress as measured by the number of semesters enrolled, number of upper-division credits earned, and number of semester credits needed to graduate with a bachelor's degree, and persistence as measured by the rate

of graduation. Comparisons were made to determine if differences in these measures of success existed among these student groups. Comparisons were then made taking into account the student characteristics of sex, ACT composite score, university enrolled, and number of credits earned prior to transfer for community college students. This was done to determine if the same results were found with different methods of comparison.

#### Purpose of the Study

The purpose of this study was to determine if differences exist in performance, progress, and degree of achievement among transfer students from Iowa community colleges, other transfer students, and students native to the university at the three Iowa state universities. The study determined answers to the following questions:

1. Did differences exist in the performance, progress, and degree achievement of Iowa community college transfer students at the three Iowa state universities among the individual community colleges from which the students transferred?

2. Did differences exist in the performance, progress, and degree achievement of Iowa community college transfer students at the three Iowa state universities among the receiving universities?

3. Did differences exist in the performance, progress, and degree achievement at Iowa universities between male and female Iowa community college transfer students?

4. Did differences exist in the performance, progress, and degree achievement among Iowa community college transfer students with at least 60 semester hours earned at time of transfer, community college transfer

students with 48 to 59 semester hours earned at the time of transfer, Iowa community college transfer students with 36 to 47 semester credits earned at the time of transfer, transfer students from other four-year institutions, and students native to the state universities?

5. Did differences exist in the performance, progress, and degree achievement among Iowa community college transfer students with at least 60 semester credits earned at time of transfer, community college transfer students with 48 to 59 semester credits earned at the time of transfer, community college transfer students with 36 to 47 semester credits earned at the time of transfer, transfer students from four-year institutions, and students native to the state universities for students with similar ACT scores?

6. Did differences exist in the performance, progress, and degree achievement among Iowa community college transfer students with at least 60 semester hours earned at time of transfer, community college transfer students with 48 to 59 semester hours earned at the time of transfer, transfer students from other four-year institutions, and students native to the state universities for students of the same sex?

#### Sources of Data

Data for this study were gathered from the permanent record of the individual students at each of the three Iowa state universities. These data were collected through the cooperation of the offices of the registrar at Iowa State University, University of Iowa, and University of Northern Iowa. Student records were collected of community college and four-year college transfers entering the universities in the fall of 1980



and of native students entering the fall of 1978 and enrolled fall term of 1980.

The following information was collected for each student:

1. University at which student was enrolled.
2. Number of semester credits earned prior to transfer or prior to fall of 1980 for natives.
3. Cumulative grade point prior to transfer or prior to fall of 1980 for natives.
4. College attended prior to transfer for transfer students.
5. ACT composite score.
6. Age.
7. Sex.
8. University college in which student was enrolled.
9. University grade point average each semester enrolled beginning with fall of 1980.
10. Number of credits earned each semester enrolled beginning with fall of 1980.
11. Semester of exit from the university.
12. Semester of graduation from the university.

#### Treatment of the Data

Analysis of variance was used to first determine if differences existed in the performance, progress, and degree achievement of community college transfer students among the Iowa community colleges from which the students transferred. Two-way analysis of variance was used to determine if differences existed in these variables for community college transfer

students among the three universities to which they transferred, and between male and female community college transfer students.

The community college transfer students were grouped into three subgroups according to the number of credit hours earned prior to transfer to the university. Analysis of variance was used to determine if differences existed among each of the three groups of community college transfer students, a sample of transfer students from four-year institutions, and students native to each of the universities with respect to their performance, progress, and degree achievement at the university. Students were then grouped by sex and by ACT score. Analysis of variance was computed for students of the same sex and ACT group to determine if differences existed among the five student groups (three community college transfer groups, four-year college transfers, and native students), for students of the same sex, and students with similar ACT composite scores.

#### Delimitations of the Study

The scope of this study was limited to an analysis of students transferring from an Iowa community college to one of the three state universities, Iowa State University, University of Iowa, and University of Northern Iowa during the fall of 1980. Each year from 1970 through 1983, approximately 4,000 students transferred to the three state universities (see Table 1). The study of progress was limited to those students who had completed a bachelor's degree.

### Hypotheses to be Tested

Hypotheses were tested in this study relating to the performance, progress, and degree achievement of community college transfer students of the three Iowa state universities and comparing their performance, progress, and degree achievement to that of transfer students from four-year colleges and students native to the universities.

#### Hypothesis 1

There was no significant difference among the individual community colleges for Iowa community college transfer students at the three Iowa state universities with respect to the following measures of success:

- a. University cumulative grade point average.
- b. Percent of degree achievement.
- c. Number of semesters enrolled at the university by those who graduate.
- d. Number of credit hours earned at the university by those who graduate.
- e. Number of total credit hours earned prior to graduation with a bachelor's degree.

#### Hypothesis 2

There was no significant difference in the following measures of success of Iowa community college transfer students at the three Iowa state universities among the receiving universities:

- a. University cumulative grade point average.
- b. Percent of degree achievement.

c. Number of semesters enrolled at the university by those who graduate.

d. Number of credit hours earned at the university by those who graduate.

e. Number of total credit hours earned prior to graduation with a bachelor's degree.

### Hypothesis 3

There was no significant difference in the following measures of success between male and female Iowa community college transfer students enrolled at the three Iowa state universities.

a. University cumulative grade point average.

b. Percent of degree achievement.

c. Number of semesters enrolled at the university by those who graduate.

d. Number of credit hours earned at the university by those who graduate.

e. Number of total credit hours earned prior to graduation with a bachelor's degree.

### Hypothesis 4

There was no significant interaction between the university enrolled and the sex of the student by the following measures of success of Iowa community college transfer students at the three Iowa state universities.

a. University cumulative grade point average.

b. Percent of degree achievement.

c. Number of semesters enrolled at the university by those who graduate.

d. Number of credit hours earned at the university by those who graduate.

e. Number of total hours earned prior to graduation with a bachelor's degree.

#### Hypothesis 5

There was no significant difference in the following measures of success among five student groups. The groups were Iowa community college transfer students with at least 60 semester credits earned prior to transfer; community college transfer students with 48 to 59 semester credits earned prior to transfer; community college transfer students with 36 to 47 semester credits earned prior to transfer; transfer students from four-year colleges; and students native to the university at each of the three Iowa state universities.

a. Upper-division grade point average.

b. Percent of degree achievement.

c. Number of upper-division semesters enrolled for those who graduate.

d. Number of upper-division credit hours for those who graduate.

e. Number of degree hours for those who graduate with a bachelor's degree.

### Hypothesis 6

There was no significant difference in the following measures of success among five student groups. The groups were Iowa community college transfer students with at least 60 semester credits earned prior to transfer; community college transfer students with 48 to 59 semester credits earned prior to transfer; community college transfer students 36 to 47 semester credits earned prior to transfer; transfer students from four-year colleges; and students native to the university at each of the three Iowa state universities when grouped according to ACT score.

- a. Upper-division grade point average.
- b. Percent of degree achievement.
- c. Number of upper-division semesters enrolled for those who graduate.
- d. Number of upper-division credit hours for those who graduate.
- e. Number of degree hours for those who graduate with a bachelor's degree.

### Hypothesis 7

There was no significant difference in the percent of degree achievement among five student groups. The groups were Iowa community college transfer students with at least 60 semester credits earned prior to transfer; community college transfer students with 48 to 59 semester credits earned prior to transfer; community college transfer students with 36 to 47 semester credits earned prior to transfer; transfer students from four-year institutions; and students native to the university at the three Iowa state universities when grouped by sex.

- a. Upper-division grade point average.
- b. Percent of degree achievement.
- c. Number of upper-division semesters enrolled for those who graduate.
- d. Number of upper-division credit hours for those who graduate.
- e. Number of degree hours for those who graduate with a bachelor's degree.

#### Definitions of Terms

For the purpose of this study, the following terms were defined as follows:

1. Community College: Two-year institutions of post-secondary education that offer associate degrees and occupational diplomas to their students and a variety of other services to the communities in which they are located (Cohen & Brawer, 1982). For this study, community college, junior college, and public two-year colleges were synonymous.

2. Senior College: A baccalaureate-granting institution where students may transfer credit from a community college or other four-year institution (Cramer, 1971).

3. Associate Degree: A transfer degree intended to meet the first two-year requirement of a baccalaureate degree program.

4. Transfer Student: A student who matriculated to a senior college from a community college or other four-year institution.

5. Native Student: A student who matriculated to a senior college directly from high school (Cramer, 1971).

6. Performance: The comparative cumulative grade point averages earned by transfer students (Richardson & Doucette, 1980).

7. Persistence: The percentage of the original population still enrolled or having graduated during specified semesters (Richardson & Doucette, 1980).

8. Progress: The number of hours earned or semesters enrolled in a specified time by transfer students (Richardson & Doucette, 1980).

9. Degree Achievement: The percentage of students graduating by a specified time (Richardson & Doucette, 1980).

10. Cumulative Grade Point Average: The grade point average of total credits earned at the senior college.

11. Transfer Grade Point Average: The grade point average of total credits earned by transfer students at their original college of enrollment.

12. Upper-Division Grade Point Average: The grade point average of the junior and senior years only for native students and the university cumulative grade point average for transfer students.

13. Upper-Division Hours: The number of credit hours earned in the junior and senior years only for native students and the total number of hours earned at the university for transfer students.

14. Degree Hours: The number of credit hours earned at the university prior to earning the bachelor's degree for native students and the total number of hours earned prior to earning a bachelor's degree for transfer students.



15. Articulation: The acceptance of transfer credits by the receiving university and applied toward a bachelor's degree.

16. Upper-Division Semesters Enrolled: The number of semesters enrolled at the university prior to earning a bachelor's degree for transfer students and the number of semesters enrolled from fall 1980 until earning a bachelor's degree for native students.

#### Significance of the Study

This study contributed to the research on the performance, progress, and degree achievement of students transferring from community colleges in the following ways:

1. It added to the literature regarding community college transfer student success.

2. It determined if differences in success existed among community college transfer students with regard to community college attended, university attended, sex of the student, and number of credits earned prior to transfer.

3. It determined if differences in success existed among community college transfer students, four-year college transfer students, and students native to the university.

4. It compared the success of community college transfer students, four-year college transfer students, and students native to the university by more than one method to determine if different methods of comparison produced different results. This added to the development of a model for comparison of community college students to other students.

5. It will assist both community colleges and universities in counseling transfer students with regard to university selection and performance, progress, and degree expectations at the university.

## CHAPTER II. REVIEW OF LITERATURE

A review of selected literature identified information regarding the success of community college transfer students, the comparison of the success of community college transfer students with other students, and the methodology used in previous studies regarding community college transfer students. The literature review was divided into three parts. The first part included information regarding performance of community college transfer students. The second part contained information regarding the progress and persistence of community college transfer students. The third part reviewed the methodology of studies of community college transfer students.

Performance of Community College  
Transfer Students

Studies prior to 1965

An early advocate of the junior college was Leonard V. Koos. Koos (1924) studied the performance of junior college students who transferred to colleges and universities and compared the average junior grade percentage of 95 junior college graduates who had transferred, to 75 University of Minnesota students who had entered the university from high school. Junior college transfer students had a mean of 80.6 percent, while the students native to the university had a mean of 79.8 percent. Koos reported no statistically significant difference between these means.

Koos (1925) also studied the scores of intelligence tests of both community college freshmen and sophomores, and freshmen and sophomores at four-year colleges and universities. Koos compared the Army Alpha Test

scores of 581 junior college freshmen and 4,479 freshmen in six colleges and universities and found the distribution of scores of each group to be the same. He found the mean score of junior college freshmen to be 132.7 and the mean of the college and university students to be 136.7. He also found the mean of 322 public junior college freshmen to be 138.4 and the mean of 3,008 freshmen from the University of Minnesota and Ohio State University to be 130.4.

Koos (1925) also studied the scores of the Thurstone Test for College Freshmen. The mean for 206 junior college freshmen was 86.5, while the mean for 5,495 four-year college freshmen was 86.6. Koos concluded that the similar intelligence distributions and means indicated similar characteristics of students at both junior colleges and senior colleges.

Early studies of junior college transfers were also carried out by Eells (1927). Eells studied 510 junior college transfers at Stanford University from 1923-1927. The findings of this study showed that junior college transfers scored higher on intelligence tests than native students and performed superior to native students with regard to grade percentage after their first quarter at Stanford.

Eells (1943) also studied 2,080 junior college transfers who entered 319 junior colleges between 1934 and 1940. In analyzing the 56 percent of the transfers who had graduated or were still in residence, Eells reported that 46 percent had grade averages above the average grades of all students in the institutions studied, 16 percent were distinctly below the overall average, and 38 percent of the transfers were the same as the overall average.

Other early studies of the performance of junior college transfer students at four-year institutions presented conflicting information. In a study of 330 transfers from 26 junior colleges entering Baylor between 1910 and 1929, Allen (1930) found no difference between the grade point average of these students while at Baylor and the grade point average of 330 native students during their last two years.

Fichtenbaum (1941), however, in a study of nearly 900 junior college transfers to the University of Texas during the period 1935-38, found the grade point average of native students exceeded that of junior college transfers. The difference was less during the senior year than during the junior year. De Ritter (1951) summarized statistics from a number of studies including those by Eells, Siemans, Sammartino, and Fichtenbaum. He reported that the studies at that time showed junior college transfers performed as well, if not better, than native students. He pointed out that while Fichtenbaum reported native students as having a higher grade point average than transfers in the junior year, the difference lessened in the senior years after the transfer student had adjusted to university life.

Martorana and Williams (1954) studied 251 junior college transfers at the State College of Washington between 1947 and 1949. These students were matched with native students on the basis of sex, major subject area, veteran status, size of high school, age upon entrance into college, ACT test score, and high school grade point average. They concluded that when considered in groups, there was no significant difference between the performance of transfer students and that of native students. Their analysis of the total 251 transfers matched with 251 native students

indicated that the transfers had done at least as well as natives. They noted that in the subject areas of engineering and physical sciences, the transfers as a group performed better than their native counterparts.

A study was conducted by the Center for the Study of Higher Education at the University of California, which compared 2,549 community college transfer students and 8,391 native students in 16 senior colleges in eight states. Medsker (1960) reported that transfer students earned grade point averages comparable to those of native students.

In a study of 231 transfer students entering Colorado State University between 1953 and 1957, Klitzke (1961) matched community college students with native students on the basis of (1) lower division college grade point average, (2) same number of students per year, (3) major by year, (4) sex by year, and (5) similar credit hours completed. Klitzke (1961) reported finding no significant differences between transfer students' grade point average and the grade point average of native students.

#### Iowa studies, 1963-1984

Studies of Iowa community college transfer students during this time period included both predictive and comparative studies. Casey (1963) studied 1,088 junior college transfers who entered the three state universities between 1955 and 1959. He concluded that there existed a strong relationship between college grade point average and success at the senior college. He found the community college grade point average to be the best predictor of the first-year post-transfer grade point average. Casey grouped students at the State College of Iowa (UNI) on the basis of

completing 30 or 60 semester hours before transfer. Because of a small N of 10, his predictions for students completing 30 hours were not significant. Casey also noted that there was great variance in individual achievement depending on the senior college.

Langston (1971) agreed with earlier studies reviewed that the two-year college grade point average was the best predictor of the first-session University of Iowa grade point average. The composite ACT score was the next best predictor. Langston also compared differences between the community colleges in which the transfer students had previously enrolled. The data revealed significant differences among the community colleges in both mean first-session University of Iowa grade point average and mean composite ACT score.

Cramer (1971) studied transfer students from Iowa Central Community College at the three Iowa state universities. This study was primarily predictive in nature. Cramer supported earlier findings that the community college grade point average was the best predictor of the first-year post-transfer grade point average. This study of 200 Iowa Central students (150 who transferred and 50 who did not) also compared community college students who transferred and graduated, students who transferred and withdrew, and students who did not transfer. Significant differences in academic predictor variables were found between all three groups. This study examined only transfer students from one community college and did not indicate post-transfer success.

A Drake University study compared all transfer students to native students of that institution. Ingram (1967) studied 856 undergraduate

transfer students who entered Drake University between the fall of 1961 and the fall of 1964 inclusive. These transfer students were divided into the categories of out-of-Iowa college transfers, liberal arts college transfers, Iowa public college transfers, and other major university transfers. Using the analysis of variance procedure, the four transfer student groups were compared to 147 students native to Drake who entered in the fall of 1961. This study indicated native students attained a higher grade point average at graduation than transfer students. Students who transferred from Iowa public colleges (which included Iowa community college transfers) and transfers from other major universities out-performed all other transfer students. Transfers from out-of-Iowa colleges performed least well. Ingram also indicated, as Casey (1963) did, that the pre-transfer grade point average was the best predictor of the post-transfer grade point average, and that it was a significant predictor along with first-year post-transfer grade point average for graduation.

Another single institution study of community college students was completed at Iowa State University (Echternacht, 1968). Echternacht compared students within individual colleges of the university. His study compared 244 junior college transfer students who entered Iowa State University between the fall of 1960 and the fall of 1964 with at least 75 quarter hours of credit at transfer to 200 students native to Iowa State and attaining junior class status between the fall of 1960 and the fall of 1964. Native students earned significantly higher grade point averages at ISU than transfer students in the College of Agriculture and the College



of Engineering. However, no significant difference was found in the College of Home Economics and the College of Science and Humanities (Echternacht, 1968).

Echternacht (1968) also compared transfer students on the basis of the size of community college which they attended. He found differences in grade point average between students from small and large community colleges in the College of Engineering and the College of Home Economics, with transfers from large community colleges attaining higher grade point averages in these colleges.

In a study of University of Iowa students on academic probation during 1982 and 1983, Graham and Dallam (1984) found that transfer students from all types of institutions were more likely to be placed on probation than native students. However, Iowa community college transfer students were no more likely to be placed on probation than any other transfer students.

Hildebrandt (1984) indicated that no differences occurred between transfer and native students in the Forestry Department at Iowa State University in terms of performance. She found no significant differences between the mean grade point average of all course work of transfer and native students or between the mean grade average of these groups in selected forestry coursework.

Wielenga et al. (1982) studied the persistence of entering undergraduate freshmen and transfer students at the three Iowa state universities for four entering undergraduate classes; 1960-61, 1965-66, 1970-71, and 1975-76. The study of the class entering in 1975-76 reported

the mean grade point average of entering freshman students who earned degrees to be 2.98 at the University of Northern Iowa, 2.89 at Iowa State University, and 2.97 at the University of Iowa. This same study found the mean university grade point averages of transfer students entering in 1975 who graduated to be 2.98 at the University of Northern Iowa, 2.89 at Iowa State University, and 2.94 at the University of Iowa. While this study did not take into consideration student ACT scores or type of college attended prior to transfer in relation to academic performance, the study did so when reporting persistence and degree achievement. These data were reported in the second part of this review of literature. Although the performance of the two groups was not statistically compared, little differences were noted between the grade point averages of transfer students and native students who had graduated.

#### Other performance studies, 1965-1985

Differences between community college transfers and native students were reported by Knoell and Medsker (1965). This national study compared a group of 7,243 community college transfer students from 345 community colleges who transferred to 43 senior colleges in 1960 to groups of 4,026 four-year college transfer students and 3,349 native students who graduated in 1962. While students were not matched according to characteristics, as was done by Klitzke (1961), this study examined different types of transfer institutions and compared community college transfer students who transferred after one year to those who transferred after two years' attendance at a community college.

