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Iowa's community college transfer students, 1996-2000: demographics, graduation, and retention rates

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Iowa's community college transfer students, 1996 – 2000:

Demographics, graduation, and retention rates

by

Ann Marie Fields

A dissertation submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Education (Higher Education)

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2001

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Ann Marie Fields
has met the dissertation requirements of Iowa State University**

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DEDICATION

I dedicate this dissertation to my father, Dr. Donald H. Perkins (1922-1997), and to my brother, Donald R. Perkins (1952-1987). Through the words of Theodore Roosevelt, I was challenged to step out of the gray twilight and to start college at the age of 40.

Far better it is to dare mighty things, to win glorious triumphs, even though checkered by failure than to take rank with those poor spirits who neither enjoy much nor suffer much, because they live in the gray twilight that knows not victory nor defeat.

Theodore Roosevelt

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ABSTRACT

This study compares Iowa community college (CC) transfer students who transferred to one of Iowa's three Regent universities in the fall of 1996 to students who started at one of the Iowa Regent universities in 1994 and who were still attending such university in the fall of 1996 (referred to as non-transfer, or NT, students). In previous educational literature, these students have been referred to as "native" students. To be culturally sensitive, this study identifies these students as "non-transfer students" or NT students. Demographic comparisons are made according to age, gender, ACT scores, and the number of credits either transferred or accumulated during the first two years of college. CC transfer students, when compared to NT students, were significantly older (22.22 vs. 20.09, $t_{(2105df)} = 18.92$, $p < 0.05$), a significantly lower percentage were female (46.6%, vs. 52.6%, $Z = -4.65$, $p < 0.05$), had significantly lower ACT scores (21.19, vs. 24.25, $t_{(6950df)} = -27.10$, $p < 0.05$), and transferred more credits than NT students had accumulated in two years (54.48 vs. 51.33 credits, $t_{(2639df)} = 6.941$, $p < 0.05$). Additional comparisons between CC transfer students and NT students were made in the spring of 2000 according to grade point averages at graduation or time of exit, graduation rates, and attrition rates, stratified by ACT scores, gender, and college major. CC transfer students' grade point average (GPA) at graduation was statistically lower than the NT students' graduation GPA (2.83, vs. 3.09, $t_{(1348df)} = -11.33$, $p < 0.05$). However when stratified by ACT scores, the differences were less than a plus or minus grade differentiation (0.33 difference on a 4.0 scale). Overall, graduation rates for CC transfer students were significantly lower than NT students and attrition rates significantly higher (53.73%, vs.

82.71%, $Z = -26.19$, $p < 0.05$; 34.37% vs. 12.6%, $Z = 22.01$, $p < 0.05$). Implications for practice include social and academic integration of CC transfer students beginning at the community colleges, collaboration with the Regent universities' faculty and advisors, and continuing once the transfer has been completed.

CHAPTER 1: INTRODUCTION

Higher Education in Iowa and the United States

Four-year public institutions

Higher education in the state of Iowa is a long-standing tradition. In fact, the University of Iowa was chartered in 1847, within the first two months of Iowa's statehood. Classes began in 1855, and the University of Iowa was on its way to become Iowa's largest public higher educational institution. In 2000, over 28,000 students came from all Iowa counties, all 50 of the United States, and 99 countries to attend the University of Iowa (*Iowa Official Register*, 1999-2000).

Iowa State University traces its roots back to the State Agricultural Society at Fairfield, Iowa in 1853. In 1858 the Iowa General Assembly funded the Iowa Agricultural College and Model Farm to be in Story County. With the passage of the Morrill Land Grant Act in 1862, the Iowa Agricultural College and Model Farm was designated as Iowa's land-grant institution. The first class of 136 men and 37 women started in 1869, making Iowa State the first land-grant school to be coeducational (ISU History, 2000). Iowa State University now boasts 25,000 students from all Iowa counties, all 50 states, and 115 other countries (*Iowa Official Register*, 1999-2000).

The last of the four-year public institutions of higher education in Iowa was founded in 1876 as the Iowa State Normal School. In 1909, it was named the Iowa State Teachers College and was accredited in 1913. The Iowa Legislature in 1961 changed the status of the institution and the name to the University of Northern Iowa. The medium-sized university currently has 13,000 students from all Iowa counties, 46 states, and 55 countries, giving Iowa

residents a friendly, small college atmosphere compared to the other larger universities (*Iowa Official Register*, 1999-2000).

Under Chapter 262 of the Code of Iowa, 1999 (2000), the State Board of Education, now the Board of Regents, was founded in 1909 to “coordinate and govern the three state institutions of higher education,” (*Iowa Official Register*, 1999-2000) replacing the three separate board of trustees for each institution. In 1911 the Board also was given the governance of the Iowa Braille and Sight Saving School, followed by the Iowa School for the Deaf in 1917. Presently, the nine-member Board of Regents, State of Iowa, has broad statutory responsibilities, including institutional budgets, appropriation requests, strategic planning, academic programs, and administration of employment and personnel policies. Since the Iowa Braille and Sight Saving School and the Iowa School for the Deaf are not four-year higher educational institutions, the Regent universities are the University of Iowa, Iowa State University, and the University of Northern Iowa.

The late 19th century brought a focus for higher education on scholarship and learning. Led by Harvard President Charles William Eliot, Greek entrance requirements and the strict prescriptive course of study were abandoned in favor of the elective principle and a broad curriculum including science, medicine, and law (Rudolph, 1990). This change of focus quickly traveled to Midwest and West where, “with their commitment to public service and to learning, [they] were more friendly than any other group of institutions to the elective principle” (Rudolph, 1990, p. 303). The German style of education, focusing on science and scholarship, also influenced higher education in the United States to concentrate on “a body of scholars and students pushing forward the frontiers of pure knowledge” (Rudolph, 1990, p. 334).

Two-year public institutions

In 1892, the University of Chicago championed a new model of higher education, dividing the traditional four academic years into two equal parts. The first two years would “be known as the junior college or academic college, where the spirit would be collegiate and preparatory, and the second to be known as the senior college or the university college” (Rudolph, p. 351). William Rainey Harper (1900), President of the University of Chicago, proposed a national two-year college system where students could terminate their education after two years or continue at a four-year university.

The first accredited junior college in Iowa started in Mason City and opened its doors in 1918. Floyd McDowell, the dean of Graceland College—a small, private, two-year junior college in Iowa, conducted the first national study of junior colleges and found that both academic (83%) and vocational programs (17%) were offered (McDowell, 1919). By 1930, Iowa had 12 accredited junior colleges.

The Great Depression expanded the junior college’s role to meet the needs of area employers and to serve working-class students (Wattenbarger & Witt, 1995). Because the junior colleges offered vocational skills, many educational elitists “complained that job training had no place in an institution that called itself a college” (p. 568). However, enrollment in junior colleges expanded from 3,250 students in 1929 to almost 14,000 three years later (Eells, 1931, p. 33). Many of these students were working-class adults receiving training to become employable during the Depression.

Coupled with the structural changes in higher education (two-year junior colleges versus the traditional four-year institutions), the changing student demographics, and the new emphasis on vocational training, a parallel debate in educational philosophy raged between

modernist theory and postmodernist theory. Modernist theory had permeated the traditional higher educational institutions. Modernistic theory is, “based on the position that reality—for example, knowledge or what we believe to be so—is eternal and unchanging and is therefore absolute” (Jacobsen, 1999, p. 8). Therefore, educators are only transmitters of knowledge. The postmodernist theory, however, argued that “educators are biased facilitators and co-constructors of knowledge.” Also central to the debate is the role of students. The modernist theorists believe that students must learn the knowledge and universal values as presented, without bias or subjectivity, while the postmodernist theorists believe that students will construct their own knowledge and that values are useful for a given culture and not true or right in any universal sense. (*Death of Truth*, 2000).

Some educators would argue that the four-year institutions are more steeped in modernist theory while junior colleges are more steeped in postmodernist theory. For John Dewey, a postmodern philosopher, “instrumentalism involved the application of pragmatism in approximated truth.” Vocational training in junior colleges provided the perfect setting for students to problem solve and to be more closely associated with the problems of society and how to serve as an active participant in a community (Jacobson, 1999).

The term “community college” was first published in a 1936 article titled “The Community College Program” (Hollingshead, 1936). Michigan created Depression-era emergency junior colleges called community colleges (Greenleaf, 1936, pp. 25-28). In 1947 the Truman Commission on Higher Education wrote:

Hence the President’s Commission suggests the name “community college” to be applied to the institution designed to serve chiefly local community educational needs. It may have various forms of organization and may have curricula of various lengths. Its dominant feature is its intimate relations to the life of the community it serves. (p. 5)

Two-year and four-year public education in Iowa

In Iowa in 1962, the Department of Education submitted a report titled “Education Beyond High School Age: The Community College” that recommended 16 area education districts, each to be served by a community college or a vocational technical school (Blong & Bedel, 1997, p. 537). The 61st General Assembly in 1965 enacted legislation that permitted the creation of a statewide system of two-year post-secondary educational institutions (Chapter 260.C of the *Code of Iowa, 1999, 2000*). By January of 1967 14 of the 15 community colleges districts were in operation (*Iowa Community College Funding Formula Task Force Report, 1998*).

Public community college education in Iowa is coordinated by the Iowa Department of Education, included with elementary and secondary education schools (Chapter 280.A of the Code of Iowa 1999, 2000). Now, over 35 years later, every Iowa resident is within an hour’s drive of a community college campus. (See Appendix A for a complete list of the fifteen community colleges, the areas they cover, and their location.) Funding comes “in equal parts from state monies, local property taxes, and student tuition and fees” (Blong & Bedel, 1997).

Higher education in Iowa, therefore, consists of two different systems, the three Regent universities under the direction of the Board of Regents and the community college system under the direction of the Iowa Department of Education. The journey for the students from Iowa community colleges to the Iowa Regent universities is becoming a larger concern as more students are starting their post-secondary education at community colleges and then transferring to one of the Regent universities.

Enrollment in Iowa community colleges has been increasing steadily, and by 1991 community college enrollment (52,252) exceeded undergraduate enrollment at the three Iowa Regent universities (50,070) (*Iowa Community College Funding Formula Task Force Report*, 1998). A much higher percentage of Iowa residents enroll at community colleges than at the Regent universities. When comparing where new freshmen who are Iowa residents enrolled in 2000, 22,179 new Iowa freshmen enrolled in community colleges, compared to 7,595 new Iowa freshmen who enrolled in the three Iowa Regent universities (ICCPHSEER, 2000). Iowa's community colleges, indeed, play a critical role in higher education for Iowa students.

Of the 15 Iowa community colleges, 11 were existing junior colleges and 4 were created as vocational technical institutes. The four vocational technical institutes are now comprehensive community colleges with a recent emphasis on transfer programs and articulation to four-year degree granting higher educational institutions. Student enrollment in transfer programs, specifically the associate in arts (AA) degree program and the associate in science (AS) program, has grown dramatically in the last two decades. In 1999 over 39,000 students, or 59% of all full-time students enrolled at community colleges, were enrolled in transfer programs (*Iowa Community Colleges Fall Term 1999 Credit Student Enrollment Report*, 2000). Never before have community colleges prepared so many students to continue their education at four-year degree granting institutions.

As the vocational-technical institutions of the late 1960's and 1970's transformed into community colleges in the 1990's with an emphasis on transfer programs, the community college faculty in transfer programs upgraded their educational levels to better prepare students. The majority of fulltime faculty at community colleges now have a master's

degree, with a masters' degree requirement in many transfer area disciplines. With the changes in community colleges and the increased number of students in community college transfer programs, students, parents, and guidance counselors are faced with several questions when looking at alternative post-secondary educational options for Iowa residents:

1. Are community college students who transfer to one of the Regent universities able to compete academically with students with similar ACT scores who start at one of the Regent universities?
2. Are students from larger community colleges better able to compete academically once they transfer to the Regent universities compared to students who start at smaller community colleges?
3. Do community college transfer students do better at one Regent university compared to another? Does age, gender, ACT scores, or number of credits transferred influence academic success of transfer students?
4. Is the rate of retention of transfer students to the Regent universities significantly different from retention of students who start at the Regent universities?
5. Does it take significantly longer for transfer students to complete a four-year degree compared to their counterparts who start at a Regent university?
6. Does age, gender, ACT scores, or number of credits transferred influence retention and graduation rates of transfer students?

Transfer and Baccalaureate Completion Challenges

National research has indicated that community college students were less likely to complete undergraduate degrees than students who start at four-year institutions, while individual background differences were held constant (Alba & Labin, 1981). Several other researchers had similar results (Crook & Lavin, 1989; Dougherty, 1987, 1992; Hilton & Schrader, 1986; Temple & Polk, 1986; Velez, 1985). Thus, even when taking into consideration family socioeconomic status, academic ability, high school rank, age, work requirements, and location, community college students seeking a bachelor's degree are at least 15% less likely than students who begin at four-year institutions to obtain such a degree.

In another national survey, Pascarella, Edison, Nora, Hagedorn, and Terenzini (1998) concluded that, "net of other influences in the model, two-year college students initially planning to obtain at least a bachelor of arts degree were about 31% more likely than similar four-year college students to lower their lifetime education plans below a bachelor of arts degree by the end of the second year of college" (p. 190). Dougherty (1994) states that, "the first years in the community college are lethal to the hopes of many baccalaureate aspirants" (p. 85). According to Cohen and Brower (1989), lower aspirations, social disadvantages, and academic preparation (or the lack thereof) are the main reasons that first-time community college students have high attrition or leaving rates in the freshman and sophomore years. Anderson (1981) researched attrition rates using fall 1972 student data and reported that two-year college entrants were 5% less likely to be enrolled after one year and 14% less likely to be enrolled after two years when compared to four-year college entrants.

Astin (1975) replicated Anderson's findings and reported significantly higher attrition rates for two-year students, even when controlling for differences between sex, race,

socioeconomic status, religion, educational aspirations, and high school record. Clark (1960) attributed the higher attrition rate, or the “cooling out” function, to the culture of community colleges. Community colleges provided alternatives or substitutes for transfer, gradual disengagement by providing other courses of study or low expectations by teachers, counseling the student concerning grades, aptitude tests, and interest tests, and stressing a diversity of talents other than academic.

Ernest Pascarella, in *New Studies Track Community College Effects on Students*, (1999) asks the tough question: “Why is it then, that with a few notable exceptions in the literature, we know so little about the impacts of community colleges on their students?” Pascarella summarizes his article by saying, “Thus, community colleges may, in fact, provide a relatively cost effective way for substantial numbers of students to obtain the first two years of post-secondary education without necessarily sacrificing the intellectual/developmental impact of their college experience on their relative competitiveness in the marketplace.”

Statement of the Problem

The problem, therefore, is determining if students who start at an Iowa community college can compete academically at the Regent universities, stay enrolled, and graduate in rates comparable to those of their counterparts who start at four-year universities. The problem is a national problem faced by all states, as community college education is an economical alternative for students to receive their first two years of higher education. Many states are conducting research and evaluation of how community college transfer students fare once they transfer to a four-year institution.

One method for determining if community college transfer students can compete academically is to examine grade point averages, retention, and graduation rates of Iowa community college transfer students who transfer to one of Iowa's Regent universities when compared to students who start at Iowa's Regent universities. Demographic comparisons have to be considered to compare similar students with similar academic backgrounds and ability. Therefore, ACT scores, gender, age, and number of credits transferred also play a part in examining grade point averages, retention, and graduation rates.

Research in Iowa was conducted over 16 years ago (Giddings, 1985) that examined the performance, progress, and degree achievement of Iowa community college transfer students to the three Regent universities. Giddings concluded that while no significant differences persisted with respect to performance or degree achievement of community college transfer students as a whole, differences did exist among the different community colleges in successful articulation of their students. Also, community college transfer students had differing grade point averages, retention, and graduation at each of the different Regent institutions. Factors that increased academic success of community college transfer students included being female and a higher number of credits transferred to the Regent universities.

With the new emphasis on transfer programs and improved teacher qualification, Giddings' research may no longer give an accurate assessment of academic success of community college transfer students to the Regent universities. An updated study is necessary to give a more current picture of community college transfer students' retention, graduation rates, and grade point averages.

Other research that has been conducted in Iowa concerning community college students over the last 10 years include:

- Kathleen Hartl (1997), *A study of initial and continued success of students in mathematics courses at Northeast Iowa Community College as related to scores on ASSET assessment*, the University of Iowa.
- Sherril Ann Harris (1995), *An Outcomes study of students participating in the Iowa postsecondary enrollment options act, 1990-1993*, Iowa State University.
- Daniel Brown (1994), *Factors related to the academic success of community college agricultural students who transfer to four-year institutions*, Iowa State University.
- Nancy Kothenbeutel (1993), *A comparison of variables associated with persisters/nonpersisters of high school graduates and general educational development (GED) diploma holders*, the University of Iowa.
- Karen Pierson (1993), *Effectiveness of development courses and the voluntary placement systems at an Iowa community college*, Iowa State University.

The above research, however, does not address the statewide issue of community college transfer students achievement at the three Regent universities. The problem, therefore, is the need for an updated research analysis of the Giddings' study to judge academic success of community college transfer students.

Purpose of the Study

The purpose of this study is to provide current research and analysis of retention, graduation rates, and grade point averages of community college transfer students who transfer to one of Iowa's Regent universities and compare with non-transfer students. This

analysis and comparison will interest community college administrators and faculty, parents, the Board of Regents, the Iowa Department of Education, and the Iowa legislature, who coordinate and fund community college education. Community college administration and faculty who develop and administer the Associate of Arts (AA) and Associate of Science (AS) transfer programs will have a measure of how community college transfer students are able to compete academically once they transferred to one of the three Regent universities. The data will be assessed with a number of models focusing on statewide data, as well as differences among different sizes of community colleges and differences among the three Regent universities.

Parents will be interested in academic preparedness, but also interested in retention and completion rates. These data will help parents in selecting higher educational options for their children. The length of completion, when adjusted for number of credits brought to the Regent university, will be compared to students starting at a Regent university. This comparison might indicate if students complete a four-year degree in a similar time frame.

The Board of Regents, the Iowa Department of Education, and Iowa legislators will be interested in this study from an educational and fiscal point of view. Based on the findings of grade point averages, retention, and completion of a four-year degree in a similar amount of time as students who start at the Regent universities, the coordinating agencies can use this information in generating fiscal policy in the future.

Objectives of the Study

This study follows the alternative dissertation structure. Chapter 1 presents the standard background, methodology, and procedures. Chapters 2, 3, and 4 are articles that

will be submitted to peer-reviewed journals. The summary, conclusions, and implications for practice appear in Chapter 5. Therefore, each chapter (2, 3, and 4) addresses a different set of questions and has objectives corresponding to the questions. Following is the list of questions and corresponding objectives for each Chapter:

Questions addressed in Chapter 2, article 1:

- 1.1. What are the demographic differences between CC students and NT students in regard to age, gender, ACT score, and the number of credits either transferred to the Regent university or accumulated at the Regent university in the fall of 1996?
- 1.2. Can community college students who transfer to one of the Regent universities compete academically with non-transfer students at the Regent universities in terms of grade point averages at graduation?
- 1.3. Do community college transfer students do better at one Regent university compared to another?
- 1.4. What are the factors that determine academic success of transfer students – age, gender, ACT scores, or number of credits transferred?

Objectives for Chapter 2, article 1:

- 1.1 Compare the demographics of community college transfer students who transferred to one of the Iowa Regent universities in the fall of 1996 to the demographics of students who started at the Regent universities in 1994.
- 1.2. Compare the grade point averages at graduation of community college transfer students who transferred to one of the Iowa Regent universities in the fall of 1996 and completed a four-year degree program by May 2000 to the grade point averages of students who started at the Regent universities in 1994.

- 1.3. **Stratify the CC and NT students according to Regent university and compare grade point averages at graduation.**
- 1.4. **Stratify CC and NT students according to age, gender, ACT scores, and number of credits transferred or accumulated by the fall of 1996 and compare grade point averages at graduation CC and NT students.**

Questions addressed in Chapter 3, article 2:

- 2.1. **What is the rate of graduation of CC transfer students compared to the NT students?**
- 2.2. **Are the graduation rates influenced by which Regent university attended, by college major, by ACT scores, or by gender?**
- 2.3. **Do full-time, traditional-age CC transfer students graduate at comparable rates to full-time, traditional-age NT students?**

Objectives for Chapter 3, article 2:

- 2.1 **Compare graduation rates of the community college (CC) transfer students starting in fall 1996 with non-transfer (NT) students who started at Regent universities in the fall of 1994 and who were still enrolled in the fall of 1996.**
- 2.2 **Stratify CC and NT students by Regent university, college major, gender, and ACT scores and compare graduation rates to examine differences.**
- 2.3 **Stratify CC and NT students by number of credits and age to compare graduation rates of full-time, traditional age CC and NT students.**

Questions addressed in Chapter 4, article 3:

- 3.1. **What is the rate of attrition (percentage of students leaving higher education) of CC transfer students compared to the NT students?**

- 3.2. Are the attrition rates influenced by which Regent university attended, by college major, gender, or by ACT scores?
- 3.3. Does the number of credits transferred or earned in the first two years of college influence attrition rates?

