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# A comparison of the enrollment, persistence and transfer rates of white and minority students at Des Moines Area Community College

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**A comparison of the enrollment, persistence and transfer rates of white and minority  
students at Des Moines Area Community College**

by

Kim Jeanine Linduska

A dissertation submitted to the graduate faculty  
in partial fulfillment of the requirements for the degree of

**DOCTOR OF PHILOSOPHY**

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Program of Study Committee:

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Major Professor

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For the Major Program

**DEDICATION**

To my husband,

Steve,

and my children:

Angela, Katie, and Joe.

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**LIST OF ACRONYMS****Iowa's Fifteen Area Community Colleges**

NICC-01	Northeast Iowa Community College
NIACC-02	North Iowa Area Community College
ILCC-03	Iowa Lakes Community College
NCC-04	Northwest Community College
ICCC-05	Iowa Central Community College
IVCCD-06	Iowa Valley Community College District
HCC-07	Hawkeye Community College
EICCD-09	Eastern Iowa Community College District
KCC-10	Kirkwood Community College
DMAACC-11	Des Moines Area Community College
WITCC-12	Western Iowa Technical Community College
IWCC-13	Iowa Western Community College
SWCC-14	Southwestern Community College
IHCC-15	Indian Hills Community College
SCC-16	Southeastern Community College

**Iowa's Three Regents Universities**

ISU	Iowa State University
UNI	Northern Iowa University
UI	University of Iowa

## ABSTRACT

The role of the community college has been to unlock the doors of education opportunity for all individuals, and provide the entry point to higher education. Community colleges are the primary gateway to education for many of our minority and first generation students. Reflecting national trends, enrollment of minority students in Iowa's community colleges is increasing. The available transfer data demonstrate the low participation and transfer rates of minority students in community colleges and in higher education, in general, in Iowa. A detailed analysis of the number of minority students enrolling, and persisting in community colleges and transferring to four-year institutions is warranted.

The purpose of this study was to determine if minority students enrolled at Des Moines Area Community College (DMACC) as probable transfer students transferred to Iowa State University at the same rate as White students, and if there were any differences in the enrollment, within-term course retention, fall-to-spring persistence, and after transfer success rates of male students and female students in each of the minority groups at DMACC. The Chi-square test was used to compare expected frequencies calculated from DMACC's White student population with actual frequencies for DMACC's minority population.

Among the findings were: (a) with the exception of Hispanic students, most minority students enrolled in larger numbers than they exist in the population of the area; (b) Black and Asian students dropped courses at an alarmingly high rate during their first semester; (c) once minority students persisted past the first term of enrollment, the differences in persistence between minority and White students were minimal; (d) the transfer rate of Asian

females was nearly double that of Black students; (e) and Black males transferred at very low rates and succeeded at significantly lower rates than their White peers.

The study should be replicated on a statewide basis, including all community colleges as well as the three Regents' universities. A qualitative study should include perceptions of adjustment to college, preparedness for college, use of college support services, importance of higher education to the student and family, and other factors that affect the quality of a student's college experience.

## CHAPTER 1. INTRODUCTION

The role and function of the community college in the United States has been to unlock the doors of education opportunity for all individuals, and provide the entry point to higher education for millions. The impact of the community colleges on the higher education system is dramatic: the 1,171 community colleges in the system enroll 10.4 million students, 46% of all U.S undergraduates (American Association of Community Colleges, 2002). Community colleges are the primary gateway to education for many of our minority and first generation students.

Minority students are enrolling in higher education at record rates. In 2000, 4.3 million African-American, Hispanic, Asian American, and American Indian students attended college, an increase from fewer than 2 million in 1980. Of that 4.3 million, 2.1 million minority students were enrolled in community colleges. In addition, 46% of all Black, 55% of all Hispanic students, 46% of Asian/Pacific Islander, and 55% of all Native American students are enrolled at a community college (AACC, 2003). These students come to community colleges to pursue a variety of educational objectives, including academic transfer, vocational-technical, remedial, continuing education, and community service (Cohen & Brawer, 2002; Coley, 2000). Many of these students aspire to transfer to four-year colleges or universities to pursue bachelor's degrees (Laanan, 2003).

Minorities have made significant gains in educational attainment at all levels. From 1977 to 1997, the percentage of Black high school graduates enrolling in college increased from 49.6% to 55%, and the percentage of Hispanics increased from 46.9% to 55%. Yet, minority students still enroll in college at significantly lower numbers than their White peers.

During the same period, the percentage of White high school graduates enrolling in college also increased from 50.7% to 67.5%. (McCabe, 2000). Blacks make up 15.5% of the 15- to-19-year-olds, but they earn only 10% of associate degrees and 8.6% of bachelor's degrees (Table 1.1). Hispanics make up 14.4% of 15-to-19-year olds but they earn only 7.4% of associate degrees and 5.5% of bachelor's degrees. Further, 25.3% of Hispanics and 13.4% of Black students drop out of high school. White students make up 70.1% of 15-to-19-year olds, and earn 83.3% of associate degrees and 85.7% of bachelor's degrees (National Center for Educational Statistic, 1998). An encouraging sign in minority student achievement comes from a new report, issued in the fall of 2003. The ACE Minorities in Higher Education Annual Status Report states that the number of associate's degrees awarded to minority students between 1980-81 and 2000-01 increased by 143%; the number of Bachelor's degrees awarded to minorities increased 164%. (American Council on Education: Minorities in Higher Education Annual Status Report, 2003).

Table 1.1. Educational progression of African American, Hispanic and White non-Hispanic students

Ethnicity	Percentage				
	of population aged 15-19	who graduate from high school	who enroll in college (directly from H.S.)	who earn associate degrees	who earn Bachelor's degrees
African American	15.5	13.3	11.6	10.0	8.6
Hispanic	14.4	11.3	9.9	7.4	5.5
White Non-Hispanic	70.1	75.3	78.4	83.3	85.7

Source: National Center for Education Statistics 1998 and U.S. Bureau of the Census 1999 (cited in McCabe, 2000, p. 35).

Yet, the data clearly show that minority students fall farther behind at each step of the educational ladder. They are disproportionately poor, which correlates to under preparation and poor performance at every level. White students earn bachelors degrees at a rate ten times that of Black students, and the ratio is wider for Hispanic students (McCabe, 2000). For community college students pursuing a bachelor's degree, transfer is not an option or merely a convenience; it is mandatory, made necessary by the structure of higher education itself. Entry to four-year colleges or universities by community college students (i.e., transfer) is central to the realization of equal opportunity in education.

According to the National Center for Academic Achievement and Transfer, an affiliate of the American Council on Education, the need for successful transfer opportunities for community college students is defined by three factors that shape the national agenda for higher education: access, equity, and quality.

1. The central role community colleges play in meeting the national goals for access to higher education, especially for Black, Hispanic, and low-income students.
2. The importance of student success in higher education to ensure that educational opportunity helps to achieve the national commitment to equity and social justice.
3. The increasing public demand for quality in higher education. This demand has raised expectations about the effectiveness of two-year institutions in helping students move successfully into four-year colleges and universities.

As we enter an information and technology intense work world, the large numbers of minorities that fail to progress through the education system bodes ill for the future of our country. Achieving equality in educational opportunities is fundamental to our values and essential to the social and economic well being of the country. By the year 2050, the United



States will become almost a “majority minority” country. Whites will make up 53% of the population, down from 75% today (McCabe, 2000). Before the year 2020, half of American youth will be minority (Hodgkinson, 1997). Research has shown that there is a positive relationship between educational attainment and income earnings (Nettles & Perna, 1997). It would be detrimental to our society if minorities continue to be added to the class of under-educated, under-prepared adults. Successful movement of minorities through the education pipeline from two-to four-year institutions is a strategic means for raising the educational attainment levels of minorities, ultimately improving their income earning potential and quality of life.