Findings concerning transfer students coming from this study included:

1. There was little difference in personal characteristics between native students and transfer students.

2. Cumulative grade point averages for transfer students at the four-year colleges were lower than their junior college averages, but reflected improvement following the first-term loss at post-transfer.

3. Variance was found in the performance of the transfer students in the individual four-year colleges and in the various types of colleges (major state universities, teachers' colleges, other state colleges, private universities, and technical institutes). Significant differences were found in the five types of colleges in grade point average and status two years after transfer.

4. Transfer students had consistently higher grade point averages than the native students at the freshman-sophomore level. Native students performed better in higher-division work. Grade differences between the groups of native and transfer student graduates from four of the five types of four-year institutions were highly significant. The exception was at teachers' colleges, where transfer students at some colleges earned higher grade point averages than they did in junior colleges.

5. Students who transferred after two years of junior college were more successful than students who transferred after one year.

These researchers concluded that most junior college transfer students could be successful in achieving their goals after transfer if they could select four-year institutions and major fields of study

appropriate to their ability and prior achievement. They also concluded that although a post-transfer grade point drop may be a reality for transfer students, the size of the drop and the degree of improvement afterward vary with the institution.

Hills (1965) reviewed more than 20 studies involving community college transfer students and their performance at four-year institutions. His summary of research findings emphasized the conflicting data regarding the success of community college transfer students. His findings included:

1. Most studies reflected a post-transfer drop in grade point average for transfer students; however, these students recovered from the drop in 34 of 38 studies.

2. Out of 33 sets of data comparing grades of transfer students to natives, 22 indicated native students performed better, seven indicated no difference in performance, and four indicated transfer students performed better than natives.

Another study which indicated differences in transfer student performance among colleges or majors within a university was completed at the Pennsylvania State University. Elliott (1972) studied 325 community college transfers at the Capitol campus of the Pennsylvania State University. The first-term grade point average for the group was 2.57, and increased to 2.83 for a cumulative average of graduation. The engineering technology students had the lowest first-term grade point average, while the elementary education students had the highest.

Hodgson and Dickinson (1974) compared 731 community college transfers and 358 four-year college transfers entering the University of Washington in fall 1968 with 1,808 native students. They found that the upper-division grade point average of natives was significantly higher than either transfer group, and the four-year transfer grade point average was higher than that of the community college transfers. The mean overall grade point average for all students was 2.84 compared to 2.96 for natives, 2.81 for four-year transfers, and 2.54 for two-year transfers. However, these researchers also found that when controlling for aptitude level differences as measured by the Washington Pre-college Testing Program scores, the differences in the grade point average disappeared for those students in the high aptitude level group.

Anderson (1977) found differences between the performance of community college transfers, four-year college transfers, and native students at the University of Illinois. Anderson's findings indicated that community college transfers entered with a grade point average equivalent to the lower-division grade point average of native students, and four-year transfers entered with a grade point average slightly lower than the other two groups. However, community college transfers achieved lower grade point averages than the other two groups after transfer.

In contrast to Hodgson and Dickinson (1974) and Anderson (1977), who found community college transfers to perform less well than other students, Nickens (1975) found no significant difference in first-term grade point average between community college transfers and native students at Florida State University. Nickens' study removed variance

accounted for by the Florida Twelfth Grade Test. Nickens found the grade point average of community college transfer students not to be significantly different from that of native students when observed over a two-year period. Students who dropped from the university were excluded from both transfer and native student groups in Nickens' study.

Studies of California community college transfer students indicated that these students perform less well in the university system than at the community college, and less well at the university than native university students. Kissler (1981) reported the performance of California community college transfer students at seven campuses of the University of California from 1972 to 1975. Kissler found a drop in grade point average from the community college to the University of California (UC) ranging from .30 lower at UC in fall of 1973 to .48 lower in fall 1978. Kissler, Lara, and Cardinal (1981) matched University of California (UC) native juniors with transfers from the California State University (CSU) system and the California Community College (CCC) system on the basis of lower-division grade point average. Comparisons for each matched group indicated that UC native students received higher upper-division grade point averages. They also reported that CSU transfers performed better than CCC transfers on all academic indicators. These findings supported a hypothesis that differences exist in upper-division performance among community college transfers, four-year college transfers, and native students when matched by lower-division grade point average.

Two studies of Arizona community college transfer students have indicated differences in performance and success between transfer and

native students disappear when students are matched by high school rank. Thompson (1978) studied community college students who transferred into the College of Business at the University of Arizona. This study indicated that there was no difference between transfer and native students when comparisons were based on grade point averages earned in the junior and senior years if students were matched on the basis of high school rank. When the two groups were not matched, a significant difference was found.

Richardson and Doucette (1980) studied community college transfers who entered Arizona State University, the University of Arizona, and the University of Northern Arizona in the fall of 1976 and 1977. These researchers compared community college transfers with 24 to 36 semester hours earned at the time of transfers (CC1), community college transfers with 48 to 60 semester hours earned (CC2), and native students. This study indicated that at all three universities, community college transfers dropped in grade point average after transfer, but steadily increased in succeeding semesters. At Northern Arizona University, CC2 students actually had a higher grade point average in all semesters studied than either natives or CC1 students. At the University of Arizona and Arizona State, native students did outperform both CC1 and CC2 students after transfer. However, when matched for high school rank, no statistical difference was found between the performance of CC2 and native students.

Richardson's and Doucette's findings supported earlier research that indicated differences in the success of community college transfer and

native students. However, they also found that when comparing transfer students who attended two years of community college to native students, or transfer students of similar high school rank as native students, little or no differences can be found. These findings supported the hypothesis that differences between the students are due to other variables than attendance at a community college.

Another study which supported Richardson's and Doucette's findings was conducted by Atherton (1981). Atherton studied community college transfer student performance in the upper division of Florida's universities measured by grade point averages earned during fall 1979. He compared transfer students who entered the universities prior to that term to university native students. He concluded that the performance of community college transfer students with an Associate in Arts (AA) degree was the same as native students. However, community college transfer students without an AA degree had lower grade point averages than either native students or transfers holding an AA degree. Atherton found that 22 percent of community college transfers with an AA degree earned a grade point average below 2.0, 32 percent earned a grade point average between 2.0 and 2.99, and 46 percent earned 3.0 and above. For native students, the respective percentages were 22 percent, 33 percent, and 45 percent. These findings supported the hypothesis that no differences exist between community college transfer students with an AA degree and native students, and that differences do exist among transfer students without an AA degree, transfer students with an AA degree, and native students.



Slark and Bateman (1981) conducted a study to assess the academic performance of former Santa Ana College (SAC) students who transferred to the California State University (CSU) system or University of California (UC) system in 1979-1980. These researchers found the average CSU grade point average of 1,343 transfers studied to be 2.72, compared to a SAC grade point average of 2.85. They also found community college transfer students who were eligible for UC upon high school graduation to perform as well as native students, and better than those transfers who were ineligible to enter UC upon high school graduation.

In a follow-up of their earlier study, Slark and Bateman (1983) found that the average CSU grade point average of 1,241 SAC transfer students was 2.69 during 1981-82, compared to their SAC average of 2.91. They also found that of 103 former SAC students who transferred to UC in fall 1979 or fall 1980, the average UC grade point average was above 2.50 for every UC campus. Slightly more men than women transferred. Most were below age 30 and were full-time day students when attending SAC. The largest number of transfer students majored in engineering, computer science, and business.

A study of the performance of Piedmont Virginia Community College transfer students at the University of Virginia (Doherty, 1984) found no difference in the third-year grade point average of 200 PVCC transfer ( $\bar{x}=3.00$ ) and 8,620 University of Virginia native students ( $\bar{x}=2.97$ ). Using the t-statistic, Doherty compared the grade point averages of 112 PVCC transfers who entered the university in 1978 and had graduated to 8,620 university native students who had graduated. He found no significant

difference between these two groups. These findings indicated that no differences exist in performance between transfer students who graduate and native students.

#### Progress and Persistence of Community College Transfer Students

The number of studies of progress and persistence or degree achievement were not as numerous as studies of performance of community college transfer students. However, a number of researchers did study progress or persistence (primarily degree achievement) of community college transfers while studying their performance. While some studies are comparative in nature, many studies of progress and persistence were descriptive or predictive rather than comparative. Again, some comparative studies compared transfer students to native students with similar characteristics, while others computed raw comparisons of the two groups without regard to matching student characteristics.

Eells (1943) studied 2,080 junior college transfers who had entered 319 junior colleges between 1934 and 1940. He reported that 43 percent graduated and 14 percent were still in residence and expecting to graduate, bringing the total to 1,177, or 56 percent, who did not withdraw. Five percent were reported to have dropped due to scholarship and 39 percent for reasons other than scholarship. Eells noted that the best record of the junior college transfers was made by the graduates in what Eells termed the general cultural field, which was a general education degree, with 67 percent graduated or still in residence.

Knoell and Medsker (1965) examined 7,243 community college transfer students from 345 community colleges who transferred to 43 senior colleges in 1960. Transfer students' probability of persistence and graduation was significantly related to their choice of major as well as choice of four-year college. Transfer students at teachers' colleges achieved the highest rate of graduation (73 percent) and lowest rate of attrition (21 percent). Also, 62 percent of the junior college transfers graduated within three years and another 9 percent were still enrolled.

Other studies presented data regarding community college transfer student degree achievement without consideration of student characteristics or comparison to native students. Lee and Suslow (1966) studied 660 transfer students entering University of California at Berkeley in 1961 and 1962. They found only 38 percent of the transfer students completed a bachelor's degree in four semesters after transfer. They also found the average grade point average of the transfer students declined the first semester at the university; however, some of the loss was regained by the fourth semester. Elliott (1972) studied 325 community college transfers at the Capitol campus of the Pennsylvania State University. Of this group, 77 percent graduated by the end of two years. Gold (1981) studied 386 Los Angeles City College students who transferred to California State University at Los Angeles in fall 1977. He found that 25 percent of the transfers had graduated by spring 1981 and that transfer students in the School of Business and Economics had grade point averages significantly below those in other schools.

There have been a number of studies conducted studying the success of Iowa junior or community college transfer students at Iowa state universities. However, the studies have been primarily limited to a single university study and mostly predictive in nature.

Ahmann (1951) studied 1,746 male transfer students who entered the engineering curriculum at Iowa State College between the fall quarter of 1946 and the fall quarter of 1949 inclusive. He studied the prediction of the academic achievement of these students as measured by the tendency to begin the fourth quarter in engineering and the tendency to graduate in the upper half of the class. He found that the probability of survival could be predicted at the transfer student's time of entry from the quantitative score on the American Council on Education Psychological Exam (Q-Score), high school grade point average, the English placement examination score, and rating of the student's prior college academic success (ISC rating). At the end of the first quarter, the probability of survival could be predicted from the first-quarter grade point average.

Lagomarcino (1955) studied 257 junior college transfers who had graduated from one of 14 Iowa junior colleges and transferred during the fall of 1951. Lagomarcino predicted the probability of graduation and the probability of graduation in the upper one-half of the graduating class at the three Iowa state senior institutions for these students. He found the junior college grade point average to be the best predictor of the transfer student's success. Lagomarcino reported that a student with a 2.0 junior college grade point average would have a 70 percent chance of graduation at Iowa State Teachers College, a 60 percent chance at the

University of Iowa, and a 53 percent chance at Iowa State College. As the grade point average increased, so did the student's chance of graduation. This study only considered transfer students with a minimum of 60 semester hours at the time of transfer, and did not show concern for the success of students who transferred with fewer hours.

Casey (1963) conducted a study similar to that of Lagomarcino and also concluded that there was a strong relationship between junior college grade point and success at the senior college. By calculating a regression equation, Casey showed that the best predictor for predicting graduation from one of Iowa's three state universities was the community college grade point average.

Casey's study of 1,088 junior college transfers who entered the three state universities between 1955 and 1959 did evaluate students at the State College of Iowa (UNI) on the basis of completing 30 or 60 semester hours before transfer. However, because of the small N of 10, his predictions for students completing 30 hours were not significant. Casey also noted that there was variance in individual achievement depending on the senior college attended.

Langston (1971) completed a study of 2,150 community college transfer students who entered the University of Iowa during the fall of 1967, fall of 1968, and spring of 1968. He found that 46 percent of those entering in the fall of 1967 had graduated within seven semesters, and 9 percent of that group were still enrolled. He also found that 25 percent of those transfers who enrolled during the fall of 1968 had graduated within five semesters and 28 percent of that group was still enrolled. This would

indicate that a follow-up of seven semesters or more would be appropriate to study persistence of transfer students.

Medsker (1960) reported the study which was conducted by the Center for the Study of Higher Education at the University of California. This study compared 2,549 transfer students and 8,931 native students in 16 senior colleges in eight states. Medsker reported that transfer students did less well than native students in the areas of retention and rate of graduation. Medsker reported that 25 percent of the transfers had dropped out by the end of one year. And 40 percent received the bachelor degree by the end of four years after the time they entered the junior college.

The study by Medsker found differences in graduation rates between transfer students and students native to the university without consideration of matching students by student characteristics. Klitzke (1961) also found significant differences between the two groups' degree achievement when student characteristics were taken into consideration. In a study of 231 transfer students entering Colorado State University between 1953 and 1957, he matched community college students with native students on the basis of (1) lower-division college background, (2) same number of students per year, (3) major by year, (4) sex by year, and (5) similar credit hours completed. Klitzke found significant differences reported between the proportion of native and transfer students who graduated with 90 percent of natives graduating and 70 percent of transfers.

Hills (1965) reviewed more than 20 studies involving community college transfer students and their performance at four-year institutions.

His research findings regarding degree achievements showed conflicting data regarding the success of community college transfer students. He found that out of 21 sets of data that compared graduation rates of transfer and native students, 19 indicated that natives graduated sooner or in greater proportions and two indicated that transfers graduated sooner or in greater proportions.

A comparative study of progress and degree achievement was conducted at Iowa State University (Echternacht, 1968). This study compared 244 junior college transfer students who entered Iowa State University between the fall of 1960 and the fall of 1964 with at least 75 quarter hours of credit at transfer to 200 students native to Iowa State and attaining junior class status between the fall of 1960 and the fall of 1964. Echternacht found differences in the number of quarters required for graduation and in the probability of graduation between native and transfer students in the College of Engineering and the College of Science and Humanities. No differences in these variables were found between natives and transfers in the College of Home Economics and the College of Agriculture.

Hodgson and Dickinson examined the question of how community college transfer students compared to native students and four-year college students with regard to degree achievement. These authors compared 731 community college transfers and 358 four-year college transfers entering the University of Washington in fall 1968 to 1,808 native students. They found that native students had a better rate of graduation than either group of transfer students (71 percent for natives compared to 53 percent

for four-year transfers and 57 percent for two-year transfers). No consideration was given to student characteristic distribution of the three groups.

Using similar methodology of raw group comparison, Anderson (1977) also found differences in the persistence of community college transfers, four-year college transfers, and native students at the University of Illinois. By the end of four semesters, approximately 83 percent of native students, 71 percent of four-year transfers, and 66 percent of community college transfers had graduated or were continuing.

While previous comparative studies found community college transfer students to have lower rates of degree achievement, Bolte and Coleman (1979) found different results when comparing Florida community college transfer students to University native students. In a study of 595 community college transfers entering the University of Central Florida in the fall of 1975 and 730 native junior students, these researchers found that 38 percent of the native students completed the bachelor's degree within three years and 44 percent of the community college transfers completed the bachelor's degree within five years. They also found that a significant greater percent of native students in biological science, computer science, and physical science graduated during the period in question and a higher percent of transfer students in education, public affairs, and general studies graduated during this period. Bolte and Coleman did not report why different lengths of time were used in comparing the persistence of transfer and native students.



Results of studies of California community college transfer students conflict with the Florida findings with regard to degree achievement and persistence. Kissler (1981) reported on the performance of California community college transfer students. He found a high and increasing failure rate of California community college students transferring into the University of California, reaching 30 percent in 1980. He also reported that graduation rates for California community college transfer students dropped at seven campuses of the University of California from 1972 to 1975. Kissler, Lara, and Cardinal (1981) matched University of California (UC) native juniors with transfers from the California State University (CSU) system and the California Community College (CCC) system on the basis of lower-division grades. T-test comparisons for each matched group indicated that UC native students were less likely to be on probation, had lower attrition rates, and higher graduation rates than comparable transfer students. They also reported that CSU transfers performed better than CCC transfers on all academic indicators.

Studies of Arizona community college transfer students previously reviewed indicated differences in performance between transfer and native students disappeared when students were matched by high school rank. However, differences were found regarding progress and degree achievement. Thompson (1978) studied community college students who transferred into the College of Business at the University of Arizona. She found that native students had significantly higher graduation rates than transfers. However, this report found transfers with the associate degree were more likely to graduate within two years than those without the associate

degree. As previously reported, Richardson and Doucette (1980) studied community college transfers who entered Arizona State University, the University of Arizona, and the University of Northern Arizona in fall 1976 and 1977. They compared community college transfers with 24 to 36 hours earned at time of transfer (CC1), community college transfers with 48 to 60 hours earned (CC2), and native students. This study found that no significant difference existed between native and CC2 students in rate of persistence at Arizona State University and University of Arizona. However, CC1 students did persist at a significantly lower rate than the other two groups. At the University of Northern Arizona, CC2 students showed the highest rate of persistence, followed by CC1 and then native students. At all three universities, native and CC2 students progressed toward a degree at a faster rate than did CC1 students. When matched for high school rank, no statistical difference was found between the degree achievement of CC2 and native students. At both Arizona State University and the University of Arizona, similar percentages of native and CC2 students accumulated enough hours to graduate by four and one-half years after hypothesized high school graduation.

Richardson and Doucette also compared differences between the colleges within Arizona State University. No differences were found between native and CC2 students in persistence or rate of graduation in the colleges of business and liberal arts. However, differences were found in both indicators between the two groups in both the colleges of Engineering and Fine Arts.

Richardson's and Doucette's findings in the area of progress and degree achievement also indicated differences existed between the success of community college transfer and native students. However, they found that if only comparing transfers with two years of community college, or transfers of similar high school rank as native students, little or no differences can be found. These findings also supported the hypothesis that differences in these variables may be due to variables other than attendance at a community college.

Hildebrandt (1984) reported that differences exist in progress between transfer and native students in the Forestry Department at Iowa State University. Differences were found in the time required to complete a bachelor's degree and the number of credits earned upon graduation. Transfer students progressed slower and had attained a greater number of hours, indicating a credit loss due to transfer.

The Iowa regents' study of persistence at the Iowa state universities (Wielenga et al., 1982) reported that 41 percent of 2,048 freshmen who entered University of Northern Iowa in 1975-76, 57 percent of 2,391 freshmen at Iowa State University, and 48 percent of 2,780 freshmen at the University of Iowa had earned bachelor's degrees by spring 1981. This compared to 57 percent of 979 transfer students entering 1975-76 at the University of Northern Iowa, 57 percent of 1985 transfers at Iowa State University, and 54 percent of 2,140 transfer students at the University of Iowa. When comparing total persistence rates (percent of those attaining degrees at regents' institutions or total persistence still enrolled), differences appear even less. At the University of Northern Iowa, a mean

of 49 percent for native students compared to 62 percent for transfers; at Iowa State University, a mean of 62 percent for native students compared to 61 percent for transfers; and at the University of Iowa, a mean of 57 percent for native students compared to 60 percent for transfer students.