Objectives for Chapter 3, article 2:

- 3.1. Compare graduation rates of the community college (CC) transfer students starting in fall 1996 with non-transfer (NT) students who started at Regent universities in the fall of 1994 and who were still enrolled in the fall of 1996.
- 3.2. Stratify CC and NT students by Regent university, college major, and ACT and compare graduation rates to examine differences.
- 3.3. Stratify C and NT students by gender and compare graduation rates to examine differences.

Hypotheses

Each objective above will be tested with a number of hypotheses.

The hypothesis statements addressed in Chapter 2, article 1, are:

- 1.1. Community college students will be older, more likely to be male, have accumulated a similar number of credits than the non-transfer students who start at the Regent universities, and will have lower ACT scores on average than the non-transfer students who start at the Regent universities. The CC transfer students will attend Regent universities in approximately the same rate and enroll in approximately the same college major as non-transfer students.
- 1.2. Community college transfer students have the same cumulative grade point averages as non-transfer students when holding ACT scores constant.

- 1.3. **Grade point averages will depend on which Regent university community college transfer students attended when holding ACT scores constant.**

The hypothesis statements for the second objective are:

- 2.1. **For community college transfer students with similar ACT scores, graduation rates are comparable with non-transfer students who started at the Regent universities.**
- 2.2. **Graduation rates are approximately the same regardless of which Regent university the community college transfer students attended.**
- 2.3. **Females, whether transfer students or non-transfer students, have higher graduation rates than their male counterparts.**
- 2.4. **Graduation rates will be different for the college major selected for both the community college transfer students and the non-transfer students.**
- 2.5. **For those community college students who are bringing in credits equal to full-time enrollment (48 credits or more), the graduation rates will be similar to the non-transfer students who have 48 credits or more.**

The hypothesis statements for the third objective are:

- 3.1. **For community college transfer students with similar ACT scores, attrition rates are comparable with non-transfer students who started at the Regent universities.**
- 3.2. **Attrition rates are approximately the same regardless of age, Regent university attended, or size of the community college transfer students attended.**
- 3.3. **Females, whether transfer students or non-transfer students, have lower attrition rates than their male counterparts.**
- 3.4. **Attrition rates will be different for the college major selected for both the community college transfer students and the non-transfer students.**

- 3.5. If holding credit hours transferred or accumulated constant, community college transfer students' attrition rates will be similar to the non-transfer students' attrition rates.

Procedure of the Study

Community college transfer students who transferred to the Regent universities in the fall of 1996 were identified and tracked through spring 2000. Non-transfer students who started at the Regent universities and who were still enrolled in the fall of 1996 also were identified and tracked through spring 2000. This is the same methodology as Giddings' study (1985). This methodology is recorded by Dougherty (1994) for comparisons of attrition rates using the following studies: the U.S. National Center for Education Statistics (1977b), Holmstrom and Bisconti (1974), California Community Colleges (1984), Florida State Department of Education (1983), Illinois Community College Board (1986), and Martinko (1978). The *Community College Transfer Students at UC: 2000 Annual Report* of the University of California (2000) highlights this methodology (p. 10) as well.

Working with the three Regent university registrar offices (i.e., Iowa State University, University of Iowa, and University of Northern Iowa), data were collected from the permanent records of the individual students. All students transferring in the fall of 1996 from Iowa's fifteen community colleges were selected and monitored until May 2000. The registrars also selected student records of all students who started at their institution in 1994 and were still enrolled in the fall 1996 semester. The registrars monitored both sets of students through May 2000.

Table 1. Cohort group tracked in this study

	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000
Non-transfer students	Entering freshmen Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
CC transfer students	At a community college Year 1	At a community college Year 2	Entering the Regent university Year 3	Year 4	Year 5	Year 6
This study's population			Cohort group Year 1	Cohort group Year 2	Cohort group Year 3	Cohort group Year 4

The following data were collected for each student:

1. University at which student is enrolled.
2. From which community college that the student transferred.
3. Number of credits transferred to the Regent university.
4. Age in fall of 1996.
5. Gender.
6. ACT composite score (ACT is not mandatory for students entering community colleges, so this variable is incomplete for some records).
7. Last semester enrolled.
8. Semester of graduation if any.
9. Grade point average at Regent university at time of graduation or exit.
10. University college of enrollment at time of exit or graduation.

After data collection, demographic comparisons are made according to age, gender, ACT scores, and the number of credits either transferred or accumulated during the first two years of college. Additional comparisons between CC transfer students and NT students

were made in the spring of 2000 according to grade point averages at graduation or time of exit, graduation rates, and attrition rates, stratified by ACT scores, gender, and college major.

Basic Assumptions

The first assumption is that community college transfer students and Regent non-transfer students selected for this study (in the fall of 1996 and 1994, respectively) will be representative of their perspective student body. In other words, community college transfer students transferring in the fall of 1996 will be representative of all transfer students, whether they transfer in the fall, spring, or summer. Likewise, the non-transfer students selected starting in the fall of 1994 and still at their respective university will be representative of non-transfer students, whether starting in the fall, spring, or summer. The student population was restricted to fall enrollment to be able to compare data with the Giddings study.

The second assumption is that grade point average, graduation, and attrition rates are adequate measures of the effectiveness of a community college education. This study will not look at community college transfer students' satisfaction levels or students' comments concerning their perceptions of academic preparedness. This is an area of research for additional study. Grade point average, graduation, and attrition rates do not replace satisfaction perceptions; however, this study is limited to these three quantifiable variables. D. J. Phelan's dissertation (1990) examined achievement and satisfaction of community college transfer students from North Iowa Area Community College. While one may argue that community college education's goal is not completion of a four-year degree, community college students who transfer to a four-year institution have a goal of completing a four-year

degree. Therefore, grade point averages, retention, and completion are adequate measures toward reaching this goal.

The third assumption is that the community college students who transfer to the Regent universities are representative samples of their community college students who transfer to any four-year institutions. There currently is not an adequate tracking system to identify all community college students who transfer to any four-year institutions other than the Regent universities. Therefore, the assumption is that the community college students who transfer to the Regent universities are representative of all community college students who transfer to any four-year institutions.

Delimitations

For this study, Iowa community college students who transferred in the fall of 1996 to the Iowa Regent universities were tracked until May, 2000. The non-transfer comparison group is comprised of the students who started at the Regent universities in the fall of 1994 and were still enrolled in 1996.

While the study includes all community college transfer students, regardless of the number of credit hours transferred to the Regent universities, the study will not include other transfer students to the Regent universities, whether from other public institutions, private institutions, or international students. At the same time, community college students who transferred to other four-year degree-granting institutions, such as private or out-of-state institutions, were not tracked.

Significance of the Study

This study is significant for the state of Iowa—students, parents, guidance counselors, community college administrators and faculty, Iowa Department of Education, Regent universities, Board of Regents, and Iowa legislators. In selecting a higher education institution, the results of this study will help students; parents, and guidance counselors make better decisions based on current research. Community college administrators and faculty can use the individual community college data as one piece in determining the effectiveness of their transfer degree programs, specifically the Associate in Arts and Associate in Science degrees. The Regent university administration and faculty, likewise, can use the individual Regent university data to determine appropriate measures to increase the success of Iowa community college transfer students. And finally, the governing bodies and the Iowa legislators will have a better idea of the effectiveness of the money spent on community college and Regent post-secondary education.

Community college data were grouped by size (small, medium, and large) and individual Regent university data helped determine if differences in success exist in regard to community college attended or Regent university attended. Individual transfer student data will also be used to see what relationships exist between successful completion a four-year degree and gender, age, ACT test score, and number of transfer credits earned.

The study will contribute to the body of knowledge concerning community college effectiveness and achievement of students transferring from one of Iowa's community colleges to one of Iowa's Regent universities. Even though this is a state specific study, the study will contribute to the national body of knowledge concerning community college effectiveness and achievement of community college transfer students.

Definition of Terms

For the purpose of this study, the following terms are defined as follows (unless otherwise noted in the text):

Associate in Arts (AA) and Associate in Science (AS) degree: A two-year community college degree composed of courses that would normally be used in a program leading to a baccalaureate degree either in arts or science, generally equally 60 credits.

Attrition: The percentage of the original population not enrolled or having dropped out of higher education during a specified amount of time. (Note: retention plus attrition for the same period of time must equal 1.00.)

Grade Point Average: A mathematical calculation determined by totaling earned grade points on a 4.0 scale divided by the total accumulated semester hours. It is assumed that community college transfer students' grade point average earned at community colleges does not transfer into the Regent universities. Therefore, community college transfer students have two grade point averages: one grade point average earned at their respective community college for the credits earned at the community college and the second grade point average earned at the Regent university.

Community college (CC) transfer students: Students who did not start at one of the Regent universities, but started at one of the community colleges as first-time students. For this study the transfer students will have transferred from one of Iowa's fifteen community colleges to one of the Regent universities in the fall of 1996.

Non-transfer (NT) students: The students starting at the Regent university as first-time students. In this study the non-transfer students will start at one of the Regent universities in fall 1994 and are still enrolled for fall 1996.

Regent Universities: One of the three universities under the governance of the Board of Regents: Iowa State University, the University of Iowa, or the University of Northern Iowa.

Retention: The percentage of the original population still enrolled or having graduated during a specified amount of time. (Note: retention plus attrition for the same period of time must equal 1.00.)

Transfer Credits: Total semester credit hours transferred from the community colleges into the Regent universities. Not all of the transfer credit hours necessarily will apply into a given program; however, the student has transferred this number into the Regent university.

Organizational Outline

This study follows the alternative dissertation structure. Chapter 1 presents the standard background, methodology, and procedures. Chapter 2 presents the first paper, which focuses on demographic differences between community college (CC) transfer students and non-transfer (NT) students, including age, gender, ACT scores, Regent university attended, and number of credits either transferred or accumulated by fall 1996. Chapter 2 also compares the grade point averages of the CC and NT students at graduation, including stratification by ACT scores, Regent university attended, and gender.

The second paper, presented in Chapter 3, continues the comparison between CC transfer students and NT students and examines graduation rates, stratified by ACT scores, gender, Regent university attended, and college major. Graduation rates of full-time, traditional-age CC, and NT students are also compared in Chapter 3.

Chapter 4 presents the third paper and examines attrition rates of the CC and NT students. The students are classified as persisters (those students who either graduate or are

still enrolled after the spring of 200) and non-persisters (those who leave the Regent universities during the four-year study. CC and NT persisters and non-persisters are stratified comparisons were made according to ACT scores, gender, age, number of credits accumulated by the beginning of the third year, Regent university, and college major.

The summary, conclusions, and implications for practice appear in Chapter 5. The key findings influence four major populations: (a) students and their families deciding on higher education; (b) community college administrators and faculty; (c) Regent university administration and faculty; and (d) Iowa's Board of Regents and Iowa's legislature.

Recommendations are made for each of these populations.

**CHAPTER 2: IOWA'S COMMUNITY COLLEGE TRANSFER
STUDENTS: HOW DO THEY COMPETE ACADEMICALLY
AT THE IOWA REGENT UNIVERSITIES?**

A paper submitted to the Community College Journal of Research and Practice

Ann M. Fields

Abstract

This study compares Iowa community college (CC) transfer students who transferred to one of Iowa's three Regent universities in the fall of 1996 to students who started at one of the Iowa Regent universities in 1994 and who were still attending such university in the fall of 1996 (referred to as non-transfer, or NT, students)¹. Demographic comparisons are made according to age, gender, ACT scores, and the number of credits either transferred or accumulated during the first two years of college. CC transfer students were significantly older (22.22 vs. 20.09, $t_{(2105df)} = 18.92$, $p < 0.05$), a significantly lower percentage were female (46.6%, vs. 52.6%, $Z = -4.65$, $p < 0.05$), had significantly lower ACT scores (21.19, vs. 24.25, $t_{(6950df)} = -27.10$, $p < 0.05$), and transferred more credits than NT students had accumulated in two years (54.48 vs. 51.33, $t_{(2639df)} = 6.941$, $p < 0.05$). Additional comparisons were made in the spring of 2000 according to grade point averages stratified by ACT scores and gender. CC transfer students' grade point average (GPA) at graduation was statistically significantly lower than the NT students' graduation GPA (2.83, vs. 3.09,

¹ In previous educational literature, these students have been referred to as "native" students. To be culturally sensitive, this study identifies these students as "non-transfer students" or NT students.

$t_{(1348df)} = -11.33, p < 0.05$). However, when stratified by ACT scores, the differences were less than a plus or minus grade differentiation (0.33 difference on a 4.0 scale).

Higher Education in Iowa

Higher education in the state of Iowa is a long-standing tradition. In fact, the University of Iowa was chartered in 1847 within the first two months of Iowa's statehood (*Iowa Official Register*, 1999-2000). Iowa State University traces its roots back to the State Agricultural Society at Fairfield, Iowa, in 1853. With the passage of the Morrill Land Grant Act in 1862, the Iowa Agricultural College and Model Farm at Ames, Iowa, was designated as Iowa's land-grant institution. The first class of 136 men and 37 women started in 1869, making Iowa State the first land-grant school to be coeducational (*ISU History*, 2001). The third and last of the four-year public institutions of higher education in Iowa was founded in 1876 as the Iowa State Normal School. The Iowa Legislature in 1961 changed the status of the institution and the name to the University of Northern Iowa.

In contrast to the long-standing tradition of public, four-year, baccalaureate degree granting institutions, comprehensive public community college education in Iowa has been a part of post-secondary education for only 35 years. The 61st General Assembly in 1965 enacted legislation that permitted the creation of a public statewide system of two-year post-secondary educational institutions (*Code of Iowa 1999, 2000, Chapter 260.C*). Prior to 1965, the state of Iowa funded several public junior colleges. The 1965 legislation gave the existing junior colleges the opportunity to become the district community colleges.

Out of the existing 15 community colleges, 11 were previously junior colleges and four were newly created vocation technical community colleges. Therefore, by January of

1967, 14 of the 15 community college districts were in operation (*Iowa Community College Funding Formula Task Force Report*, 1998). Now, over 35 years later, every Iowa resident is within an hour's drive of a community college campus.

Higher education in Iowa, therefore, consists of two different public sectors, the three Regent universities under the coordination of the Board of Regents, State of Iowa, and the community colleges, under the general coordination of the Iowa Department of Education. Each community college is governed by a locally elected Board of Trustees, while the Department of Education has regulatory responsibilities. The journey for the students from Iowa community colleges to the Iowa Regent universities is becoming a larger area of interest for the Board of Regents, the Iowa Department of Education, parents, and students as an increasing number of students are starting their post-secondary education at community colleges and then transferring to one of the Regent universities.

Enrollment in Iowa community colleges has been increasing steadily, and by 1991 community college enrollment (52,252) exceeded undergraduate enrollment at the three Iowa Regent universities (50,070). "Community colleges are the largest provider of undergraduate level education in the state" (*Iowa Community College Funding Formula Task Force Report*, 1998). Almost three times the number of Iowa residents enrolled at community colleges than at the Regent universities in 2000. When comparing where new freshmen who are Iowa residents enrolled in 2000, 22,179 enrolled in community colleges compared to 7,595 who enrolled in the three Iowa Regent universities (ICCPHSEER, 2000). Iowa's community colleges, indeed, play a critical role in higher education for Iowa citizens.

Of the 15 Iowa community colleges, 11 were existing junior colleges and 4 were created as vocational technical institutes (see Table 1). The four vocational technical

Table 1. Number and percentage of transfer students by community college and average distance to the three Regent universities

Community college	Transferring to Regent university			Population in 1995			Average distance to the three Regent universities
	n	%	Cum. %	Total (n)	College parallel track (n)	Transferred to Regent university (%)	
Kirkwood	433	21.1	21.1	9,752	6,073	7.1	68
Des Moines Area	359	17.5	38.6	11,034	8,318	4.3	81
North Iowa Area	220	10.7	49.3	2,878	2,341	9.4	112
Iowa Valley CC District	176	8.6	57.9	2,001	1,557	11.3	65
Eastern IA CC District	161	7.8	65.8	6,447	4,329	3.7	132
Hawkeye*	130	6.3	72.1	3,426	1,498	8.7	66
Iowa Central	120	5.9	78.0	3,136	1,552	7.7	123
Southeastern	91	4.4	82.4	2,660	847	10.7	162
Indian Hills	90	4.4	86.8	3,289	1,744	5.2	125
Iowa Lakes	80	3.9	90.7	2,057	1,393	5.7	201
Northeast IA*	58	2.8	93.5	2,586	1,153	5.0	119
Iowa Western	53	2.6	96.1	4,788	2,414	2.2	213
Southwestern	33	1.6	97.7	1,222	1,049	3.1	165
Western IA Tech*	26	1.3	99.0	2,664	764	3.4	238
Northwest IA*	21	1.0	100.0	574	209	10.0	242
Total	2,051	100.0		58,514	35,241	5.8	141

*Began as vocational technical institutes. (The rest were junior or pre-existing two-year colleges.)

institutes are now comprehensive community colleges with a recent emphasis on transfer programs and articulation to four-year degree-granting higher educational institutions.

Student enrollment in transfer programs, specifically the associate in arts (A.A.) degree program and the associate in science (A.S.) program, has grown dramatically in the last two decades. In 1999, over 39,000 students, or 59% of all full-time students enrolled at

community colleges, were enrolled in transfer programs (*Iowa Community Colleges Fall Term 1999 Credit Student Enrollment Report, 2000*).

With the increased enrollment in community college transfer programs, students, parents, and guidance counselors are faced with several questions when looking at alternative post-secondary educational options for Iowa residents: If students start at a community college and then transfer to a Regent university, can they compete academically at the Regent university? Do the CC transfer students graduate from the Regent universities? Do the transfer students attain similar grade point averages at graduation as students with similar ACT scores who start at the Regent institutions? Do students who transfer from community colleges have similar demographics as students who start at the Regent universities?

Transfer and Articulation Challenges

There is a growing body of research nationally to answer these questions. Tinto (1975) developed and applied a theoretical model of the student persistence/withdrawal process in postsecondary institutions. Tinto (1) examined a wide range of background traits (e.g., family background, individual attributes, and precollege schooling); (2) surveyed commitments to the goal of receiving a four-year degree and to institutional commitment; and (3) analyzed the academic and the social system within the institution (e.g., grade performance, intellectual development, peer-group interactions, and faculty interactions). Background traits influenced the type of institution attended and their performance at that institution. However, persistence/withdrawal was in correlation to the individual's level of social and academic integration at the institution. The greater a student perceived connection to the academic system (intellectual development and faculty interaction) and to the social

system (peer-group interaction), the more likely a student would be committed to continuing and receiving a four-year degree.

Pascarella and Chapman (1983) applied Tinto's (1975) model to 2,316 freshmen from 11 postsecondary institutions, four-year residential and commuter, and two-year commuter institutions. While the results generally supported Tinto's model, Pascarella and Chapman (1983) found that social integration had a stronger influence in persistence at four-year residential institutions, while academic integration was more important at two- and four-year commuter institutions. One limitation was that, even though the 11 institutions were distributed geographically across the United States, "it would be incorrect to consider them as a representative national sample" (p. 89).

Tinto's (1975) research was limited to mostly four-year residential institutions; therefore, Pascarella, Smart, and Ethington (1986) replicated Tinto's model and applied it to long-term persistence of 825 two-year college students over a nine-year period, 1971-1980. Consistent with Tinto's model, the only two variables with direct significant positive effects on persistence/graduation were academic and social integration, with precollege traits having an indirect influence on persistence/graduation. In the Pascarella et al. (1986) data, after the nine-year sample period, 53% of the sample had completed their bachelor's degree, with an additional 15% of the men still pursuing their undergraduate degree and 17% of the women still pursuing their undergraduate degree. The paper did not document year-by-year retention or graduation rates and did not identify trends or patterns when students are most likely to drop out.

Alba and Lavin (1981) tracked students seeking a bachelor's degree who started initially at two-year colleges, and discovered that they are 15% less likely to complete

undergraduate degrees than are students who start at a four-year institution, while individual background differences were held constant. Several other researchers did similar studies and had similar results (Crook & Lavin, 1989; Dougherty, 1987, 1992; Hilton & Schrader, 1986; Temple & Polk, 1986; Velez, 1985). Thus, even when taking into consideration family socioeconomic status, academic ability, high school rank, age, work requirements, and location, community college students seeking a bachelor's degree are at least 15% less likely than students who begin at four-year institutions to obtain such a degree.

In a more recent study, Pascarella, Bohr, Nora, and Terenzini (1995) compared the cognitive impacts of two-year and four-year students, and discovered that “men benefited cognitively more from two-year colleges, whereas women realized greater cognitive returns from four-year colleges.” The magnitude of learning in this study, therefore, was not dependent on the type of institution, either a two-year or four-year institution. One of the limitations of this study was the sample size of five two-year and six four-year colleges and, accordingly, “we cannot necessarily generalize the results to all two- and four-year institutions.”