### **Minority Student Enrollment in Iowa’s Community Colleges**

Reflecting national trends, community college enrollment in Iowa is growing. For the fiscal years 1999-2002, enrollment in Iowa’s community colleges grew from 93,140 credit students to 105,719. In 2002, 24.93% of Iowa’s adult population was enrolled in at least one community college course (Table 1.2). Iowa does not have a large minority population, but it is increasing, particularly in urban areas. While there are not large numbers of minority students in higher education in Iowa, that number is also growing. In 2000, there were 188,974 students in higher education in Iowa (two and four year degree-granting institutions). Of those, 14,313, or 7.6% were minority students. Black students comprised 2.9% (5,389 students), of the minority population, Hispanic students 1.9% (3,570 students), Asian students 2.3% (3,570 students), American Indian students .5% (933), and non-resident aliens 4.2% (7922) (*Digest of educational statistics, 2002.*)

Table 1.2. Iowa community college student enrollment (FY 1999-2002)

Fiscal year	Credit unduplicated enrollment	Non-credit duplicated enrollment	Non-credit unduplicated enrollment	Credit & non-credit unduplicated enrollment	Rate of Iowa's adult population enrolled in community college courses
1998-1999	93,140	616,825	324,371	417,511	23.78%
1999-2000	95,556	670,899	354,587	450,143	23.64%
2000-2001	98,602	684,853	347,578	446,180	25.41%
2001-2002	105,719	672,910	331,948	437,667	24.93%

Note: Reports based on census total of state adult population (18-64 years of age—website 2/7/2003).

Source: Iowa Department of Education MIS Reports, 1999-2002 Fiscal Year-End Reports.

In Iowa's community colleges, the percent of minority student enrollment is similar to the statewide numbers. It is small, but is steadily increasing. In the most recent Condition of Iowa's Community Colleges Report (2002), the Department of Education reports a minority population increase in the years between 1999 and 2002. In 1999, there were 6,682 American Indian, Asian, Black, and Hispanic students enrolled in Iowa's community colleges. In 2002, that number had grown to 8,083, an increase of 1,401 minority students. There was an increase in each of the four ethnic categories: American Indian students increased by 148, Asian students increased by 64, Black students increased by 662, and Hispanic students increased by 527 (Table 1.3).

The fastest growing community college minority student population in Iowa is Hispanic. From FY 1999 to FY 2002, Hispanic community college credit student enrollment increased from 1,519 to 2,046 (34.69%) (Table 1.4). The number of Black students attending Iowa's community colleges increased 25.74% during that same three-year period. The number of American Indian students has increased 25.91% since 1999. Only the Asian

Table 1.3. Iowa community college rate of growth of minority student populations

Minority student population	Enrollment change from FY 1999 to FY 2002	Percentage change from FY 1999 to fiscal year 2002
Asian	64	3.31%
Black	662	25.74%
American Indian	148	25.91%
Hispanic	527	34.69%

Source: Iowa Department of Education, Bureau of Community Colleges and Career and Technical Education, 2003.

Table 1.4. Iowa community college credit student ethnicity, fiscal year 1999 - 2002

Fiscal year	American Indian	Asian	Black	Hispanic	White	Unknown / No response	Total
1999	571	2,020	2,572	1,519	81,518	4,940	93,140
2000	622	1,998	2,587	1,672	83,412	5,265	95,556
2001	623	2,072	2,866	1,807	84,837	6,397	98,602
2002	719	2,084	3,234	2,046	90,993	6,643	105,719

Source: Iowa Department of Education, Bureau of Community Colleges and Career and Technical Education, 2003.

student population has shown little increase among minorities in the community college system.

In 2001, the Iowa Community College System developed a comprehensive planning document, entitled *Shaping the Future: A Five-Year Plan for Iowa's System of Community Colleges*. Within that plan are several key planning assumptions that recognize the changing demographic in Iowa, and the need to provide better services to meet the needs of the changing population. Specifically, the plan assumed that:

- The Iowa population will become more diverse;
- New Iowans (ethnically diverse/immigrants) will increase as a percentage of the population;
- Higher proportions of minority and ethnically diverse populations begin career preparation in community colleges; and
- A growing number of students planning to complete a four-year degree will begin college with two years at a community college. Many first generation college students will continue to choose to attend community colleges.

Although several goals within the five year plan touch on these planning assumptions, a key initiative in the five-year plan is to improve articulation of arts and sciences and technical programs across Iowa's education system so that more students, White and minority, can access the baccalaureate degree.

While the overall percentage of minority students in Iowa's community colleges remains less than 8% of the total student population, the number of minority students served by the community colleges grew from 7.2% of the total student population in fiscal year (FY) 1999 to 7.5% of the population in 2002. Table 1.5 depicts the Iowa Community college credit enrollment by ethnicity by college, for FY 2002.

The largest growth in the community college system during the last four years was in the arts and sciences divisions. In 2001, as a part of the Community College Strategic Plan, the Iowa Department of Education began collecting data for statewide performance indicators for student success in Iowa's community colleges. During that first year of performance indicator reporting, there were 65,733 students enrolled in credit arts and science programs in the community college system; by 2002, there were 74,779

Table 1.5. Iowa community college credit enrollment by ethnicity by college, FY 2002

College	FY 2002						Total
	American Indian	Asian	Black	Hispanic	White	No response	
NICC-01	34	31	71	34	4,795	638	5,603
NIACC-02	9	43	89	78	3,771	1	3,991
ILCC-03	10	25	19	30	4,287	33	4,404
NCC-04	3	22	4	4	1,493	59	1,585
ICCC-05	7	30	36	53	5,759	298	6,183
IVCCD-06	54	36	136	82	2,843	159	3,310
HCC-07	36	88	473	66	5,766	107	6,536
EICCD-09	75	181	468	404	7,833	1,029	9,990
KCC-10	225	301	571	356	14,977	2,150	18,580
DMACC-11	74	945	952	421	17,516	828	20,736
WITCC-12	95	166	120	284	5,966	482	7,113
IWCC-13	28	88	115	75	5,114	397	5,817
SWCC-14	5	8	14	16	1,675	1	1,719
IHCC-15	48	70	58	68	5,426	383	6,053
SCC-16	16	50	108	75	3,772	78	4,099
Total	719	2,084	3,234	2,046	90,993	6,643	105,789
Percentage of total	0.63%	2.10%	2.91%	1.83%	86.04%	6.49%	100.00%

Source: Iowa Department of Education, Bureau of Community Colleges and Career and Technical Education, 2003.

students. Table 1.6 depicts the enrollment by gender and race, in arts and sciences transfer courses. The enrollment trends in Iowa are similar to the national rate of enrollment: more females than males enroll in transfer arts and sciences courses, and significantly smaller numbers of minority students are enrolled in arts and science courses than White students.