The Iowa regents' study also reported rates of degree and achievement for various types of transfer students listing Iowa private college two-year transfers, Iowa public two-year college transfers, Iowa private four-year transfers, and colleges outside of Iowa transfers. The mean percentages of degree achievement of Iowa public two-year transfer students were 65 percent at University of Northern Iowa, 55 percent at Iowa State University, and 50 percent at University of Iowa, compared to 57 percent, 57 percent, and 54 percent, respectively, for the overall transfer group.

This study of persistence at Iowa state universities also reported rates of degree achievement of freshmen entering the universities during 1975-76 according to ACT composite standard score levels. For students with an ACT composite standard score of 23 and above, graduation rates at the three universities were 54 percent at the University of Northern Iowa, 65 percent at Iowa State University, and 55 percent at the University of Iowa. The rates of degree achievement for students with an ACT composite score of 19 through 21 are 46 percent, 51 percent, and 41 percent, respectively, and for students with ACT scores of 18 or less, the mean graduation rates were 33 percent, 41 percent, and 30 percent, respectively. The data reported by the Iowa regents' study indicated differences in persistence may exist among the three Iowa state

universities. These data also indicated that differences may occur among students who transfer from different types of institutions and among students of different ACT level.

A study of Piedmont Virginia Community College (PVCC) transfer students at the University of Virginia (Doherty, 1984) compared the rate of degree achievement of those community college transfer students to students entering University of Virginia as eligible freshmen. Using a t-statistic, differences were found between the 73 percent of the transfer students graduating and 84 percent of the native students. This study similarly compared PVCC graduates and nongraduates and found 79 percent of the graduates attained a degree at the University of Virginia, while 52 percent of the nongraduates attained a degree within two years of time of transfer.

#### Methodologies of the Studies of Community College Transfer Students

When Koos (1924) compared junior college graduates' performance at four-year colleges to students entering four-year colleges and universities directly from secondary schools, he also compared these two groups of students with respect to distribution of intelligence test scores as well, and found no differences in either category. A number of later studies found differences in performance, progress, or persistence between community college transfer students and students native to four-year colleges or universities. Many of these studies made raw comparisons of these student groups rather than comparing groups of students of similar sex, undergraduate grade point average, ACT score,

major, or number of credit hours earned prior to transfer for community college transfer students. Also, many studies of community college transfer students have been descriptive or predictive in nature. These studies provided information regarding transfer student success only, with no comparison to native student success.

Eells (1943) studied the performance and progress of junior college transfers at four-year colleges and universities; however, findings were more descriptive in nature than comparative. Other studies which reported descriptive findings included Lee and Suslow (1966), Goodale (1971), Elliott (1972), Gold (1981), and Wielenga et al. (1982).

Knoell and Medsker (1965) reported findings of a national study regarding the performance and degree achievement of community college transfer students. They compared 7,243 community college transfer students from 345 community colleges who transferred to 43 senior colleges in 1960 to 4,026 transfer students from four-year colleges, and 3,349 students native to four-year colleges. This study made raw group comparisons rather than following a procedure involving matched comparisons by student characteristics. The authors stated that "ideally a comparison of native and junior college transfer students would involve the selection of matched groups at the freshman level and the two types of institutions, with follow-up over at least a five-year span" (Koos, 1970, p. 302). This study did compare transfer students who transferred after one year to those who transferred after two years' attendance at a community college.

Two later studies (Hodgson & Dickinson, 1974; Anderson, 1977) found differences between the performance and persistence of community college transfer students and native students. These studies also did not match or group students by student characteristics for comparison. Earlier studies using similar procedures (Allen, 1930; Fichtenbaum, 1941) reported finding no difference in the performance of the two groups.

In a study completed at Iowa State University, Echternacht (1968) compared 244 junior college transfer students with at least 75 quarter hours of credit at transfer to 200 students native to Iowa State. Differences were found in performance and progress when students were not matched. However, differences were not found in some colleges of the university when students within the same college were compared.

Martorana and Williams (1954) compared junior college transfer students with native students at the State College of Washington. These students were matched on the basis of sex, major, veteran status, high school size, age, ACT score, and high school grade point average. No difference in performance was found between the transfer students and native students.

In a study of 231 transfer students entering Colorado State University between 1953 and 1957, Klitzke (1961) also matched community college transfers with native students on the basis of (1) lower-division grade point average, (2) same number of students per year, (3) major by year, (4) sex by year, and (5) similar credit hours completed. No significant difference was found between the mean grade point average of

transfer students and native students; however, differences were found in the percent of degree achievement of the two groups.

Other studies have compared community college transfer students to native students with similar student characteristics. Nickens (1972) found no difference in first-term grade point average between the two groups at Florida State University after variance accounted for by the Florida Twelfth Grade Test was removed. Thompson (1978) found no differences existed in the upper-division grade point average between the two groups enrolled in the College of Business at the University of Arizona when matched on the basis of high school rank. When the two groups were not matched, differences were found.

Richardson and Doucette (1980) compared community college transfer students grouped according to the number of credits earned prior to transfer to native students with similar high school rank. This study compared community college transfers with 24 to 36 semester hours earned prior to transfer, community college transfers with 48 to 60 semester hours earned prior to transfer, and native students at the three Arizona state universities. When students were matched by high school rank, no differences in performance were found between transfer students with 48 to 60 semester hours earned prior to transfer and native students. Differences were found between the two community college transfer groups.

Atherton (1981) and Doherty (1984) used the t-statistic to compare community college transfer students who earned associate degrees (AA) prior to transfer to those who did not. Doherty found differences in persistence between these two groups. Atherton found differences in



performance between these two groups; however, he found no differences between transfers with an AA degree and native students.

Studies of Iowa community college transfer students have primarily been concerned with predicting success at the transfer institution (Lagomarcino, 1955; Casey, 1963; Cramer, 1971). In single institutional studies, Ingram (1967) and Echternacht (1968) compared transfer and native student success.

Fleming (1972) studied 1,825 first-time, full-time arts and science students who entered the 16 Iowa community colleges in the fall of 1966. Although Fleming did not analyze post-transfer success, findings were pertinent to this study. Significant differences were found among the 16 community colleges on a number of variables. Highly significant differences were found among students transferring from different community colleges in semester hours earned at the community college, semesters completed at the community college, and cumulative grade point average at the community college. These findings support a hypothesis that differences would exist between the 15 community colleges regarding success of their transfer students. Fleming found no significant differences among the community colleges in percent of transfer students, semester hours completed at the transfer institution, number of four-year graduates, or cumulative grade point average at the transfer institution. The researcher did indicate a small sample size at some community colleges, and a seemingly large range in some of the post-transfer variables. The small sample size could affect the analysis of variance results. The percent of transfers ranged from a low of 27 percent to a

high of 50 percent, semester hours completed at transfer institution ranged from 45 semester hours to 69 semester hours, number of four-year graduates from 31 percent to 80 percent, and grade point average from 2.11 to 2.81. While the null hypotheses could not be rejected based on the data available, differences may exist.

Goodale (1971) surveyed 822 student personnel officers at four-year institutions regarding programs and services offered specifically for transfer students. This research was descriptive in nature. Goodale indicated that approximately 56 percent of the total transfer students enrolling at these institutions in the fall of 1970 came from community colleges. Goodale recommended further study to compare the success of community college transfer students to those transfers from other types of institutions.

Ingram (1967) did compare non-Iowa college transfers, liberal arts college transfers, Iowa state-supported college transfers, and other major university transfers to native students at Drake University. Differences were found among the transfer groups. The Iowa regents' persistence study (Wielenga et al., 1982) also reported data for different groups of transfer students. This study was descriptive in nature and statistical comparisons were not made. Data were reported for persistence and performance for different transfer student groups.

The Iowa regents' study also reported data for each of the three Iowa state universities and reported rates of degree achievement for different levels of ACT composite scores.

### Summary of the Literature Review

This review of selected literature was divided into three parts. The first part reviewed research regarding the performance of community college transfer students at four-year colleges and universities and the comparison of this performance of community college transfer students to the performance of students native to four-year colleges and universities. The findings of this literature review indicate conflicting results. While some studies reported no differences in performance between community college transfer students and students native to four-year colleges or universities, other studies indicated differences in performance did exist between these two groups of students.

The second part reviewed research regarding the progress, persistence, and degree achievement of community college transfer students at four-year colleges and universities and comparison of such with students native to the four-year colleges or universities. Many studies reviewed were descriptive or predictive, with the best predictor of community college transfer success reported as community college grade point average, with ACT composite score also reported as a predictor. These studies reviewed reported findings similar to the studies of performance. When community college transfer students were compared to other students, some researchers found differences in progress or persistence did exist, while other researchers found differences did not exist between the groups of students.

The third part reviewed the different methodologies used in studying community college transfer students and comparing their performance to

that of other students. While differences are found between the success of community college transfer students and students native to the four-year institutions by some researchers (Knoell & Medsker, 1965; Hodgson & Dickinson, 1974; Anderson, 1977), other studies indicated that when student groups are matched for ability, ACT scores, high school rank or major, no differences exist between transfer and native student performance (Nickens, 1975; Richardson & Doucette, 1980; Slark and Bateman, 1981). The research also indicated that community college transfer students who completed two years at the community college performed as well as native students, while students who completed less credits at the community college did not perform as well (Richardson & Doucette, 1980; Atherton, 1981; Doherty, 1984). This indicated that if only like students are compared, students who transfer from community colleges to four-year institutions have similar success at the four-year institution as those who enter directly from secondary schools, and that differences that have been found in comparison studies are due to distributions of student characteristics rather than to community college attendance. Table 2 lists the studies of community college transfer students reviewed, the findings of each study, and the methodology used. Similarities of findings of similar methodologies can be noted from this table.

Table 2. Studies of performance, progress, or persistence of community college transfer students

Author	Date	Findings	Methodology
Koos	1924, 1925	No difference in performance of transfers and natives	C
Eells	1927	Transfers scored higher in performance than natives	C
Eells	1943	Mostly descriptive	D, C
Allen	1930	No difference in performance of transfers and natives	C
Fichtenbaum	1941	Natives scored higher in performance	C
Martorana and Williams	1954	No difference in performance of transfers and natives	CM
Ahmann	1951	H.S. GPA and Q-Score best predictors of persistence	P
Lagomarcino	1955	Junior college GPA best predictor of persistence	P
Medsker	1960	No difference in performance of transfers and natives; difference in persistence	C
Klitzke	1961	No difference in performance of transfers and natives; difference in persistence	CM
Casey	1963	Community college GPA best predictor of persistence; found differences among community colleges	P, CC

<sup>a</sup>D = descriptive; P = predictive; CM = matched comparative (consideration of student characteristics); and C = comparative without matching or consideration of student characteristics.

Table 2. Continued

Author	Date	Findings	Methodology
Knoell and Medsker	1965	Difference in performance and persistence between transfers and natives	C
Lee and Suslow	1966	Descriptive	D
Ingram	1967	Differences in performance of transfers and natives	C
Echternacht	1968	Differences in performance and progress; difference between small and large community colleges	C
Cramer	1971	Community college GPA best predictor	P
Goodale	1971	Descriptive	D
Langston	1971	Descriptive, community college GPA and ACT score best predictors	D, P
Elliott	1972	Descriptive	D
Fleming	1972	Found difference in student characteristics among Iowa community colleges	D
Hodgson and Dickinson	1974	Difference in performance and persistence between transfers and natives	C
Anderson	1977	Difference in performance and persistence between transfers and natives	C
Nickens	1975	No difference in performance between transfers and natives	CM
Bolte and Coleman	1979	No difference in persistence between transfers and natives	C
Gold	1981	Descriptive	D

Table 2. Continued

Author	Date	Findings	Methodology
Kissler	1981	Descriptive	D
Kissler, Lara, and Cardinal	1981	Difference in performance and persistence between transfers and natives	CM
Thompson	1978	No difference in performance when matched by high school rank	CM
Richardson and Doucette	1980	No difference in performance of natives and two-year transfers when matched by H.S. rank; differences between one-year and two-year transfers	CM
Atherton	1981	No difference in performance between transfers with AA degree and natives; differences found for transfers without AA degree	CM
Slark and Bateman	1981, 1983	No difference in performance of eligible transfers and natives, difference between eligible and ineligible transfers	D, C
Hildebrandt	1984	No difference in performance, difference in progress of transfers and natives in same major	C
Wielenga et al.	1982	Descriptive	D
Doherty	1984	No difference in performance; difference in degree achievement between community college graduates and nongraduates	C
Graham and Dallam	1984	Transfers more likely to be on academic probation than natives	C

## CHAPTER III. METHODOLOGY

The purpose of this study was to examine the performance, progress, and degree achievement of Iowa community college transfer students at the three Iowa state universities and compare these students' performance, progress, and degree achievement to that of transfer students from four-year colleges and students native to the universities. This chapter explained the procedures utilized to examine these data. This chapter was organized into the following subsections: sources of data, data collection, design of the study, statistical analysis, and summary.

## Sources of Data

Population

The population studied by this research consisted of public community college transfer students who entered any one of the three state universities in Iowa. This population was compared to the population of students native to the three state universities and to the population of four-year college transfer students at the three state universities.

Sample

The samples for this study included a sample of community college transfer students at Iowa State University, University of Iowa, and University of Northern Iowa who entered during the fall semester of 1980, a sample of four-year college transfer students who entered each of the three universities in the fall semester of 1980, and a sample of students native to each of the three universities, who entered in the fall of 1978 and were still enrolled during the fall semester of 1980.



The sample of community college transfer students included all students transferring to one of the three universities from one of the 15 public Iowa community colleges in the fall of 1980. This sample was selected to ensure that all Iowa community colleges transferring students to the universities in fall 1980 would be represented in the sample. The samples of four-year college transfer students and native students were randomly selected by the office of the registrar at each university. Sample size of these two groups were stipulated by this researcher to be approximately 150 at each university. This sample size was selected so that each of the subsets or cells tested in Hypotheses 6 and 7 would have cell size of at least 10. This is recommended for the one-way analysis of variance (Hinkle et al., 1979).

#### Data Collection

The data were collected from the offices of the registrar at Iowa State University, University of Iowa, and University of Northern Iowa. Permanent records and computer files were utilized to obtain the necessary information on each student. The following information was collected for each student:

1. University at which the student was enrolled.
2. Number of semester credits earned prior to transfer or prior to fall of 1980 for natives.
3. Cumulative grade point average prior to transfer or prior to fall of 1980 for natives.
4. College attended prior to transfer for transfer students.
5. ACT composite score.

6. Age.
7. Sex.
8. University college in which student was enrolled.
9. University grade point average each semester enrolled beginning with fall of 1980.
10. Number of credits earned each semester enrolled beginning with fall of 1980.
11. Semester of exit from the university.
12. Semester of graduation from the university.

The data were collected for community college transfer and four-year college transfer students who entered one of the three universities during the fall term of 1980 and for native students who entered the universities during the fall term of 1978 and were still enrolled in the fall of 1980. The university grade point average, number of credits earned, term of enrollment, and term of graduation were collected for eight semesters beginning with fall 1980 through spring 1984. The Iowa regent's persistence study (Wielenga et al., 1982) reported that over 90 percent of transfer student graduates admitted to the three Iowa state universities in 1975 with sophomore status or above had graduated within eight semesters of transfer.

The registrar's office at each of the three universities omitted all student identification from the data. When copies of student records were provided, name, social security number, or other individual identifications (such as parents' names) were omitted from the student record. This ensured individual confidentiality to the students studied.

### Design of Study

This study examined the performance, progress, and degree achievement of Iowa community college students who transferred to one of the three Iowa state universities in the fall of 1980. The study compared their performance, progress, and degree achievement to that of a sample of transfer students from four-year colleges entering the three Iowa state universities in the fall of 1980, and a sample of students who entered the three state universities directly from secondary school in the fall of 1978.

First, this study determined if differences existed among the 15 public Iowa community colleges in the performance, progress, and degree achievement at one of the three state universities. The study determined if there were differences in the success of the Iowa community college transfer students among Iowa State University, the University of Iowa, and the University of Northern Iowa. Next, the community college transfer students were grouped by sex, to determine if differences existed in performance, progress, or degree achievement between male and female transfer students.

The review of literature found that differences may exist between the success of community college students who transfer after one year of study at a community college and students who transfer after two years of study. The study completed by Richardson and Doucette (1980) concluded that differences in success existed between students who transferred with 24 to 36 semester hours earned prior to transfer and those who transferred with 48 to 60 semester hours earned prior to transfer. These researchers

recommended study to determine if differences existed between the 48 to 60 semester credit group and students who transfer with 36 to 48 semester credits earned prior to transfer.

Using the categories suggested by Richardson and Doucette (1980) for this study, the sample of community college transfer students was divided into three groups. Group 1 included community college transfer students who entered the university with 36 to 47 semester credits earned prior to transfer; Group 2 included community college transfer students who entered the university with 48 to 59 semester credits prior to transfer; and Group 3 included community college transfer students who entered the university with 60 semester credits or more prior to transfer. These three groups were then compared to a sample of transfer students from the four-year colleges and a sample of students native to each of the universities to determine if differences existed in performance, progress, and degree achievement among the five resulting groups.

In the review of literature, several authors (Koos, 1970; Knoell & Medsker, 1965; Richardson & Doucette, 1980) advocated that when community college transfer students are compared to other transfer students or native students, matching should occur so that similar students are compared. This study stratified each of the five student groups compared by ACT composite score and by sex. This study then examined the data to determine if differences that may have existed among the five student groups when comparing the total groups still existed when only comparing students with similar ACT composite scores or of the same sex.

A schematic of the design of this portion of the study is as follows:

	Community college transfer Group 1	Community college transfer Group 2	Community college transfer Group 3	Four-year transfers	Native students
	Community college transfer Group 1	Community college transfer Group 2	Community college transfer Group 3	Four-year transfers	Native students
High ACT level					
Middle ACT level					
Low ACT level					
	Community college transfer Group 1	Community college transfer Group 2	Community college transfer Group 3	Four-year transfers	Native students
Male					
Female					

This study examined the performance and degree achievement of the total samples. The progress of only those students who completed a bachelor's degree was studied.

### Statistical Analysis

The statistical tests used to analyze the data regarding the performance, progress, and degree achievement of Iowa community college transfer students were analysis of variance-one-way classification and analysis of variance-two-way classification. The Statistical Package for the Social Sciences (SPSSX) procedures of ONEWAY and ANOVA were used to analyze the data.