In another national survey, Pascarella, Edison, Nora, Hagedorn, and Terenzini (1998) concluded that “net of other influences in the model, two-year college students initially planning to obtain at least a bachelor of arts degree were about 31% more likely than similar four-year college students to lower their lifetime education plans below a bachelor of arts degree by the end of the second year of college.”

However, a study by Whitaker and Pascarella (1998) reported that, “when the level of educational attainment was held constant, there was a general parity in the prestige and earnings of the jobs held by those who began their postsecondary education at a two-year and

four-year college” (p. 29). This study was conducted from 1972 through 1986 and involved a national sample of 3,171 students. Therefore, the key was not whether students started at a four-year or two-year school, but whether they received a four-year degree. The degree, not whether the students started at a community college or a four-year institution, increased the prestige and earnings of the students.

The national research concerning community colleges and four-year institutions is important when looking at national trends. Parents, students, and legislators in Iowa, however, are interested in knowing about the transition of students from Iowa’s community colleges to Iowa Regent universities. Can community college transfer students successfully transfer to a Regent university—completing a bachelor’s degree with similar grade point averages at graduation?

Purpose

The purpose of this study is to focus on students transferring from one of Iowa’s 15 community colleges in the fall of 1996 to Iowa’s Regent universities and to compare them to students who started at a Regent university in 1994. Demographic comparisons will help describe who the students are and analysis will help examine if the CC transfer students have comparable grade point averages at graduation. A later paper will address the issues of graduation and retention rates.

Population of the Study

As shown in Table 2, the cohort group tracked by this study was composed of students from two categories.

Table 2. Cohort group tracked by the current study

	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000
Non-transfer students	Entering freshmen Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
CC transfer students	At a community college Year 1	At a community college Year 2	Entering the Regent university Year 3	Year 4	Year 5	Year 6
This study's population			Cohort group Year 1	Cohort group Year 2	Cohort group Year 3	Cohort group Year 4

1. Students who transferred from Iowa's community colleges in the fall of 1996 to the Regent universities—Iowa State University (ISU), University of Iowa (UI), and the University of Northern Iowa (UNI). These students will be referred to as CC transfer students.
2. Students who started at one of the Regent universities in 1994 and who were still enrolled in 1996. These students will be referred to as non-transfer (NT) students.

The students were tracked for four academic years, from fall 1996 through June 2000.

Procedure

Working with the three Regent university registrar offices (Iowa State University, University of Iowa, and University of Northern Iowa), data were collected from the permanent records of the individual students. All full- and part-time undergraduate students transferring in the fall of 1996 from Iowa's 15 community colleges to one of the three Regent universities were selected and monitored until May 2000. The registrars also selected records of all full- and part-time undergraduate students who started at one of the Regent

universities in the fall of 1994, were still enrolled in the fall 1996, and monitored through May 2000.

The following data were collected for each student:

1. University at which student is enrolled;
2. From which community college the student transferred;
3. Number of credits transferred to the Regent university in 1996 from a community college or accumulated by fall of 1996 for students who began at the Regent universities in the fall of 1994;
4. Age in fall of 1996;
5. Gender;
6. ACT composite score (ACT is not mandatory for students entering community colleges, so this variable is incomplete for some records);
7. Last semester enrolled;
8. Semester of graduation;
9. Grade point average at Regent university at time of graduation; and
10. University college of enrollment at time of exit or graduation.

After collection, the data were analyzed by variable. After the analysis was completed, comparisons were made and cross-tabulated according to individual Regent universities, ACT group, and gender.

Demographic Comparisons

Before examining whether CC transfer students have comparable grade point averages upon graduation, demographic comparisons will help explain the different student

populations. Comparisons were made regarding age of the students, gender distribution, ACT test scores, and the number of credits either transfer by the CC transfer students or accumulated by the NT students. By placing the CC transfer students in a cohort group with students who have been at the Regent institution two years, the assumption was that the CC transfer students were similar to the NT students who entered the Regent universities two years previously.

Number of credits transferred or accumulated

Community college students transferred significantly more credits on the average than the NT students accumulated in two years at the Regent universities (54.5 vs. 51.3 credits, $t_{(2639df)} = 6.941$, $p < 0.05$). There was a larger range of credits transferred by CC students, from 1 to 184, compared to the range of credits NT students accumulated during the first two years at the Regent universities, from 1 to 105. When stratified by Regent university, the CC transfer student consistently transferred in slightly over 54 credits to all three universities, while the NT students accumulated 42.9 credit at the University of Iowa, 54.0 credits at ISU, and 62.1 credits at UNI (see Table 3).

The number of credits that apply toward a degree program is not easy to identify. While the number of credits transferred to a Regent university is specified, many credits are transferred as “electives” or “vocational technical” credits, of which a maximum of 16 can be applied to a degree program. In an analysis of six of the fifteen community college grade equivalency guides (GEGs) found on the websites of ISU (www.iastate.edu) and UNI (www.uni.edu).²

² The University of Iowa will not have course equivalency guides on their website until fall 2001.

Table 3. Demographic comparison of CC transfer students and NT students in the fall of 1996

	CC transfer students	NT students	Combined
Attending ISU	709	2,261	2,925
Attending UI	675	2,365	3,040
Attending UNI	667	1,323	1,990
Total number of students	2,051	5,904	7,955
Credits transferred to ISU	54.6	54.0	54.2
Credits transferred to UI	54.3	42.9	45.4
Credits transferred to UNI	54.5	62.1	59.6
Mean number of credits	54.5	51.3	52.2
Mean age in years	22.2	20.1	20.6
Percentage female	46.6	52.6	51.0
Mean ACT scores	21.19	24.25	23.62

- 36.5% of the courses are articulated to meet requirements of a specific course
- 55.2% of the courses listed are transferable, but are “elective” credits and are not articulated to meet the requirements of a specific course. Therefore, these credits cannot apply toward a specific degree program without discussion and work by the individual student and his/her advisor.
- 8.3% of the courses are classified as Vocational-Technical courses, which are limited to a 16 credit maximum limit for meeting degree requirements.

The Registrar’s Office determines which credits are accepted for transfer by the university according to the GEG, then it is the work of the transfer student and advisors at the Regent university to ferret out which credits count toward a degree program and which credits can only be used as elective credits. The University of Northern Iowa and the University of Iowa have general education requirements at the college level. How the A.A.

community college degrees meet these requirements is different for each of the colleges to determine. At Iowa State University the departments determine which courses satisfy degree program requirements. The University of Northern Iowa recently has initiated a program-to-program articulation agreement in the area of industrial technology.

NT students who started at the Regent universities face the same dilemma of meeting degree course requirements if the students change degree programs. Requirements for a specific degree program (i.e., music) may not be the requirements of another degree program (i.e., history). Therefore, if students change degree programs, these credits (a required course in music theory, for example) are considered elective credits (toward a history degree in our example). Students then must take more than the required number of credits to complete all the required coursework for that specific degree program.

The Regent universities record graduation and retention rates for a ten-year period for NT students, as well as CC transfer students. For CC transfer students, the ten-year period is the ten years that are spent at the Regent institution, not including the time spent at a community college. However, the most frequent reporting is for six-year graduation and retention rates.

Since the number of credits transferred by the CC transfer students exceeds the number of credits that the NT students earned during their first two years at a Regent university, the CC transfer students in this study were placed in a cohort group with NT students who were beginning their third year. The assumption is that the CC transfer students spend their first two years at a community college and spend the last four years at a Regent institution, hence, a six-year graduation rate.

The cohort grouping and tracking as explained above is different than the tracking methodology used by the Regent universities. The Regent universities follow the federally-accepted practice for higher educational institutions—tracking six-year graduation rates for transfer students as six years at the Regent university, not taking into account the credits transferred from the previous institution (in this case the community colleges). However, for this study, since the transfer students are transferring slightly more credits than beginning third year NT students have accumulated, it is logical to compare transfer students with beginning third year NT students at the Regent universities.

After establishing the group of students to be studied, demographic comparisons were made regarding age, gender, mean ACT scores, community college attended, and Regent university attendance. Table 3 [2] summarizes the demographic comparisons between the CC transfer students and the NT students at the three Regent universities.

Number of students

Of the 2,051 CC transfer students who transferred to one of the three Regent universities in fall 1996, 34.6% transferred to Iowa State University (ISU), 32.9% transferred to the University of Iowa (UI), and 32.5% transferred to the University of Northern Iowa (UNI). At ISU, the CC transfer students comprised 24.2% of the third-year students studied. At UI, the CC transfer students comprised 22.2% of the third-year students in this study, and at UNI, the CC transfer students comprised 33.5% of the third-year students in this study. Overall, the CC transfer students comprise 25.8% of the third year students at the Regent universities.

The 2,051 CC transfer students tracked in this study transferred from one of Iowa's 15 community colleges. Almost half (49.3%) of the CC transfer students came from three community colleges—Kirkwood Community College, Des Moines Area Community College (DMACC), and North Iowa Area Community College (NIACC). The number of CC students transferring to the Regent universities was dependent on both the size and the location of the community college. In Table 1, the average distance to the three Regent universities is recorded for each community college. The low percentage of students who transferred to the three Regent universities can be explained partially by the fact that students in the college parallel track are in a two-year program. Figures were not available as to how many of these students were in the second-year of college-parallel programs.

Age

Table 3 identifies that CC transfer students are significantly older than NT students (22.22 vs. 20.09, $t_{(2105df)} = 18.92$, $p < 0.05$). There was also a wider variation in the range of ages. In the fall of 1996, the vast majority of the NT students (91.4%) were 20 years old and below, while only slightly more than half of the community college transfer students (53.6%) were 20 years old and below. The CC transfer students had a higher percentage of younger students, below age 20, and a higher percentage of older students, age 25 or older, than NT students. Almost 17% of the CC transfer students were 19 or younger, compared to 7% of the NT students. Slightly over 16% of the CC transfer students are 25 years old and older (331 students), while less than 0.5% of the NT students are 25 years old and older (29 students). For the 25-year-old and older student, it seems that the preferred method of

attending a Regent university is to start at a community college and then transfer to a Regent university (see Figure 1).

Gender

In examining gender differences, a significantly lower percentage of CC transfer students were female than NT students (46.6%, vs. 52.6%, $Z = -4.65$, $p < 0.05$). Conversely, a significantly higher percentage of males started at the community colleges compared to the percentage of males that started at the Regent universities (47.4%, vs. 53.4%, $Z = 4.65$, $p < 0.05$). Overall at the three universities combining CC transfer students and NT students, the percentage of females was 51.0%, following a nationwide trend of more females in higher education (Santiago 2001). As shown in Table 4, ISU did not have significantly different

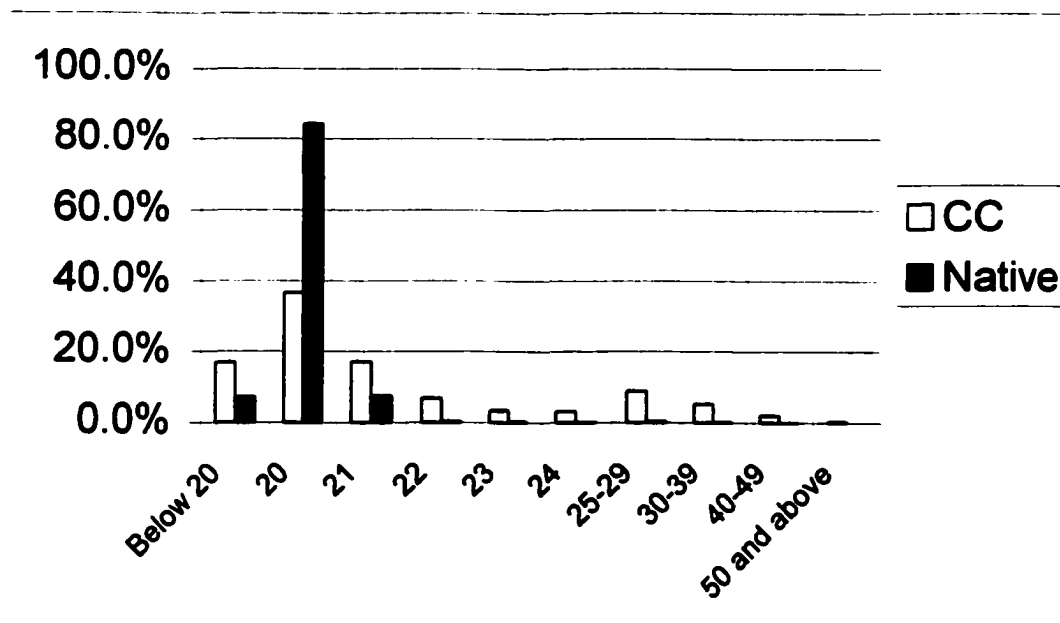


Figure 1. Students' age categories by CC transfer or NT students (fall, 1996)

Table 4. Percentage and number of female community college transfer and non-transfer students cross-tabulated by Regent university

	Transfer		Non-transfer		Total		Z
	(%)	(n)	(%)	(n)	(%)	(n)	P < 0.05
ISU	41.6	295	43.6	966	43.1	1,261	0.93 – no
UI	50.2	339	55.5	1,313	54.3	1,652	2.44 – yes
UNI	48.3	322	62.4	826	57.7	1,148	6.03 – yes
Total	46.6	956	52.6	3,105	51.0	4,061	4.65 - yes

percentages of CC females than NT females. However at both the University of Iowa and the University of Northern Iowa, there were significantly fewer CC female transfer students than female NT students. Combining CC and NT females, ISU's female population is significantly lower than either UI or UNI (43.1%, vs. 54.3%, $Z = -8.67$; 43.1%, vs. 57.7%, $Z = -10.04$; both with $p < 0.05$).

ACT scores

Nationwide, more than 70% of entering four-year college students take either the SAT or ACT (Adelman, 2000). However, community colleges accept all students and do not require ACT scores. The Iowa Regent universities accept students graduating in the top 50% of their class or have an ACT score of 20 or above, depending on the student's high school class ranking. If students cannot meet the admission requirements, they can attend a community college, maintain a 2.0 or better grade point average for a minimum of 24 credits, and then transfer to a Regent university. Therefore, students who cannot meet the Regent universities' admission requirements have the option of beginning their academic career at a community college or another higher educational institution.

Recently, there has been controversy about the reliability of the SAT or ACT scores, especially for minority students. The justification for using test scores “is that they are a decent predictor of first-year college grades” (Adelman, 2000, p. 24), yet are not a good predictor of college graduation rates. Adelman continues that, “high school grades and class rank are even weaker predictors than standardized tests” (p. 24). Adelman argues that the quality and rigor of high school curriculum is the best indicator of college graduation rates. Students who go one step beyond Algebra II in high school double their chances of completing a bachelor’s degree. The registrar’s office did not have this information recorded on student records for use in this study.

In this survey, the registrars’ offices at the three Regent universities did not have a measure of high school curriculum quality. While they recorded an ACT score when provided by the student, only about two-thirds of the CC transfer students (63%) in this study had ACT scores recorded, while almost all (96%) of the NT students had ACT scores recorded. High school ranking was available but was not consistent among the three Regent universities, as well as notations concerning students who are the first generation to attend higher education. Lacking curriculum data, ACT scores were used as a variable when examining grade point averages at graduation.

As shown in Table 5, the CC transfer students have significantly lower composite ACT scores than the NT students (21.19, vs. 24.25, $t_{(6950 \text{ df})} = -27.10$, $p < 0.05$). ACT scores range from 1 to a high of 36. Dividing the students according to which Regent university they attend, yielded similar analysis with differences in mean ACT scores with slightly higher mean ACT scores for CC transfer students attending ISU (21.55) compared to those CC transfer students attending UNI (20.72). When examining NT students’ ACT scores,

Table 5. Mean ACT scores of community college transfer and non-transfer students cross-tabulated with the Regent universities

University	Transfer			Non-transfer		
	ACT mean	N	%	ACT Mean	N	%
ISU	21.55	286	22.0	24.38	2,095	37.1
UI	21.44	517	39.8	24.58	2,241	39.7
UNI	20.72	497	38.2	23.46	1,316	23.3
Total	21.19	1,300	100.0	24.25	5,652	100.0

those student attending UI had slightly higher ACT scores (24.58) than the NT students attending either ISU (24.38) or UNI (23.46).

In trying to understand the ACT test score differences, the ACT scores were divided into groups by range of scores:

- Students with ACT scores of 18 and below;
- Students with ACT scores of 19 to 23; and
- Students with ACT scores of 24 and above.

As shown in Table 6, almost 25% of the CC transfer students had ACT scores of 18 and lower, compared to less than 5% of the NT students who had ACT scores of 18 and lower. Conversely, slightly more than 26% of the CC transfer students had ACT scores of 24 and above, compared to almost 56% of NT students who had ACT scores of 24 and above.

Figure 2 provides a graphic representation of the statistics for the ACT groups.

Table 6. ACT mean scores of community college transfer and non-transfer students cross-tabulated with ACT groups

ACT score	Transfer			Non-transfer		
	ACT mean	N	%	ACT Mean	N	%
18 and below	16.73	313	24.1	17.21	268	4.7
19 – 23	20.89	647	49.8	21.35	2,226	39.4
24 and above	25.87	340	26.2	26.88	3,158	55.9
Total	21.19	1,300	100.0	24.24	5,652	100.0

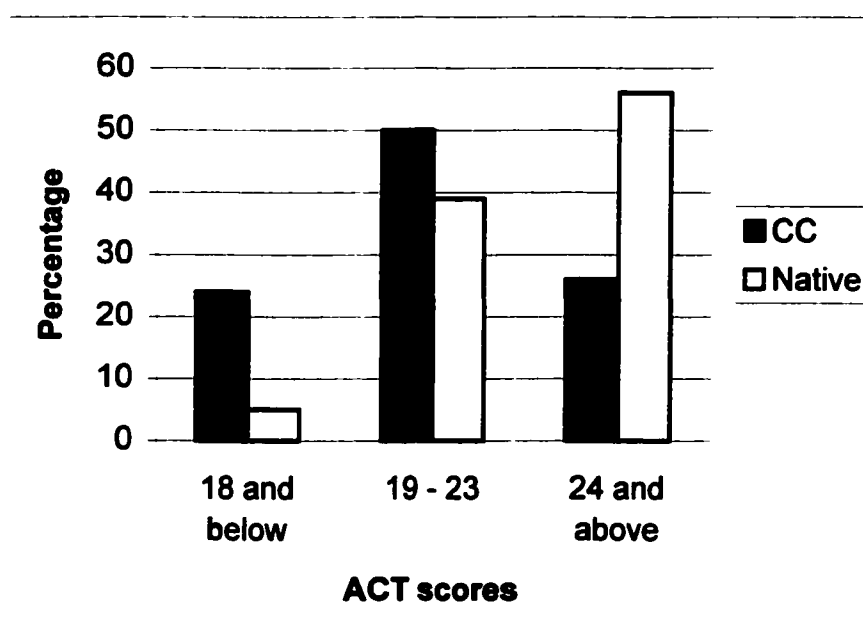


Figure 2. Percentage of students in each ACT group

For students with ACT scores lower than 20 and who were not in the top 50% of their graduating class, a four-year degree at the Regent universities was available only by starting at a higher educational institution that accepts students with lower high school class ranking and ACT scores. Since community colleges accept students regardless of ACT or high

school class ranking, community college education becomes a viable option. Thus, it seemed that students who were not eligible for admission from one of the Regent universities easily could have started at a community college, maintained a 2.0 grade point average for 24 or more semester hours, and then transferred to a Regent university.

The question, therefore, became: Given the differences in ACT scores, did CC transfer students compete academically (grade point averages) compared with the NT students?

Academic Competitiveness based on Grade Point Average

Grade point averages (GPAs) of graduated students were examined to see if the CC transfer graduates were able to compete academically with the NT graduates. Since the CC transfer students had lower ACT scores, the GPAs at graduation were cross-tabulated according to the three ACT groups. Even though the differences were judged to be significantly different (at the .05 α level) for each group, the difference in GPAs were not even a partial grade differentiation. For example, on a 4.0 grade scale, there is a 0.33 differential between a B and a B+ (3.00 versus 3.33).

In the article, "Twenty years of research on college students: Lessons for future research," Terenzini and Pascarella (1991) warn that studies need not only to identify statistical significant changes, but also to examine "the magnitude of those changes" (p. 86). Even though there were significant differences in GPA, the magnitude of those differences was not meaningful.

The graduation GPAs then were stratified according to Regent university as well as being cross-tabulated by ACT group (see Table 7). There was only one instance when CC

Table 7. Graduation grade-point averages for community college transfer and non-transfer students at the three Regent universities cross-tabulated by ACT groups' scores

ACT score	Transfer	Non-transfer
18 and below	2.47	2.59
19 – 23	2.66	2.78
24 and above	2.93	3.05

transfer students' GPAs were not significantly different than GPAs of the NT students: This was at the University of Iowa (UI) for the students with ACT scores of 18 and lower (2.43 for CC transfer students, compared to 2.45 for the NT students). In the other eight comparisons, the CC transfer students had statistically significantly lower GPAs than the NT students (Table 8).