An analysis of how well students persist toward some type of award (degree, diploma, or certificate) attainment in Iowa's community colleges was released in September, 2003 by the Iowa Department of Education in its first ever persistence report. Table 1.7 depicts the breakdown of persistence by community college students toward an

Table 1.6. Credit arts and science programs by gender and ethnicity (1999-2002)

Breakdown	FY2001	FY2001 %of total	FY 2002	FY2002 % of total
Gender				
Male	29,215	41.51%	30,550	40.85%
Female	41,139	58.46%	44,190	59.09%
Unknown	19	0.03%	39	0.05%
Total	70,373	100.00%	74,779	100.00%
Ethnicity				
American Indian	376	0.53%	454	0.61%
Asian	1,674	2.38%	1,680	2.25%
Black	2,142	3.04%	2,407	3.22%
Hispanic	1,272	1.81%	1,433	1.92%
White	60,025	83.30%	63,874	85.42%
No Reply	164	0.23%	1,169	1.56%
Unknown	4,720	6.71%	3,762	5.03%
Total	70,373	100.00%	74,779	100.00%

Source: Iowa Department of Education MIS Reports; 1999-2002 Fiscal Year-End Reports.

award between 1999 and 2002. Of those students tracked, 50.31% of White students, 22.79% of Black students, 33.73% of Asian students, 33.82% of American Indian students, and 35.75% of Hispanic students persisted to obtain a community college award. These data are quite impressive when compared to national statistics on award attainment by race/ethnic background. Nationally, the distribution of Associates degrees by race/ethnicity is much different from the preliminary data from Iowa (Table 1.8). The difference could be attributed to the difference in the definition of award. In Iowa, the awards include diplomas and certificates as well as degrees. A better measure of how well Iowa compares to the national average of attainment of degrees by minority students is a comparison of AA degrees attained.

Table 1.7. Persistence rate of first-time/full-time credit students granted awards (FY 1999)

Breakdown	Total FY 1999 cohort first-time/full-time students	Unduplicated students in whose cohort received awards in F7 99, 00, 01, and/or 02	Persistence Percent of Total
<b>Gender</b>			
Male	5,523	2,568	46.50%
Female	5,329	2,722	51.08%
Unknown	9	0	2.42%
Total	10,853	5,290	100.00%
<b>Ethnicity</b>			
American Indian	68	23	33.82%
Asian	169	57	33.73%
Black	193	1,167	22.79%
Hispanic	193	69	35.75%
White	9,777	4,919	50.31%
No Reply	9	5	55.56%
Unknown	343	150	43.73%
Total	10,853	5,290	48.74%

Source: Iowa Department of Education MIS Reports: 1999-2002 Fiscal Year-End Report; 2002 Condition of Iowa Community Colleges, 2003.

Table 1.8. Number and percentage distribution of degrees conferred by colleges and universities, by race/ethnicity and degree level (1999-2000)

Degree level	Total	White, non-Hispanic	Black, non-Hispanic	Hispanic	Asian/Pacific Islander	Am Indian/Alaska Native	Non-resident alien
Number of degrees conferred							
Associate degree	564,933	408,508	60,191	51,541	27,764	6,494	10,445
Bachelor's degree	1,237,875	928,013	107,891	74,963	77,793	8,711	40,504
Master's degree	457,056	317,999	35,625	19,093	22,899	2,232	59,208
Doctor's degree	44,780	27,492	2,220	1,291	2,380	159	11,238
First professional	80,057	59,601	5,552	3,865	8,576	564	1,899
Percentage distribution of degrees conferred							
Associate degree	100.0	72.3	10.7	9.1	4.9	1.1	1.8
Bachelor's degree	100.0	75.0	8.7	6.1	6.3	0.7	3.3
Master's degree	100.0	69.6	7.8	4.2	5.0	0.5	13.0
Doctor's degree	100.0	61.4	5.0	2.9	5.3	0.4	25.1
First professional	100.0	74.4	6.9	4.8	10.7	0.7	2.4

Note: Includes 2- and 4-year degree-granting institutions that were participating in Title IV federal financial aid programs. A nonresident alien is a student at a U.S. degree-granting institution on a temporary visa and without the right to remain in the country indefinitely. Detail may not add to totals due to rounding.

Source: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 2001*, based on Integrated Postsecondary Education Data System (IPEDS), "Completion" survey, 1999-2000.

As a part of the same persistence report, the Iowa Department of Education began tracking the number of community college students who earned degrees in Iowa's community colleges. Table 1.9 depicts the number and percentage of AA awards earned during the four-year period beginning in 1999. A comparison of the percentage of minority students *enrolled* in arts and sciences courses and the percentage of the total AA degrees *earned* reveals that minority students in Iowa community colleges do not obtain degrees at the same rate as they enroll in courses leading toward the AA degree. In FY 2001, 85.30% of the enrolled students in arts and science programs were white, and 85.90% of the AA degrees were awarded to White students. However, in the same year, Black students enrolled in 3.04% of the arts and science courses, yet only 2.39% AA degrees were awarded to Black students; and 2.38% of the enrollment was comprised of Asian students, yet only 1.84% of

Table 1.9. Credit student Associate of Arts (AA) awards by gender/ethnicity (1999-2002)

Breakdown	FY1999 AA	Fy1999 AA % of total	FY2000 AA	FY2000 AA % of total	FY2001 AA	FY2001 AA % of total	FY2002 AA	FY2002 AA % of total
Gender								
Male	1,347	36.79%	1,251	35.15%	1,400	36.76%	1,399	35.73%
Female	2,203	60.17%	2,178	61.20%	2,217	58.20%	2,386	60.93%
Unknown	111	3.03%	130	30.65%	192	5.04%	131	3.35%
Total	3,661	100.00%	3,559	100.00%	3,809	100.00%	3,916	100.00%
Ethnicity								
Am Indian	11	0.30%	11	0.31%	22	0.58%	29	0.74%
Asian	55	1.50%	45	1.26%	70	1.84%	60	1.53%
Black	79	2.16%	81	2.28%	91	2.39%	74	1.89%
Hispanic	42	1.15%	56	1.57%	70	1.84%	52	1.33%
White	3,275	89.46%	3,151	88.54%	3,272	85.90%	3,477	88.02%
No reply	2	0.05%	0	0.00%	1	0.03%	12	0.31%
Unknown	197	5.38%	215	6.04%	283	7.43%	242	6.18%
Total	3,661	100.00%	3,559	100.00%	3,809	100.00%	3,916	100.00%

KEY: AA= Associate of Arts; percentages may not be equal due to rounding.

Source: Iowa Department of Education MIS Reports: 1999-2002 Fiscal Year-End Report; 2002 Condition of Iowa Community Colleges



the degrees were awarded to Asian students. Only 1.81% of the Arts and Science enrollment comprised Hispanic students, which was nearly identical (1.84%) to the Hispanic students receiving AA degrees. Finally, 0.53% of the arts and sciences enrollment was comprised of American Indian students, which equaled the percentage (0.53%) of the AA graduates. For 2001, the percentage of students enrolling in arts and sciences credits compared to the percentage that graduated with the AA degree remained lower for minority students: White students (85.42% enrollment, 88.02% graduates); Black students (3.22% enrollment, 1.89% graduates); Asian students (2.25% enrollment, 1.53% graduates); Hispanic students (1.92% enrollment, 1.33% graduates); and American Indian students (0.61% enrollment and 0.74% graduates).

According to the research, it is a national trend that minority students are underserved by higher education, and that minority students transfer from community colleges to four-year colleges and universities at a lower rate than their White counterparts (Rendon, 1993). The small numbers of minority students enrolling in and receiving AA degrees from Iowa's community colleges reflects the national trends, and should be of concern, not only to the community colleges but also to the four-year colleges and universities in Iowa that strive to boost minority enrollment.