The analysis of variance (ANOVA) is an inferential technique used to determine whether two or more means are significantly different from one another (Hinkle et al., 1979). The hypothesis tested by ANOVA is that the population means from which the two or more samples are selected are equal. The procedure analyzes the variance of the scores of the dependent variable. In this analysis, the variation of the dependent variable scores are divided into two parts: The variation of scores within each group, and the variation of scores between the group means and the means of the total group (grand mean). The test statistic for ANOVA is the F-ratio of the two variable estimates (Hinkle et al., 1979, p. 256).

$$F = \frac{MS_B}{MS_w}$$

<u>Source of variation</u>	<u>Sum of squares</u>	<u>Degrees of freedom</u>	<u>Variance estimate or mean square</u>	<u>F-ratio</u>
Between	$\sum_{j=1}^k n_j (\bar{X}_j - \bar{X})^2$	K-1	$MS_B = \frac{SS_B}{K-1}$	$\frac{MS_B}{MS_w}$
Within	$\sum_{j=1}^k \sum_{i=1}^{n_j} (X_{ij} - \bar{X})^2$	N-K	$MS_w = \frac{SS_w}{N-K}$	
Total	$\sum_{j=1}^k \sum_{i=1}^{n_j} (X_{ij} - \bar{X})^2$	N-1		

where:  $MS_B$  = mean squares between,

$MS_W$  = mean squares within,

$\bar{X}_j$  = sample mean,

$\bar{X}$  = grand mean,

$K$  = number of groups, and

$N$  = number of observations in each sample.

In order to use the F-distribution as the underlying distribution for testing the hypotheses, the following assumptions were met:

1. The observations were random and independent samples from the population.
2. Measurement of the dependent variable was on at least an interval scale.
3. The populations from which the samples were selected were normally distributed.
4. The variance of the populations were equal (Homogeneity of Variance) (Hinkle et al., 1979, pp. 260-261).

Analysis of variance-one-way classification was utilized to test Hypotheses 1, 5, 6, and 7, which are stated on pages 14 and 16-18 of this study. Analysis of variance-two-way classification is utilized to test hypotheses when two independent variables are considered simultaneously. An advantage of the two-way classification is efficiency. Two separate hypotheses may be tested concurrently. In addition to investigating how different levels of two independent variables affect the dependent variable, one can test whether levels of one independent variable affects the dependent variable the same way across different levels of the second

independent variable, or whether there is interaction between the two independent variables. This procedure was used for Hypotheses 2, 3, and 4, stated on pages 14-16 of this study.

All hypotheses were tested at a .05 level of significance. Post hoc tests were used following the rejection of the null hypotheses. When the null hypothesis is rejected, at least one mean differs significantly from another mean or combination of means (Hinkle et al., 1979, p. 269). The Duncan post hoc procedure was used.

#### Summary

This chapter reviewed the methods and procedures followed in carrying out this research study and in collecting and analyzing the data. The data analysis involved the use of one-way analysis of variance and two-way analysis of variance. The independent variable was stratified for Hypotheses 6 and 7 (ACT composite score and sex).

This study was organized such that comparisons of community college transfer students were first made among themselves in regard to community college attended, university attended, sex, and number of credits earned prior to transfer (Hypotheses 1, 2, 3, and 4). This study then compared community college transfer students, four-year college transfer students, and students native to the universities in Hypothesis 5.

While individual students were not statistically matched, comparisons were made among similar community college transfer students with varying numbers of credits earned prior to transfer, four-year college transfers, and students native to the universities. Hypotheses 6 and 7 grouped the students by ACT composite score and sex to find if differences that



existed when comparing the entire groups still existed when only comparing similar students in each group.

## CHAPTER IV. RESEARCH FINDINGS AND DATA ANALYSIS

## Introduction

The statistical analysis and findings presented in this chapter were based on data collected from the offices of the registrar at Iowa State University, the University of Iowa, and the University of Northern Iowa. During October through December 1984, student records were collected from the three registrar's offices. The records included all Iowa public community college transfer students who had enrolled at the three universities during the fall term of 1980, a random sample of four-year college transfer students who had enrolled the fall term of 1980, and a random sample of students who had enrolled at the universities without prior college credits earned (native students) during the fall term of 1978 and were still enrolled at the beginning of the fall term of 1980. The random samples of four-year college transfers and university native students were generated by the registrar's offices. A sample size of between 120 and 150 was selected for each of these two groups, as explained in Chapter III, pages 58-59 of this study.

## Description of Data Collected

The data used for this study were collected from the student records of 923 Iowa public community college transfer students, 274 four-year college transfer students, and 362 students native to the university at the Iowa state universities. Initially, the student records of 2,120 students were collected by the registrar's offices (1,330 community college transfers, 395 four-year transfers, and 395 native students).

Five hundred and sixty student records were eliminated from the study because of missing or unclear student record data or because the data did not meet the criteria established for this study. Table 3 shows the sample size of each group by university.

Of the 923 Iowa public community college transfer students studied, 342 were enrolled at Iowa State University, 302 were enrolled at the University of Iowa, and 279 were enrolled at the University of Northern Iowa. Of the 923 community college transfer students, 536 (58%) were male and 387 (42%) were female. The age of the community college transfer students ranged from 18 years old to 47 years old with a mean age of 21.5 years as of fall 1980. Seventy-four percent of these transfer students were 19, 20, or 21 years old.

Table 4 indicates a profile of the community college transfer students studied by listing the statistical means of the following characteristics: transfer grade point average, number of semester credits earned prior to transfer, university grade point average, number of hours earned at the university, ACT composite score, percent of those graduating with a bachelor's degree, and age.

Of the 274 four-year college transfer students studied, 104 were enrolled at Iowa State University, 94 were enrolled at the University of Iowa, and 76 were enrolled at the University of Northern Iowa. Of these 275 four-year college transfers, 126 (46%) were male, and 148 (54%) were female. The age of the four-year college transfer students ranged from 18 years to 36 years with a mean age of 20.8 years as of fall 1980. Table 5 indicates a profile of the four-year college transfer students studied by

Table 3. Student sample sizes at each university

Sample size	Iowa State University	University of Iowa	University of Northern Iowa	Total
Community college transfers	342 (37.1%)	302 (32.7%)	279 (30.2%)	923
Four-year college transfers	104 (38.1%)	94 (34.1%)	76 (27.8%)	274
Natives	127 (35.1%)	147 (40.6%)	88 (24.3%)	362
Total	573	543	443	

Table 4. Mean student characteristics of Iowa community college transfer students (N=923)

Characteristic	Mean
Transfer grade point average	2.89
Transfer hours (semester credits)	60.53
University grade point average	2.48
University hours (semester credits)	61.30
ACT composite score	20.01
Percent graduated	60.6%
Age	21.5

listing the statistical means of the following characteristics: transfer grade point average, number of semester credits earned prior to transfer, university grade point average, number of semester credits earned at the university, the ACT composite score, the percent of those graduating with a bachelor's degree, and age.

Of the 362 native students which were studied, 127 were enrolled at Iowa State University, 147 were enrolled at the University of Iowa, and 88 were enrolled at the University of Northern Iowa. Of these 362 native students, 176 (48.5%) were male and 186 (51.5%) were female. The age of these native students ranged from 19 years to 27 years with a mean of 20.3 years as of fall 1980. Ninety-six percent of these native students were 19 and 20 years old. Table 6 indicates a profile of the native students by listing the statistical means of the following characteristics: undergraduate grade point average, number of undergraduate hours earned prior to fall 1980, university grade point average, ACT composite score, percent graduating with a bachelor's degree, and age.

Table 7 indicates a profile of the students studied at each of the three Iowa state universities. This table lists the statistical means of all students at each university of undergraduate grade point average, university grade point average, the ACT composite score, and the percent of students graduating with a bachelor's degree.

#### Variables Measured

For each of the hypotheses tested in this research study, five dependent variables were measured to determine performance, progress, and degree achievement. One dependent variable was used to measure

Table 5. Mean student characteristics of four-year college transfer students (N=275)

Characteristic	Mean
Transfer grade point average	2.82
Transfer hours (semester credits)	53.98
University grade point average	2.63
University hours (semester credits)	61.46
ACT composite score	21.83
Percent graduated	56.2%
Age	20.8

Table 6. Mean student characteristics of students native to the universities (N=362)

Characteristic	Mean
Lower-division grade point average	2.76
Lower-division hours (semester credits)	67.35
University grade point average	2.76
ACT composite score	23.39
Percent graduated	82.3%
Age	20.3

Table 7. Mean student characteristics at each university

Characteristic	Iowa State University	University of Iowa	University of Northern Iowa
Lower-division grade point average	2.79	2.90	2.84
University grade point average	2.49	2.59	2.65
ACT composite score	22.60	21.16	20.01
Percent graduated	66.4%	60.3%	68.4%

performance, one dependent variable was used to measure degree achievement, and three dependent variables were used to measure progress.

To measure performance, an upper-division grade point average was computed for native students based on credits completed from fall 1980 until exit from the university or upon graduation with a bachelor's degree. The upper division grade point average used for community college and four-year college transfer students was their grade point average of all work completed at the university. To measure degree achievement, the dependent variable used was the percent of those transfer students enrolling, or native students enrolled, the fall term of 1980 who graduated with a bachelor's degree.

Progress was measured only for those students who completed a bachelor's degree. The three dependent variables used to measure progress were upper-division credit hours earned, total degree credit hours earned, and number of semesters enrolled. The upper-division hours earned was computed as the number of semester credits earned between fall 1980 and graduation with a bachelor's degree. The total degree hours earned was computed as the total number of semester credits earned at the university for native students who graduated. The total degree hours earned was computed as the sum of the number of transfer semester credits earned and the number of university semester credits for community college and four-year college transfer students. The data collected reported quarter hour credits earned and transferred for the 1980-81 year at Iowa State University. This was transformed to semester credits for this study.

The dependent variable of total semesters enrolled for those who graduated with a bachelor's degree was computed as the number of semesters enrolled beginning with fall 1980 until graduation. The data collected for Iowa State University reported three quarters for the 1980-81 year. Students enrolled the fall quarter of 1980 were reported as enrolled only one semester. Students enrolled all three quarters of 1980-81 were reported as enrolled for two semesters. No students studied in this research were enrolled for a two-quarter period.

### Statistical Findings of Hypotheses

#### Hypothesis 1

There was no significant difference among the individual community colleges for Iowa community college transfer students at the three Iowa state universities with respect to the following measures of success:

1. University cumulative grade point average.
2. Percent of degree achievement.
3. Number of semesters enrolled at the university by those who graduate.
4. Number of credit hours earned at the university by those who graduate.
5. Number of total credit hours earned prior to graduation with a bachelor's degree.

To test this hypothesis, one-way analysis of variance was used to test each of the dependent variables.

Performance      The results of the one-way analysis of variance indicated that there was no significant difference at the .05 level among



the mean of the 14 Iowa community colleges from which the students transferred with regard to university cumulative grade point average. The results are shown in Table 8.

Table 9 shows that the mean university grade point averages of the 14 community colleges represented a range from 1.64 to 3.62. The community colleges with the mean GPA of 1.64 and 3.62 had sample sizes of 2 and 1, respectively, and fail to result in statistically significant differences. (One of the 15 Iowa community colleges which offered only vocational programs had no students represented in this study.)

Degree achievement      The results of the one-way analysis of variance indicated that there is no significant difference at the .05 level of the mean percent of graduation among the 14 Iowa community colleges from which the students transferred. The results are shown in Table 10.

Table 9 shows that the graduation rates of the 14 community colleges represented ranged from 0 percent to 100 percent; however, the N of 1 in the cases of community colleges 4 and 10 and the N of 2 for community college 14 again failed to result in statistically significant differences.

Progress      The results of the one-way analysis of variance indicated that there were statistically significant differences for the means of two of the dependent variables which measured progress among the 12 Iowa community colleges. Table 11 shows the results for the number of semesters enrolled, Table 12 shows the results for the number of semester

Table 8. ANOVA results for university GPA by community college attended

Source	D.F.	Sum of squares	Mean square	F-ratio	F prob.
Between groups	13	86,769.7573	6,674.5967	1.1026	.3526
Within groups	909	5,502,860.906	6,053.7524		
Total	922	5,589,630.663			

Table 9. Mean characteristics by community college of Iowa community college transfers enrolled at the three state universities

Community college	N	Mean univ. GPA	Mean percent of graduation	Mean semesters enrolled (graduates)	Mean university hours (graduates)	Mean degree hours (graduates)
1	26	2.60	57.69	5.73	76.87	122.20
2	112	2.48	65.18	5.08	68.60*	129.94
3	28	2.53	53.57	5.80	77.87	139.75*
4	1	1.98	100.00	8.00	99.00	133.00
5	120	2.59	66.67	5.58	76.16	130.75
6	158	2.40	62.66	5.80	77.54	131.52
7	93	2.55	60.22	5.86	80.41	134.78
8	111	2.52	53.15	5.81	78.61	129.08
9	151	2.39	61.59	5.57	76.97	128.96
10	1	3.62	00.00	--	--	--
11	41	2.41	53.66	5.59	78.55	130.80
12	11	2.79	72.73	5.25	67.25	124.06
13	68	2.48	55.88	5.66	78.08	131.25
14	2	1.64	00.00	--		
Total/ group means	923	2.48	60.56	5.62	76.45	130.70

\* $p < .05$ .

Table 10. ANOVA results for percent of graduation by community college attended

Source	D.F.	Sum of squares	Mean square	F-ratio	F prob.
Between groups	13	3.3029	.2541	1.0636	.3877
Within groups	909	217.1478	.2389		
Total	922	220.4507			

Table 11. ANOVA results for semesters enrolled by community college attended

Source	D.F.	Sum of squares	Mean square	F-ratio	F prob.
Between groups	11	37.8828	3.4439	1.7946	.0519
Within groups	547	1,049.7165	1.9190		
Total	558	1,087.5993			

Table 12. ANOVA results for university hours by community college attended

Source	D.F.	Sum of squares	Mean square	F-ratio	F prob.
Between groups	11	7,157.6735	650.6976	2.2627	.0106
Within groups	545	156,730.2187	287.5784		
Total	556	163,887.8923			

Table 13. ANOVA results for degree hours by community college attended

Source	D.F.	Sum of squares	Mean square	F-ratio	F prob.
Between groups	11	3,992.4043	362.9458	2.0827	.0200
Within groups	540	94,103.9160	174.2665		
Total	551	98,096.3202			

credits earned at the university, and Table 13 shows the results for the total number of semester credits earned prior to graduation.

Table 11 indicates that there was no significant difference at the .05 level in the number of semesters enrolled at the university for community college transfer students who graduated. The one-way analysis of variance indicated that differences occurred in both the mean number of semester credits earned at the university and the mean number of semester credits earned toward a degree by those community college transfer students who graduated. Tables 12 and 13 show the results for these variables.

The results of the post hoc tests indicated that community college 2 differed from seven other community colleges at the .05 level with respect to semester credits earned at the university. The community college 2 mean of 68.60 semester credits was significantly lower than the other seven community colleges. With respect to the number of semester credits earned toward a degree, community college 3 differed from seven other

community colleges at the .05 level, with the highest mean number of semester credits earned of 139.75 semester credits.

These results indicated that Hypothesis 1 failed to be rejected in three out of five cases. There were no significant differences among community college transfer students with respect to:

1. University cumulative GPA.
2. Percent of degree achievement.
3. Number of semesters enrolled at the university.

These three dependent variables were measures of performance, persistence, and progress.

Hypothesis 1 was rejected on two dependent variables measuring progress. The variables were:

4. Number of credits earned at the university.
5. Number of total degree credits earned.

The implications of these findings are discussed in Chapter V of this study.

## Hypothesis 2

There was no significant difference in the following measures of success of Iowa community college transfer students at the three Iowa state universities among the three universities:

1. University cumulative grade point average.
2. Percent of degree achievement.
3. Number of semesters enrolled at the university by those who graduate.

4. Number of credit hours earned at the university by those who graduate.

5. Number of total credit hours earned prior to graduation with a bachelor's degree.

To test Hypothesis 2, Hypothesis 3, and interaction between the university enrolled and the sex of the student, a two-way analysis of variance was calculated for each of the dependent variables. A one-way analysis of variance was then utilized along with the Duncan post hoc test to determine between which universities differences occurred for each of the dependent variables. Statistically significant differences at the .05 level were found among the three universities for all dependent variables tested.

Performance Table 14 shows the results of the two-way analysis of variance by university and sex for the university cumulative grade point average of community college transfer students. A significant difference was found among the three universities at the .05 level.

The results of the post hoc test indicated that the mean cumulative grade point average at the University of Northern Iowa was significantly different from the mean cumulative grade point averages of community college transfer students at Iowa State University and the University of Iowa. Table 15 shows the mean GPA at UNI to be 2.61 compared to 2.41 at Iowa State University and 2.45 at the University of Iowa.

Degree achievement Table 16 shows the results of the two-way analysis of variance by university and sex for the percent of graduation

Table 14. Two-way ANOVA results of university GPA by university and sex for community college transfers

Source of variation	Sum of squares	D.F.	Mean square	Significance	
				F	of F
Main effects	268,983.128	3	89,661.043	15.498	0.000
University	37,913.118	2	18,956.559	3.277	0.038
Sex	204,650.842	1	204,650.842	35.374	0.000
Two-way interactions	15,439.029	2	7,719.514	1.334	0.264
University/sex	15,439.029	2	7,719.514	1.334	0.264
Explained	284,422.157	5	56,884.431	9.832	0.000
Residual	5,305,208.506	917	5,785.396		
Total	5,589,630.663	922	6,062.506		

Table 15. Performance, progress, and degree achievement of community college transfer students by university

University	N	Univ. GPA	Percent of graduation	Semesters enrolled (graduates)	University hours (graduates)	Degree hours (graduates)
Iowa State University	342	2.41	61.70	5.90*	83.12*	134.98*
University of Iowa	302	2.45	52.32*	5.47	72.99	127.90
University of Northern Iowa	279	2.61*	68.10	5.44	71.94	128.35
Total/group means	923	2.48	60.56	5.62	76.45	130.70

\*Statistically significantly different at the .05 level according to results of Duncan post hoc test.

Table 16. Two-way ANOVA results of percent of graduation by university and sex for community college transfers<sup>a</sup>

Source of variation	Sum of squares	D.F.	Mean square	Significance	
				F	of F
Main effects	3.703	3	1.234	5.228	0.001
University	3.608	2	1.804	7.641	0.001
Sex	0.021	1	0.021	0.088	0.767
Two-way interactions	0.246	2	0.123	0.521	0.594
University/sex	0.246	2	0.123	0.521	0.594
Explained	3.949	5	0.790	3.345	0.005
Residual	216.502	917	0.236		
Total	220.451	922	0.239		

<sup>a</sup>923 cases were processed; 0 cases (0.0%) were missing.

of Iowa community college transfer students. Significant differences were found among the three universities at the .01 level.

Results of the post hoc test indicated that the mean graduation rate of community college transfer students at the University of Iowa was significantly lower at the .05 level than the graduation rates at Iowa State University and the University of Northern Iowa. Table 15 shows the mean graduation rate for 302 community college transfers at the University of Iowa to be 52.32 percent, in contrast to 61.70 percent at Iowa State University and 68.10 percent at the University of Northern Iowa.

Progress The two-way analysis of variance for all three dependent variables measuring the progress of community college transfer students who graduated from one of the three universities indicated significant difference among the three universities at the .01 level. Results of the



Duncan post hoc test indicated the progress of community college transfer students at Iowa State University to be significantly different from the progress of community college transfers at the University of Iowa or University of Northern Iowa. Tables 17, 18, and 19 show the results of the two-way analysis of variance by university and sex for the dependent variables semesters enrolled, number of university hours, and number of degree hours, respectively, for community college transfer students.