Table 8. Graduation grade-point averages for community college transfer and non-transfer students at each Regent university cross-tabulated based on ACT scores

ACT score	Iowa State		Iowa		Northern Iowa	
	Transfer	Non-transfer	Transfer	Non-transfer	Transfer	Non-transfer
18 and below	2.23	2.54	2.43*	2.45*	2.61	2.76
19 – 23	2.48	2.70	2.54	2.72	2.85	2.94
24 and above	2.86	2.98	2.87	3.03	3.08	3.20

*No significant difference.

Conclusion

The students who transferred from one of Iowa's 15 community colleges in the fall of 1996 to one of the three Regent universities were more heterogeneous than the students who started at the Regent universities two years earlier. The CC transfer students:

1. transferred in significantly more credits than the NT students accumulated during the previous two years (54.48 vs. 51.33 credits, $t_{(2639df)} = 6.941$, $p < 0.05$);
2. were significantly older with more age diversity than the NT students (22.22 vs. 20.09 years, $t_{(2105df)} = 18.92$, $p < 0.05$);
3. had ACT scores significantly lower than the NT students (21.19, vs. 24.25, $t_{(6950 df)} = -27.10$, $p < 0.05$) with almost 74% of the CC students having ACT scores of 23 or below, compared to 44% of the NT students; and
4. were significantly less likely to be female when compared to the NT students (46.6%, vs. 52.6%, $Z = -4.65$, $p < 0.05$).

When stratified for ACT scores, the grade point averages upon graduation were statistically significantly lower for the CC transfer students than the NT students, but never more than a plus or minus grade differentiation (0.33 difference on a 4.0 scale). However, when further stratified by Regent university the grade point average difference was reduced, and in one case was not statistically significant.

Implications for Practice

In this study, CC transfer students were grouped with NT students starting their third year at the Regent universities due to similar credits transferred or completed. However, due to other demographic differences, the Regent universities could develop a comprehensive plan for transfer students, including policies and practices that start at the community college level and continue once the transfer is completed to a Regent university. Some programs could include: (1) the creation of a statewide computer system to help students in selecting degree programs that utilize community college courses; (2) learning communities for CC

transfer students; (3) peer mentors for the CC transfer students; (4) pre-advising by Regent advisors for transfer students; and (5) joint admission policies.

First, a study needs to be conducted examining the credits transferred to the Regent universities. Even though over 54 credits transfer to the Regent universities (on the average), it is not clear how many of these credits are articulated and fulfill degree requirements or how many credits are transferred as electives. When CC students select the college-parallel tracks, the students could identify whether they plan to transfer to one of the Regent universities. If so, Regent advisors could be notified and help advise the potential transfer student as to which classes would meet degree requirements and which classes would transfer only as electives. CC students could be enrolled jointly at a Regent university and be encouraged to come to the Regent campus to take part in some of the campus-wide activities. The advisors could help meet the academic integration that Tinto (1975) identified as crucial and the Regent campus activities could help start the social integration even before the CC students transfer to the Regent university.

Second, to make transfer and articulation as easy as possible, either a common numbering system or dual numbering of courses should be initiated or a statewide computer system that would help transfer students identify articulation options. Since every department is responsible for determining articulation and course transfer acceptability, students need an easy way to determine how many credits will be needed to fulfill degree requirements if they opt to transfer. A statewide computer system, similar to www.transfer.com, could help students select a degree program that best utilizes the courses completed at community colleges.

Since the CC transfer students have similar grade point averages upon graduation, the assumption can be made that the CC transfer students can compete academically once they transfer to Regent universities. Learning communities could be designed for transfer students to help in social integration. Iowa State University has over 50 learning communities for new freshmen, but transfer students do not have a learning community established for them.

Another program could be pairing the CC transfer student with a NT student in the same degree program. These “peer mentors” could help in both the social and academic integration of the CC transfer student. The program could be voluntary and used as a leadership opportunity for the NT student.

Since CC transfer students are more diverse in age, materials should be developed to suit the diverse needs of the CC transfer students. Only 0.5% of the Regent universities’ population is over 25 years old, while slightly over 16% of the CC transfer students are 25 years and older. Materials could include options for child care, scholarships, food stamps, and welfare programs, as well as social interaction to create a community of non-traditional learners.

A joint task force of community college and Regent administrators could oversee these programs and policy changes. Since CC transfer students comprise one-fourth of the third-year students, their success socially and academically impacts each of the Regent universities. Implementing the programs, policies, and procedures outlined above can make a tremendous difference for the Regent universities, the students, and the taxpayers who are contributing to higher education in the state of Iowa.

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**CHAPTER 3: IOWA'S COMMUNITY COLLEGE TRANSFER STUDENTS:
COMPARISON OF GRADUATION RATES WITH NON-TRANSFER STUDENTS
AT THE IOWA REGENT UNIVERSITIES**

A paper to be submitted to the Community College Journal of Research and Practice

Ann M. Fields

Abstract

This study compares Iowa community college (CC) transfer students who transferred to one of Iowa's three Regent universities in the fall of 1996 to students who started at one of the Iowa Regent universities in 1994 and who were still attending such university in the fall of 1996 (referred to as non-transfer [NT] students).¹ Graduation rates were compared between CC transfer students and NT students according to Regent university attended, gender, ACT scores, and college major.² CC transfer students transferred significantly more credits than NT students had accumulated in two years (54.48, vs. 51.33 credits, $t_{(2639df)} = 6.941, p < 0.05$). However, CC transfer students graduated at significantly lower rates (test of proportions, $Z = -26.19, p < 0.05$) than students who started at the Regent universities and were still enrolled at the beginning of the third year (53.7%, vs. 82.7%). Cross-tabulating graduation rates with ACT scores, gender, Regent university, and college major still resulted in significantly lower graduation rates for the CC transfer students when compared to the NT

¹ In previous educational literature, these students have been referred to as "native" students. To be culturally sensitive, this study identifies these students as "non-transfer students" or NT students.

² Note: Demographic comparisons (age, gender, ACT scores, and the number of credits either transferred or accumulated during the first two years of college) and grade point averages at graduation were analyzed in

students (test of proportions or t-tests included in the paper for each cross-tabulation, $p < 0.05$).

Higher Education in Iowa

Community colleges trace transfer function roots back to 1851 when Henry Tappan, president of the University of Michigan, proposed that junior colleges would relieve the university of freshman and sophomore studies, allowing the universities to concentrate on the “higher-order scholarship” (Cohen & Brawer, 1982). Tappan’s proposal was echoed in 1852 at the University of Michigan, in 1859 at the University of Georgia, in 1896 by the University of Minnesota, in 1907 at Leland Stanford, and again in 1926 at Johns Hopkins University (Bogue, 1950). In 1892, the University of Chicago implemented the proposal and championed a new model of higher education, dividing the traditional four academic years into two equal parts. The first two years would “be known as the junior college or academic college, where the spirit would be collegiate and preparatory, and the second to be known as the senior college or the university college” (Rudolph, 1990, p. 351). In 1990 William Rainey Harper (Rudolph, 1990), President of the University of Chicago, proposed a national two-year college system whereby students could terminate their education after two years or continue at a four-year university.

The term community college was introduced formally in 1936 by Hollinshead when he wrote in *The Junior College Journal* that: “the junior college should be a community college meeting community needs” (p. 111). The community colleges would maintain the academic transfer preparation component but also would focus on adult education, vocation-

technical education, remedial education, and community service. According to Dougherty (1994), the debate rages concerning the present-day community colleges and trying to determine which function should become central (Breneman & Nelson, 1981; Clowes & Levin, 1989; Cohen & Brawher, 1987; Cross, 1985; Gleazer, 1980; Kerr, 1980; Richardsons & Bender, 1987).

The first accredited junior college in Iowa started in Mason City and opened its doors in 1918. Floyd McDowell, the dean of Graceland College—a small private two-year junior college in Iowa—conducted the first national study of junior colleges and found that both academic (83%) and vocational programs (17%) were offered (McDowell, 1919). By 1930, Iowa had 12 accredited junior colleges.

In 1947 the President's (Truman) Commission on Higher Education wrote:

Hence the President's Commission suggests the name "community college" to be applied to the institution designed to serve chiefly local community educational needs. It may have various forms of organization and may have curricula of various lengths. Its dominant feature is its intimate relations to the life of the community it serves. (p. 5)

In Iowa in 1962, the Department of Education submitted a report titled "Education Beyond High School Age: The Community College" that recommended 16 area education districts, each to be served by a community college or a vocational technical school (Blong & Bedel, 1997, p. 537). The 61st General Assembly in 1965 enacted legislation that permitted the creation of a statewide system of two-year post-secondary educational institutions (Chapter 260.C of the *Code of Iowa, 1999, 2000*). By January of 1967 14 of the 15 community colleges districts were in operation (*Iowa Community College Funding Formula Task Force Report, 1998*).

Public community college education in Iowa is coordinated by the Iowa Department of Education, included with elementary and secondary education schools (Chapter 280.A of the *Code of Iowa 1999, 2000*). Now over 35 years later, every Iowa resident is within an hour's drive of a community college campus. The funding coming "in equal parts from state monies, local property taxes, and student tuition and fees" (Blong & Bedel, 1997).

Enrollment in Iowa community colleges has been increasing steadily, and by 1991 community college enrollment (52,252) exceeded undergraduate enrollment at the three Iowa Regent universities (50,070). "Community colleges are the largest provider of undergraduate level education in the state" (*Iowa Community College Funding Formula Task Force Report, January 1998*). Almost three times as many new freshmen who are Iowa residents were enrolled at community colleges than at the Regent universities in 2000. When comparing where new freshmen who are Iowa residents enrolled in 2000, 22,179 enrolled in community colleges compared to 7,595 who enrolled in the three Iowa Regent universities (Iowa Coordinating Council for Post High School Education Enrollment Report, 2000). Iowa's community colleges, indeed, play a critical role in higher education for Iowa citizens.

Iowa's community college legislation in 1967 promoted vocational-technical education. However, over the last twenty years, there has been a renewed emphasis on transfer programs and articulation to four-year degree-granting higher educational institutions. Student enrollment in transfer programs has grown dramatically in the last two decades. In 2000, over 66,000 students were enrolled in Iowa's community colleges, with 65% enrolled in either college-parallel programs (54%) or career option/college-parallel programs (11%) (*Credit Student Enrollment Report, December 2000*). Never before have Iowa community colleges prepared so many students to continue their education at four-year

degree granting institutions. (See Appendix A for a complete list of the fifteen community colleges and their enrollment in college-parallel tracks.)

Purpose

The purpose of this study is to compare baccalaureate graduation rates of Iowa community college students who transferred to the Iowa Regent universities in the fall of 1996 to students who started at one of the Iowa Regent universities in 1994 and who were still enrolled in the fall of 1996. Demographic comparisons and grade point averages at graduation were examined in a previous paper, "Iowa's Community College Transfer Students: How do they compete academically at the Iowa Regent universities?" (Fields & Ebbers, 2001). In the present study, graduation rates are compared between the CC transfer students and NT students and then were cross-tabulated using ACT scores, gender, age, Regent university attended, and college major to examine different variables affecting graduation rates.

As tuition rates increase both at community colleges and the Regent universities, parents, guidance counselors, and students are considering whether attendance at a community college with aspirations to transfer to a Regent university is, in fact, a viable route. Possible reasons for starting at a community college may include saving money, living at home, students lacking the confidence to move to a larger city, and proximity to friends and relatives (Dougherty, 1994). This study tries to address these concerns by providing current information concerning graduation rates of transfer students from Iowa's community colleges compared to students who started at Iowa's Regent universities.

Procedure

Working with the three Regent university registrar offices (Iowa State University, University of Iowa, and University of Northern Iowa), data were collected from the permanent records of the individual students. All full- and part-time undergraduate students transferring in the fall of 1996 from Iowa's 15 community colleges to one of the three Regent universities were selected and monitored until May 2000. The registrars also selected records of all full- and part-time undergraduate students who started at one of the Regent universities in the fall of 1994 and were still enrolled in the fall 1996, and monitored these NT students through May 2000.

The following data were collected for each student:

1. University at which student is enrolled;
2. From which community college the student transferred;
3. Number of credits transferred to the Regent university in 1996 from a community college or accumulated by fall of 1996 for students who began at the Regent universities in the fall of 1994;
4. Age in fall of 1996;
5. Gender;
6. ACT composite score (ACT is not mandatory for students entering community colleges, so this variable is incomplete for some records);
7. Last semester enrolled;
8. Semester of graduation;
9. Grade point average at Regent university at time of graduation; and
10. University college of enrollment at time of exit or graduation.

After collection, the data were analyzed to identify differences in how the variable relate to each other for community college transfer students and NT students to meet the objectives of the study. Following the analysis of variance, comparisons were made by cross-tabulating relevant variables according to individual Regent universities, ACT group, gender, and college major.

Methodology

Transfer students' graduation rates can be analyzed using several different methodologies. One methodology tracks graduation rates for transfer students and NT students for six years, beginning with the year that the students begin at the four-year or degree-transferring institution. Therefore, for transfer students the time spent at the previous institution(s) is not calculated in the length of time to graduation. For a community college transfer student, the six-year graduation rate translates into two, or more, years at a community college and six years at a Regent institution. This methodology is used by the NCAA and by the Iowa Regent universities for internal reports, as well as for the Integrated Post-secondary Education Data System reports.

Using this methodology, six-year graduation data are available for beginning full-time NT students and full-time CC transfer students who started in at the Regent universities in the fall of 1994. The data in Table 1, taken from the Board of Regent's *Annual Report on Student Retention and Graduation Rates* (November 6, 2000), show that the CC transfer students' six-year graduation rates are comparable at ISU and UI, and at UNI the CC transfer students' six-year graduation rate slightly exceeds that of NT students.

Table 1. Six-year graduation rates for CC transfer students and NT students starting in the fall of 1994

Community college	CC transfer students	NT students
ISU	60.9	62.4
UI	56.3	63.1
UNI	66.0	62.2

A second methodology analyzes transfer students as third-year students and compares the transfer students with third-year NT students. The cohort group is then tracked for four years, translating into six years in higher education for NT students and an assumed six years for transfer students (two years at the community college and then four years at the degree-bestowing institution). This methodology is used by Dougherty (1994) for comparisons of graduation rates using the following studies: the National Center for Education Statistics (1977), Holmstrom and Bisconti (1974), California Community Colleges (1984), Florida State Department of Education (1983), Illinois Community College Board (1986), and Martinko (1978). The University of California, *Community College Transfer Students at UC: 2000 Annual Report*, highlights this methodology (p. 10) as well.

The second methodology was selected for use in this study. Previously (Fields & Ebbers, 2001) it was determined that the CC transfer students bring a mean of 54.5 credit hours into the Regent universities, compared with NT students, who have accumulated 52.5 credit hours by the beginning of their third year. The CC transfer students also are on the average two years older (22.2 years) than the third-year NT students (20.1 years). Therefore, CC transfer students are roughly comparable to third-year NT students. (See Appendix B for

a demographic comparison between CC transfer students and NT students tracked in this study.)

For all tests of significance, alpha was set at 0.05. The statistical test employed for comparing percentages was the two-tailed test of the null hypothesis of equal proportions conducted with the standard normal Z statistic. The t -test was used as appropriate using the critical value of t for the appropriate number of degrees of freedom.

Study Population

The study population cohort is divided into two groups:

- students who transferred from one of Iowa's 15 community colleges in the fall of 1996 to one of Iowa's three Regent universities (referred to as CC transfer students); and
- students who started at one of the Iowa Regent universities in 1994 and who were still attending such university in the fall of 1996 (referred to as non-transfer, or NT, students).

The cohort population was tracked for four academic years, from the fall of 1996 through the spring of 2000. The cohort group tracked by this study was composed of full-time and part-time students both for the CC transfer students and the NT students. Table 2 identifies the population cohort for this study.

Table 2. Cohort group tracked in this study

	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000
Non-transfer students	Entering freshmen Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
CC transfer students	At a community college Year 1	At a community college Year 2	Entering the Regent university Year 3	Year 4	Year 5	Year 6
This study's population			Cohort group Year 1	Cohort group Year 2	Cohort group Year 3	Cohort group Year 4

Graduation Rate Comparisons

Table 3 shows the graduation rates for both community college (CC) transfer students and non-transfer, or NT, students by semester for the four cohort years of the study period. (The NT students would have six years at the Regent universities; the CC transfer students would have two years at a community college and four years at a Regent university). The bolded percentages indicate that, at the end of six years, the NT students who were still at the Iowa Regent universities at the beginning of their third year graduated at a significantly ($Z = 26.19, p < 0.05$) higher percentage rate (82.7 %) than CC transfer students (53.7 %) who transferred at the beginning of their third year to a Regent university. These figures show a significant difference between the CC transfer students and the NT students (the Z values are listed in Table 3; all are significant at $p < 0.05$).

Table 3. Graduation rates by semester for CC transfer students and NT students

Graduation semester	CC transfer students		NT students		Z value
	%	Cum. %	%	Cum. %	
Fall 97 or before	1.1	1.1	2.6	2.6	4.14*
Spring 98	6.6	7.7	29.9	32.5	21.30*
Summer 98	4.1	11.8	6.0	38.5	3.26*
Fall 98	11.3	23.1	17.6	56.1	6.65*
Spring 99	14.2	37.3	17.6	73.7	3.55*
Summer 99	3.8	41.1	2.7	76.4	2.48*
Fall 99	6.7	47.8	3.6	80.0	5.93*
Spring 2000	5.9	53.7	2.7	82.7	6.74*
Currently enrolled	11.9	65.6	4.7	87.4	11.36*
Did not graduate/ Currently not enrolled	34.4	100.0	12.6	100.0	22.01*

*Significant at $p < 0.05$.

The fundamental reason that the graduation rates are high for the NT students is that research shows that the majority of students who leave an institution do so during the first two years of college (U.S. National Center for Education Statistics, 1977a). Therefore, the NT students who are enrolling during the fall of their third year have persisted through the first two years of higher education, and therefore have a high graduation rate.

It was assumed that CC transfer students experienced the high attrition rate during their community college career, and thus would not experience a high “leaving” rate when transferring to the Regent universities. However, Table 3 sheds serious doubt on this assumption. Even though the CC transfer students have enough credits to be tracked as third-year students, their “leaving” patterns are more like those of first-year, beginning students.

Alba and Lavin (1981) tracked students seeking a bachelor’s degree who initially started at two-year colleges, and discovered that they are 15% less likely to complete

undergraduate degrees than students who start at a four-year institution, while individual background differences were held constant. Several other researchers did similar studies and had similar results (Crook & Lavin, 1989; Dougherty, 1987, 1992; Hilton & Schrader, 1986; Temple & Polk, 1986; Velez, 1985). Thus, even when taking into consideration family socioeconomic status, academic ability, high school rank, age, work requirements, and location, community college students seeking a bachelor's degree are at least 15% less likely than students who begin at four-year institutions to obtain such degree.

In some research, this is referred to as "transfer shock." The term transfer shock was coined in 1965 by John Hill (1965). Hill identified key indicators of transfer shock as lower grade points in the first term at the 4-year institution compared to the grade point averages at the 2-year institution, lower persistence rates for transfer students, and lower graduation rates for transfer students. Patricia Diaz's (1991) meta-analysis identified 13 studies where transfer shock did not exist and 49 studies where transfer shock was present.

Transfer shock is built on the concept of culture shock, which implies that the experience of a new culture (in this case a new academic culture) is an unpleasant surprise (Furnham & Bochner, 2001). Anthropologist Oberg (1960), who first used the term culture shock, mentions six psychological aspects of the phenomenon: stress requiring necessary psychological adaptations; a sense of loss and feelings of separation from friends, status, profession, and possessions; rejection by members of the new culture; confusion in expectations, values, feelings, and self-identity; anxiety after awareness of cultural differences; and inability to cope with a new environment.

Instead of transfer shock, a more descriptive term could be "academic culture shock," referring to the cultural differences among academic institutions, whether students are

transferring from community colleges, private 2-year institutions, or other 4-year institutions. The key indicators listed above (Hill, 1965), therefore, are outward manifestations of experiencing academic culture shock. Community college students are more heavily working class, minority, female, and older than are four-year college students (Adelman, 1992; Cohen & Brawer, 1989; Grubb, 1991). Both qualitative and quantitative methodology concerning academic culture shock need to be used in future research studies.

To understand better the manifestations of possible “academic culture shock,” this paper examines graduation rates cross-tabulated with ACT scores, Regent university attended, gender, and college major. Graduation rates are calculated for the student with 48 or more credits at the beginning of the transfer period, or the beginning of the third year for non-transfer students.

Graduation rates cross-tabulated by ACT scores

Nationwide, more than 70% of entering four-year college students take either the SAT or ACT (Adelman, 2000). However, community colleges accept all students and do not require ACT scores. The Iowa Regent universities accept students graduating in the top 50% of their class or who have an ACT score of 20 or above depending on the student’s high school class ranking. If students cannot meet the admission requirements, they can attend a community college, maintain a 2.0 or better grade point average for a minimum of 24 credits, and then transfer to a Regent university. Therefore, students who cannot meet the Regent universities’ admission requirements have the option of beginning their academic career at a community college or another higher education institution.