### **Transfer as a Function of Iowa's Community Colleges**

The transfer function is an important component of all of Iowa's community colleges, and community colleges are a primary provider in the first two years of undergraduate education for Iowa's students. Table 1.10 depicts the total enrollment from 1998 to 2002 in

Table 1.10. Summary of total state enrollment of students (fall 1998, fall 1999, fall 2000, fall 2001, & fall 2002)

Term	Iowa Regents	Private colleges & universities	Iowa community colleges	Other colleges*
Fall 1998	67,619	48,334	61,480	5,096
Fall 1999**	68,509	48,141	64,793	5,229
Fall 2000	68,930	48,337	65,836	5,803
Fall 2001	70,661	49,362	68,581	5,783
Fall 2002	71,521	49,231	73,805	4,194

\* Iowa professional colleges, private junior colleges & business schools, nursing schools, radiological tech schools.

\*\* One business school did not report in fall 1999.

Source: Iowa College and University Enrollment Report (Fall 1998-2002).

higher education in Iowa. In 2002, for the first time, community college enrollment was larger than enrollment at the three Regent universities. More students are enrolling at community colleges, many with the intention of transferring to finish their baccalaureate degree.

There is a long history of cooperation between the community college system and the Regent universities on transfer issues. In 1972, the Liaison Advisory Committee of Transfer Students (LACTS) committee was created by the Board of Regents, State of Iowa, to make student transition among Iowa's public institutions of higher education as seamless as possible. LACTS was originally created in response to transcript and grading symbol issues, but soon began to address broader transfer related issues. Since its inception, the LACTS committee has developed several transfer agreements between the community colleges and the Regents universities, including:

- Vocational-technical credit agreement;
- College Level Examination Program (CLEP) agreement; and
- The Associate of Arts articulation agreement.

The LACTS committee has addressed the issues of transfer and articulation between the community colleges and the Regents universities in terms of the process within each institution to identify and articulate specific courses, most effectively for the Associate of Arts degree. In 2002, a new policy group, the 2+2 Council, was formed by the Board of Regents, to further study and make recommendations to the Regents and to community colleges about articulation and transfer processes in Iowa.

Despite cooperative efforts, the Board of Regents and the Department of Education have not used the same systems to track the transfer rates of students from Iowa's community colleges to the three state universities. As a result of the goals identified in the Five-Year plan for Iowa's System of Community Colleges (2001), the community colleges, the Iowa Department of Education, and the Iowa College Student Aid Commission began collaborating with the National Student Clearinghouse in an effort to track Iowa Community College students transfer rates. In FY 2002, the community college credit enrollment totaled 105,719 students. A cohort of 200 award recipients in FY 02 was randomly selected as a pilot test to provide a snapshot of transfer students from Iowa's Community Colleges. Of the 200 pilot test graduates who transferred, 43.50% earned an AA degree (Table 1.11).

The specific transfer data are presented in Table 1.12 by gender and race/ethnicity. Over 90% of the transfer students in the cohort that received an AA award were White, whereas only 4.60% were designated as minority students. Of this cohort group, 63, or

Table 1.11. Transfer rate for award recipients by award (FY 02)

Award type	Number of transfers	Percentage of transfers
Associate in Arts (AA)	87	43.50%
Associate in Science (AS)	22	11.00%
Associate in Applied Science (AAS)	91	45.50%
Total	200	100.00%

Source: Iowa Department of Education, Bureau of Community Colleges, Management Information System (MIS), 2003.

Table 1.12. Iowa Associate of Arts recipients (FY 02)

Characteristic	Number of students	Percent of students
Gender		
Male	33	37.93%
Female	54	62.07%
Race/Ethnicity		
American Indian	1	1.15%
Asian	0	0.00%
Black	1	1.15%
Hispanic	2	2.30%
White	79	90.80%
Unknown	4	4.60%

Source: Iowa Department of Education, Bureau of Community Colleges, Management Information System (MIS), 2003.

31.50%, transferred to a four-year institution. Of those 63, 15 transferred to Iowa State University, 13 transferred to the University of Iowa, and 11 transferred to the University of Northern Iowa. The remainder of the students transferred to private colleges and universities in Iowa, or out of state institutions (National Student Clearinghouse, 2003). Since the pilot test data were only compiled in the summer of 2003, no data are available that tracks how well the transfer students do upon transfer.

The data collected by the Department of Education on the composition of the community college student population, and the enrollment and transfer rates establish a clear picture of the participation of minority students in the community college system. The minority population in Iowa is small, but growing, and the community college is the primary choice to access higher education opportunities. More minority students were enrolled in the community colleges in 2002 (8,083) than in the three public universities (5,370). While minority students enter community colleges with many goals other than transfer, the alarmingly low number of minority students that do transfer warrants further study.

### **Need for the Study**

Tracking Iowa community college enrollment, persistence, and graduation and transfer rates has received increased attention in recent years, due to several factors. More students are enrolling at a community college as their first step in their goal of obtaining the baccalaureate degree, the Iowa General Assembly is calling for more accountability in all segments of education, and the community colleges are requesting more accountability as a part of the five-year strategic plan adopted in 2001. More statewide accountability translates into greater local accountability for tracking enrollment, persistence, graduation, and transfer rates of students. The available transfer data demonstrate the low participation and transfer rates of minority students in community colleges and in higher education in Iowa. A more detailed analysis of the number of minority students enrolling, and persisting in the community college system and transferring to four-year institutions is warranted.

DMACC enrolls the largest number of minority students in the community college system (Condition of Iowa Community Colleges, Iowa Department of Education, 2003).

From FY 1999 to 2002, DMACC enrolled 8,604 minority students (Iowa Department of Education, 2003). For fall term 2003 at Des Moines Area Community College, minority students comprised 10% of the total student population, a reflection of the minority population in its eleven county service area. Of the 10% minority population, 5 % were Black, 2% Hispanic, and 3% Asian. The largest percentage of minority students at DMACC is located on the Urban campus in downtown Des Moines (Table 1.13) with a minority population of 26% (Fall, 2003). DMACC Urban campus serves the largest percentage of minority students of any public two or four year college in Iowa.

Table 1.13. DMACC credit student enrollment by race/ethnicity (1999-2000)

2003 – 2004	Campus			
	District		Urban	
Race/ethnicity	Number	Percent	Number	Percent
White	11,014	81	1,594	71
Unknown	1,246	9	73	3
Black	702	5	367	16
Asian	457	3	153	7
Hispanic	254	2	75	3
Total		100		100

  

2002 – 2003	Campus			
	District		Urban	
Race/ethnicity	Number	Percent	Number	Percent
White	11,135	84	1,516	71
Unknown	633	5	72	3
Black	630	5	343	15
Asian	491	4	143	7
Hispanic	268	2	76	4
Total		100		100

The increasing enrollment numbers of minority students at DMACC suggest that many minority students in central Iowa are choosing DMACC as the entry point for higher education. Yet, the college has very little data about how well minority students fare in the pursuit and attainment of their educational goals at DMACC. Although there is information available about the number of minority students that enroll at DMACC, there has been no data analysis at DMACC to measure the rate at which minority students persist during their first and subsequent terms compared to White students, or the transfer rate of minority students at DMACC compared to the transfer rate of White students. There is no information about how well minority female students fare compared to male minority students, or compared to White students.