Table 15 indicates that community college transfer students who graduated from Iowa State University were enrolled for a mean of 5.90 semesters compared to 5.47 semesters for transfer students at the University of Iowa and 5.44 semesters at the University of Northern Iowa. Table 15 also shows that transfers at Iowa State University enrolled for a mean of 83.12 semester credits at the university and had a mean of 134.98 semester credits for total hours earned for a bachelor's degree. These hours were significantly different from the 72.99 and 127.90 semester credits at the University of Iowa and 71.94 and 128.35 semester credits at the University of Northern Iowa, respectively.

These results indicated that Hypothesis 2 was rejected for all dependent variables. There were significant differences in the success of Iowa community college transfer students among the three state universities with respect to:

1. University cumulative grade point average.
2. Percent of degree achievement.
3. Number of semesters enrolled at the university by those who graduate.

Table 17. Two-way ANOVA results of semesters enrolled by university and sex for community college transfers<sup>a</sup>

Source of variation	Sum of squares	D.F.	Mean square	Significance	
				F	of F
Main effects	43.197	3	14.399	7.644	0.000
University	22.386	2	11.193	5.942	0.003
Sex	17.445	1	17.445	9.261	0.002
Two-way interactions	2.743	2	1.372	0.728	0.483
University/sex	2.743	2	1.372	0.728	0.483
Explained	45.940	5	9.188	4.878	0.000
Residual	1,041.659	553	1.884		
Total	1,087.599	558	1.949		

<sup>a</sup>559 cases were processed; 0 cases (0.0%) were missing.

Table 18. Two-way ANOVA results for university hours by university and sex for community college transfers<sup>a</sup>

Source of variation	Sum of squares	D.F.	Mean square	Significance	
				F	of F
Main effects	15,997.392	3	5,332.464	19.979	0.000
University	14,395.676	2	7,197.838	26.968	0.000
Sex	911.759	1	911.759	3.416	0.050
Two-way interactions	827.770	2	413.885	1.551	0.213
University/sex	827.770	2	413.885	1.551	0.213
Explained	16,825.161	5	3,365.032	12.608	0.000
Residual	147,062.731	551	266.902		
Total	163,887.892	556	294.762		

<sup>a</sup>559 cases were processed; 2 cases (0.4%) were missing.

Table 19. Two-way ANOVA results for degree hours by university and sex for community college transfers<sup>a</sup>

Source of variation	Sum of squares	D.F.	Mean square	Significance	
				F	of F
Main effects	7,366.846	3	2,455.615	14.796	0.000
University	5,715.112	2	2,857.556	17.218	0.000
Sex	1,322.267	1	1,322.267	7.967	0.005
Two-way interactions	113.990	2	56.995	0.343	0.709
University/sex	113.990	2	56.995	0.343	0.709
Explained	7,480.835	5	1,496.167	9.015	0.000
Residual	90,615.485	546	165.962		
Total	98,096.320	551	178.033		

<sup>a</sup>559 cases were processed; 7 cases (1.3%) were missing.

4. Number of credit hours earned at the university by those who graduate.

5. Number of total credit hours earned prior to graduation with a bachelor's degree.

The implications of these findings on Hypothesis 2 are discussed in Chapter V of this study.

### Hypothesis 3

There was no significant difference in the following measures of success between male and female Iowa community college transfer students enrolled at the three Iowa state universities:

1. University cumulative grade point average.
2. Percent of degree achievement.

3. Number of semesters enrolled at the university by those who graduate.

4. Number of credit hours earned at the university by those who graduate.

5. Number of total credit hours earned prior to graduation with a bachelor's degree.

To test this hypothesis and interaction between this hypothesis and Hypothesis 2, the two-way analysis of variance was calculated for each of the dependent variables. Tables 14, 16, 17, 18, and 19 show the results of the two-way analysis of variance for the five dependent variables studied.

Performance Examination of Table 14 shows that there was a significant difference between the mean university grade point average of male and female community college transfer students. Table 20 shows the mean GPA of 387 female students to be 2.67, while the mean GPA of the 536 male students was 2.35.

Degree achievement The results of the two-way analysis of variance for percent of graduation are shown in Table 16. There was no significant difference indicated between male and female community college students indicated for this variable. The graduation rate of male community college transfers was found to be 59.70 percent and that of females to be 61.76 percent (see Table 20).

Progress Table 20 shows the means of the number of semesters enrolled, number of university hours, and number of degree hours for male

Table 20. Performance, progress, and degree achievement of male and female community college transfers

Sex	N	Univ. GPA	Percent of graduation	Semesters enrolled (graduates)	University hours (graduates)	Degree hours (graduates)
Male	536	2.34	59.70	5.79	77.92	132.20
Female	387	2.67**	61.76	5.40**	74.49*	128.71**
Total/ group means	923	2.48	60.56	5.62	76.45	130.70

\* $p < .05$ .\*\* $p < .01$ .

and female community college transfer students. These results indicated female students progressed at a faster rate than male students.

The two-way analysis of variance indicated that a significant difference at the .01 level existed between male and female community college transfers graduating from one of the universities for both the number of semesters enrolled at the university and the total number of degree hours. The two-way analysis of variance indicated that a significant difference at the .05 level existed for the variable university hours. Tables 17, 18, and 19 show the results of the two-way analysis of variance for the progress variables.

These results indicated that this hypothesis was rejected in four out of five cases. There were significant differences found between male and female community college transfer students with respect to:

1. University cumulative grade point average.

2. Number of semesters enrolled at the university by those who graduate.

3. Number of credit hours earned at the university by those who graduate.

4. Number of total credit hours earned prior to graduation with a bachelor's degree.

The hypothesis failed to be rejected for the dependent variable of percent of degree achievement. The implications of these findings are discussed in Chapter V of this study.

#### Hypothesis 4

There was no significant interaction between the university enrolled and the sex of the student by the following measures of success of Iowa community college transfer students at the three Iowa state universities:

1. University cumulative grade point average.

2. Percent of degree achievement.

3. Number of semesters enrolled at the university by those who graduate.

4. Number of credit hours earned at the university by those who graduate (university hours).

5. Number of total hours earned prior to graduation with a bachelor's degree (degree hours).

The two-way analysis of variance was used to test this hypothesis. The results of these tests for the five dependent variables are shown in Tables 14, 16, 17, 18, and 19.

No interaction between university and sex was found for any of the dependent variables measured. Table 21 shows the means of male and female community college transfer students for university GPA, graduation rate, semesters enrolled for graduates, university hours of graduates, and degree hours of graduates. Female students were found to earn a higher university GPA, have a higher rate of graduation, and progress at a faster pace. The results of no interaction shown by the two-way analysis of variance indicated this to be true at all three universities. Table 21 shows the means of the dependent variables by sex by university.

Table 21. Performance, progress, and degree achievement of male and female community college transfers by university

University/ sex	N	Univ. GPA	Percent of graduation	Semesters enrolled (graduates)	University hours (graduates)	Degree hours (graduates)
Iowa State University						
Male	216	2.34	61	6.10	85.33	136.63
Female	126	2.53	63	5.56	79.52	132.39
University of Iowa						
Male	184	2.31	54	5.60	73.49	129.06
Female	118	2.66	50	5.27	72.14	125.93
University of Northern Iowa						
Male	136	2.41	66	5.54	72.07	129.44
Female	143	2.79	70	5.34	71.82	127.38

Hypothesis 5

There was no significant difference in the following measures of success among five student groups. The groups were Iowa community college transfer students with 36 to 47 semester credits earned prior to transfer; community college transfer students with 48 to 59 semester credits earned prior to transfer; community college transfer students with at least 60 semester credits earned prior to transfer; transfer students from four-year colleges; and students native to the university at each of the three Iowa state universities.

1. Upper-division grade point average.
2. Percent of degree achievement.
3. Number of upper-division semesters enrolled for those who graduate.
4. Number of upper-division credit hours for those who graduate.
5. Number of degree hours for those who graduate with a bachelor's degree.

The purpose of this hypothesis was to determine if differences existed among the three groups of Iowa community college transfer students, four-year college transfer students, and students native to the university. To test this hypothesis, the one-way analysis of variance along with the Duncan post hoc test was used.

For the purpose of this hypothesis, community college transfer students were divided into three groups according to the number of semester credits completed prior to transfer. Community college Group I was comprised of transfer students who had earned between 36 and 47



semester credits at the community college prior to transfer to the university, community college Group II was made up of transfer students who had earned between 48 and 59 semester credits prior to transfer, and community college Group III was made up of students who had earned 60 semester credits or more prior to transfer. The minimum requirement for the Associate of Arts (AA) degree at Iowa community colleges is 60 semester credits; therefore, students who had received the AA degree prior to transfer were in Group III. Table 22 shows differences among the three community college groups according to the following characteristics: community college GPA, ACT composite score, university GPA, graduation rate, and age.

Since differences were found in Hypothesis 2 among the three state universities on all dependent variables, this hypothesis was tested for each of the three universities individually and results reported for each university. Thus, three one-way analysis of variances were computed for each dependent variable.

Performance An upper-division cumulative grade point average was computed for the native students for work completed beginning fall 1980 through exit from the university. This upper-division GPA was compared to the university grade point averages of the four groups of transfer students. Table 23 shows the mean upper-division GPA of each group at each of the three universities and results of the Duncan post hoc tests.

At Iowa State University, significant differences were found at the .05 level among the five groups. The Duncan post hoc test found that community college Group II students earned a significantly lower

Table 22. Community college transfer students grouped according to number of credits earned prior to transfer

Semester credits	<u>Group I</u> 36-47 S.H.	<u>Group II</u> 48-59 S.H.	<u>Group III</u> 60+ S.H.
Community college GPA	2.94	2.71	3.01
ACT composite	20.87	18.55	20.36
University GPA	2.42	2.24	2.57
Graduation rate	56.2%	59.3%	67.5%
Age	21.3	23.0	21.8
Total N	96	91	496
N by university			
Iowa State University	43	33	153
University of Iowa	29	32	166
University of Northern Iowa	24	26	177

upper-division GPA than either four-year college transfers or native students. However, no differences were found between community college Group III students and either four-year college transfers or native students.

At the University of Iowa, the one-way analysis of variance results shown in Table 23 indicated differences existed among the five groups at the .01 level. The post hoc test indicated that native students earned a higher upper-division GPA than all three community college transfer groups. Also, four-year college transfers were found to earn a higher upper-division GPA than either community college Groups I or II, but not community college Group III. Community college Group III students were

Table 23. Mean upper-division grade point average, F-ratio, and probability for student comparison groups by university

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University	2.38	2.18	2.45	2.57 <sup>a</sup>	2.60 <sup>a</sup>	2.69	.03
University of Iowa	2.34	2.16	2.59 <sup>a</sup>	2.72 <sup>b</sup>	2.83 <sup>c</sup>	7.76	.00
University of Northern Iowa	2.56	2.42	2.66	2.62	2.99 <sup>d</sup>	4.70	.001

<sup>a</sup>Significantly different from community college Group II.

<sup>b</sup>Significantly different from community college Groups I and II.

<sup>c</sup>Significantly different from all three community college groups.

<sup>d</sup>Significantly different from all transfer groups.

found to earn a significantly higher GPA than community college Group II students.

At the University of Northern Iowa, the mean GPA of native students was found to be significantly higher than that of all transfer student groups at the .01 level. The mean upper-division GPA of native students was 2.99 compared to 2.62 for four-year transfers and 2.66 for community college Group III. No significant differences were indicated by the post hoc test among the transfer groups.

The results of the tests of this hypothesis would lead to the conclusion of rejection of the hypothesis. Differences were found between native students at all three universities. Differences were found between

four-year college transfers and community college Group II and Iowa State University and community college Groups I and II at the University of Iowa. No difference was found, however, between community college group III and four-year college transfers or native students at Iowa State University, and the mean GPA of the community college Group III was found to be higher than Group II at the University of Iowa. Table 23 summarizes the results of the three one-way analysis of variances for this hypothesis with respect to mean GPA.

Degree achievement At both Iowa State University and the University of Iowa, native students had a significantly higher rate of graduation than any of the transfer student groups at the .01 level. No differences were found among any of the transfer student groups.

At the University of Northern Iowa, native students had a significantly higher rate of graduation than community college Group I and four-year college transfers only. Four-year college transfer students were also found to have a significantly lower rate of graduation than community college Groups II and III.

The results of the one-way analysis of variances for each university with regard to rate of graduation are found in Table 24. This table shows the mean rates of graduation and results of the Duncan post hoc tests.

Progress Progress of those students who graduated was measured by the dependent variables of semesters enrolled prior to graduation, number of upper-division semester credits earned prior to graduation, and total number of semester credits earned toward the bachelor's degree. The upper-division semester credits earned were computed for native students

Table 24. Mean percent of graduation, F-ratio, and probability for student comparison groups by university

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University	60.47	63.64	69.28	60.58	84.25 <sup>a</sup>	4.97	.00
University of Iowa	57.72	43.75	59.04	55.32	79.59 <sup>a</sup>	7.25	.00
University of Northern Iowa	54.17 <sup>b</sup>	73.08	74.01	51.32 <sup>c</sup>	84.09	6.7	.00

<sup>a</sup>Significantly different from all other groups.

<sup>b</sup>Significantly different from native students.

<sup>c</sup>Significantly different from community college Groups II and III and native students.

for all semesters enrolled from fall 1980 through graduation and compared to the number of semester credits earned at the university for transfer students. The degree hours were computed to be the total university credits earned for native students and the sum of university credits and transfer credits for transfer students. Adjustments were made for Iowa State University during the 1980-81 year, because that university operated on the quarter system.

Significant differences were found at all three universities among the five groups at the .01 level with respect to the number of semester graduates who were enrolled prior to graduation. At Iowa State University, students in community college Group III were enrolled for a

significantly fewer number of semesters than any of the other groups. Native students were also found to enroll for fewer semesters than community college Group II students.

At the University of Northern Iowa, native students were enrolled for a significantly fewer number of semesters than students in all transfer groups. At the University of Iowa, natives were enrolled for a fewer number of semesters than all transfer students except those of community college Group III.

At both the University of Iowa and the University of Northern Iowa, community college Group III students were enrolled for fewer semesters than those students in community college Groups I and II or four-year college transfers.

These results indicated that while native students progressed toward graduation at a faster rate than transfer students at the University of Northern Iowa and the University of Iowa, community college Group III students progressed faster at Iowa State University with respect to the number of semesters enrolled. Also, community college Group III students progressed faster than all other transfers at the University of Northern Iowa and the University of Iowa and no difference from native students at the University of Iowa. Table 25 shows the mean number of semesters enrolled for each group at each university, the results of the one-way analysis of variance, and the results of the Duncan post hoc tests.

Significant differences were found at the .01 level at all three universities with respect to the number of upper division credits earned prior to graduation. Table 26 shows the results of the one-way analysis

Table 25. Mean number of semesters enrolled, F-ratio, and probability for student comparison groups by university

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University	6.38	6.62 <sup>a</sup>	5.16 <sup>b</sup>	6.08	5.96	12.43	.00
University of Iowa	6.00	5.57	4.96 <sup>c</sup>	6.06	4.77 <sup>c</sup>	12.26	.00
University of Northern Iowa	6.00	6.32	5.00 <sup>c</sup>	5.87	4.34 <sup>b</sup>	22.81	.00

<sup>a</sup>Significantly different from native students.

<sup>b</sup>Significantly different from all other groups.

<sup>c</sup>Significantly different from community college Groups I and II and four-year college transfers.

of variances. At both Iowa State University and the University of Northern Iowa, native students who graduated earned significantly fewer upper-division semester credits prior to graduation than all transfer students. Also, community college Group III students needed fewer upper-division semester credits than any other transfer students.

At the University of Iowa, native students and students in community college Groups II and III needed fewer upper-division semester credits to graduate than either community college Group I or four-year college transfers. Table 26 shows the results of the Duncan post hoc tests with regard to upper-division hours.

Table 26. Mean number of upper-division hours, F-ratio, and probability for student comparison groups by university

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University	93.84 <sup>a</sup>	87.86	71.92 <sup>b</sup>	84.71	50.01 <sup>c</sup>	72.88	.00
University of Iowa	83.50	70.78 <sup>d</sup>	66.51 <sup>d</sup>	80.60	64.35 <sup>d</sup>	14.32	.00
University of Northern Iowa	86.23	78.89	65.22 <sup>b</sup>	82.28	61.49 <sup>c</sup>	35.14	.00

<sup>a</sup>Significantly different from four-year transfer students.

<sup>b</sup>Significantly different from community college Groups I and II and four-year college transfers.

<sup>c</sup>Significantly different from all other groups.

<sup>d</sup>Significantly different from community college Group I and four-year transfers.

At all three universities, differences were also found at the .01 level among the five student groups regarding the total number of credits earned toward a bachelor's degree. At Iowa State University, native students needed significantly fewer hours to graduate than any of the groups of transfer students studied. Community college Groups II and III had the highest mean number of degree hours (168.99 and 168.00, respectively) and were significantly higher than either community college Group I or four-year college transfers.

At the University of Iowa, the only statistically significant difference was found to be between community college Group III with a mean



of 129.73 semester credits and native students whose mean was 121.24 semester credits. At the University of Iowa, both community college Groups I and II had a comparatively small N of 14, while community college Group III had an N of 98 and native student an N of 117.

At the University of Northern Iowa, native students were found to earn significantly fewer semester credits for a bachelor's degree than any of the transfer groups. Also, community college Group III students earned significantly fewer semester credits toward a bachelor's degree than community college Group II students.

Table 27 shows the results of the one-way analysis of variance with regard to degree hours at Iowa State University, the University of Iowa, and the University of Northern Iowa, respectively. This table shows the mean number of semester credits earned for a bachelor's degree for each comparison group at each university and the significant differences found.

Hypothesis 5 was rejected for all dependent variables at all three universities. There were significant differences found among the five student comparison groups with respect to:

1. Upper-division grade point average.
2. Percent of degree achievement.
3. Number of upper-division semesters enrolled for those who graduate.
4. Number of upper-division credit hours for those who graduate.
5. Number of degree hours for those who graduate with a bachelor's degree.

Table 27. Mean number of total degree hours, F-ratio, and probability for student comparison groups by university

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University	154.92 <sup>a</sup>	168.00	168.99	160.10 <sup>a</sup>	135.36 <sup>b</sup>	70.25	.00
University of Iowa	125.36	126.00	129.73	125.44	121.24 <sup>c</sup>	4.71	.00
University of Northern Iowa	129.00	134.42 <sup>c</sup>	128.52	128.41	124.00 <sup>b</sup>	4.20	.00

<sup>a</sup>Significantly different from community college Groups II and III.

<sup>b</sup>Significantly different from all other groups.

<sup>c</sup>Significantly different from community college Group III.

The implications of these findings on Hypothesis 5 are discussed in Chapter V of this study.

#### Hypothesis 6

There was no significant difference in the following measures of success among five student groups. The groups were Iowa community college transfer students with 36 to 47 semester credits earned prior to transfer; community college transfer students with 48 to 59 semester credits earned prior to transfer; community college transfer students with at least 60 semester credits earned prior to transfer; transfer students from four-year colleges; and students native to the university when grouped according to ACT score.