Recently, there has been controversy about the reliability of SAT or ACT scores, especially for minority students. The justification for using test scores “is that they are a decent predictor of first-year college grades” (Adelman, 2000), yet are not a good predictor of college graduation rates. Adelman continues that “high school grades and class rank are even weaker predictors than standardized tests.” Adelman argues that the quality and rigor of high school curriculum is the best indicator of college graduation rates. Students who go one step beyond Algebra II in high school double their chances of completing a bachelor’s degree.

In this survey, the registrars’ offices at the three Regent universities did not have a measure of high school curriculum quality. While they recorded an ACT score when provided by the student, only about two-thirds of the CC transfer students (63%) in this study had ACT scores recorded, while almost all (96%) of the NT students had ACT scores recorded. High school ranking was available but was not consistent among the three Regent universities, as well as notations concerning students who are the first generation to attend higher education. Lacking curriculum data, ACT scores were used as a variable when examining graduation rates. Table 4 shows that there was a statistically significant difference in mean ACT scores between the CC transfer students and the NT students (21.19, vs. 24.25, $t_{(6950df)} = -27.102, p < 0.05$). ACT scores range from 1 to a high of 36.

In using the ACT division, the graduation rates for CC transfer students increased from 48.6% to 60.6%, a range of 12.0 percentage points, which is statistically significant ($Z = 3.08, p < 0.05$). Also among NT students higher graduation rates corresponded to higher ACT scores, ranging from 76.5% for those students with ACT scores of 18 and below to

Table 4. Graduation rates of community college transfer and non-transfer students cross-tabulated by ACT score

ACT score	Transfer				Non-transfer				Z value
	ACT mean	N	%	Grad. rate	ACT mean	N	%	Grad. rate	
18 and below	16.73	313	24.1	48.6	17.21	268	4.7	76.5	6.90*
19 – 23	20.89	647	49.8	55.6	21.35	2,226	39.4	81.8	13.57*
24 and above	25.87	340	26.2	60.6	26.88	3,158	55.9	84.3	10.81*
Total	21.19	1,300	100.0	55.2	24.24	5,652	100.0	82.9	21.65*

*Significant at $p < 0.05$.

84.3% for those students with ACT scores of 24 and above (a difference that is statistically significant, with $Z = 3.32$, $p < 0.05$). However, when comparing CC transfer students NT students according to ACT scores, for each ACT group, CC transfer students had significantly lower graduation rates than their NT counterparts, 48.6%, vs. 76.5%; 55.6%, vs. 81.8%; 60.6%, vs. 84.3% (see Table 4 for Z values).

Graduation rates by Regent university

Graduation rates were calculated according to which Regent university was attended: Iowa State University (ISU), the University of Iowa (UI), or the University of Northern Iowa (UNI). The CC transfer students again had significantly lower graduation rates than NT students at each of the three Regent universities (see Table 5 for Z values, significant when $p < 0.05$).

UNI had the highest graduation rates for CC transfer students, at 56.8%; ISU was next, with 54.4%; and UI had the lowest rate for CC transfer students, at 49.9%. When comparing CC transfer students' graduation rates among the three Regent universities, UNI and ISU did not have significantly different graduation rates (56.8%, vs. 54.4%, $Z = 0.89$, $p > 0.05$). UNI had significantly higher graduation rates than UI (56.8%, vs. 49.9%, $Z = 2.53$, p

Table 5. Graduation rates of community college transfer and non-transfer students by spring 2000

Regent univ.	Transfer				Non-transfer				Z value
	ACT mean	N	%	Grad. rate%	ACT mean	N	%	Grad. rate%	
ISU	21.55	286	22.0	54.4	24.38	2,095	37.1	80.1	13.51*
UI	21.44	517	39.8	49.9	24.58	2,241	39.7	84.0	18.41*
UNI	20.72	497	38.2	56.8	23.46	1,316	23.3	84.8	13.69*
Total	21.19	1,300	100.0	53.7	24.25	5,652	100.0	82.7	26.19*

*Significant at $p < 0.05$.

< 0.05) while ISU did not have significantly higher graduation rates than UI (54.4%, vs. 49.9%, $Z = 1.68$, $p > 0.05$).

Each Regent university creates its own numbering system and general education requirements, and collaborates with each community college to develop articulation agreements. However, the data suggest that none of the Regent universities' CC transfer students complete graduation at a rate comparable to that for students who start at community colleges and then transfer to one of the Regent universities. More research and study needs to be completed to identify barriers in the system as a whole.

Student Academic Services in the Office of the President at the University of California uses the same methodology employed in this paper. From the 109 community colleges in California, the CC student can transfer to one of the 9 universities in the University of California (UC) system. If accepted and transferred, the California CC transfer students have a graduation rate of 75.8% after four years, compared to the graduation rate for NT students of 76.0% (1991 cohort) (2000 Annual Report, University of California, 2000). California has worked hard to encourage more students to start in the community college system and then transfer to the UC system. Joint advising, more standardization of general

education requirements, and programs aimed at academic and social integration have boosted CC transfer students' graduation rates. However, the transfer requirements are more stringent (must have a 3.0 grade point average or better, depending on the college and major to transfer to the UC system), thereby limiting transfer student access to the UC system.

Graduation rates by gender

The Regent universities are striving to retain and graduate women and minority students (*Annual Report on Student Retention and Graduation Rates*, November 6, 2000). There were not enough CC minority transfer students to conduct a valid statistical analysis. The graduation rates for women were better than for their male counterparts, except for ISU where the CC transfer women had lower graduation rates than the CC transfer men (see shaded area in Table 6). For the CC transfer students, there was no statistically significant difference in female graduation rates vs. male graduation rates at ISU or UI. However, at UNI, CC transfer women graduated at a significantly higher rate than CC male transfer students (see *Z* values). In each of the three Regent universities, the NT female students had significantly higher graduation rates than their male counterparts (see *Z* values).

Table 6. Graduation rates by spring 2000 of community college transfer and non-transfer students by gender

Regent univ.	Transfer student			Non-transfer student		
	Female	Male	Z value	Female	Male	Z value
ISU	53.2 ¹	55.3 ¹	0.55 ¹	85.0	76.2	5.11*
UI	52.8 ²	47.0 ²	1.50 ²	85.8	81.7	2.69*
UNI	63.4	50.7	3.29*	86.6	81.9	2.29*
Total	56.5	51.8	2.33*	85.8	79.3	6.54*

*Significant at $p < 0.05$; Note: no significance between males/female graduation rates at ISU¹ or at UI².

Graduation rates by college major

To try to understand the effect of curriculum choices on graduation rate differences between CC transfer students and NT students, an analysis was done according to college major, regardless of Regent university. College majors were grouped by like curriculum (see Table 7). Table 8 then lists the number of students and the percentage of students in each major grouping. For both CC transfer students and NT students, over half of the students (52.7%, and 56.5%, respectively) were enrolled in Liberal Arts & Sciences. There is no statistical difference for enrollment percentages for CC transfer students and NT students in Business (18.0%, vs. 17.9%, $Z = 0.12, p > 0.05$). However, there are statistically significant differences in enrollment patterns between CC transfer students and NT students for each of the remaining colleges—Education (12.6%, vs. 7.7%, $Z = 6.71, p < 0.05$), Engineering (4.3%, vs. 9.7%, $Z = -7.58, p < 0.05$), and Liberal Arts & Sciences (52.7%, vs. 56.5%, $Z = -3.01, p < 0.05$).

Graduation rates were cross-tabulated with the different major groupings to determine whether there were significant differences across major groupings. Consistent with the other analysis, regardless of college major, CC transfer students had significantly lower graduation rates than did NT students (see Table 8 for Z values). Chi-square analysis demonstrated that enrollment in Liberal Arts & Sciences resulted in a lower than expected graduation rate and enrollment in Engineering resulted in a higher than expected graduation rate.

Table 7. Colleges included in like-major groups

Major	Colleges included		
	ISU	UI	UNI
Business	Business	Business	Business Adm.
Education	Education	Education	Education
Engineering	Engineering	Engineering	None
Liberal Arts & Science	Family/Consumer Sciences Liberal Arts & Science Design	Liberal Arts & Science	Social & Behavioral Science Humanities/Fine Arts Natural Sciences
Other	Agriculture Undecided	Nursing Public Health Dentistry	Undecided

Table 8. Graduation rates by major by for CC transfer students and NT students

Major	Transfer students			Non-transfer students			Z value
	N	%	Grad. rate %	N	%	Grad. rate %	
Business	370	18.0	63.5	1,058	17.9	89.0	11.10*
Education	258	12.6	58.1	453	7.7	87.6	8.98*
Engineering	89	4.3	67.4	573	9.7	85.3	4.18*
Liberal Arts & Science	1,081	52.7	49.2	3,338	56.5	80.0	19.73*
Other	253	12.3	49.4	482	8.2	79.5	8.38*
Total	2,051	100.0	53.7	5,904	100.0	82.7	26.19*

Significant at $p < 0.05$

Graduation rates of the full-time student

In trying to analyze the effects of full-time vs. part-time status on differences in graduation rates between CC transfer students and NT students, students with 48 credits or more were isolated from the rest of the survey. These students represent full-time students who have taken a minimum of 12 credits per semester. As shown in Table 9, of the CC transfer students, 69% (1,415 students) transferred in 48 credits or more. Of the NT students, 61.1% (3,608 students) accumulated 48 credits or more. Several analyses were completed.

Table 9. Graduation rates by spring 2000 of community college transfer and non-transfer students having 48 or more credits

	Transfer students %	NT students %	Z value
All ages	57.5	88.9	24.99*
18-19-20 year olds	64.7	89.0	15.72*
Female students only	60.2	90.9	18.22*
Male students only	55.1	86.5	16.87*
ACT: 18 and below	50.8	86.3	7.12*
ACT: 19 – 23	63.0	87.6	11.27*
ACT: 23 and above	67.1	90.0	9.73*
CC students from large CC	59.1		
CC students from medium CC	56.4		
CC students from small CC	57.1		

Significant at $p < 0.05$

First, the entire isolated group was analyzed for differential graduation rates. The graduation rate for CC transfer students (transferring in 48 or more credits) was significantly lower—57.5%, vs. 88.9%. The group then was reduced further to include only students 20 years old and younger, to represent traditional-age, full-time students. A total of 635 CC transfer students were in this traditional-age group compared to 3,299 NT students. These traditional-age, full-time CC transfer students had a graduation rate of 64.7% compared to an 89.0% graduation rate for traditional-age, full-time NT students.

These full-time students also were divided according to gender; both full-time CC and NT females had significantly higher graduation rates than their male counterparts. Female full-time CC transfer students did not have significantly higher graduation rate than male CC transfer students (60.2%, vs. 55.1%; $Z = 1.95, p > 0.05$; however, significant at $p = 0.0512$).

The full-time NT females also had a significantly higher graduation rate than their male counterparts (90.0%, vs. 86.5%; $Z = 4.19, p < 0.05$).

The full-time students also were divided according to ACT scores. As before, the CC transfer students in each ACT group had significantly lower graduation rates than their NT counterparts (see Table 9 for Z scores). For the full-time CC transfer students with ACT scores of 18 and below, their graduation rate of 50.8% was significantly lower than the graduation rates for CC transfer students with ACT scores of 19 to 23 and 23 and above (63.0% and 67.1%, respectively; $Z = 2.87$ and 3.39 , respectively; both $p < 0.05$). However, for the full-time NT students, the graduation rates for NT students with ACT of 18 and below were not statistically different from those for the NT students with ACT scores of 19-23 or 23 and above ($Z = 0.46$ and 1.48 , respectively; both $p > 0.05$).

The last analysis using the full-time student group (those students with 48 credits or more) was conducted using the number of students transferring from community colleges as a variable. Community colleges were grouped (large, medium, and small) according to the number of students transferring to the Regent universities. One hypothesis was that if there were a large number of students transferring to the Regent universities, the CC transfer students would have a larger peer group both at the community colleges and once the transfer happened. Appendix A shows how community colleges were grouped as large, medium, or small. However, the graduation rates for full-time CC transfer student were not significantly different according to community college size ($Z = 0.89, 0.54, \text{ and } 0.21$; all $p > 0.05$).

Implications for Practice

Based on the methodology of placing CC transfer students with NT students who are starting their third year, CC transfer students have significantly lower graduation rates than do NT students. Even when holding ACT constant, CC transfer students still have significantly lower graduation rates than NT students after four years. Cross-tabulations were completed for Regent university, gender, and full-time students; in all instances CC transfer students' graduation rates were significantly lower than NT students' graduation rates.

All three of the Regent universities have policies, procedures, and programs for transfer students. However, a more systemic view and better publicity about the existing programs, as well as expanding and developing new programs specifically for CC transfer students, are needed. It might be cost effective to fund a staff position focusing on social and academic integration of CC transfer students, based on Tinto's (1975) model and using other states as benchmarks for success. This position also could monitor the graduation rates as a means of accountability for the expanded programming.

Community colleges need to be included in the collaboration and partnership. Successful transfer starts before students attend a Regent university. Expanded policies and practices need to be initiated upon enrollment at the community colleges, such as:

- Joint admission or dual admission from the beginning of community college education to alert the Regent universities to CC students who are enrolled in a college-parallel track program and considering transfer in the future.
- Advising of students by Regent university advisors while students are at the community colleges.

- **Yearly orientation for those CC students who anticipate transfer to the Regent universities.**

The Regent universities could develop additional, comprehensive programs for transfer students, including students from community colleges and also students from other two-year and four-year institutions. Examples of these programs might include:

- **Learning communities designed for transfer students. Iowa State University has over 50 learning communities for new freshmen, but transfer students do not have a learning community established for them.**
- **A four-year guarantee program, guaranteeing CC students that they will complete a four-year degree program in four years. This might translate into two years at the community college and two years at the Regent university, or one year at the community college and three years at the Regent university, based upon the program desired and the community college.**
- **Peer mentors or learning partners. CC transfer students could be paired with NT students to help integrate them into the social and academic culture of the Regent university.**
- **A one-year core curriculum at the Regent universities that could be replicated at the community colleges.**

In conclusion, Iowa CC transfer students are graduating at significantly lower rates than NT students who start at the Regent universities. The community colleges and Regent universities must work together so CC transfer students can complete a four-year degree program at the same graduation rate as the NT students. Practices must be established to promote social and academic integration.

Appendix A: Number and Percentage of Transfer Students by Community College

Community College	Number of CC students transferred to Regent university	CC transfer students %	Cumulative %	Size grouping	Total population of CC in 1995	Total CC students in college parallel track	College track students transferred to Regent university %
Kirkwood	433	21.1	21.1	Large	9,752	6,073	7.1
Des Moines Area	359	17.5	38.6	Large	11,034	8,318	4.3
North Iowa Area	220	10.7	49.3	Medium	2,878	2,341	9.4
Iowa Valley CC District	176	8.6	57.9	Medium	2,001	1,557	11.3
Eastern IA CC District	161	7.8	65.8	Medium	6,447	4,329	3.7
Hawkeye*	130	6.3	72.1	Medium	3,426	1,498	8.7
Iowa Central	120	5.9	78.0	Medium	3,136	1,552	7.7
Southeastern	91	4.4	82.4	Small	2,660	847	10.7
Indian Hills	90	4.4	86.8	Small	3,289	1,744	5.2
Iowa Lakes	80	3.9	90.7	Small	2,057	1,393	5.7
Northeast IA*	58	2.8	93.5	Small	2,586	1,153	5.0
Iowa Western	53	2.6	96.1	Small	4,788	2,414	2.2
Southwestern	33	1.6	97.7	Small	1,222	1,049	3.1
Western IA Tech*	26	1.3	99.0	Small	2,664	764	3.4
Northwest IA*	21	1.0	100.0	Small	574	209	10.0
Total	2051	100.0			58,514	35,241	5.8

*Began as vocational technical institutes. (The remainder were junior or pre-existing two-year colleges.)

**Appendix B: Demographic Comparison of CC Transfer Students and NT Students
in the Fall of 1996**

	CC transfer students	NT students	Combined
Attending ISU	709	2,261	2,925
Attending UI	675	2,365	3,040
Attending UNI	667	1,323	1,990
Total number of students	2,051	5,904	7,955
Credits transferred to ISU	54.6	54.0	54.2
Credits transferred to UI	54.3	42.9	45.4
Credits transferred to UNI	54.5	62.1	59.6
Mean number of credits	54.5	51.3	52.2
Mean age in years	22.2	20.1	20.6
Percentage female	46.6	52.6	51.0
Mean ACT scores	21.19	24.25	23.62
Mean GPA at graduation for students with ACT of 18 and below	2.47	2.59	2.53
Mean GPA at graduation for students with ACT of 19 – 23	2.66	2.78	2.76
Mean GPA at graduation for students with ACT of 24 and above	2.93	3.05	3.04

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**CHAPTER 4: IOWA'S COMMUNITY COLLEGE TRANSFER STUDENTS:
COMPARISON OF ATTRITION RATES WITH NON-TRANSFER STUDENTS AT
THE IOWA REGENT UNIVERSITIES**

A paper to be submitted to the Community College Journal of Research and Practice

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Abstract

This study compares Iowa community college (CC) transfer students who transferred to one of Iowa's three Regent universities in the fall of 1996 to students who started at one of the Iowa Regent universities in 1994 and who were still attending such university in the fall of 1996 (referred to as non-transfer [NT] students).¹ CC transfer students transferred, on average, 54.5 credits compared to beginning NT third-year students, who had accumulated 51.3 credits.² However, CC transfer students had a significantly higher attrition rate (percentage of students leaving higher education) than students who started at the Regent universities and were still enrolled at the beginning of the third year (34.4%, vs. 12.6%, test of proportions, $Z = 22.01, p < 0.05$). Cross-tabulating attrition rates with ACT scores, gender, Regent university, and college major still resulted in significantly lower graduation rates for the CC transfer students when compared to the NT students (test of proportions for each cross-tabulation, $p < 0.05$).

¹ In previous educational literature, these students have been referred to as "native" students. To be culturally sensitive, this study identifies these students as "non-transfer students" or NT students.

² Note: Demographic comparisons (age, gender, ACT scores, and the number of credits either transferred or accumulated during the first two years of college) and grade point averages at graduation were analyzed in a

Transfer Function of Community Colleges

Community colleges trace transfer function roots back to 1851 when Henry Tappan, president of the University of Michigan, proposed that junior colleges would relieve the university of freshman and sophomore studies allowing the universities to concentrate on the “higher-order scholarship” (Cohen & Brawer, 1982). Tappan’s proposal was echoed in 1852 at the University of Michigan, in 1859 at the University of Georgia, in 1896 by the University of Minnesota, in 1907 at Leland Stanford, and again in 1926 at Johns Hopkins University (Bogue, 1950). In 1892, the University of Chicago implemented the proposal and championed a new model of higher education, dividing the traditional four academic years into two equal parts. The first two years would “be known as the junior college or academic college, where the spirit would be collegiate and preparatory, and the second to be known as the senior college or the university college” (Rudolph 1990, p. 351). In 1990 William Rainey Harper (Rudolph, 1990), President of the University of Chicago, proposed a national two-year college system where students could terminate their education after two years or continue at a four-year university.

The term community college was introduced formally in 1936 by Hollinshead, when he wrote in *The Junior College Journal* that “the junior college should be a community college meeting community needs” (p. 111). The community colleges would maintain the academic transfer preparation component but also would focus on adult education, vocation-technical education, remedial education, and community service. According to Dougherty (1994), the debate rages concerning which function should become central to the present-day

previous paper, “Iowa’s Community College Transfer Students: How do they compete academically at the Iowa Regent universities?”.

community colleges (Breneman & Nelson, 1981; Clowes & Levin, 1989; Cohen & Brawer, 1987; Cross, 1985; Gleazer, 1980; Kerr, 1980; Richardsons & Bender, 1987).

The first accredited junior college in Iowa started in Mason City and opened its doors in 1918. Floyd McDowell, the dean of Graceland College—a small private two-year junior college in Iowa—conducted the first national study of junior colleges and found, of the programs offered, 83% were academic and 17% were vocational programs (McDowell, 1919). By 1930, Iowa had 12 accredited junior colleges.

In 1947 the President's (Truman) Commission on Higher Education wrote:

Hence the President's Commission suggests the name "community college" to be applied to the institution designed to serve chiefly local community educational needs. It may have various forms of organization and may have curricula of various lengths. Its dominant feature is its intimate relations to the life of the community it serves. (p. 5)

In 1962, the Iowa Department of Education submitted a report titled "Education Beyond High School Age: The Community College," which recommended 16 area education districts, each to be served by a community college or a vocational technical school (Blong & Bedel, 1997, p. 537). The 61st General Assembly in 1965 enacted legislation that permitted the creation of a statewide system of two-year post-secondary educational institutions (Chapter 260.C of the *Code of Iowa, 1999, 2000*). By January of 1967 14 of the 15 community colleges districts were in operation (*Iowa Community College Funding Formula Task Force Report, 1998*).