Because a primary purpose of the community college is to provide transfer education to all who seek it, monitoring transfer rates of all students that leave DMACC for a four-year institution is essential. Although DMACC works with ISU and the other Regents universities to track the number of students that transfer, there is no data analysis of how many minority students transfer or how well the minority student population from DMACC performs after transfer. In order to better serve the minority student population at DMACC that intends to transfer, an analysis of minority student performance at DMACC, and transfer rates and success upon leaving DMACC is necessary. Because the most significant number of students who transfer from DMACC choose to transfer to Iowa State University, this study focused only on the transfer rate from DMACC to ISU. Table 1.14 illustrates the number of DMACC graduates who transfer to the three public universities, and the three private universities in the Des

Table 1.14. Number of DMACC graduates transferred to public and private Iowa universities

Iowa university	2001-2002	2000-2001*	1999-2000	1993-1999	1997-1998	1996-1997
ISU	108	NR	70	79	61	82
UNI	34	NR	22	24	21	24
UI	22	NR	9	13	13	18
Grandview	52	NR	20	13	19	12
Drake	18	NR	14	10	8	12
Simpson	7	NR	7	2	8	7

\*Not reported. Source: Placement Reports, DMACC Placement and Resources Center.

Moines metro area. This table does not represent all the students that transfer, since many students transfer prior to graduating. However, since the DMACC Placement Office only conducts follow-up studies on graduating students, there is no consistent data available on the number of students that transfer to Iowa colleges and universities without having earned an Associate of Arts Degree.

When the present researcher undertook this study, there were no data available on a statewide basis that tracked the transfer rates of Iowa community college students. The only data available were the transfer reports to each of the community colleges from the three Regents universities that list the names of the students, the student's GPA upon entering, and the GPA during the current term. Any comprehensive study would be difficult to undertake, primarily because of different data collection systems at the community colleges, and until the spring of 2003, there was no system at the Department of Education to collect, analyze, and disseminate the data.

In August of 2003 the Department of Education released its first pilot study of transfer students to provide a snapshot of the transfer success of community college students.



The Department, in conjunction with 13 community colleges, worked with the National Student Clearinghouse to begin collecting and analyzing transfer data. The pilot test provided a good beginning for data gathering and analysis of transfer students in Iowa. However, the test, by design, examined only a very small sample (200 students) statewide. The Department anticipated that, by 2005, it will be able to release statewide transfer rate data.

Although a statewide study is necessary, each community college maintains a responsibility to track students and monitor transfer and success rates. The current study was the first to analyze institutional data at DMACC to determine how minority students compare to White students in enrollment, persistence, and transfer to Iowa State University.

### **Purpose of the Study**

The purpose of this study was to determine if the minority students enrolled at DMACC as probable transfer students transferred to Iowa State University at the same rate as White students, and to determine if there were any differences in the enrollment, within-term course retention, fall-to-spring persistence, and after transfer success rates of male students and female students in each of the minority groups at DMACC. If DMACC is to address locally the national trend of enrollment and transfer rates that are lower for minority students than for White students, then an analysis is necessary to determine how minority students compare to White students in enrollment, persistence and transfer to baccalaureate degree institutions.

Information about the enrollment and transfer rate of minority students is important to Iowa's higher education system, because successful movement of minorities through the

education system from two-to four-year institutions is central to raising the educational attainment levels of minorities, ultimately improving their income earning potential and quality of life. Because DMACC enrolls the largest percentage of minority students in higher education in Iowa, a study of the success of minority students at DMACC who enroll with the intent to transfer to ISU is an important beginning point for a statewide study.

### **Objectives**

The primary objective of the study was to compare the enrollment, within term course retention, fall-to-spring term retention, and transfer rate to ISU of minority and White students enrolled at DMACC to determine if there were significant differences between White students and minority students, and between male and female White and minority students. More specifically, the objectives were to determine if minority students:

1. Enroll at DMACC at the same rate at which they are represented in the population of the college's eleven county service district.
2. Are more or less likely than White students to persist in courses during their first term.
3. Are more or less likely than White students to return during the spring term immediately following their first fall term at DMACC.
4. Are more or less likely than White students to transfer from DMACC to ISU.
5. Are more or less likely to succeed at ISU upon transfer as defined by having earned at least 24 credits with a cumulative GPA=> 2.00 or earned a baccalaureate degree.

### Research Questions

Three research questions guided the investigation:

1. Are there significant differences between the enrollment, within-term course retention, and fall-to-spring persistence rates of minority and White students at Des Moines Area Community College?
  - a. What is the percentage of minority students that enroll at Des Moines Area Community College compared to the percentage that exist in DMACC's service area population?
  - b. What is the rate at which minority students are retained in the courses they register for during their first term at DMACC compared to White students?
  - c. What is the rate at which minority students persist from the fall to spring term at DMACC compared to White students?
  - d. Is there any difference in male and female minority students in their enrollment, within-term course retention, and fall-to-spring persistence rates at DMACC?
2. Are there significant differences in the transfer rate of minority and White students from Des Moines Area Community College to Iowa State University?
  - a. What is the rate at which minority students transfer to ISU from DMACC compared to White students?
  - b. Are there differences in the rate at which male and female minority students transfer to ISU?
3. Are there significant differences in the success of minority students and White students after transfer from DMACC to ISU?

- a. What is the rate at which minority students succeed at ISU as measured by 24 earned credits at ISU with a cumulative GPA of  $\geq 2.00$  or having earned a baccalaureate degree compared to White students?
- b. Is there a difference in the success rate (as defined in 3.a.) at ISU of male and female minority students?

### Hypotheses

Data analysis was performed to address twelve hypotheses:

1. DMACC serves a lower percentage of male minority credit earning transfer-oriented students 18 years old and older than exist in the general population of DMACC's eleven county service area.

$H_0$  No difference exists between percentages of male minority students 18 years old and older in the total population of DMACC's eleven county service area, and DMACC's minority credit earning transfer-oriented student body.

2. DMACC serves a lower percentage of female minority credit earning transfer-oriented students 18 years old and older than exist in the general population of DMACC's eleven county service area.

$H_0$  No difference exists between percentages of female minority students 18 years old and older in the total population of DMACC's eleven county service area, and DMACC's minority credit earning transfer-oriented student body.

3. DMACC does not serve the same proportion of male and female credit earning transfer-oriented minority students than exist in the 18-year old and older total population of DMACC's eleven county service area.

$H_0$  No difference exists between the percentage of male and female minority credit earning transfer-oriented students 18 years old and older in the total population of DMACC's eleven county service area, and DMACC's credit earning transfer-oriented student body.

4. The within-term course retention and fall-to-spring persistence rates for first-time, full-time male minority credit earning transfer-oriented students is significantly less than the within-term course retention and fall-to spring persistence rates for first-time, full-time male credit earning transfer-oriented White students at DMACC.

$H_0$  No differences exist in the within-term course retention rates and the fall-to-spring persistence rates between first-time, full-time male minority credit earning transfer-oriented students and first-time, full-time male White students at DMACC

5. The within-term course retention and fall-to-spring persistence rates for first-time, full-time female minority credit earning transfer-oriented students is significantly less than the within-term course retention and fall-to-spring persistence rates for first-time, full-time female credit earning transfer-oriented White students at DMACC.

$H_0$  No differences exist in the within-term course retention rates and the fall-to-spring persistence rates between first-time, full-time female credit earning transfer-oriented minority students and first-time, full-time female credit earning transfer-oriented White students at DMACC.

6. The within-term course retention and fall-to-spring persistence rates for first-time full-time male credit earning transfer-oriented students is significantly different than

the within-term course retention and fall-to-spring persistence rates for first-time, full-time female credit earning transfer-oriented students at DMACC.