1. Upper-division grade point average.
2. Percent of degree achievement.
3. Number of upper-division semesters enrolled for those who graduate.
4. Number of upper-division credit hours for those who graduate (upper-division hours).
5. Number of degree hours for those who graduate with a bachelor's degree (degree hours).

The purpose of this hypothesis was to determine if differences that existed among the three groups of Iowa community college transfer students, four-year college transfer students, and native students who were found in Hypothesis 5 still existed when comparing students in the five comparison groups with similar ACT composite scores. The one-way analysis of variance and Duncan post hoc test were computed for each of three ACT levels at each university for each of the five dependent variables.

For the purpose of this hypothesis, students in each of the five groups were subdivided into three groups according to their ACT composite score. The high ACT groups were students who had earned an ACT composite score of 23 or above. The middle ACT groups were students scoring an ACT composite of between 17 and 22. And the low ACT groups were comprised of students scoring 16 or below on the ACT composite score. The ACT levels were determined by dividing the range of ACT composite scores into three groups of approximately the same size.

Performance At Iowa State University, no significant differences were found among the five comparison groups in upper-division grade point average for students scoring 23 or above ACT composite score. When comparing all students in Hypothesis 5, native students and four-year college transfers were found to earn a higher GPA than community college Group II students. This was not the case when comparing only the high ACT level students.

No significant differences were found at Iowa State University in upper-division GPA among the five groups when comparing students in the middle or low ACT levels. This indicated that when comparing only students at Iowa State University of similar ACT level, no differences occurred in the upper-division GPA among the five comparison groups.

At the University of Iowa, significant differences in upper-division GPA were found when students of high and middle ACT levels were compared, but not when students with ACT composite scores of 16 and below were compared. When comparing students at the high ACT level (ACT composite scores of 23 and above), community college Group II students earned a significantly lower upper-division GPA than community college Group III, four-year college transfers, or native students. When comparing students at the middle ACT level (ACT scores of 17 through 22), community college Groups I and II earned lower GPAs than the other comparison groups. When comparing all students in Hypothesis 5, native students earned a higher GPA than all community college transfer students. When comparing students by similar ACT level, the differences between natives and community college Group III students disappeared at the University of Iowa.

At the University of Northern Iowa, differences occurred at the .05 level in upper-division GPA among the five groups for the middle ACT level students only. For students in the high and low ACT levels, no differences occurred. For middle ACT level students (ACT composite scores of 17 through 22) at the University of Northern Iowa, native students earned higher upper-division GPA than any of the transfer students. Small subset size of some groups are noted in Table 28.

The results of this hypothesis failed to reject the hypothesis except at the University of Iowa, where differences were still found between community college Groups I and II and the other groups. While differences were found in Hypothesis 5 among the five groups with respect to upper-division grade point average at all three universities, these differences are found in only two of nine cases when comparing students of similar ACT level. Table 28 shows the results of the one-way analysis of variances for each ACT level at each university. This table indicates the mean upper-division grade point average for each ACT level of each comparison group at each university and the differences that were indicated by the Duncan post hoc tests.

Degree achievement At Iowa State University, no significant differences were found at all three ACT levels among the five comparison groups with respect to the percent of students graduating with a bachelor's degree. When comparing all students in Hypothesis 5, native students had a significantly higher rate of graduation than all transfer students. This difference was not found when comparing students of similar ACT level.

Table 28. Mean upper-division GPA, F-ratio, and probability for student comparison groups (ACT level by university)

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University							
ACT $\geq$ 23	2.57	2.08(6)	2.84	2.94	2.65	2.31	.06
ACT 17-22	2.66(8) <sup>a</sup>	2.18(4)	2.30	2.66	2.57	1.15	.34
ACT $\leq$ 16	2.18(5)	2.13(1)	1.47(6)	1.91(3)	2.55(6)	2.20	.12
University of Iowa							
ACT $\geq$ 23	2.62	2.20(9) <sup>b</sup>	2.83	2.88	3.02	3.20	.02
ACT 17-22	1.94(5) <sup>b</sup>	1.88(7) <sup>b</sup>	2.66	2.69	2.56	4.02	.01
ACT $\leq$ 16	2.22(8)	2.15	2.07	2.16(9)	2.35	.44	.78
University of Northern Iowa							
ACT $\geq$ 23	3.18(5)	3.11(2)	2.83	3.00	3.08	.63	.64
ACT 17-22	2.52(6)	2.03(4)	2.67	2.54	2.99 <sup>c</sup>	3.38	.01
ACT $\leq$ 16	1.62(3)	2.22(8)	2.34	2.19	2.65	1.34	.27

<sup>a</sup>Subset N $\leq$ 10 indicated in parentheses.

<sup>b</sup>Significantly different from community college Group III, four-year college transfers, and natives.

<sup>c</sup>Significantly different from all transfer groups.

At the University of Iowa, native students were found to have a higher percent of graduation than community college Group III and four-year college students for students with ACT scores of 23 or above. Native students had a higher rate of graduation than all transfer students when comparing students at the middle ACT level (ACT scores of from 17 through 22). No significant differences were found among students at the low ACT level (ACT scores of 16 or below).

At the University of Northern Iowa, no significant differences were found in rate of graduation among the five groups for students at the high ACT level (ACT scores of 23 and above). Differences were still found for students with middle and low ACT level students. For students at the middle ACT level at the University of Northern Iowa, post hoc results indicated a difference existed between students in community college Group II and other groups. A sample size of two for this group is noted in Table 29. For students with ACT composite scores of 16 and below, native students had a better rate of persistence than did four-year college transfers or community college Group I students.

The results indicated that this hypothesis would fail to be rejected in five of nine cases with regard to percent of degree achievement. At Iowa State University, there were no significant differences in rate of graduation among the community college transfer groups, four-year college transfers, and native students of similar ACT level. At the University of Iowa, native students graduated at a higher rate, even when students of similar ACT level were compared. At the University of Northern Iowa, no differences were found for students at the high ACT level; however,

Table 29. Mean percent of graduation, F-ratio and probability for student comparison groups (ACT level by university)

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University							
ACT > 23	58.33	66.67(6) <sup>a</sup>	88.00	69.57	82.95	1.77	.14
ACT 17-22	71.43(7)	66.67(3)	57.69	75.00(4)	85.00	1.01	.41
ACT ≤ 16	50.00	100.00(2)	60.00	25.00(4)	100.00(7)	2.45	.07
University of Iowa							
ACT > 23	63.64(11)	66.67(9)	60.71	65.12	82.42 <sup>b</sup>	2.51	.04
ACT 17-22	25.00(4)	00.00(6) <sup>c</sup>	62.50	57.08	83.33 <sup>d</sup>	5.49	.00
ACT ≤ 16	44.44(9)	46.15	52.00	28.57	57.89	.79	.53
University of Northern Iowa							
ACT > 23	80.00(5)	100.00(2)	75.00	72.22	80.00	.28	.89
ACT 17-22	60.00(5)	00.00(2) <sup>e</sup>	81.25	70.00	88.89	2.94	.03
ACT ≤ 16	25.00(4)	70.00(10)	62.16	42.11	87.50 <sup>f</sup>	2.51	.04

<sup>a</sup>Subset size of N ≤ 10 shown in parentheses.

<sup>b</sup>Significantly different from community college Group III and four-year college transfers.

<sup>c</sup>Significantly different from community college Groups II and III and four-year college transfers.

<sup>d</sup>Significantly different from all other groups.

<sup>e</sup>Significantly different from community college Group III, four-year college transfers, and natives.

<sup>f</sup>Significantly different from community college Group I and four-year college transfers.



differences were found among the five groups for the other two ACT levels. Table 29 indicates the mean graduation rate for each ACT level of each comparison group at each university and the differences indicated by the post hoc test. The implications of these findings are discussed in Chapter V.

Progress At Iowa State University, no differences were found among the five groups compared with respect to the number of semesters graduates were enrolled for high ACT level and low ACT level students. Community college Group II students were found to need significantly more semesters to graduate than either community college Group III or native students at the middle ACT level.

Significant differences were found in both upper-division hours and degree hours for students of all ACT levels. Native students needed significantly fewer semester credits to graduate at all ACT levels and earned significantly fewer upper-division credits at all ACT levels except the low ACT level. Community college Group III students earned significantly fewer upper-division hours and fewer degree hours than other transfer students of the middle ACT level.

These results indicated that at Iowa State University, transfer students of all transfer groups earned more upper-division credits and needed more credits for graduation than native students. However, in most cases, there were no differences found among the groups of students in the number of semesters enrolled prior to graduation. Thus, the transfer students were completing more credits than natives in the same number of semesters. Table 30 shows the mean number of semesters enrolled for each

Table 30. Mean number of semesters enrolled, F-ratio, and probability for student comparison groups (ACT level by university)

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University							
ACT $\geq$ 23	6.57(7)	7.00(4) <sup>a</sup>	5.45	6.00	5.93	1.99	.10
ACT 17-22	6.00(5)	8.00(2) <sup>b</sup>	5.27	6.67(3)	5.71	3.71	.01
ACT $\leq$ 16	6.00(3)	6.00(2)	5.00(6)	6.00(1)	6.00(7)	1.44	.27
University of Iowa							
ACT $\geq$ 23	5.71(7) <sub>b</sub>	5.50(6)	4.65	6.10 <sup>b</sup>	4.69	7.60	.00
ACT 17-22	8.00(1) <sub>b</sub>	--	5.06	6.16 <sup>b</sup>	5.07	5.39	.00
ACT $\leq$ 16	5.50(4)	5.67(6)	5.27	5.50(4)	4.36	1.84	.14
University of Northern Iowa							
ACT $\geq$ 23	5.75(4) <sub>b</sub>	5.00(2)	4.52 <sub>c</sub>	5.85 <sup>b</sup>	4.08 <sub>d</sub>	11.43	.00
ACT 17-22	6.00(2)	--	5.26 <sub>c</sub>	6.43(7) <sub>e</sub>	4.50 <sub>d</sub>	8.29	.00
ACT $\leq$ 16	7.00(1)	6.86(7) <sub>b</sub>	5.30	6.13(8) <sub>e</sub>	4.71	6.01	.00

<sup>a</sup> Subset size of N $\leq$ 10 shown in parentheses.

<sup>b</sup> Significantly different from community college Group III and native students.

<sup>c</sup> Significantly different from four-year college transfers.

<sup>d</sup> Significantly different from all other groups.

<sup>e</sup> Significantly different from native students.

ACT level of each comparison group at each university and the differences found by the post hoc tests.

At the University of Iowa, significant differences existed between native students and transfer students for all progress dependent variables at most ACT levels. Native students were enrolled for significantly fewer semesters than four-year college transfers at the high ACT level and four-year college transfers and community college Group I students in the middle ACT level. No differences were found at these ACT levels between native students and community college Group III students. Community college Group III students needed fewer semesters than community college Group I or four-year college transfers at the middle ACT level.

Both native students and community college Group III were found to earn significantly fewer upper-division credit hours than four-year college transfers at all three ACT levels and fewer than community college Group I students at the middle and low ACT levels. Again, there were no differences between community college Group III students and native students for upper-division hours earned at all ACT levels. Differences were found between community college Group III and native students with regard to number of degree hours earned for the middle ACT level; however, there was no difference for the high and low ACT levels.

At the University of Northern Iowa, both native students and community college Group III students needed fewer semesters to graduate at the .01 level of significance than four-year college transfers and community college Group I students at the high ACT level. The differences in semesters enrolled between native students and community college Group

III students found in Hypothesis 5 were not found when only students with high ACT composite scores (23 and above) were examined. This was also true with respect to upper-division hours earned. Both native and community college Group III students earned significantly fewer upper-division hours than four-year college or community college Group I transfers.

No differences were found among the five comparison groups with respect to degree hours earned for high and low ACT level students. Native students earned significantly fewer degree hours than all transfer students at the middle ACT level and were enrolled fewer semesters than all transfer students at this level. Tables 31 and 32 show the mean number of upper-division hours and mean number of degree hours, respectively, for each ACT level of each comparison group at each university and the resulting differences that were identified.

The results indicated that Hypothesis 6 failed to be rejected for eight of 27 cases with regard to progress. No significant differences were found among the student groups with respect to:

1. Semesters enrolled for high and low ACT levels at Iowa State University and low ACT level at the University of Iowa.
2. University hours for low ACT level at Iowa State University.
3. Degree hours for high and low ACT levels at the University of Iowa and the University of Northern Iowa.

This hypothesis was rejected for 19 of 27 cases with regard to progress.

Table 31. Mean number of upper-division hours, F-ratio, and probability for student comparison groups (ACT level by university)

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
<b>Iowa State University</b>							
ACT $\geq$ 23	101.33(6) <sup>a,b</sup>	82.25(4) <sup>b</sup>	75.27	85.94 <sup>b</sup>	47.75 <sup>c</sup>	25.40	.00
ACT 17-22	87.80(5) <sup>b</sup>	92.50(2) <sup>b</sup>	70.07	85.67(3) <sup>b</sup>	51.76 <sup>c</sup>	16.75	.00
ACT $\leq$ 16	91.67(3)	85.50(2)	70.50(6)	88.00(1)	61.71(7)	3.01	.06
<b>University of Iowa</b>							
ACT $\geq$ 23	80.33(6) <sup>d</sup>	66.17(6)	68.15	80.46 <sup>d</sup>	64.08	4.82	.00
ACT 17-22	99.00(1) <sup>d</sup>	--	64.89	82.37 <sup>d</sup>	65.33	13.03	.00
ACT $\leq$ 16	81.00(4) <sup>d</sup>	74.00(6)	66.19	74.50(4)	62.55	3.23	.02
<b>University of Northern Iowa</b>							
Act $\geq$ 23	83.25(4) <sup>d</sup>	73.00(2)	62.70	85.92 <sup>d</sup>	60.25	15.20	.00
ACT 17-22	93.00(3) <sup>d</sup>	--	65.97	90.57(7) <sup>d</sup>	62.29	25.53	.00
ACT $\leq$ 16	86.00(1)	80.71(7)	64.74	86.63(8) <sup>d</sup>	63.29	9.44	.00

<sup>a</sup> Subset size of N $\leq$ 10 shown in parentheses.

<sup>b</sup> Significantly different from community college Group III.

<sup>c</sup> Significantly different from all other groups.

<sup>d</sup> Significantly different from community college Group III and native students.

Table 32. Mean number of degree hours, F-ratio, and probability groups (ACT level by university)

Univers'ity	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University							
ACT $\geq$ 23	164.50(6) <sup>a</sup>	162.00(4)	171.64	150.06 <sup>b</sup>	135.78 <sup>c</sup>	26.67	.00
ACT 17-22	148.60(5) <sup>d</sup>	179.50(2)	164.53	144.33(3) <sup>c</sup>	133.24 <sup>c</sup>	23.94	.00
ACT $\leq$ 16	150.00(3)	164.50(2)	167.17(6)	136.00(1)	136.57(7) <sup>d</sup>	4.74	.01
University of Iowa							
ACT $\geq$ 23	121.83(6)	122.33(6)	132.24	124.61	122.00 <sup>b</sup>	2.06	.09
ACT 17-22	135.00(1)	--	128.09	125.68	120.57 <sup>b</sup>	3.17	.03
ACT $\leq$ 16	121.00(4)	128.33(6)	128.31	129.50(4)	118.27	2.55	.06
University of Northern Iowa							
ACT $\geq$ 23	124.50(4)	129.00(2)	126.33	133.08	125.17 <sup>e</sup>	1.16	.34
ACT 17-22	134.67(3)	--	129.67	130.00(7)	122.46 <sup>e</sup>	4.30	.01
ACT $\leq$ 16	133.00(1)	135.57(7)	127.52	126.50(8)	123.64	1.71	.16

<sup>a</sup> Subset size of N $\leq$ 10 shown in parentheses.

<sup>b</sup> Significantly different from community college Group III.

<sup>c</sup> Significantly different from all other groups.

<sup>d</sup> Significantly different from community college Groups II and III.

<sup>e</sup> Significantly different from community college Groups I and III.

The differences that occurred in Hypothesis 5 in the progress of students were still found in most cases among the five comparison groups when only students of similar ACT level were compared. However, the differences that were found in performance and degree achievement in Hypothesis 5 primarily did not exist when only students of similar ACT level were examined. While native students at the University of Iowa earned a significantly higher GPA when compared in Hypothesis 5 when grouped according to ACT score, no difference was found between native students or community college Group III students at any ACT level. When the findings of Hypothesis 6 were contrasted to those of Hypothesis 5, similar results were found with regard to performance at the University of Northern Iowa.

At Iowa State University, native students graduated at a higher rate than transfer groups when compared in Hypothesis 5. When comparing students of similar ACT level, no differences were found at any level in degree achievement.

With regard to progress at the University of Iowa and the University of Northern Iowa, the differences between community college Group III and native students that were found in Hypothesis 5 were not found in this hypothesis. Community college Group III and native students both progressed faster than other groups when compared by similar ACT level. Further discussion is found in Chapter V of this study.

#### Hypothesis 7

There was no significant difference in the following measures of success among five student groups. These groups were Iowa community

college transfer students with 36 to 47 semester credits earned prior to transfer (Group I); community college transfer students with 48 to 59 semester credits earned prior to transfer (Group II); community college transfer students with at least 60 semester credits earned prior to transfer (Group III); transfer students from four-year institutions; and students native to the university at the three Iowa state universities when grouped by sex.

1. Upper-division grade point average.
2. Percent of degree achievement.
3. Number of upper-division semesters enrolled for those who graduate.
4. Number of upper-division credit hours for those who graduate.
5. Number of degree hours for those who graduate with a bachelor's degree.

The purpose of this hypothesis was to determine if differences that were found among the five groups of students in Hypothesis 5 would be found when comparing students of the same sex. Each of the five comparison groups were divided into male and female groups. One-way analysis of variance was computed for each sex at each university for each of the five dependent variables.

Performance There was no significant difference found among the five comparison groups in upper-division GPA for female students at Iowa State University and male students at the University of Northern Iowa. Also, there was no significant difference between female native students and community college Group III students at the University of Iowa and the



University of Northern Iowa. When comparing all students in Hypothesis 5, native students earned a higher GPA than all other student groups.

The results indicate this hypothesis was rejected in four of six cases with regard to upper-division grade point average. Table 33 indicates the mean upper-division grade point averages of each comparison group for each sex at each university and indicates the results of the one-way analysis of variance and post hoc tests.

Degree achievement No significant differences were found among the five comparison groups in percent of graduation for female students at Iowa State University and for male students at the University of Iowa and the University of Northern Iowa. However, there were differences found at all three universities; native students showed a higher graduation rate than did transfer groups when all students were examined in Hypothesis 5.

Male native students at Iowa State University and female native students at the University of Iowa graduated at a significantly higher rate (.05 level) than all transfer student groups. Also, female native students showed a significantly higher graduation rate than four-year college transfers and community college Group II students but no difference with community college Group III students. These were similar results that were shown in Hypothesis 5.

This hypothesis was rejected in three of six cases with regard to degree achievement. No differences were found in three of the six cases. Table 34 shows the mean graduation rate for each sex in each comparison group at each of the three universities. The results of the one-way analysis of variance and Duncan post hoc test are also shown.