Public community college education in Iowa is coordinated by the Iowa Department of Education, included with elementary and secondary education schools (Chapter 280.A of the *Code of Iowa 1999, 2000*). Now over 35 years later, every Iowa resident is within an

hour's drive of a community college campus. The funding coming "in equal parts from state monies, local property taxes, and student tuition and fees" (Blong & Bedel, 1997).

Enrollment in Iowa community colleges has been increasing steadily, and by 1991 community college enrollment (52,252) exceeded undergraduate enrollment at the three Iowa Regent universities (50,070). "Community colleges are the largest provider of undergraduate level education in the state" (*Iowa Community College Funding Formula Task Force Report*, January 1998). Almost three times the number of new freshmen who are Iowa residents were enrolled at community colleges than at the Regent universities in 2000. Of new freshmen who are Iowa residents, in 2000, 22,179 enrolled in community colleges compared to 7,595 who enrolled in the three Iowa Regent universities (Iowa Coordinating Council for Post High School Education Enrollment Report, 2000). Iowa's community colleges, indeed, play a critical role in higher education for Iowa's citizens.

Iowa's community college legislation in 1967 promoted vocational-technical education. However, over the last twenty years, there has been a renewed emphasis on transfer programs and articulation to four-year degree-granting higher educational institutions. Student enrollment in transfer programs has grown dramatically in the last two decades. In 2000, over 66,000 students were enrolled in Iowa's community colleges, with 65% enrolled in either college-parallel programs (54%) or career option/college-parallel programs (11%) (*Credit Student Enrollment Report*, December 2000). Never before have Iowa community colleges prepared so many students to continue their education at four-year degree-granting institutions. (See Appendix A for a complete list of the fifteen community colleges and their enrollment in college-parallel tracks.)

Purpose of the Study

The purpose of this study is to compare attrition rates of Iowa community college students who transferred to the Iowa Regent universities in the fall of 1996 to students who started at one of the Iowa Regent universities in 1994 and who were still enrolled in the fall of 1996. In the present study, attrition rates are compared between the CC transfer students and NT students and then were cross-tabulated using ACT scores, gender, age, Regent university attended, and college major to examine different variables affecting attrition rates, or the percentage of students leaving higher education.

Two previous papers were written using the same cohort of students. Demographic comparisons and grade point averages at graduation were examined in a previous paper, "Iowa's Community College Transfer Students: How do they compete academically at the Iowa Regent universities" (Fields & Ebbers, 2001a). A second paper, "Iowa's Community College Transfer Students: Comparison of Gradation Rates with Non-transfer Students at the Iowa Regent Universities," is currently under review (Fields & Ebbers, 2001b).

As tuition rates increase both at community colleges and the Regent universities, parents, guidance counselors, and students are considering whether attendance at a community college with aspirations to transfer to a Regent university is, in fact, a viable route. Possible reasons for starting at a community college may include saving money, living at home, students lacking the confidence to move to a larger city, and proximity to friends and relatives (Dougherty, 1994). This study tries to address these concerns by providing current information concerning attrition rates of transfer students from Iowa's community colleges compared to students who started at Iowa's Regent universities.

Procedure

Working with the three Regent university registrar offices (Iowa State University, University of Iowa, and University of Northern Iowa), data were collected from the permanent records of the individual students. All full- and part-time undergraduate students transferring in the fall of 1996 from Iowa's 15 community colleges to one of the three Regent universities were selected and monitored until May 2000. The registrars also selected records of all full- and part-time undergraduate students who started at one of the Regent universities in the fall of 1994 and were still enrolled in the fall of 1996, and monitored these non-transfer (NT) students through May 2000.

The following data were collected for each student:

1. University at which student is enrolled;
2. From which community college the student transferred;
3. Number of credits transferred to the Regent university in 1996 from a community college or accumulated by the fall of 1996 for students who began at the Regent universities in the fall of 1994;
4. Age in the fall of 1996;
5. Gender;
6. ACT composite score (ACT is not mandatory for students entering community colleges, so this variable is incomplete for some records);
7. Last semester enrolled;
8. Semester of graduation;
9. Grade point average at Regent university at time of graduation; and
10. University college of enrollment at time of exit or graduation.

After data collection, the data were analyzed for each variable. Test of proportions with $p < 0.05$ and t -tests with $p < 0.05$ were used to identify significant differences between community college transfer students and NT students to meet the objectives of the study. After the analysis was completed, comparisons were made and cross-tabulated according to individual Regent universities, ACT group, gender, and college major.

Methodology

Transfer students' attrition rates can be analyzed and compared with NT students using several different methodologies. One methodology tracks attrition rates for transfer students and compares their attrition rates to the NT students, beginning with the year that the students begin at the four-year or degree-transferring institution. Therefore, for transfer students the time spent at the previous institution(s) is not calculated in the length of time at the Regent university. For a CC transfer student, the six-year time frame translates into two, or more, years at a community college and six years at a Regent institution. This methodology is used by the NCAA and by the Iowa Regent universities for internal reports, as well as for the Integrated Post-secondary Education Data System reports.

Using this methodology, six-year data are available for beginning full-time NT students and full-time CC transfer students who started in at the Regent universities in the fall of 1994. Table 1's data for NT students is taken from the Iowa Board of Regents' *Annual Report on Student Retention and Graduation Rates* (November 6, 2000). CC transfer students' attrition rates are not available through the Iowa Board of Regents. Iowa State University's (ISU) *Student Profile 2000-2001*, published by the Office of Institutional

Research, provided the statistics for CC transfer students. This data were not available from the University of Northern Iowa.

A second methodology analyzes transfer students as third-year students and compares the transfer students with third-year NT students (see Table 1). The cohort group is then tracked for four years, translating into six years in higher education for NT students and an assumed six years for transfer students (two years at the community college and then four years at the degree-bestowing institution). This methodology is recorded by Dougherty (1994) for comparisons of attrition rates using the following studies: the U.S. National Center for Education Statistics (1977b), Holmstrom and Bisconti (1974), California Community Colleges (1984), Florida State Department of Education (1983), Illinois Community College Board (1986), and Martinko (1978). The University of California, *Community College Transfer Students at UC: 2000 Annual Report* highlights this methodology (p. 10) as well.

I have selected the second methodology for use in this study. Previously (Fields & Ebbers, 2001a) it was determined that the CC transfer students bring a mean of 54.5 credit hours into the Regent universities compared with the NT students, who have accumulated 52.5 credit hours by the beginning of their third year. The CC transfer students are also, on

Table 1. Attrition rates for CC transfer students and NT students starting in the fall of 1994

Regent university	CC transfer students				NT students			
	Attrition after first year	Attrition after 2nd year	Attrition after three years	Total for first three years	Attrition after first year	Attrition after 2nd year	Attrition after three years	Total for first three years
ISU	23.4	8.5	3.8	35.70	18.5	9.7	2.9	31.10
UI	-	-			19.9	7.9	2.6	31.10
UNI	-	-			19.3	8.6	3.6	31.50

average, two years older (22.2 years) than the third-year NT students (20.1 years).

Therefore, CC transfer students are roughly comparable to third-year NT students. (See Appendix B for comparisons between CC transfer students and NT students tracked in this study on demographic traits, grade point averages at graduation, and graduation rates.)

For all tests of significance, alpha was set at 0.05. The statistical test employed for comparing percentages was the test of proportions with the appropriate critical value of Z . The t -test was used as appropriate using the critical value of t with an appropriate number of degrees of freedom.

Study Population

The study population cohort is divided into two groups (see Table 2):

- students who transferred from one of Iowa's 15 community colleges in the fall of 1996 to one of Iowa's three Regent universities (referred to as CC transfer students); and
- students who started at one of the Iowa Regent universities in 1994 and who were still attending such university in the fall of 1996 (referred to as non-transfer, or NT, students).

The cohort population was tracked for four academic years, from the fall of 1996 through the spring of 2000. The cohort group tracked by this study was composed of full-time and part-time students for both the CC transfer students and NT students. Table 2 identifies the population cohort for this study.

Table 2. Cohort group tracked by this study

	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000
Non-transfer students	Entering freshmen Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
CC transfer students	At a community college Year 1	At a community college Year 2	Entering the Regent university Year 3	Year 4	Year 5	Year 6
This study's population			Cohort group Year 1	Cohort group Year 2	Cohort group Year 3	Cohort group Year 4

Attrition Rate Comparisons

Brief literature review

There is a growing body of research nationally that addresses the questions of attrition for transfer and non-transfer students. Tinto (1975) developed and applied a theoretical model of the student persistence/withdrawal process in postsecondary institutions. Tinto: (1) examined a wide range of background traits (e.g., family background, individual attributes, and precollege schooling); (2) surveyed commitments to the goal of receiving a four-year degree and to institutional commitment; and (3) analyzed the academic and the social system within the institution (e.g., grade performance, intellectual development, peer-group interactions, and faculty interactions). Background traits influenced the type of institution attended and their performance at that institution. However, persistence/withdrawal was related to the individual's level of social and academic integration at the institution. The greater a student perceived connection to the academic system (intellectual development and faculty interaction) and to the social system (peer-

group interaction), the more likely a student would be committed to continuing and receiving a four-year degree.

Pascarella and Chapman (1983) applied Tinto's model to 2,316 freshmen from 11 postsecondary institutions—four-year residential and commuter and two-year commuter institutions. While the results generally supported Tinto's model, Pascarella and Chapman found that social integration had a stronger influence in persistence at four-year residential institutions, while academic integration was more important at two- and four-year commuter institutions. One limitation was that, even though the 11 institutions were distributed geographically across the United States, "it would be incorrect to consider them as a representative national sample" (p. 89).

Tinto's research was limited to mostly four-year residential institutions; therefore, Pascarella, Smart, and Ethington (1986) replicated Tinto's model and applied it to long-term persistence of 825 two-year college students over a nine-year period, 1971-1980. Consistent with Tinto's model, the only two variables with direct significant positive effects on persistence/graduation were academic and social integration with precollege traits having indirect influence on persistence/graduation. In Pascarella, Smart, and Ethington's (1986) analysis, after the nine-year sample period, 53% of the sample had completed their bachelor's degree, with an additional 15% of the men still pursuing their undergraduate degree and 17% of the women still pursuing their undergraduate degree. The paper did not document year-by-year attrition or graduation rates and did not identify trends or patterns indicating when students are most likely to dropout.

Alba and Lavin (1981) discovered that students seeking a bachelor's degree who started initially at two-year colleges are 15% less likely to complete undergraduate degrees

than are students who start at a four-year institution, when individual background differences were held constant. Several other researchers had similar results in similar studies (Crook & Lavin, 1989; Dougherty, 1987, 1992; Hilton & Schrader, 1986; Temple & Polk, 1986; Velez, 1985). Thus, even when taking into consideration family socioeconomic status, academic ability, high school rank, age, work requirements, and location, community college students seeking a bachelor's degree are at least 15% less likely than students who begin at four-year institutions to obtain such degree.

In another national survey, Pascarella, Edison, Nora, Hagedorn, and Terenzini (1998) concluded that "net of other influences in the model, two-year college students initially planning to obtain at least a bachelor of arts degree were about 31% more likely than similar four-year college students to lower their lifetime education plans below a bachelor of arts degree by the end of the second year of college."

Dougherty (1994) states that: "the first years in the community college are lethal to the hopes of many baccalaureate aspirants." According to Cohen and Brower (1989), lower aspirations, social disadvantages, and academic preparation (or the lack thereof) are the main reasons that first-time community college students have high attrition, or leaving, rates in the freshman and sophomore years. Anderson (1981) researched attrition rates using fall 1972 student data and reported that two-year college entrants were 5% less likely to be enrolled after one year and 14% less likely to be enrolled after two years when compared to four-year college entrants.

Astin (1975) replicated Anderson's findings and reported significantly higher attrition rates for two-year students, even when controlling for differences in sex, race, socioeconomic status, religion, educational aspirations, and high school record. Clark (1960) attributed the

higher attrition rate, or the “cooling out” function, to the culture of community colleges.

Community colleges provided alternatives or substitutes for transfer, gradual disengagement by providing other courses of study or low expectations by teachers, counseling the student concerning grades, aptitude tests, and interest tests, and stressing a diversity of talents other than academic.

What happens to community college students who survive two years at a community college and transfer to four-year institutions? What is their attrition rate or leaving rate at the four-year institution? Several national and state studies have found that community college (CC) transfer students have a high attrition rate when compared to non-transfer college students entering the junior year (California Community Colleges, 1984; Florida State Education Department, 1983; Holmstrom & Bisconti, 1974; Illinois Community College Board, 1980; Martinko, 1978; U.S. National Center for Education Statistics, 1977a).

The first methodology is based on the hypothesis that the CC transfer students experience attrition rates similar to NT students starting their freshman year and thus should be compared to first-time NT students. The attrition rates as reported by Iowa’s Board of Regents (see Table 1) are very similar and would seem to verify the first hypothesis: CC transfer students have attrition rates similar to those of NT freshman attending Iowa’s Regent universities. This seems to be the case at all three Regent universities.

The second methodology is based on the hypothesis that CC transfer students experienced high attrition rates while at community colleges (the first and second years in higher education) and, therefore, have attrition rates similar to the NT students starting their junior year. This study and methodology examines the second hypothesis, comparing attrition rates of Iowa community college (CC) transfer students enrolling in the fall of 1996

and non-transfer (NT) third-year students who enrolled in the fall 1994 and who were still attending the Iowa Regent universities in the fall of 1996. Since both sets of students earned similar credits by the fall of 1996, CC transfer students were compared to third-year NT students. The two sets of students were tracked for the four cohort years. Table 3 records the attrition rate, graduation rates, and current enrollment for CC transfer students and NT students. Note that the attrition rate for CC transfer students is significantly higher than for NT students and that graduation rates for CC transfer students are significantly lower than those for NT students.

Academic culture shock

The CC transfer students had statistically significantly higher attrition rates (see Table 3 for Z values) than their NT counterparts. In some research, this is referred to as “transfer shock.” The term transfer shock was coined in 1965 by John Hill (1965). Hill identified key indicators of transfer shock as lower grade points in the first term at the 4-year institution compared to grade point averages at the 2-year institution, lower persistence rates for transfer students, and lower

Table 3. Four-year profile for CC transfer and NT students, Fall 1996 – Spring 2000

	Percentage		Z value
	CC transfer students	NT students	
Attrition rate	34.4	12.6	22.01*
Graduation rates by Spring 2000	53.7	82.7	26.19*
Currently enrolled	11.9	4.7	11.36*

*Significant at $p < 0.05$.

graduation rates for transfer students. Patricia Diaz's (1991) meta-analysis identified 13 studies where transfer shock did not exist and 49 studies where transfer shock was found.

Transfer shock is built on the concept of culture shock, which implies that the experience of a new culture (in this case a new academic culture) is an unpleasant surprise (Furnham & Bochner, 2001). Anthropologist Kolervo Oberg (1960) first used the term culture shock and mentions six psychological symptoms: stress requiring necessary psychological adaptations; a sense of loss and feelings of separation from friends, status, profession and possessions; rejection by members of the new culture; confusion in expectations, values, feelings, and self-identity; anxiety after awareness of cultural differences; and inability to cope with the new environment. Furnham and Bochner (2001) stress that good social skills can help prevent certain aspects of culture shock and, once culture shock has been experienced, social skills can relieve the stress and pressure of culture shock.

Instead of transfer shock, a more descriptive term could be "academic culture shock," referring to the academic cultural differences among academic institutions, whether students are transferring from community colleges, private 2-year institutions, or other 4-year institutions. The key indicators listed above (Hill, 1965), therefore, could be outward manifestations of experiencing the stress and anxiety created by academic culture shock. Borrowing from Furnham and Bochner (2001), preparing students with social skills could help avoid or at least alleviate academic culture shock.

Community college students are more heavily working class, minority, female, and older than are four-year college students (Adelman, 1992; Cohen & Brawer, 1989; Grubb, 1991). Thus, these community college transfer students are adapting to a different social culture. The academic culture at community colleges is also different from four-year

institutions, where larger classes, faculty more attuned to specific disciplines and involved in research, and less innovation in the classroom are more prevalent (Cohen & Brawer, 1987). Both qualitative and quantitative methodology concerning academic culture shock need to be used in future research studies.

In fact, transfer students, whether from two-year public or private or other four-year institutions, might, in effect, experience two bouts of academic culture shock – the first during their freshman year at the community college and the second during their first year at the four-year institution. The hypothesis would be that the more similar in academic culture, the less academic culture shock the students would experience. Academic culture could be based on size, philosophy, mission, and educational expectations of the institution, as well as whether the institution is residential- or commuter-based. This is an area where more research in Iowa needs to be conducted. The Regent universities could conduct exit interviews of CC transfer students to examine the reasons why they are leaving.

To understand better the manifestations of possible “academic culture shock,” this paper examines attrition rates in light of demographic differences between CC transfer students and NT students – age, gender, number of credits transferred to the Regent institution, and size of community college attended. Attrition rates were cross-tabulated with ACT scores, Regent university attended, GPA when exiting, and college major. For each of these variables, differences will be noted between the persisters and non-persisters, as well as between CC transfer students and NT students. Cross-tabulating different variables with attrition could help explore which students, if any, exhibited less manifestations of academic culture shock.

The students were divided into four different groups:

- **Community college (CC) transfer students who left the Regent university during the study (fall of 1996 – spring 2000). This group will be referred to as the CC non-persisters. These students were not tracked after leaving so we do not know if they transferred to another public or private institution, re-entered college at a later date, or did not continue their education.**
- **CC transfer students who stayed at the Regent university during the study (fall of 1996 – spring 2000), either graduating with a four-year baccalaureate degree or still enrolled at the university. This group will be referred to as the CC persisters.**
- **Non-transfer (NT) students who left the Regent university during the study (fall of 1996 – spring 2000). This group will be referred to as the NT non-persisters. These students were not tracked after leaving so we do not know if they transferred to another public or private institution, re-entered college at a later date, or did not continue their education.**
- **NT students who stayed at the Regent university during the study (fall of 1996 – spring 2000), either graduating with a four-year baccalaureate degree or still enrolled at the university. This group will be referred to as the NT persisters.**

Demographic Differences between Persisters and Non-persisters

Previously it was noted that the total attrition rates from fall 1996 through spring 2000 for CC transfer students was significantly higher at 34.4%, compared to 12.6% for the NT students (see Table 3). Table 4 records the demographic differences among the four student groups – CC

Table 4. Demographic descriptors

Demographic descriptor	CC		NT	
	Non-persisters	Persisters	Non-persisters	Persisters
Age	22.8 yrs.	21.9 yrs.	20.2 yrs.	20.1 yrs.
Percentage female	33.2%	66.8%	11.0%	89.0%
Percentage male	35.4%	64.6%	14.4%	85.6%
Number of credit hours, fall 1996	53.7	54.9	43.4	52.4
Attended large CC	31.6%	68.4%		
Attended medium CC	36.3%	63.7%		
Attended small CC	35.8%	64.2%		

non-persisters, CC persisters, NT non-persisters, and NT persisters. Note that the non-persisters tend to be slightly older (both for CC and NT students) and male. For CC transfer students, there was no significant difference between the proportion of CC females and males concerning persistence rates or non-persistence rates ($Z = 1.08, p > 0.05$). However, significantly more NT males were non-persisters and significantly more NT females were persisters ($Z = 4.03, p < 0.05$).

For community college students, the number of credits transferred to the Regent universities is not a good indication of non-persistence ($t_{(2033df)} = -1.261, p > 0.05$); however, for NT students, non-persisters have significantly fewer credits earned in the first two years at the Regent university when compared to persisters (43.4 credits, vs. 52.62 credits, $t_{(824.5df)} = -16.44, p < 0.05$).

Community colleges were grouped (large, medium, and small) according to the number of students transferring to the Regent universities. One hypothesis was that if there were a large number of students transferring to the Regent universities, the CC transfer students would have a larger peer group both at the community colleges and at the Regent

university before and after the transfer. This peer group would act to decrease attrition rates and increase graduation rates. Appendix A shows how community colleges were grouped as large, medium, or small according to the number of students transferring to the Regent universities. There were significantly lower attrition rates for CC transfer students from community colleges with large transfer populations when compared to CC transfer students from community colleges with medium transfer populations (31.6%, vs. 36.3%, $Z = 2.00$, $p < 0.05$). However, there is no significant difference in persistence rates between those CC students from those community colleges with large transfer populations when compared to persistence rates for CC students from small transfer populations (31.6%, vs. 35.8%, $Z = 1.54$, $p > 0.05$).

Attrition rates cross-tabulated by ACT scores and grade point averages

Nationwide, more than 70% of entering four-year college students take either the SAT or ACT (Adelman, 2000). However, community colleges accept all students and do not require ACT scores. The Iowa Regent universities accept students graduating in the top 50% of their class or have an ACT score of 20 or above, depending on the student's high school class ranking. If students cannot meet the admission requirements, they can attend a community college, maintain a 2.0 or better grade point average for a minimum of 24 credits, and then transfer to a Regent university. Therefore, students who cannot meet the Regent universities' admission requirements have the option of beginning their academic career at a community college or another higher educational institution.