$H_0$  No differences exist in the within-term course retention rates and the fall-to-spring persistence rates between first-time full-time male credit earning transfer-oriented students and first-time, full-time female credit earning transfer-oriented students at DMACC.

7. A significantly smaller percentage of male minority credit earning transfer-oriented students transfer from DMACC to Iowa State University than do male credit earning transfer-oriented White students.

$H_0$  No difference exists between the rate male minority credit earning transfer-oriented and White credit earning transfer-oriented students transfer from DMACC to Iowa State University.

8. A significantly smaller percentage of female minority credit earning transfer-oriented students transfer from DMACC to Iowa State University than do credit earning transfer-oriented White female students.

$H_0$  No difference exists between the rate female credit earning transfer-oriented minority and White credit earning transfer-oriented students transfer from DMACC to Iowa State University.

9. A significant difference exists between the rate male and female DMACC credit earning transfer-oriented students transfer to Iowa State University.

$H_0$  No difference exists between the rate male and female DMACC credit earning transfer-oriented students transfer to Iowa State University.

10. Upon transfer to Iowa State University, male minority students succeed at a lower rate than male White students.

$H_0$  Once transferred from DMACC to Iowa State University, no difference exists between the rate of success of male minority and White students.

11. Upon transfer to Iowa State University, female minority students succeed at a lower rate than female White students.

$H_0$  Once transferred from DMACC to Iowa State University, no difference exists between the rate of success of female minority and White students.

12. Upon transfer from DMACC to Iowa State University, significant differences exist between the rate of success of male and female students.

$H_0$  Upon transfer from DMACC to Iowa State University, no differences exists between the rate of success of male and female students.

### **Significance of the Study**

DMACC is the largest community college in Iowa. In 2002, 23.95% of the arts and science students in the community college system were enrolled at DMACC (Department of Education, Condition of Iowa Community Colleges, 2003). Twenty-three percent of Iowa's population (686,795 residents) lives in the DMACC service delivery area, and 56,490, or 8% of the total population is minority (Census 2000 Summary File). DMACC also enrolls the largest minority population of the community colleges in the state (Department of Education, Condition of Iowa Community Colleges, 2003). If the college is to adequately serve this population, accurate data on enrollment, retention, and transfer patterns must be accessible to college decision makers. Research on the role of community colleges in providing access to

higher education for the nation's minority population reveals that minority students do not enroll at the community college, or transfer and persist toward a baccalaureate degree at the same rate as White students. It is unknown if DMACC reflects the same trends in enrollment and transfer of minority and White student populations as the national statistics. Des Moines Area Community College has not previously conducted an analysis of the rate of enrollment and persistence of the minority student population, or the rate of transfer of minority students to ISU.

A study to examine if there is a significant difference in the enrollment, persistence and transfer rates of minority students compared to White students will yield useful information for DMACC and ISU. Analysis of the data will enable the decision makers at DMACC to identify services to assist minority students as they enroll and persist to transfer or graduation. These data will also prove useful to the transfer advisors, Minority Student Affairs, and Admissions staff at ISU in developing transfer assistance programs for minority students attending ISU. Students of all race and ethnic background should be provided equal opportunity to successfully meet their academic goals, and community colleges must be especially diligent in assuring equal access and opportunity for minority students.

If we are to ensure the maximum benefit of the community college experience, especially for minority students, careful scrutiny, evaluation, and strengthening of all dimensions of institutional transfer activity are essential. Increased commitment to academic persistence and transfer is a key factor in honoring higher education's obligation to minority students who enter baccalaureate degree programs through the community college system.



### **Assumptions**

The following assumptions were made considering this study:

1. The student populations accurately reported their race/ ethnicity on the application form for Des Moines Area Community College.
2. The data obtained from the Office of Institutional Research at DMACC, the Registrar's office at ISU, the Iowa Department of Education, and the United States Census Bureau were accurate.
3. Enrollment in the gateway transfer courses: English 117, Composition I; Psychology 101, General Psychology; Spanish 101, Elementary Spanish I; or Math 115, Finite Mathematics was a reliable indicator of a full-time student's intent to declare a transfer major at DMACC.
4. A first time, full-time student who enrolled at DMACC in transfer courses was assumed to have a goal of transfer at some point from DMACC.
5. If a student enrolled at DMACC in the fall and subsequent spring terms without dropping, that student was considered a successful persister.
6. If a transfer student completed a minimum of 24 credit hours, maintained a cumulative GPA of  $\geq 2.0$  during their enrollment at ISU, or graduated with a baccalaureate degree, that student was considered a successful transfer.

### **Limitations of the Study**

There were several limitations of this study. By necessity, the study population was narrowly defined. It is nearly impossible to reliably measure a student's intent upon enrolling at DMACC; students declare a major upon application, but are not required to

update or change the declared major while at DMACC. Therefore, to attempt to reliably assess a student's intent to transfer, and to maintain consistency in the data, the study population was limited to those students that were first-time, full-time students enrolled in a DMACC gateway transfer course. Students in the study were anonymous; there was no ability or intent to interview students about what their goal was when entering DMACC. The study was also limited by its exclusion of part-time students, or students that started and stopped out for a period of time, then re-entered with an intent to transfer.

The data for the study were drawn from fall 1997 to summer 2003 enrollment records. Any data before that timeframe were collected on a now-defunct administrative computing system, and cannot be compared to data that were collected beginning in 1997. It was necessary to rely entirely on statistical data gathered from existing sources, including DMACC's administrative computing system, the Office of Planning and Research at DMACC, the Iowa Department of Education, and from the Office of the Registrar at ISU.

Because the population size for the minority groups was small, there was no ability to track any one cohort through DMACC and ISU. In this study, there was no analysis of how long minority students spend at DMACC before transfer compared to how long White students spend at DMACC prior to transfer. Also, the sample size was too small to determine if the number of credits transferred from DMACC had any effect on student success at ISU.

The study only examined the transfer rate of students from DMACC to ISU for two reasons. Of the three Regent universities and the three private colleges in the Des Moines area, the majority of students that transfer from DMACC continue their studies at ISU. Additionally, the number of minority students from DMACC that transfer to and persist at

the five other institutions was unavailable for the five-year period studied. Therefore, this information cannot be generalized to the statewide transfer rate of minority students to baccalaureate degree-granting institutions.

There was no attempt to gather qualitative data or to draw conclusions about the reasons minority students did or did not enroll at DMACC and persist to transfer to ISU at the same rate as White students. Further study is required to determine the reasons behind any significant differences in the enrollment and persistence transfer rates of minority students compared to White students at DMACC.

### **Definition of Terms**

The following terms were defined for use in the study:

*Articulation:* The process of mutually agreeing upon courses and programs earned at a sending institution for credit or advanced placement at a receiving institution.

*Arts and Science:* Courses in the liberal Arts and Sciences, pre-professional, or other instructional areas that partially fulfill the requirements for a baccalaureate degree (Iowa Code, Section 260C.2.).

*Associate in Arts Degree:* The degree issued to a person who has satisfied the curricular requirements that consist of content equivalent to a two-year college parallel curriculum (291 Iowa administrative Code 21.2(10)(1).).

*Community college:* A regionally accredited institution of higher education that offers the associate degree as its highest degree.

*Credit earning, transfer-bound:* Any student enrolled in one of the four gateway transfer courses, with an assumed intent to transfer to a baccalaureate degree granting institution.

*Gateway transfer course:* One of a series of courses required, usually as a freshman, as a part of the Associate of Arts degree. The gateway transfer courses used for this study were Composition I, General Psychology, Elementary Spanish I, and Finite Math.