Table 33. Mean upper-division GPA, F-ratio, and probability for student comparison groups (sex by university)

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University							
Male	2.37	1.97	2.34	2.30	2.50 <sup>a</sup>	2.49	.04
Female	2.40	2.55	2.62	2.81	2.79	1.21	.31
University of Iowa							
Male	2.33	2.08	2.45 <sup>b</sup>	2.65 <sup>b</sup>	2.76 <sup>a</sup>	4.66	.00
Female	2.35	2.27	2.85 <sup>c</sup>	2.79 <sup>c</sup>	2.88 <sup>c</sup>	3.40	.01
University of Northern Iowa							
Male	2.55	2.22	2.38	2.36	2.71	1.31	.27
Female	2.63	2.66	2.95	2.82	3.12 <sup>d</sup>	3.04	.02

<sup>a</sup>Significantly different from community college Groups II and III.

<sup>b</sup>Significantly different from community college Group II.

<sup>c</sup>Significantly different from community college Groups I and II.

<sup>d</sup>Significantly different from four-year college transfers, community college Groups I and II.

Table 34. Mean percent of graduation, F-ratio, and probability for student comparison groups (sex by university)

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University							
Male	60.00	61.90	68.75	55.10	83.72 <sup>a</sup>	3.86	.00
Female	61.54	66.67	70.18	65.45	85.37	1.42	.23
University of Iowa							
Male	50.00	47.37	60.55	59.09	77.05 <sup>b</sup>	2.18	.07
Female	52.94	38.46	56.14	52.00	81.40 <sup>b</sup>	5.50	.00
University of Northern Iowa							
Male	53.85 <sup>c</sup>	64.29	72.22	51.52 <sup>d</sup>	79.31	1.98	.10
Female	54.55 <sup>c</sup>	83.33	75.86	51.16 <sup>d</sup>	86.44	5.03	.01

<sup>a</sup> Significantly different from four-year college transfers, community college Groups I and III.

<sup>b</sup> Significantly different from all others.

<sup>c</sup> Significantly different from native students.

<sup>d</sup> Significantly different from native students, and community college Groups II and III.

Progress      The results of this hypothesis paralleled the results of Hypothesis 5 with regard to the number of semesters enrolled prior to graduation. At Iowa State University, both male and female community college Group III students were enrolled for significantly fewer semesters (at .01 level) than all other transfers and native students.

At the University of Iowa, significant differences among the groups were found for both male and female students. Male and female native students were enrolled for fewer semesters than were four-year college transfers and community college Groups I and II. Both male and female community college Group III students were enrolled for fewer semesters than were four-year college transfers. There was no difference between native students and community college Group III students.

At the University of Northern Iowa, differences were found in the number of semesters enrolled among the five groups for both male and female students at the .01 level of significance. Female native students were found to enroll for significantly fewer semesters than all groups of transfer students. For male students, native students enrolled for fewer semesters than four-year college transfers and community college Groups I and II students. No significant differences were found between male native students and community college Group III students. Both male and female community college Group III students were enrolled for fewer semesters prior to graduation than any other transfer students. Table 35 shows the mean number of semesters enrolled for each group for each sex at each university. The results of the analysis of variance are also shown.

Table 35. Mean number of semesters enrolled, F-ratio, and probability for student comparison groups (sex by university)

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University							
Male	6.33	6.92	5.39 <sup>a</sup>	6.37	6.04	7.54	.00
Female	6.50	6.12	4.78 <sup>a</sup>	5.86	5.80	6.10	.00
University of Iowa							
Male	6.00(6) <sup>b</sup>	6.00(9)	5.12 <sup>c</sup>	6.38 <sup>d</sup>	4.72 <sup>d</sup>	8.28	.00
Female	6.00(9)	4.80(5)	4.63 <sup>e</sup>	5.73	4.80 <sup>e</sup>	5.52	.00
University of Northern Iowa							
Male	6.00	6.78	5.11 <sup>d</sup>	6.24	4.78 <sup>d</sup>	10.98	.00
Female	6.00	5.90	4.89 <sup>d</sup>	5.59	4.14 <sup>a</sup>	11.99	.00

<sup>a</sup>Significantly different from all other groups.

<sup>b</sup>Subset size of N<10 shown in parentheses.

<sup>c</sup>Significantly different from four-year transfers.

<sup>d</sup>Significantly different from four-year transfers and community college Groups I and II.

<sup>e</sup>Significantly different from four-year transfers and community college Group I.

No significant differences were found among the five comparison groups with regard to degree hours for female students at the University of Iowa. Significant differences were found (at either the .05 or .01 level) for all other comparisons with regard to degree hours and upper-division semester credits earned prior to graduation.

At Iowa State University, differences were found among the five groups at the .01 level in both upper-division credits earned and degree hours earned by both male and female graduates. Both male and female native students earned significantly fewer upper-division semester credits and fewer degree hours than all transfer student groups. As was also the case in Hypothesis 5, community college Group III students earned fewer upper-division credits than all other transfer students.

At the University of Iowa, differences were found among the groups at the .01 level for both male and female students with regard to upper-division credits earned and for male students with regard to degree hours earned. While no differences were found in upper-division hours earned between either male or female native students and community college Group III students, both of these groups earned significantly fewer upper-division credits than four-year college transfers and community college Group I transfers.

At the University of Northern Iowa, significant differences were found at the .01 level among the groups for both male and female students with respect to upper-division credits earned, and at the .05 level with regard to total degree hours. Again, results similar to those found in Hypothesis 5 were found with this hypothesis. There were no differences

between native students and community college Group III students. Both of these groups earned fewer hours than did the other transfer student groups.

Tables 36 and 37 show the mean upper-division hours and mean degree hours, respectively, for each sex at each university. Individual differences among the groups found by the analysis of variance and Duncan post hoc tests are also indicated.

The results indicated this hypothesis was rejected in 17 of 18 cases with regard to progress. This hypothesis failed to be rejected in only one case. No differences were found among the five groups with regard to degree hours for female students at the University of Iowa. The implications of these findings on Hypothesis 7 are discussed in Chapter V of this study.

#### Summary

This chapter has presented the findings of the statistical analysis used to test each of the seven hypotheses of this study. The seven hypotheses were formulated to determine if differences existed in the performance, progress, and degree achievement among transfer students from Iowa community colleges, other transfer students, and students native to the university at the three Iowa state universities. Five dependent variables were used to measure performance, progress, and degree achievement for each hypothesis. These dependent variables were: upper-division grade point average, percent of graduation, upper-division credit hours, total degree credit hours, and number of semesters enrolled.

Table 36. Mean number of upper-division hours, F-ratio, and probability for student comparison groups (sex by university)

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University							
Male	92.82	91.08	74.41 <sup>a</sup>	87.41	50.58 <sup>b</sup>	47.86	.00
Female	96.00(8)	82.63(8)	67.80 <sup>a</sup>	82.69	48.83 <sup>b</sup>	27.25	.00
University of Iowa							
Male	81.50(6) <sup>c</sup>	72.67(9)	67.88 <sup>d</sup>	82.81	63.96 <sup>d</sup>	8.47	.00
Female	85.00(8)	67.40(5)	63.69 <sup>d</sup>	78.38	64.61 <sup>d</sup>	6.46	.00
University of Northern Iowa							
Male	82.71	82.89	66.03 <sup>a</sup>	85.94	66.52 <sup>a</sup>	19.64	.00
Female	90.33	75.30	64.42 <sup>a</sup>	79.45	59.22 <sup>b</sup>	18.42	.00

<sup>a</sup>Significantly different from four-year transfers and community college Groups I and II.

<sup>b</sup>Significantly different from all other groups.

<sup>c</sup>Subset size of  $N \leq 10$  shown in parentheses.

<sup>d</sup>Significantly different from four-year transfers and community college Group I.



Table 37. Mean number of total degree hours, F-ratio, and probability for student comparison groups (sex by university)

University	Community college			Four-year transfers	Natives	F-ratio	F prob.
	Group I	Group II	Group III				
Iowa State University							
Male	153.18	171.54	171.65	168.15	136.11 <sup>a</sup>	64.08	.00
Female	158.63(8) <sup>b</sup>	162.25(8)	160.60	154.06 <sup>c</sup>	133.80 <sup>d</sup>	18.13	.00
University of Iowa							
Male	126.33(6)	128.00(9)	131.56	123.19 <sup>c</sup>	119.81 <sup>c</sup>	5.77	.00
Female	124.63(8)	122.40(5)	125.97	127.69	122.20	.76	.55
University of Northern Iowa							
Male	126.43(7)	138.67(9) <sup>a</sup>	128.86	127.24	126.83	2.74	.03
Female	132.00(6)	130.60(10)	128.18	129.32	122.73 <sup>d</sup>	2.60	.04

<sup>a</sup>Significantly different from all other groups.

<sup>b</sup>Subset size of N<10 shown in parentheses.

<sup>c</sup>Significantly different from community college Group III.

<sup>d</sup>Significantly different from four-year transfers and community college Group III.

Hypothesis 1 stated that no differences existed in the five dependent variables among the individual Iowa community colleges. This hypothesis failed to be rejected in three out of five cases. There were no significant differences among the community colleges with respect to:

1. University cumulative GPA.
2. Percent of degree achievement.
3. Number of semesters enrolled.

This hypothesis was rejected on two dependent variables measuring progress:

4. Number of university credit hours earned.
5. Total number of degree credit hours earned.

Hypothesis 2 stated that no differences existed in the five dependent variables of Iowa community college transfer students among the three state universities. Significant differences were found among the three state universities with respect to all five dependent variables measured: university cumulative GPA, percent of degree achievement, number of semesters enrolled, number of university credits earned, and total number of degree hours.

Hypothesis 3 stated that no differences existed in the five measures of performance, progress, and degree achievement of Iowa community college transfers between male and female students. This hypothesis was rejected and found differences between male and females for the dependent variables of university cumulative GPA, semesters enrolled, university hours, and total degree hours earned. The hypothesis failed to be rejected with respect to the rate of degree achievement.

Hypothesis 4 tested the interaction between the university enrolled and the sex of the students with respect to the five measures of success. No interaction was found for all dependent variables. This indicated that females earned a higher university GPA, progressed faster, and had the same rate of degree achievement as males at all three universities.

Hypothesis 5 stated that no significant differences existed with respect to the five dependent variables among five student groups. The groups were: Iowa community college transfer students with at least 60 semester credits earned prior to transfer; community college transfer students with 48 to 59 semester credits earned prior to transfer; community college transfer students with 36 to 47 semester credits earned prior to transfer; transfer students from four-year colleges; and students native to the university at each of the three Iowa state universities. This hypothesis was tested for each university separately for each dependent variable. The hypothesis was rejected for each variable at each university. The results and implications of this hypothesis are explained in detail in Chapter V of this study.

Hypotheses 6 and 7 tested differences among the same five groups examined in Hypothesis 5, but in these two hypotheses, students were grouped by ACT composite score and sex, respectively. The results of Hypothesis 6 indicated that no differences existed among the five groups of students with respect to upper-division GPA or degree achievement for students at Iowa State University when grouped by ACT score. This was also true at the high ACT level (ACT composite score of 23 and above) at the University of Northern Iowa.

When female students at Iowa State University were compared, no differences were found among the five student groups in Hypothesis 7 with respect to upper-division GPA and percent of degree achievement. Also, there were no differences with respect to these two variables when male students at the University of Northern Iowa were compared. These results of Hypotheses 6 and 7 indicated that some differences among the five groups of students found in Hypothesis 5 were not found when students of similar ACT level or of the same sex were compared.

The next chapter provides an in-depth discussion of these findings, and discusses the results related to the purpose of this study and to implications for further research.

## CHAPTER V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## Summary

This study examined the performance, progress, and degree achievement of Iowa public community college transfer students at the three Iowa state universities and compared these students' performance, progress, and degree achievement to that of transfer students from four-year colleges and students native to the universities. Comparisons were made among the student groups with regard to performance measured by upper-division grade point average; progress measured by the number of semesters enrolled, the number of upper-division credits earned, and the number of semester credits needed to graduate with a bachelor's degree; and persistence measured by the rate of graduation. After making raw comparisons, students were then grouped by sex, ACT composite score, university enrolled, and number of credits earned prior to transfer for community college students to determine if the same results were found using different methods of comparison.

Prior research reviewed in Chapter II was inconclusive in determining if the performance of community college students was equivalent to either the performance of students who enroll directly from secondary schools to the university or the performance of students who transfer from other four-year colleges to the university. Some studies indicated that transfer students performed less well (Anderson, 1977; Kissler, Lara, & Cardinal, 1981), while other studies indicated no difference in the performance of the two groups (Richardson & Doucette, 1980; Atherton, 1981).

The method of these studies also varied. The review of the literature showed that studies which made raw comparisons of community college transfer students to students native to a university found differences between the two groups (Knoell & Medsker, 1965; Hodgson & Dickinson, 1974; Anderson, 1977). Other studies matched or grouped students by student achievement characteristics such as high school rank, college placement test scores of the American College Testing Service (ACT), number of hours earned prior to transfer, or undergraduate grade point average. These studies with grouped or matched data found no differences between students from community colleges and those native to the universities (Nickens, 1975; Thompson, 1978; Richardson & Doucette, 1980; Atherton, 1981).

#### Conclusions

A first objective of this study was to examine the performance, progress, and degree achievement of Iowa community college transfer students at the three state universities and determine if differences existed among these community college transfer students. Echternacht (1968) compared community college transfer students at Iowa State University on the basis of the size of community college which they attended. He found differences in grade point average between students from small and large community colleges in the College of Engineering and the College of Home Economics; transfers from large community colleges earned higher grade point averages in these two colleges. In a study of Iowa community college students, Fleming (1972) found significant differences among students from different community colleges according to

semester hours earned, semesters completed at the community college, and cumulative grade point average at the community college. Fleming found no significant differences among the community colleges in percent of transfer students, semester hours completed at the transfer institution, number of four-year graduates, or cumulative grade point average at the transfer institution. Lagomarcino (1955) and Casey (1963) reported differences in transfer student success among the three Iowa state universities.

Hypothesis 1 of this study examined the performance, progress, and degree achievement of Iowa community college transfer students to determine if differences existed among the Iowa community colleges. No differences were found in performance or degree achievement. No difference was found in progress as measured by the number of semesters enrolled at the university. Differences were found with respect to the number of semester credits earned at the university and the number of total credits earned for a bachelor's degree.

In each of the cases where differences were found, one community college was found to be significantly different from the rest. The differences in the number of credits earned at the university and number of credits earned toward a degree could be accounted for by differences in the number of transfer credits accepted by the universities for these students. Students from one community college earned significantly fewer credits at the universities than other students, but earned the same total number of credits for a degree as other students. This would indicate these students earned more credits prior to transfer which were accepted

by the universities. Students from another community college earned more total credits for a bachelor's degree than other students. This would indicate that differences exist among the community colleges in the number of transfer credits accepted by the university which in turn lead to differences in progress.

The findings of Hypothesis 1 indicated that students from each Iowa public community college have similar post-transfer success at the state universities with regard to performance and degree achievement. The differences found in two of the three progress variables indicated that differences may exist among the different community colleges in successful articulation of their students. However, the differences found involving only one community college in each of the two variables may indicate the difference was due to measurement error.

The performance, progress, and degree achievement of community college transfer students was found to differ at each of the three Iowa state universities. The results of Hypothesis 2 of this study indicated that community college transfer students earned a higher grade point average at the University of Northern Iowa, progressed slower at Iowa State University, and had a lower rate of degree achievement at the University of Iowa. These findings supported earlier findings of Lagomarcino and Casey that differences existed in the success of transfer students among the three universities.

These findings indicated that community college transfer students who attend Iowa State University were found to need more credits to earn a bachelor's degree than those who attend the other two universities. This



indicated fewer credits earned prior to transfer were accepted by Iowa State University. Also, fewer community college transfer students earned a bachelor's degree at the University of Iowa than at the other two universities. These findings supported the conclusion that community college transfer students had the greatest chance of success at the University of Northern Iowa and suffered the least amount of transfer shock at this university. Examination of Tables 4 and 7 show similar mean ACT scores for community college transfer students and University of Northern Iowa native students (20.01 in each case). This may have been one factor influencing these results.

Hypothesis 3 examined differences between male and female community college transfer students and found female students to perform better for all variables except degree achievement. Female community college transfer students were found to earn higher grade point averages and progress at a faster rate than male community college transfer students. No difference was found in degree achievement between male and female community college transfer students. Hypothesis 4 tested interaction between sex and university attended, and found this to be the case at all three universities. These findings indicate that female community college students do have greater post-transfer success than males.

The second objective of this study was to compare the performance, progress, and degree achievement of community college transfer students to that of four-year college transfer students and university native students. The community college transfer students were divided into three student groups according to the number of credits earned prior to

transfer. Community college Group I was comprised of transfer students who had earned between 36 and 47 semester credits at the community college prior to transfer to the university, community college Group II was made up of transfer students who had earned between 48 and 59 semester credits prior to transfer, and community college Group III was made up of students who had earned 60 semester credits or more prior to transfer. These groupings paralleled the student groupings of earlier studies (Richardson & Doucette, 1980; Atherton, 1981) to determine if similar results would be found. These studies found that community college transfers who had earned an AA degree, or attended two years at a community college prior to transfer, performed as well as university native students and performed better than transfer students who had earned fewer credits prior to transfer. Differences were found in Hypothesis 2 among the three universities; therefore, separate comparisons were made among the student groups for each university.

The results of the comparisons of Hypothesis 5 partially supported the prior research findings of Richardson and Doucette and Atherton. At Iowa State University, no difference was found in the grade point average among community college Group III, four-year college, and native students. However, community college Group I and Group II students did earn significantly lower grade point averages than native students and four-year college transfers. At the University of Iowa and University of Northern Iowa, native students earned higher GPAs than all three community college transfer students. At the University of Iowa, however, community

college Group III students did earn a higher mean GPA than community college Group II students.

With respect to degree achievement, native students graduated at a higher rate than all transfer student groups at Iowa State University and University of Iowa. At the University of Northern Iowa, no difference was found among native students, community college Group III students, and community college Group II students.

Native students also progressed faster than the transfer student groups in six of the nine cases tested. The exceptions were at Iowa State University where community college Group III students were enrolled for fewer semesters than all other groups and at the University of Iowa where there was no difference in the number of semesters enrolled and the number of upper-division credits earned between community college Group III students and native students. Both of these two groups enrolled for fewer semesters and earned fewer upper-division credits than the other transfer groups.

The findings of Hypothesis 5 indicated that community college Group III students performed as well as native students in five of the 15 cases (five variables at each three universities). However, community college Group III students performed as well or better than four-year college transfer students in all cases and performed better than other community college transfer student groups in nine of the 15 cases.

These findings indicated that community college transfer students who earned at least 60 semester credits prior to transfer had better post-transfer success than community college students who transferred with

fewer credits. This also indicated that post-transfer success was not dependent upon the type of institution attended prior to transfer (two-year or four-year), however, may be dependent on the number of transfer credits earned.