Recently, there has been controversy about the reliability of SAT or ACT scores, especially for students of color. The justification for using test scores "is that they are a

decent predictor of first-year college grades” (Adelman, 2000), yet are not a good predictor of college graduation rates. Adelman continues that “high school grades and class rank are even weaker predictors than standardized tests.” Adelman argues that the quality and rigor of high school curriculum is the best indicator of college graduation rates. Students who go one-step beyond Algebra II in high school double their chances of completing a bachelor’s degree.

In this survey, the registrars’ offices at the three Regent universities did not have a measure of high school curriculum quality. While they recorded an ACT score when provided by the student, only about two-thirds of the CC transfer students (63%) in this study had ACT scores recorded, while almost all (96%) of the NT students had ACT scores recorded. High school ranking was available but was not consistent among the three Regent universities, as well as notations concerning students who are the first generation to attend higher education. Lacking curriculum data, ACT scores were used as a variable when examining attrition rates.

CC transfer students had statistically significant lower mean ACT scores than the NT students – 21.19 vs. 24.25 ($t_{(6950df)} = -27.10, p < 0.05$). (Note: ACT scores range from 1 to a high of 36.) The students were divided into three categories based on their ACT scores, less than 18, 19 to 23, and those students whose ACT score was 23 and above. In using the ACT division, the attrition rates for CC transfer students significantly decreased from 42.5% to 29.1%, a range of 13.4 points ($Z = 3.57, p < 0.05$). The NT students also had significantly lower attrition rates correlating to higher ACT scores, from 16.4% for those students with ACT scores of 18 and below to 11.3% for those students with ACT scores of 24 and above (Z

= 2.48, $p < 0.05$). However, regardless of ACT scores, CC transfer students had significantly higher attrition rates compared to the NT students' attrition rates (see Table 5).

One of the common assumptions is that community college transfer students are not prepared academically to transfer to four-year universities (Kinzer, 1996). As a measure of academic preparedness, grade point averages (GPAs) of students leaving without a baccalaureate degree were examined to see if non-persisters had significantly lower GPAs than persisters who were either still enrolled or had graduated. Since the CC transfer students had lower ACT scores, the GPAs at the time they left the Regent universities (for non-persisters) or graduated (for persisters) were analyzed according to the ACT scores.

Table 5. Attrition rates and GPAs cross-tabulated by ACT score for non-persisters

ACT score	CC transfer students				NT students				Z value
	Total N	%	Attr. rate %	GPA leavers	Total N	%	Attr. rate %	GPA leavers	
18 and below	313	24.1	42.5	2.21	268	4.7	16.4	2.12	6.84*
19 – 23	647	49.8	32.2	2.31	2,226	39.4	13.6	2.14	10.85*
24 and above	340	26.2	29.1	2.62	3,158	55.9	11.3	2.25	9.24*
Total & mean ACT	1,300	21.19	34.4	2.35	5,652	24.24	12.5	2.10	18.73*

*Significant at $p < 0.05$.

Grade point averages (GPAs) were cross-tabled for the non-persisters for both the CC transfer students and the NT students. In all three ACT groups, the CC transfer students had GPAs that exceeded 2.00 (the minimum passing grade) and exceeded the GPAs of NT students who did not persist. The hypothesis that CC transfer students withdraw from the Regent universities due to grades can be questioned using this data. While the CC transfer students left the Regent universities at significantly higher rates than NT students (see Z values in Table 5), there was no significant difference in the GPAs between CC transfer

students and NT students who had ACT scores of 18 and below ($t_{(121.5df)} = 0.99, p > 0.05$). Furthermore, the CC non-persister transfer students had significantly higher GPAs than the NT non-persister students who had ACT scores of 19 to 23 and who had ACT scores of above 23 ($t_{(350 df)} = 2.80$, and $t_{(447df)} = 4.98$, respectively; both $p < 0.05$).

Table 6 examines the retention rates (those who either graduated or are still enrolled at the Regent university) and GPAs analyzed by ACT score. Once again, the CC transfer students' retention rate is significantly lower than the NT students (see Z values in Table 6). However, the GPAs for the CC transfer students who have ACT scores of 18 and below are not significantly lower than the corresponding NT students ($t_{(302.7 df)} = -6.87, p < 0.05$). While the GPAs for CC transfer students who have ACT scores of 19 to 23, and 24 and above had significantly lower GPAs (2.82 vs. 2.88 and 3.05 vs 3.15, $t_{(567.6df)} = -2.33$ and $t_{(265df)} = -2.55$ respectively, both $p < 0.05$), the GPAs are both well over the 2.00 minimum GPA for graduation and the differences are not meaningful. This indicates that CC transfer students are prepared academically and can compete at the Regent university.

Table 6. Retention rates analyzed by ACT score for persisters

ACT score	CC transfer students				NT students				Z value
	Total N	%	Attr. rate %	GPA persisters	Total N	%	Attr. rate %	GPA persisters	
18 and below	313	24.1	57.5	2.65	268	4.7	83.6	2.68	6.84*
19 – 23	647	49.8	67.8	2.82	2,226	39.4	86.4	2.88	10.85*
24 and above	340	26.2	70.9	3.05	3,158	55.9	88.7	3.15	9.24*
Total	1,300		65.6	2.85	5,652	24.24	87.5	3.02	18.73*

*Significant at $p < 0.05$.

Understanding that the CC transfer students, even those who do not persist have GPAs above the minimum required, is very interesting. The fact that CC students whose ACT scores are 24 and above left the Regent universities with an average GPA of 2.62 might support the idea of “academic culture shock” and the need for increased social skills to cope with the different cultures.

Attrition rates by Regent university and college major

At the end of the study period, students could have left (attrition), could still be enrolled, or could have graduated. Attrition, enrollment, and graduation rates were calculated according to which Regent university was attended: Iowa State University (ISU), the University of Iowa (UI), or the University of Northern Iowa (UNI). The CC transfer students again had significantly higher attrition rates than NT students at each of the three Regent universities (see Table 7 for Z values). ISU had the lowest attrition rates and highest current enrollments for CC transfer students, at 30.8% and 14.8%, respectively. UI had the highest attrition rate for CC transfer students and NT students at 38.4% and 13.4%, respectively. UI has worked in the past years to promote a 4-year graduation contract with their first-time full-time students. The low enrollment rate of 2.6% for NT students might be a manifestation of that program. UNI had the highest graduation rates and the lowest current enrollment for CC transfer students – 56.8% and 9.0%, respectively.

Each Regent university creates its own numbering system and general education requirements, and collaborates with each community college to develop articulation agreements. However, the data suggest that CC transfer students have an attrition rate of

Table 7. Attrition, enrollment, and graduation rates by spring 2000 based on Regent university

Regent university	CC transfer students			NT students		
	Attrition	Enrollment	Graduated	Attrition	Enrollment	Graduated
ISU	30.8% Z = 11.24	14.8% Z = 5.94	54.4% Z = 13.51	12.6%	7.4%	80.1%
UI	38.4% Z = 14.6	11.7% Z = 9.98	49.9% Z = 18.41	13.4%	2.6%	84.0%
UNI	34.2% Z = 12.32	9.0% Z = 4.63	56.8% Z = 13.69	11.3%	3.9%	84.8%
Total	34.4% Z = 22.01	11.9% Z = 11.36	53.7% Z = 26.19	12.6%	4.7%	82.7%

almost three times the NT students. More research and study needs to be completed to identify barriers in the system as a whole and then implement programs designed to break-through these barriers. One possible program might be the four-year graduation contract with community college students who are in a “preferred” program of study. More research and study needs to be completed to identify barriers in the system as a whole and create strategies and programs to overcome these barriers.

Student Academic Services in the Office of the President at the University of California uses the same methodology employed in this paper. From the 109 community colleges in California, the CC student can transfer to one of the 9 universities in the University of California (UC) system. If accepted and transferred, the California CC transfer students have a graduation rate of 75.8% after four years compared to the graduation rate for NT students of 76.0% (1991 cohort) (*2000 Annual Report, University of California, 2000*).

California has worked hard to encourage more students to start in the community college system and then transfer to the UC system. Joint advising, more standardization of general education requirements, and programs aimed at academic and social integration have boosted CC transfer students' graduation rates. However, the transfer requirements are more stringent (students must have a 3.0 grade point average or better, depending on the college and major, to transfer to the UC system), thereby limiting transfer student access to the UC system.

In trying to understand attrition rate differences between CC transfer students and NT students, an analysis was done according to college major, regardless of Regent university. College majors were grouped by like curriculum (see Table 8). Table 9 then lists the number of students and the percentage of students in each major grouping. For both CC transfer students and NT students, over half of the students (52.7% and 56.5%, respectively) were enrolled in Liberal Arts & Sciences.

Table 8. Colleges included in like-major groups

Major	Colleges included		
	ISU	UI	UNI
Business	Business	Business	Business Adm.
Education	Education	Education	Education
Engineering	Engineering	Engineering	None
Liberal Arts & Sciences	Family/Consumer Sciences Liberal Arts & Science Design	Liberal Arts & Science	Social & Behavioral Science Humanities/Fine Arts Natural Sciences
Other	Agriculture Undecided	Nursing Public Health Dentistry	Undecided

Table 9. Number and attrition rates by major for CC transfer students and NT students

Major	No. & % total CC transfer students		No. CC left univ. and attrition rates		No. & % total NT students		No. NT left univ. & attrition rates		Z value
	N	%	N	%	N	%	N	%	
Business	370	18.0	98	26.5	1,058	17.9	81	7.7	9.45*
Education	258	12.6	81	31.4	453	7.7	32	7.1	8.53*
Engineering	89	4.3	15	16.9	573	9.7	54	9.4	2.13*
Liberal Arts & Science	1,081	52.7	436	40.3	3,338	56.5	512	15.3	17.40*
Other	253	12.3	75	29.6	482	8.2	65	13.5	5.30*
Total	2,051	100.0	705	34.4	5,904	100.0	744	12.6	22.01*

Significant at $p < 0.05$

Attrition rates were analyzed by the different college major groupings to determine whether there were significant differences across college major groupings (see Table 9 for Z values). Consistent with the other analysis, CC transfer students had significantly higher attrition rates than did NT students. The lowest attrition rate for CC transfer students were for those students in engineering (16.9%); the highest attrition rate for CC transfer students were those students enrolled liberal arts and sciences (40.3%). This is a significant difference ($Z = 4.37, p < 0.05$). For NT students, those students who were enrolled in education had the lowest attrition rate (7.1%), compared to the highest attrition rate for those NT students enrolled in liberal arts and sciences (15.3%). This is also a significant different ($Z = 4.71, p < 0.05$).

Attrition rates of full-time students

In trying to analyze the differences in attrition rates between CC transfer students and NT students, students grouped by the number of credits they had either accumulated or transferred in the fall of 1996. The three groupings included:

- 28 to 47 credits;
- 48 to 59 credits; and
- 60 to 76 credits.

If students were full-time for two years (12 credit hours per semester), they would accumulate 48 credit hours. Therefore, students with less than 48 hours would not be classified as full-time. If CC students had completed an AA degree, they would transfer in 60 or more credits. Likewise, for NT students, even though a full-time student is required to take 12 credits per semester, students wanting to graduate in 4 years must take 16 credit hours per semester, or have accumulated 64 or more credits.

For the CC transfer students, the attrition rate is lowest for the student with 60 to 76 credits and the highest for students who transfer 48 to 57 credits (see Table 10). There are no significant differences in the attrition rates for the CC transfer students who transfer 28 to 47 credits vs. the students who transfer 48 to 59 credits and for the CC transfer students who transfer 28 to 47 credits vs. the students who transfer in 60 to 76 credits ($Z = 1.36$ and $Z = 0.85$, respectively; both $p > 0.05$). However, the CC transfer students who transfer in 48 to 59 credits have significantly higher attrition rates than those CC transfer students who transfer in 60 to 76 credits ($Z = 2.25$, $p < 0.05$). For the NT student, there are significant differences among NT students in all credit groupings (for 28 to 47 credits, vs. 48 to 59

Table 10. Attrition rates of students according to total credits transferred or earned by fall 1996

No. credits	Attrition rate		Z value
	CC transfer students	NT students	
28 – 47	34.6%	18.2%	7.32*
48 – 59	39.9%	12.4%	11.01*
60 – 76	32.3%	4.7%	20.20*

credits, $Z = 4.92$; 48 to 59 credits, vs. 60 to 76 credits, $Z = 8.31$; and for 28 to 47 credits, vs. 60 to 76 credits, $Z = 12.91$; all with $p < 0.05$).

Implications for Practice

In comparing four-year attrition rates between community college (CC) transfer students and non-transfer (NT) students (based on the methodology of placing CC transfer students with NT students who are starting their third year), CC transfer students have significantly higher attrition rates than NT students. Even when holding ACT constant, the CC transfer students still have significantly higher attrition rates than NT students after four years. Cross-tabulations were completed for Regent university, gender, age, college major, and number of credits either transferred into the Regent university or accumulated by the beginning of the third year for the NT student; in all instances CC transfer students' attrition rates were significantly higher than NT students' attrition rates.

Even though CC transfer students have significantly more credits than NT students (54.48 vs. 51.33, $t_{(2639df)} = 6.941$, $p < 0.05$), it seems that the attrition rate patterns are more similar to first-time students rather than junior students. This could be due to academic culture shock, based on Oberg's (1960) culture shock theory and the six psychological

impacts of moving into a new culture: stress, requiring necessary psychological adaptations; a sense of loss and feelings of separation from friends, status, profession, and possessions; rejection by members of the new culture; confusion in expectations, values, feelings, and self-identity; anxiety after awareness of cultural differences; and inability to cope with a new environment. To combat academic culture shock, I propose a number of programs and policies to give the CC transfer students the social skills needed to relieve the stress and pressure of culture shock (Furnham & Bochner, 2001).

All three of the Regent universities have policies, procedures, and programs for transfer students. However, a more systemic view and better publicity about the existing programs, as well as expanding and developing new programs specifically for CC transfer students, are needed. It might be cost effective to fund a staff position focusing on social and academic integration of CC transfer students (Tinto, 1975), using other states as benchmarks for success. This position could also monitor attrition and graduation rates for CC transfer students as a means of accountability for the expanded programming.

Community colleges need to be included in the collaboration and partnership. Successful transfer starts before students attend a Regent university. Expanded policies and practices need to be initiated upon enrollment at the community colleges, such as:

- Joint admission or dual admission from the beginning of community college education to alert the Regent universities to CC students who are enrolled in a college-parallel track program and considering transfer in the future.**
- Advising of students by Regent university advisors while students are at the community colleges.**

- Semester orientation and follow-up meetings for those CC students who anticipate transfer to the Regent universities, including trips to the Regent university campuses.
- Learning communities at the community colleges for CC students who have indicated that they plan on transferring to the Regent universities.

The Regent universities could develop additional, comprehensive programs for transfer students, including students from community colleges and also students from other two-year and four-year institutions. Examples of these programs might include:

- Learning communities designed for transfer students. Iowa State University has over 50 learning communities for new freshmen, but transfer students do not have a learning community established for them because they are not classified as freshmen.
- A four-year guarantee program, guaranteeing CC students that they will complete a four-year degree program in four years. This might translate into two years at the community college and two years at the Regent university, or one year at the community college and three years at the Regent university, based upon the program desired and the community college.
- Peer mentors or learning partners. CC transfer students could be paired with NT students to help integrate them into the social and academic culture of the Regent university.
- A one-year core curriculum at the Regent universities that could be replicated at the community colleges.

In conclusion, Iowa CC transfer students have significantly higher attrition rates than NT students who start at the Regent universities. The community colleges and Regent universities must work together so CC transfer students have the social and academic skills to

stay at the Regent universities and complete a four-year degree program at the same graduation rates as the NT students. Practices must be established to promote social and academic integration.

Appendix A: Number and Percentage of Transfer Students by Community College

Community College	Number of CC students transferred to Regent university	CC transfer students %	Cumulative %	Size grouping	Total population of CC in 1995	Total CC students in college parallel track	College track students transferred to Regent university %
Kirkwood	433	21.1	21.1	Large	9,752	6,073	7.1
Des Moines Area	359	17.5	38.6	Large	11,034	8,318	4.3
North Iowa Area	220	10.7	49.3	Medium	2,878	2,341	9.4
Iowa Valley CC District	176	8.6	57.9	Medium	2,001	1,557	11.3
Eastern IA CC District	161	7.8	65.8	Medium	6,447	4,329	3.7
Hawkeye*	130	6.3	72.1	Medium	3,426	1,498	8.7
Iowa Central	120	5.9	78.0	Medium	3,136	1,552	7.7
Southeastern	91	4.4	82.4	Small	2,660	847	10.7
Indian Hills	90	4.4	86.8	Small	3,289	1,744	5.2
Iowa Lakes	80	3.9	90.7	Small	2,057	1,393	5.7
Northeast IA*	58	2.8	93.5	Small	2,586	1,153	5.0
Iowa Western	53	2.6	96.1	Small	4,788	2,414	2.2
Southwestern	33	1.6	97.7	Small	1,222	1,049	3.1
Western IA Tech*	26	1.3	99.0	Small	2,664	764	3.4
Northwest IA*	21	1.0	100.0	Small	574	209	10.0
Total	2051	100.0			58,514	35,241	5.8

*Began as vocational technical institutes. (The remainder were junior or pre-existing two-year colleges.)

**Appendix B: Demographic Comparison of CC Transfer Students and NT Students
in the Fall of 1996**

	CC transfer students	NT students	Combined
Attending ISU	709	2,261	2,925
Attending UI	675	2,365	3,040
Attending UNI	667	1,323	1,990
Total number of students	2,051	5,904	7,955
Credits transferred to ISU	54.6	54.0	54.2
Credits transferred to UI	54.3	42.9	45.4
Credits transferred to UNI	54.5	62.1	59.6
Mean number of credits	54.5	51.3	52.2
Mean age in years	22.2	20.1	20.6
Percentage female	46.6	52.6	51.0
Mean ACT scores	21.19	24.25	23.62
Mean GPA at graduation for students with ACT of 18 and below	2.47	2.59	2.53
Mean GPA at graduation for students with ACT of 19 – 23	2.66	2.78	2.76
Mean GPA at graduation for students with ACT of 24 and above	2.93	3.05	3.04

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CHAPTER 5: FINDINGS, IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSION

Key Findings

This study compares Iowa community college (CC) transfer students who transferred to one of Iowa's three Regent universities in the fall of 1996 to students who started at one of the Iowa Regent universities in 1994 and who still attended such university in the fall of 1996 (referred to as non-transfer, or NT, students)¹. Working with the three Regent university registrar offices (Iowa State University, University of Iowa, and University of Northern Iowa), data were collected from the permanent records of individual students. All full- and part-time undergraduate students transferring in the fall of 1996 from Iowa's 15 community colleges to one of the three Regent universities were selected and monitored until May 2000. The registrars also selected records of all full- and part-time undergraduate students who started at one of the Regent universities in the fall of 1994, were still enrolled in the fall 1996, and monitored these non-transfer (NT) students through May 2000 (see Table 1 in Chapter 1).

Demographic comparisons are made according to age, gender, ACT scores, and the number of credits either transferred or accumulated during the first two years of college. The key demographic findings of the study are that CC transfer students when compared to NT students:

- were significantly older on average (22.22, vs. 20.09 years, $t_{(2105df)} = 18.92$, $p < 0.05$);
- were significantly less likely to be female (46.6%, vs. 52.6%, $Z = -4.65$, $p < 0.05$);

¹ In previous educational literature, these students have been referred to as "native" students. To be culturally sensitive, this study identifies these students as "non-transfer students" or NT students.

- had significantly lower mean ACT scores (21.19, vs. 24.25, $t_{(6950\text{ df})} = -27.10$, $p < 0.05$); and
- transferred significantly more credits than NT students had accumulated in two years (54.48, vs. 51.33 credits, $t_{(2639\text{ df})} = 6.941$, $p < 0.05$).

Additional comparisons between CC transfer students and NT students were made in the spring of 2000 according to grade point averages at graduation or time of exit, graduation rates, and attrition rates, stratified by ACT scores, gender, and college major. When comparing CC transfer students to NT students, the key findings included:

- mean grade point average (GPA) at graduation was significantly lower than the NT students' mean graduation GPA, (2.83, vs. 3.09, $t_{(1348\text{ df})} = -11.33$, $p < 0.05$). However when stratified by ACT scores, the differences were less than a plus or minus grade differentiation (0.33 difference on a 4.0 scale);
- graduation rates for CC transfer students were significantly lower than for NT students (53.73%, vs. 82.71%, $Z = -26.19$, $p < 0.05$); and
- attrition rates were significantly higher (34.37%, vs. 12.6%, $Z = 22.01$, $p < 0.05$).

Furthermore, many stratifications were examined relating to graduation and attrition rates, including gender, ACT scores, Regent university, college major, and full-time traditional-age students. In all stratification tests, CC transfer students had significantly lower graduation rates and significantly higher attrition rates.