*Minority:* Black or African American, American Indian and Alaska Native, Asian, native Hawaiian and Other Pacific Islander as defined by the US Census Bureau as race. For the Census data, Hispanic was self-identified as an ethnicity.

*Persistence:* Attending college fall to spring without interruption, without failing or dropping all classes.

*Full-time student:* A student enrolled in at least 12 credit hours at Des Moines Area Community College fall and spring term, and 8 hours summer term.

*Transfer:* The initial enrollment in a community college followed by subsequent enrollment at any four-year institution in an undergraduate program.

*Transfer Rate:* All students entering the two-year college in a given year who have no prior college experience and who complete at least 12 college credit units, divided into the number of that group who take one or more classes at a university within four years. (Jones, 1991)

*Within-term course retention:* Maintaining enrollment for an entire term without dropping all courses.

*Success after transfer:* Having earned 24 or more credits with a cumulative GPA of  $\geq 2.0$  at ISU, or having earned a baccalaureate degree.

## CHAPTER 2. REVIEW OF RELATED LITERATURE

### Introduction

This chapter reviews important and relevant literature on the enrollment of minority students in the nation's community college system, and the issues surrounding retention, and transfer to four-year baccalaureate granting institutions. This review is intended to identify key issues and current research related to minority student enrollment at community colleges and subsequent transfer to baccalaureate degree institutions.

Much has been written about the role of the community colleges as the great democratizing force in higher education by offering access to higher education to all that desire it. Community colleges do not have the admission standards of four-year colleges and universities, which often make students of low socio-economic status ineligible for admission. Often comprised disproportionately of minority students, community colleges are low cost and geographically accessible. Those who otherwise would have no access to higher education because of admissions' requirements, cost and transportation, are able to access higher education through the community college system, and obtain a baccalaureate degree by transferring to a four-year college or university.

Community colleges should play a major role for minority populations in providing access to the American dream of obtaining a college degree in equal proportion to their White peers. However, much of the literature reviewed for this study indicated the opposite: minority students, while enrolling in community colleges in large numbers, are not transferring to baccalaureate degree institutions or obtaining degrees at the same rate as White students. This trend is disturbing, as it calls into question one of the basic tenants of

the community college system, that of being an equalizing force in the access to higher education for all students.

A considerable amount of literature on the subject of the transfer function of community colleges is available, as that function has been studied since community colleges were first created. There is a much smaller, but growing, body of research on the success of minority students in meeting their educational goals by entering the higher education system through the community college, then completing their baccalaureate education after transfer. In the last decade, research on minority students has emerged as a popular research paradigm. Given the great changes in the student demographics at two-and four-year institutions, questions about minority students' progress and educational outcomes are receiving increased attention in the higher education literature. According to Eimers and Pike (1997), a majority of the empirical research on undergraduate retention for both minority and White students has relied upon theoretical perspectives advanced by Tinto (1975, 1986), Bean (1980, 1982, 1983), and Cabrera and Nora (1984).

For students who begin their postsecondary education at a two-year college and transfer to a four-year college or university, most research studies have addressed the adjustment process known as "transfer shock" (Cejda, 1994; Diaz, 1992; Graham & Hughes, 1994; Keeley & House, 1993; Laanan, 1996). These studies found that transfer students tend to experience a temporary dip in grades during their first or second semester after transferring to a senior institution. The majority of the research in this area focuses on the differences between native and transfer students' academic achievement as measured by traditional measures such as GPA and persistence to a degree (Best & Gehring, 1993; Graham & Hughes, 1994). Recently, studies have examined specific racial/ethnic groups and explored

their academic and social adjustment experiences at the four-year institution (Allen, 1985, 1988; Hurtado et al., 1996; Olivas, 1986; Justiz & Rendon, 1989).

The review of literature focused on three bodies of research:

1. A historical perspective: the intended role of the community college as a point of access to higher education for all students, particularly minority and disadvantaged students.
2. The study of the transfer function of the community college.
3. Minority student enrollment and retention in the community college system, and the transfer of minority students from community colleges to baccalaureate degree granting institutions.

### **A Historical Perspective**

#### **The intended role of the community college—The great democratizer**

A study of relevant research literature that addresses the transfer function of the community college cannot be complete without a brief history of its purpose and role, a topic that continues to be debated to this day. The purpose of the community college has evolved since its inception in the early 1960s. Established during the second half of the 20<sup>th</sup> century, community colleges were an outgrowth of the junior college system. The functions of the community colleges grew from the core functions of the junior college movement, primarily that of the first two years of a four-year degree, to a need to meet the employment demands of a region, guidance of students as they chartered their educational path, adult and community service, and the development and provision of remedial education.

The highly influential Carnegie Commission for Higher Education (1968-1973) made the community college the centerpiece of its call for universal access to higher education:

The Commission believes that access to higher education should be expanded so that there will be an opportunity within the total system of higher education in each state for each high school graduate. ... The Commission recommends that all states enact legislation providing admission to the public community colleges of all applicants who are high school graduates or are persons over 18 years of age who are capable of benefiting from continuing education. (Carnegie Commission on Higher Education, 1970, p. 15)

Three factors contributed to the national focus on open access to community colleges during its early years. First, the baby boomers began reaching college age during the 1960s and, for them; a college education was the ticket to a bright future. Second, the civil rights and women's rights movements broke down some of the barriers to a college education to under-represented groups, and college was promoted as a national goal for President Johnson's Great Society. Third, the demands for political and social action during the 1960s and 1970s resulted in a federal commitment to increase financial aid for higher education.

Open access, as practiced by the community college, is a manifestation of the belief that a democracy can thrive, only if its people are educated to their fullest potential. Basic to the community college mission, then, is a commitment to open access in its admissions policies and to fair and equal treatment of all students. Access is achieved by maintaining a low tuition rate and offering program choices; equity is achieved by removing artificial barriers to access for these traditionally not served by higher education (Vaughn, 2000).

Of the many functions of the community colleges, perhaps the most touted is that of providing opportunity to the masses. As noted by Medsker (1960), a leading community college researcher in his day:



The two-year college...is perhaps the most effective democratizing agent in higher education. It decentralizes post-high school opportunities by placing them within reach of a large number of students. It makes higher education available at a low cost to the student and at moderate cost to society. (p. 4)

To this day, the advocates of the community college system defend its role as the primary gateway to education for many minority and first generation students. The number of minority students that access higher education through the community college increases each year, and a majority of minority students use the community college as their entrance to the higher education system (AACC, 2002).

Nevertheless, there is an entire body of research that refutes the claim that community colleges have met the goal of becoming the democratizing force in higher education. The critics have a set of claims about the community college's impact on society that contradict the advocates' support; arguing that the community college upholds only in word the ideal of equality of educational opportunity. The perspectives of these critics are of value to a review of literature that addresses success or failure of minority students' use of community colleges as the primary gateway to baccalaureate degrees. In the critics' view, the community college's real societal role is to reproduce the class inequalities of capitalist society (Karabel, 1972, Nasaw, 1979; Pincus, 1974,). Pincus stated:

Community college critics...argue that community colleges are part of an educational system that reproduces social inequity.... The leaders of private industry get workers who are trained at public expense. The more privileged sectors of society are less likely to be challenged since the aspirations of working class and minority students are lowered by community colleges. (p. 4)

Critics also argue that most community college entrants, particularly those from working-class and minority backgrounds, either drop out or are "cooled-out" by being shunted into

occupational-education programs with little economic payoff (Karabel, 1972; Nasaw, 1979; Pincus, 1980).