These findings supported the findings of Richardson and Doucette (1980) and Atherton (1981) that community college students who had earned an associate degree, or attended two years at a community college prior to transfer, performed better than transfer students who earned fewer credits prior to transfer. Richardson and Doucette compared community college transfers who earned 24 to 36 credits prior to transfer to students who earned 48 to 60 credits prior to transfer. They recommended comparison with students earning 37 to 47 credits prior to transfer. This study found differences between community college Group I (36 to 47 credits earned prior to transfer) and community college Group II (48 to 59 credits earned prior to transfer) in only two of 15 cases. These findings did not fully support the thesis that differences in performance existed between these two groups. Community college Group III performed better than community college Group II in seven of the 15 cases, partially supporting the thesis that differences exist between community college transfer students with 60 or more semester credits earned prior to transfer (AA degree students) and community college students with 48 to 59 semester credits earned prior to transfer.

The findings of Hypothesis 5 confirmed and added to the research base of earlier studies by comparing community college transfer students to four-year college transfers. Community college Group III students were

found to perform as well as four-year college transfers in all cases. From the findings of this study and previous research cited, it was concluded that no difference exists in the performance of community college transfer students who earn at least 60 semester credits prior to transfer and four-year college transfer students.

From the findings of Hypothesis 5 and previous research cited, it was also concluded that community college Group III students performed better than other transfer student groups. However, native students were found to perform better than all transfer students in 10 of 15 cases. These findings led to the conclusion that when raw comparisons are made, native students outperform transfer students. This leads to the question of whether the results of raw comparisons differ from the results of comparisons where students are grouped by similar academic characteristics.

The third aspect of this study was to determine if different methods of comparison produced similar or dissimilar results when comparing community college transfer students to other student groups. Knoell and Medsker (1965) reported the findings of a national study which made raw comparisons of the performance and degree achievement of community college transfers and native students. They found native students to perform better than the transfer students. On the basis of their study, Knoell and Medsker recommended making matched comparisons of the student groups (Koos, 1970). Richardson and Doucette (1980) compared community college transfer students to native students, grouping the students by high school rank. They reported that differences were found between the two groups

with respect to performance and degree achievement when making raw comparisons. However, differences were not found when only students of similar high school rank were compared.

This study compared students in the five student comparison groups of similar ACT composite score and of the same sex. Hypothesis 6 grouped students into three ACT levels (Level 1 was ACT scores of 16 and below, Level 2 was ACT scores of 17 through 22, and Level 3 was ACT scores of 23 and above). Comparisons were made among the five student groups for each ACT level at each of the three universities. Hypothesis 7 grouped students by sex. Comparisons were then made among the five student groups for each sex at each university.

When comparing students of similar ACT scores, this study found differences in grade point average among community college transfer students, four-year college transfers, and native students in three of nine cases examined. At the University of Northern Iowa, native students in the middle ACT level earned a higher GPA than all transfer students. At the University of Iowa, community college Group II students in the middle and high ACT level earned lower GPAs than community college Group III students, four-year college transfers, and native students. No differences were found in performance among community college Group III students, four-year college students, and native students at the high ACT level. Differences were found among these three student groups in only one of the nine cases examined. These findings supported the findings of Richardson and Doucette (1980), Atherton (1981), and Nickens (1975) that when similar students were compared, no differences were found in

performance between community college transfer students who completed two years at the community college prior to transfer and native students. These results augmented prior research by finding no differences between community college Group III students and four-year college transfers. These findings further supported the conclusion that post-transfer success is not dependent upon the type of institution attended prior to transfer (two-year or four-year), however, it may be dependent on the number of credits earned prior to transfer.

Differences in percent of degree achievement were found among community college Group III students, four-year college transfers, and native students of similar ACT level in only two of the nine cases examined. Native students at the University of Iowa were found to have a higher rate of graduation than four-year college transfers and community college Group III students at the middle and high ACT levels.

From the findings of Hypothesis 6 and previous research cited, it was concluded that no differences exist in performance and degree achievement between community college transfer students who complete at least 60 semester credits prior to transfer and university native students of similar ACT level. These findings differed from the findings of Hypothesis 5 where raw comparisons of students were made. This would also lead to the conclusion that different methods of comparison produce different results.

The results of Hypothesis 6 indicated that differences existed among the community college Groups I, II, and III, four-year college transfers, and native students with regard to progress. Differences were found among

the five student groups in 19 of the 27 cases examined. However, native students were found to progress faster with regard to semesters enrolled than community college Group III students in only one of nine cases (at the University of Northern Iowa for middle ACT level students). And native students were found to progress faster with respect to upper-division hours than community college Group III students in only two of nine cases (at Iowa State University for middle and high ACT level students). Significant differences were found between these two groups in the total number of degree credits earned in five of nine cases.

Based on the findings of Hypothesis 6 relative to student progress, it was concluded that there was no difference in number of semesters enrolled or in the number of upper-division hours earned by community college Group III students and by native students of similar ACT levels. Differences were found in the total number of degree hours earned between community college Group III students and university native students of similar ACT level. This indicated that the differences found in total degree hours earned by these two groups were due to differences in the number of lower-division credits earned.

Examination of Tables 30, 31, and 32 shows there were differences in progress among the five student groups of similar ACT level, but that most of the differences were between native students and transfer students other than community college Group III students, and between community college Group III students and other transfer students. When raw student comparisons were made in Hypothesis 5, native students progressed faster than community college Group III students in six of nine cases. When



students of similar ACT level were compared in Hypothesis 6, differences were found between the two groups in only eight of 27 cases. Five of these eight cases were with respect to total degree hours earned. These findings indicated that when students of similar ACT level were compared, the differences found in raw comparisons of the two student groups were no longer found in most cases.

From the findings of this study and previous research cited, it was concluded that different methods of comparison may produce different results. When students were grouped according to similar student academic characteristics (ACT scores), the differences found in ungrouped comparisons between community college transfer students with 60 semester credits earned prior to transfer and university natives were no longer found.

Based on findings of Hypothesis 6, it was concluded that differences in performance, progress, and degree achievement do not exist between community college Group III students and native students when students of similar ACT level are compared. Differences did exist among community college Group III students and other transfer students. The comparative findings of Hypotheses 5 and 6 also indicated that when students of similar ACT level were compared, fewer differences were found among students than when raw student comparisons were made. These findings supported the recommendations of Knoell and Medsker and of Richardson and Doucette that, when community college transfer students are compared to native university students, only students of similar academic characteristics should be analyzed.

Hypothesis 7 compared students in the five student groups of the same sex. Native students earned a significantly higher university GPA than transfer students in four of the six cases examined (male and female students at each of three universities). Native students earned a higher university GPA than community college Group III students in only two of these cases (male students at Iowa State University and University of Iowa).

Differences in the percent of students who graduated among the five student comparison groups existed in three of six cases. In two of these cases, native students graduated at a higher rate than community college Group III students (the two cases were male students at Iowa State University and female students at the University of Iowa).

These results further supported the conclusion that when similar students are compared, differences do not exist between community college Group III students and native students with respect to performance and degree achievement. From these findings, it was concluded that students should be grouped by sex as well as student academic characteristics when comparisons are made.

The findings of Hypothesis 7 indicated that differences in progress existed among the five student groups examined in 17 of 18 cases. The only exception was female students at the University of Iowa where no difference was found among the groups. Native students were found to progress at a faster rate than transfer students in 15 of the 17 cases. However, community college Group III students were found to progress at the same rate or faster than native students in nine of these cases. When

students of the same sex were compared in Hypothesis 7, native students progressed faster with regard to the number of semesters enrolled than community college Group III students in only one case (female students at University of Northern Iowa). Native students progressed faster than community college Group III students with regard to upper-division hours earned in three of six cases and in five of six cases with respect to total degree hours earned.

Based on these findings, it was concluded that there was no difference in the number of semesters enrolled between community college Group III students and university native students of the same sex. However, differences did exist in the number of upper-division hours earned and the total number of degree hours earned. From these results, it was concluded that native students do progress faster than all community college transfer students of the same sex with respect to upper-division credits earned and total degree credits earned. It was concluded from these findings that grouping students by sex did not change the results of raw comparisons made with respect to these progress variables.

The findings of Hypothesis 7 partially corroborated the findings of Hypothesis 6. When similar students were compared, differences in performance, progress, and degree achievement did not exist between native students and community college Group III students. While the findings of Hypothesis 5 indicated native students performed better than community college Group III students in two of three cases with regard to both university GPA and percent of graduation, Hypothesis 7 found native

students to perform better with respect to these variables in only two of six cases. These results supported the conclusion that differences in performance and degree achievement found between these two student groups in unmatched comparisons are not found when similar students are compared.

The findings of Hypotheses 5, 6, and 7 all indicated differences in progress among the five student groups. Hypotheses 6 and 7 found that when similar students were compared, native students progressed at a faster rate than community college Group III students in fewer cases than when raw comparisons were made in Hypothesis 5. Native students did progress at a faster rate than other transfer student groups in most cases. On the basis of these findings, it was concluded that when only similar students are compared, differences do not exist between native students and community college students who earn two years credit prior to transfer. These findings also supported the conclusion that different methods of comparison produce different results.

These findings along with the findings of earlier research cited indicated that students should be grouped or matched by similar characteristics such as ACT score and sex when comparisons are made. Because grouped or matched comparisons of transfer students produce different results from unmatched or raw comparisons, community colleges and universities should examine the method of comparison of transfer students to native students before the results of such comparisons are interpreted. These findings also indicated the importance of providing information regarding the method of comparison when results of student comparisons are distributed by universities, community colleges, or state

agencies, so that this may be taken into consideration in the interpretation of such results.

The findings of Hypotheses 5, 6, and 7 also indicated that most differences in progress between native students and community college Group III students were in the number of upper-division hours earned and the total number of degree hours. These findings indicated that community college Group III students did not enroll for more semesters than native students but that community college Group III students earned more credits each semester than native students. It was concluded that differences in progress between community college Group III students and native students were due to differences in the number of lower-division credits earned and applied toward the bachelor's degree.

Examination of Table 6 shows that university native students earned an average of 67 undergraduate semester credits. Community college Group III students earned at least 60 semester credits prior to transfer. Significant differences in total degree hours found between community college Group III students and university native students indicated that community college Group III students had fewer undergraduate credits applied toward the bachelor's degree. This was found to be the case irrespective of the method of comparison.

#### Recommendations for Future Research

This study was part of a continuing effort to study the performance, progress, and degree achievement of community college transfer students. The findings of this study indicated areas that would seem appropriate for future research.

The findings of Hypothesis 1 indicated that differences existed among the Iowa community colleges studied in the post-transfer progress of their students. The difference shown in the number of upper-division hours earned and the total number of degree hours indicated differences may exist among the community colleges in the number of transfer credits accepted by the universities. The findings of Hypothesis 2 also indicated that differences in progress existed among the three Iowa state universities for community college transfers. Further studies should examine the articulation of Iowa community college students with the Iowa state universities. Further studies could determine if there are differences in curriculum and degree requirements among the Iowa community colleges. If differences do exist, further studies could determine if these differences result in differences in transfer credit accepted by the universities.

In 1981, a voluntary articulation agreement was developed by a committee comprised of Iowa community college and state university personnel (see Appendix A). The purpose of this agreement was to allow students transferring from an Iowa community college with an Associate in Arts (AA) degree to an Iowa state university to have met the general education requirements for the college of liberal arts or its equivalent and to be enrolled at the junior level status. Students who transfer without an AA degree would require a course-by-course transfer evaluation. Parameters were also set with regard to what would be included in an AA degree. Further studies could determine if pre- and post-articulation

agreement differences exist in the progress and degree achievement of Iowa community college students.

Kintzer (1985) described four types of articulation/transfer agreements. These were formal and legally based agreements, state system agreements, voluntary agreements, and vocational-technical credit transfer agreements. Formal and legally based agreements use statutes and/or regulations as a base for policy development. State system agreements are often enforced by a state agency or coordinating board, while voluntary agreements are usually negotiated between individual universities and community colleges. Further studies could compare the progress and degree achievement of Iowa community college transfer students to that of community college students in states where formal and legally based or state system agreements exist to determine if differences in progress and degree achievement of transfer students exist among the various systems.

The findings of Hypothesis 2 indicated that differences existed among the three Iowa state universities in the performance, progress, and degree achievement of community college transfers. Further studies should be conducted to determine if differences exist among the colleges and majors within the universities. These studies could determine if community college transfer students better succeed in some colleges and majors than in others. Further studies should also be conducted to determine if differences exist among the universities for transfer students of the same major or college (such as comparing business students at Iowa State University to business students at the other universities). These studies

could determine if grouping students by major as well as other student characteristics would account for more variance among the universities.

The findings of Hypotheses 5, 6, and 7 indicated that differences existed between community college students who earned at least 60 semesters of credit prior to transfer and community college students who earned fewer credits prior to transfer. Further studies should be conducted by individual community colleges to determine if differences in post-transfer performance, progress, and degree achievement exist between students who complete the associate degree prior to transfer and students who do not complete the degree. These studies could identify students by degree earned rather than number of credits earned and further determine whether students who earn an AA degree prior to transfer attain greater post-transfer success than those who do not.

Hypotheses 6 and 7 of this study examined students of similar level of ACT score and of the same sex and found fewer differences in performance, progress, and degree achievement to exist between community college transfer students and native university students than when raw student comparisons were made in Hypothesis 5. Future studies should be conducted which further match students such as using a matched t-test comparison between community college students who had earned at least 60 semester credits prior to transfer and native university students. These studies could determine if further matching would explain even more of the variance between these two student groups.

Richardson and Bender (1985) suggested that most studies of transfer student success do not provide results that are disaggregated by ethnic



status. These researchers reported that there exists under-representation of minority students in four-year institutions, while urban community colleges enrolled disproportionately large numbers of minorities. This study did not take ethnic status into account. However, 38 percent of the community college transfer students studied in this research were previously enrolled at a community college in an urban Iowa area (see Table 8). This would suggest that ethnic status should also be taken into consideration in future research of Iowa community college transfer students.

This research continued an effort in higher education to study the performance, progress, and degree achievement of community college transfer students. While few variances were found among the students from the different community colleges, significant variances were found in the success of community college transfer students among the receiving institutions. Differences in success were also found among community college transfer students with varying numbers of credits earned prior to transfer, while few differences were found between community college transfer students and students native to the university when similar students were compared. This research also found that different methods of comparison produced different results.

This research supported and added to previous studies regarding community college transfer student success. The findings of this study may be used to further the knowledge of those studying community college transfer student success and as a basis for further research which was recommended in this study.

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APPENDIX

IOWA COMMUNITY COLLEGE/REGENTS ARTICULATION AGREEMENT

It is understood that the following requirements will be met by all students transferring with an Associate in Arts degree from an Iowa Community College to any one of the three Regents institutions in Iowa, i.e., Iowa State University, University of Iowa, University of Northern Iowa:

1. The Associate in Arts degree will include a minimum of 60 semester (90 quarter) hours of courses designed and acceptable for transfer, with the understanding that 16 semester (24 quarter) hours of vocational courses could be included in the total.
2. General education courses are defined as those courses which are created to broaden student knowledge in the arts and sciences. Forty semester (60 quarter) of transfer credit hours will be required within the following general divisions:
  - a. Communications - 8 semester (12 quarter) hours
  - b. Humanities - 8 semester (12 quarter) hours
  - c. Math and/or Science - 8 semester (12 quarter) hours
  - d. Social Science - 8 semester (12 quarter) hours
  - e. Distributed requirement - 8 semester (12 quarter) hours will be taken from among the above four divisions.
3. The remaining 20 semester (30 quarter) hours will be taken from arts and sciences electives designed and acceptable for transfer, with the understanding that 16 semester (24 quarter) hours of vocational courses could be taken.
4. Each student transferring an Associate in Arts degree to a Regents institution must have maintained a minimum cumulative grade point average of 2.0 on all courses acceptable for transfer.
5. It is understood that where a Foreign Language is required a student must meet this requirement either at the community college or the Regents institution of intended transfer.
6. Having fulfilled the above requirements, each student transferring with an Associate in Arts degree to a Regents institution will have met the general education requirements for the college of liberal arts or its equivalent.



# ARTICULATION AGREEMENT UNDERSTANDINGS

The three Regent universities support and accept the articulation agreement. It is important that potential transfer students familiarize themselves with limitations and/or requirements operative at an individual Regent university.

University of Northern Iowa

The University of Northern Iowa has approved and will honor the articulation agreement as it is signed.

University of Iowa

The University of Iowa will honor the articulation agreement within the College of Liberal Arts under the conditions that the students will satisfy the language requirement (stated below) in addition to the appropriate courses mentioned in 2e of the agreement.

Language requirement to be met:

B.A. requirements: 4 terms (hours not specified) of the same language (one year of high school is a term--one semester of college is a term)

B.S. requirements: 2 terms of the same foreign language.

Iowa State University

Students who have been awarded AA degrees from accredited two-year community colleges in Iowa prior to their first registration at Iowa State University and who have earned at least sixty (60) semester hours of transferable credit with a cumulative grade average or at least 2.00 (C average), will have met the General Education Requirements and Basic Education Requirements<sup>(a)</sup> in the College of Sciences and Humanities if they have arranged their transferable credits so as to include:

\* SEE  
NOTE  
BELOW

1. six (6) credits of English composition (a Basic Education Requirement);
2. one-half (1/2) credit of Library (a Basic Education Requirement);

\* \* \*

3. no less than twelve (12) credits in the Humanities (Literature, History, Philosophy and Religious Studies) with at least six (6) credits in one of the disciplines included in this Group<sup>(b)</sup>;
4. no less than two (2) credits in Verbal Communication (includes only those speaking and composition courses with main emphasis on speaking and writing proficiency development);
5. no less than eight (8) credits in Natural Sciences (Astronomy, Astrophysics, Biochemistry, Biophysics, Biology, Botany, Chemistry, Genetics, Geology, Meteorology, Microbiology, Physics, and Zoology) and three (3) credits in Mathematical Disciplines (Mathematics, Statistics and Computer Science);
6. no less than nine (9) credits from at least two different disciplines in the Social Sciences (Anthropology, Economics, Geography, Journalism, Political Science, Psychology and Sociology).

## Special Notes

- (a) Beginning with the 1983 Catalog the Basic Education Requirements of the College of Sciences and Humanities will be expanded to include a foreign language/foreign culture requirement of six (6) to eight (8) credits.
- (b) Disciplines from which courses are selected for satisfying General Education Requirements are arranged in clusters known as "Groups." There are four such Groups in terms of which the General Education Requirements of the College of Sciences and Humanities are stated.  
NOTE: See attached list of courses applicable to these disciplines.  
Students graduating under the 1981-83 Catalog will be required to earn a minimum of thirty-four (34) credits in courses from the Groups outside of the Group in which their major is included. Those students who choose to include one year of college-level foreign language study in their program or who take six (6) credits in approved foreign cultures courses will be required to take but twenty-six (26) additional transferable credits in courses from Groups outside of the Group in which their major is included. Both categories of students are expected to earn the minimum number of credits required in the Group which includes their discipline. These credits must be in disciplines other than that of their major.

\* Note: Students transferring from Iowa Central receive credit as follows for English 10:101 and 10:102 (8 semester hours) at ISU: English 104--4 hours; English 105--4 hours; Speech 1:101--4 hours; Library 100--Requirement fulfilled.