After examining the national research (Alba & Labin, 1981; Anderson, 1981; Austin, 1975; Cohen & Brower, 1989; Crook & Lavin, 1989; Dougherty, 1987, 1992; Hilton & Schrader, 1986; Pascarella, Edison, Nora, Hagedorn & Terenzini, 1998; Temple & Polk,

1986; Velez, 1985), this study was consistent with the national data of lower graduation rates and higher attrition rates of CC transfer students than NT students.

Implications

The study has implications for three different populations

1. Students and their parents contemplating enrollment in higher education
2. Iowa's community colleges and Regent university administrators and faculty
3. Iowa Board of Regents and policy makers

Students and their parents contemplating enrollment in higher education

When selecting a pathway into higher education, students and their parents need to balance many factors – admission qualification, the student's desired outcome (desire for a four-year degree), cost, the student's emotional and social level (is the student comfortable and confident of interacting at a large institution), and family obligations (does the student have to work, move a family, etc.). This study does not measure or identify which factors influence why students select either a community college or a Regent university as a beginning entrance into higher education. This study gives a statistical snapshot of what happened after the selection decisions were made for students who either attended Iowa's community colleges and transferred to the Regent universities or began their higher education pathway at the Regent university. The implications are based on a limited, one-time snapshot. Students and their parents need to examine the implications carefully, consider their own factors, and then select a pathway selected for an individual student.

In this study, graduation rates of CC transfer students were 33.4% lower than NT students and attrition rates 173% higher than NT students after four years at the Regent

universities. Furthermore, CC transfer students who have low ACT scores (18 and below) have graduation rates of 36.5% lower and attrition rates of 159% higher than NT students with similar ACT scores. Even for those CC transfer students with higher ACT scores (24 and above), the graduation rates were 28.1% lower and attrition rates for CC students were 134% higher than NT students with similar ACT scores. Based on these statistics, students who start at the Regent universities and continue into their third year have significantly higher graduation rates and significantly lower attrition rates than CC transfer students.

It appears that students experience *academic culture shock* when starting at the Regent universities, even for those CC transfer students who have successfully completed over 50 credits at a community college. Since attrition rates are similar for first-time freshmen and CC transferring first-year students, students should be aware that they will experience academic culture shock when they transfer to the Regent university. However, transfer students are given less orientation, have fewer opportunities to join clubs and honoraries, are not part of learning communities, and face academic culture the same as freshmen NT students.

Academic culture shock is built on the concept of culture shock, which implies that the experience of a new culture (in this case a new academic culture) is an unpleasant surprise (Furnham & Bochner, 2001). Anthropologist Kolervo Oberg (1960), who first used the term, mentions six psychological aspects of culture shock: stress requiring necessary psychological adaptations; a sense of loss and feelings of separation from friends, status, profession and possessions; rejection by members of the new culture; confusion in expectations, values, feelings, and self-identity; anxiety after awareness of cultural differences; and inability to cope with the new environment. The encouraging viewpoint is

that if students know about academic culture shock they can prepare for and be aware of how to counteract it.

One positive aspect of this study is that CC transfer students transferring to engineering majors had significantly lower attrition rates than CC students transferring to liberal arts and sciences fields (16.9%, vs. 40.3%, $Z = -4.37$, $p < 0.05$). Even though more research needs to be conducted, it appears that CC students who know what they want to do and are adequately advised and prepared for transfer can be successful, even in the challenging engineering programs.

Students and parents need to realize that not all courses from community colleges apply to a degree program. Many courses transfer, but not are part of a degree program, and therefore the courses will be used as electives. Students should collaborate with advisers from the community colleges, as well as promote collaboration with advisors from the Regent universities on their course selection. Academic integration is essential for successful transfer from community colleges to four-year institutions.

Academic success of CC transfer students was based on grade point averages (GPAs). Even though this criteria may be narrow, students and parents question whether a student will be academically prepared to compete at the four-year institution. Even though CC transfer students had significantly lower GPAs when stratified by ACT scores and Regent university, except for students with ACT scores of 18 or lower who attended the University of Iowa, the differences were not meaningful and for all ACT groups were less than a plus or minus grade differentiation (0.33 difference on a 4.0 scale) (See Table 2). This would support the idea that CC students can successfully compete academically once they transfer to the Regent

Table 2. Graduation grade-point averages for community college transfer and non-transfer students at each Regent university cross-tabulated based on ACT score

ACT score	Iowa State		Iowa		Northern Iowa	
	Transfer	Non-transfer	Transfer	Non-transfer	Transfer	Non-transfer
18 and below	2.23	2.54	2.43*	2.45*	2.61	2.76
19 – 23	2.48	2.70	2.54	2.72	2.85	2.94
24 and above	2.86	2.98	2.87	3.03	3.08	3.20

*No significant difference.

universities. The problem, therefore, does not appear to be academic preparation, but social and academic integration at the Regent universities.

For the 53.7% of the CC transfer students who graduate from the Regent institutions, community colleges provide a lower-cost alternative for the first two years of their higher education. More research needs to be done to examine other factors and why graduation rates are significantly lower for CC transfer students after four years at the Regent universities. Parents need to encourage students who start at community colleges to contact Regent university advisors as soon as possible to work on a curriculum that will prepare students academically for their four-year field of study.

For students who do not meet the Regent universities' admissions requirements, community college enrollment is the best alternative, if not the only one. In fact, Iowa State University routinely sends letters to those students with ACT scores of 17 and below advising them to attend community colleges. The CC transfer students with ACT scores of 18 and below have graduation rates of 48.6% (see Table 3). While this is the lowest graduation rate, almost half of the CC transfer students do graduate after four years at the

Table 3. Graduation rates of community college transfer and non-transfer students cross-tabulated by ACT score

ACT score	Transfer				Non-transfer				Z value
	ACT mean	N	%	Grad. rate	ACT mean	N	%	Grad. rate	
18 and below	16.73	313	24.1	48.6	17.21	268	4.7	76.5	6.90*
19 – 23	20.89	647	49.8	55.6	21.35	2,226	39.4	81.8	13.57*
24 and above	25.87	340	26.2	60.6	26.88	3,158	55.9	84.3	10.81*
Total	21.19	1,300	100.0	55.2	24.24	5,652	100.0	82.9	21.65*

*Significant at $p < 0.05$.

Regent universities. Parents need to encourage their CC transfer students to work with their CC advisors and the advisors at the Regent universities if they are to be successful.

Parents need to be aware that enrolling in an Associate of Arts (AA) degree program will not necessarily guarantee that the students have completed an equivalent two years in a specific degree program at a Regent university. Each four-year degree program has its own academic program requirements. The students must seek current information about articulation and transfer. The community college advisors will help the students through the AA degree program, but that does not mean that the students will be prepared for the third year in a specific degree program at one of the Regent universities. Students must identify a specific degree program at a Regent university and work with its advisor to be prepared for the third-year in that program *before* they transfer.

Iowa's community colleges and Regent university administrators and faculty

The implications of this study for community colleges and Iowa's Regent universities are that they need to continue and encourage more collaboration to address better the transfer function of community colleges. First, if transfer to four-year institutions is a priority for the community college students, then better records must be kept to track students, both those

who transfer to the Regent universities and those who transfer to other private and public four-year institutions. These records could identify successful institutions and programs and help administrators understand how to prepare students better for transfer.

Iowa's Regent universities are conducting an extensive qualitative study exploring reasons why students left the Regent universities, as requested by the Iowa Board of Regents. However, this study concentrates on first-time, full-time freshmen and excludes transfer students. A second study needs to be conducted for transfer students, especially community college transfer students. With CC transfer students comprising over 25% of the student body at the Regent universities, more research needs to be devoted to the community college transfer students.

Cohen (1996) has researched differences between high and low-transfer-rate of two-year colleges within the same state. The differences among two-year institutions appeared not to be focused on mandated policy-related issues – articulation agreements, common course-numbering systems, or the presence/absence of honors programs. These mandated policies were the same within the state. The differences, however, focused on the social integration and preparedness for the culture at the four-year institutions. Some characteristics of high-transfer-rate two-year colleges included a visible and vigorous transfer center staff, an accessible university that accepts transferring students with lower grade point averages (i.e., 2.0 GPA accepted for transfer, vs. 3.5 or higher GPA required for transfer), and a staff with expectations regarding transfer and students who were focused on transferring to a specific program.

To increase graduation rates of CC transfer students, both community colleges and Regent universities need staff to help advise, counsel, and have expectations for successful

transfers. Furnham and Bochner (2001) stress that social skills can make it possible for CC transfer students to avoid certain aspects of culture shock and, once culture shock has been experienced, social skills can relieve the stress and pressure of that culture shock. Borrowing from Furnham and Bochner (2001), preparing students with social skills could help avoid or at least alleviate academic culture shock.

Community college administrators and Regent university administrators need stronger ties to share information about articulation agreements and changes in program degree requirements at the Regent universities, and to publicize the importance of early identification of specific degree programs and their requirements. The Regent universities have a common site for all distance education courses (www.IRIDE.com), and a similar website could be established to help potential transfer students understand the necessity of early selection of a four-year institution, and the different programs that are available at each Regent university. These programs and websites can be established without changes in government policies or mandates by the Iowa legislature.

Iowa Board of Regents and policy makers

This study identifies a disparity in graduation rates and attrition rates between CC transfer students and NT students that cannot be ignored. The challenge of improving graduation rates and decreasing attrition rates is not only a statewide issue – it is a national issue. The journal, *New Directions for Community Colleges*, dedicated the winter 1996 issue to examining these challenges, “Transfer and Articulation: Improving Policies to Meet New Needs.”

Kintzer and Wattenbarger (1985) analyzed state policies to explore the relationships, if any, among higher education state policies concerning two-year and four-year public institutions, transfer rates, graduation rates, and attrition rates. They categorized states into four frameworks concerning transfer and articulation policies.

- Formal and legally based guidelines and policies, mandated by state law, state code, or a master plan with emphasis on completion of AA degree prior to transfer. Approximately eight states fall into this framework. Two examples are the Florida Formal Agreement Plan and Illinois' Legally-Based Plan.
- State system policies, with stronger and more direct state control. About 25 states fall into this framework, with examples including New Jersey's Full-Faith-and-Credit Policy and the Oklahoma State System Plan.
- Voluntary agreements among institutions. Approximately 28 states fit this framework, with Iowa and the Washington Intercollege Relations Commission being examples.
- Special agreements on vocational and technical credit transfer. A few states fit into this framework with special agreements. Examples include Michigan Mandated Policies and the North Carolina Health Articulation Project.

Arthur Cohen, Director of the National Center for Academic Achievement and Transfer (1996), relates increased transfer rates and high completion rates to the state's policy framework. States with formal policies mandated by state law and code have higher transfer rates and higher completion rates than states that do not have formal policies. The State of California, *Community college transfer students at UC: 2000 annual report*,

highlights the fact that CC transfer students have 75.8% graduation rate after four years in the UC system and 76.0% graduation rate for non-transfer students after six years (p. 10).

Iowa's Board of Regents is working hard to promote interinstitutional cooperation among the Regent universities. In a time of diminishing resources, retention of students can increase the bottom line for the Regents' universities. To serve the students and citizens of Iowa better, Iowa may want to research other states with more formalized policies and adopt policies for applicability in Iowa. More importantly, however, is a commitment on the part of the community colleges and the Iowa Board of Regents to work more closely together.

Recommendations

Given the key findings and implications of this study, the following recommendations will address increasing graduation rates and lowering the attrition rates of the CC transfer students:

- Publicizing current programs and articulation agreements, including expanding programs that are successful.
- Researching other state's policies and tracking programs for applicability to improve Iowa's transfer programs and graduation rates.
- Researching the social integration of CC transfer students.
- Researching academic integration of CC transfer students.

Publicizing current programs and articulation agreements, including expanding programs that are successful

All three of the Regent universities have policies, procedures, and programs for transfer students. However, a more systemic view and better publicity about the existing programs are needed, as well as expanding and developing new programs specifically for CC

transfer students. To promote successful transfer and articulation, all community college students who are enrolled in college-parallel tracks need to identify a four-year program degree as early as possible, understand the college equivalency guides, and request an advisor at the four-year institution.

One pilot program, Program Assisting College Transfer (PACT), is a collaboration among Iowa State University's College of Family and Consumer Sciences, College of Business, and Des Moines Area Community College (DMACC). In PACT, the students first must decide on a college degree program that they will pursue. The students then discuss the transfer options with their DMACC advisor and are given the name of the ISU advisor for that four-year college degree program. The students then contact the ISU advisor a minimum of once a semester. Each semester community college grade transcripts are sent to the ISU advisor for tracking purposes. This program is only in its first year, and meets the criteria listed above. Once evaluated and revisions made, PACT has the possibility of being expanded to include all Regent university colleges and all community colleges.

Community colleges and Regent university faculty need to be included in the collaboration and partnership. The faculty at the Regent institutions decide on course equivalencies articulation. Therefore, successful transfer starts when Regent university faculty and community college faculty communicate and agree on course equivalency and articulation programs. Once articulation agreements are in place; they need to be publicized so students are aware of them before the students transfer to the Regent institutions.

Expanded policies and practices need to be initiated upon enrollment at the community colleges, such as:

- Expanding the PACT program or a similar prototype to all Regent universities and community colleges.
- Creating joint admission or dual admission from the beginning of community college education to alert the Regent universities to CC students who are enrolled in a college-parallel track program and considering transfer in the future. The University of Iowa has initiated agreements with several community colleges, and these programs need to be monitored for successful transfer of community college students. The University of Northern Iowa has initiated a 2 + 2 program in technology education, which needs to be evaluated.
- Advising of students by Regent university advisors while students are at the community colleges. Even though this is a large part of the PACT program, this could be done without a formal program. Community college advisors need more information to inform community college transfer students about the barriers to, as well as the opportunities for, transfer to the Regent universities.
- Conducting yearly orientation for those CC students who anticipate transfer to the Regent universities. Community college students cannot wait until they finish two years at a community college to think about transferring to the Regent universities. Students need to be given more opportunities to come to the Regent campuses to interact with faculty and advisors.

Researching other state's policies and tracking programs for applicability to improve Iowa's transfer programs and graduation rates

In recent months, the Regent universities' registrars are becoming aware of this study and its findings. The issue of increasing CC transfer students' graduation rates is being

discussed and more strategies are being explored to increase social and academic integration of CC transfer students. Since this study is a one-time study, replication would strengthen the findings and provide a foundation for judging success of future programs. Collaboration between the Iowa Board of Regents and the Colleges of Education might stimulate other masters' and Ph.D. studies in this area, as well as researching peer institutions' policies and tracking systems. Mandated statewide policies will not guarantee successful transfer, but they might help eliminate barriers that now exist.

One barrier is the course numbering system that is different for each Regent university and different for each community college. One common numbering system, started by the Regent universities and expanded over time to include the community colleges, would reduce the confusion about course equivalency. Nebraska accomplished this task within two years after a statewide mandate. A separate, but similar issue, is that courses could be outcome- and competency-based to promote the building of skills needed for future courses in a degree program.

Autonomy of the Regent universities has resulted in strong, individualized specific degree programs. Just as the autonomy of the Regent universities is a strength, the autonomy of the community colleges is also a strength. At this time, it does not appear to be beneficial to require common AA degree requirements among community colleges. The AA degree gives the students a well-rounded body of knowledge, however, it does not prepare individual students for individual degree programs. AA degrees need to be flexible enough to give students a well-rounded body of knowledge, as well as preparing students for transfer into a specific degree program.

Many states have initiated tracking systems of community college and four-year state universities for accountability and to estimate effectiveness of transfer programs. Students do not follow a set pattern going from one community college to one Regent institution. Therefore, a statewide tracking system would enhance the knowledge of transfer patterns, successful completion of four-year degrees, and areas for improvement. The tracking system should include many key variables that were not available for this study through the Registrar's Office. Other variables that need to be included in a statewide tracking system would include race or ethnicity, socioeconomic data, parents' educational background, and quality of high school curriculum. After a tracking system is implemented, identifying key indicators for success or failure for transfer students could help community colleges and Regent universities develop programs to address these needs. The tracking system needs to be a collaboration among the Regent universities and the community colleges, for greatest efficiency and effectiveness.

Researching the social integration of CC transfer students

This study did not measure the social integration of community college students after they had transferred to the three Regent universities. First, research needs to be conducted to examine social integration, or lack thereof, of CC transfer students. Non-persister transfer students could be surveyed and focus groups could be conducted to examine the reasons for leaving the Regent universities.

However, this study did show that even though CC transfer students have slightly more credits than NT students do, it seems that the graduation and attrition rate patterns are more similar to first-time students rather than junior students. This could be due to academic

culture shock, based on Oberg's culture shock theory (1960). To combat academic culture shock, a number of programs are needed to give the CC transfer students the social skills to relieve the stress and pressure of culture shock (Furnham & Bochner, 2001). Examples of these programs might include:

- **Learning communities designed for transfer students.** Iowa State University has over 50 learning communities for new freshmen, but transfer students do not have a learning community established for them because they are not classified as freshmen. Learning communities could be started at the community colleges and then continued at the Regent universities. CC transfer students, therefore, would have a group of peers that travel with them from the community college to the Regent university. Some learning communities from smaller community colleges might have to merge their students to have enough students. However, the CC transfer students would still have social interaction with other CC transfer students facing similar academic culture shock.
- **Peer mentors or learning partners.** CC transfer students could be paired with NT students to help integrate them into the social and academic culture of the Regent university. These learning partners could be CC transfer students who transferred in previous years (social integration), or could be NT students who are in the same degree program as the CC transfer student (help with academic integration as well).

Researching academic integration of CC transfer students

Tinto (1975) developed one of the first models of student persistence. One of his main findings was that, "it is the individual's integration into the academic and social systems of the college that most directly relates to his continuance at that college" (p. 96).

Tinto measured academic integration by grade point averages, membership in scholastic societies, and interaction with classroom faculty. Increasing membership in scholastic societies and creating opportunities for community college students to relate directly with four-year institutions could result in increased academic interaction.

Transfer students miss most of the opportunities to become active in many honor societies, clubs, and organizations because of their arrival on campus at the beginning of their junior year. If clubs and organizations were aware of the large number of CC transfer students, they might consider a second round of application. The Registrar's Office could make transfer student names available to these clubs and organizations and encourage participation by the CC transfer students. Student Affairs could also publicize the importance of including transfer students in student-run organizations.

For students who know that after community college they plan on enrolling at a regent university, promoting a four-year guarantee program, that is, guaranteeing CC students that they will complete a four-year degree program in four years, might encourage academic integration. This might translate into two years at the community college and two years at the Regent university, or one year at the community college and three years at the Regent university, based upon the program desired and the community college. Many articulation programs for a successful 2 + 2 program are in place. Creating and then promoting this four-year guarantee would appeal to both parents and legislators.

Conclusion

In conclusion, this study shows that Iowa CC transfer students have significantly lower graduation rates and higher attrition rates than NT students who start at the Regent

universities and are still enrolled at the beginning of the third year. The community colleges and Regent universities must work together so CC transfer students have the social and academic skills to stay at the Regent universities and complete a four-year degree program at the same graduation rates as the NT students. Practices must be established to promote social and academic integration.

Ways need to be found to address the significantly lower graduation rates and significantly higher attrition rates experienced by community college transfer students. Policies and procedures need to be developed to address these issues. The community colleges and the Regent universities are collaborating and discussing ways to enhance the successful transfer of CC students. These collaborations and cooperation among the community colleges and the Regent universities need to be fostered and accelerated. By these institutions working together for the good of all Iowans, community college transfer students can be successful and obtain bachelor degrees at the same rates as the students who start at the Regent universities.

**APPENDIX: NUMBER AND PERCENTAGE OF TRANSFER STUDENTS BY
COMMUNITY COLLEGE**

Community College	Number of CC students transferred to Regent university	CC transfer students %	Cumulative %	Size grouping	Total population of CC in 1995	Total CC students in college parallel track	College track students transferred to Regent university %
Kirkwood	433	21.1	21.1	Large	9,752	6,073	7.1
Des Moines Area	359	17.5	38.6	Large	11,034	8,318	4.3
North Iowa Area	220	10.7	49.3	Medium	2,878	2,341	9.4
Iowa Valley CC District	176	8.6	57.9	Medium	2,001	1,557	11.3
Eastern IA CC District	161	7.8	65.8	Medium	6,447	4,329	3.7
Hawkeye*	130	6.3	72.1	Medium	3,426	1,498	8.7
Iowa Central	120	5.9	78.0	Medium	3,136	1,552	7.7
Southeastern	91	4.4	82.4	Small	2,660	847	10.7
Indian Hills	90	4.4	86.8	Small	3,289	1,744	5.2
Iowa Lakes	80	3.9	90.7	Small	2,057	1,393	5.7
Northeast IA*	58	2.8	93.5	Small	2,586	1,153	5.0
Iowa Western	53	2.6	96.1	Small	4,788	2,414	2.2
Southwestern	33	1.6	97.7	Small	1,222	1,049	3.1
Western IA Tech*	26	1.3	99.0	Small	2,664	764	3.4
Northwest IA*	21	1.0	100.0	Small	574	209	10.0
Total	2051	100.0			58,514	35,241	5.8

*Began as vocational technical institutes. (The remainder were junior or pre-existing two-year colleges.)

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