Until the last decade, few studies have examined the impact of community college culture on minority students. Karabel's (1972) classic study of the community colleges is one of the few studies to critically examine the role and the ultimate effect of the community college on the clientele they attract and serve. Karabel contended that two-year colleges maintained a class-based stratification of society by tracking minority and working class students into vocational programs and away from academic programs. Tracking these students into vocational programs would have the effect of squashing their intentions of transferring to four-year colleges, or they are "cooled" out by diverting their academic goals (Clark, 1960; London, 1978). Karabel (1972) also suggested that the "cooling out" process allows community colleges to perform their sorting function by channeling students away from four-year colleges and into middle-level technical positions. One of the features of the cooling-out process is that it causes people to blame themselves rather than the system for their "failure". The most common consequence is that cooled-out students often fail to realize their academic aspirations or withdraw from the system altogether.

The critics charged that the community colleges were failing even in their mission to provide post-secondary opportunities for the underserved. Pincus (1974) and Zwerling (1976) also accused these "people's colleges" of serving as the cooling out function that Clark (1960) had identified years earlier. They saw community colleges as actually maintaining the status quo, tracking poor and minority students into lower paying careers rather than promoting transfer to four-year institutions.

Additional studies suggested that where a student begins his/her postsecondary educational experience is significantly associated with educational aspirations, persistence, and eventual level of educational attainment (Astin, 1993; Pascarella & Terenzini, 1991). Specifically, for students who begin their education at two-year rather than four-year colleges or universities, their chances of obtaining bachelor's degrees are lowered significantly (Pascarella & Terenzini, 1991; Velez, 1985).

More recent studies also support the contentions of the early critics that community colleges were failing as the great democratizing force in higher education. Community colleges were founded with the mandate to provide access to the under prepared, and responded by creating innovative curriculum and flexible scheduling. Yet, by the early 1980s, fewer than 14% of community college students were transferring to four-year institutions. Of these students, about 5% graduated in two years with associate's degrees and transferred immediately; another 8% to 9% transferred before completing their associate's degrees (Cohen & Brawer, 1987).

An extensive body of research shows that students who transfer to a four-year institution frequently perform worse than students who begin their freshman experience at a four-year institution. Research indicates that transfer students earn lower grade point averages (Diaz, 1992; Dupraw & Micheal, 1995) and experience lower retention and graduation rates (Anglin, Davis & Mooradian, 1995; Dougherty, 1992; Sauper & Long, 1997), although the longer transfer students attend the less the difference between their performance and that of native students (Glass & Harrington, 2002).

Dougherty (1991, 1994) has been one of the most vocal critics of the community college system as the democratizing force in higher education. He argued that, although the community college does provide access to higher education to minority, low-income, and first generation students, the structure of the community college does not provide opportunities to achieve a bachelor's degree that are equal to four-year colleges and universities (1994). According to Dougherty, baccalaureate aspirants are less likely to succeed if they enter community colleges rather than if they enter four-year colleges. In his book, *A contradictory college*, Dougherty (1994) outlined several arguments for why community college students are less successful at eventually obtaining the baccalaureate degree. Briefly, he theorized that most community colleges are commuter and do not have dormitories, thus students are less integrated into the academic and social life. In addition, community college students receive less financial aid than their peers at four-year institutions; therefore, they do not persist to the next level at the same rate. Finally, community college students who transfer to four-year institutions suffer from transfer shock, and, as a result, do not persist at the same rate as their native peers.

The debate continues between the community college defenders and critics, and the role the community college plays in providing access to the baccalaureate degree. The critics argue that three-quarters of the community college's students wish to get a four-year degree, and that less than one-fifth actually succeed. The defenders counter with the argument that the community college enables minority students to enter higher education at a much higher rate than four-year institutions. In reality, the community college could be very good at allowing student access to higher education, and yet be poor at helping them achieve a baccalaureate degree (Dougherty, 1994). Certainly, progress has been made in providing

equal access to all who wish to participate in higher education, but there is still far to go, especially for students of color and low socioeconomic status (McCabe, 2000). Studies of transfer rates of community college students, particularly those who are minority and low income, will provide additional data to address the issue of whether students that choose community colleges as their first step in higher education are well served or hindered by their choice.

### **The transfer function of the community college**

Community colleges are the nation's most accessible institutions of higher education. There are 1,171 community and technical, two-year branch, tribal and junior colleges in the United States. Of these, 970 are public community colleges. These public colleges serve 10.4 million students per year, five million in credit courses and five million in non-credit courses. Nearly 46% of all first-time college students and 49% of minority students attend a community college, and 51% of community college students are first-generation (Vaughn, 2000).

Quality in higher education is judged in a variety of ways by educators and those outside the education community. The interest in quality relating to the transfer function of community colleges focuses on three indicators: the extent to which students moving from two-year to four-year schools are prepared to meet the collegiate expectations of the four-year institutions; the ease with which students are able to move from one institution to another; and the rate of baccalaureate degree attainment among transfer students compared to that among students native to the four-year institution. Quality, as measured by baccalaureate degree attainment among transfer students is an indicator of the success of

community colleges in providing access, equity, and academic opportunity, especially for minority students (National Center for Academic Achievement and Transfer, 1991).

Several major longitudinal studies conducted during the 1980s and early 1990s provide insight into the magnitude of the transfer function, and form the basis for most transfer rate studies today. In 1991, the American Council on Education and the National Center for Academic Achievement and Transfer, through funding by the Ford Foundation, conducted one of the most comprehensive studies of transfer education in the United States, entitled *Setting the National Agenda: Academic Achievement and Transfer. A Policy Statement and Background Paper About Transfer Education*. This report summarized the major studies, primarily those that relied on analyses of two national longitudinal databases developed by the U.S. Department of Education. These studies yielded valuable descriptive information that supports four premises about the nature of community college transfer education:

- Transfer is key to the collegiate experiences of a significant proportion of those who enroll in community colleges and of those who earn the baccalaureate;
- The community college contribution to baccalaureate education is variable, because of the tendency of students to transfer at different points of time;
- Some students, particularly those who exhibit poor academic skills or come from low socioeconomic backgrounds, may find transfer to be a more difficult process than other students; and
- Transfer success is a function both of institutional characteristics and of student background and educational experience.

Calculating transfer rates and success upon transfer for community college students has spawned its own body of research. Comparing transfer and first-time student performance is complicated, and must consider several factors. Although transfer rates are difficult to calculate, given variability in student mobility, between 5% and 25% of students are believed to transfer successfully to four-year institutions (Astir, 1982; Bensimon & Riley, 1984; Richardson & Bender, 1986). More specifically, as part of the National Transfer Assembly Project, Cohen (1991) estimated a transfer rate of 23% based on a sample of students enrolled at two-year colleges with no prior college experience, each of whom had earned at least 12 college-level credits at the community college within 4 years of entry. Lee and Frank (1990, p. 178) based their estimated transfer rate of 24% on 1980 high school graduates who enrolled at a community college at some point in the first two years after high school graduation. The National Effective Transfer Consortium (Berman and others, 1990) estimated the rate at 25%. In two separate studies, Grubb (1990a; 1991) calculated the rate at 20% and 29%, depending on the study results. Adelman (1988) calculated the transfer rate to be 21%.

The most common method of comparing transfer students to “native” students—those who began their college experience at the college or university, uses cohort groups of new transfers and new native students who both began school during the same semester (Carlan & Byxbe, 2000; Holahan, Green, & Kelly, 1983; Jones & Lee, 1992; Newlon & Gaither, 1980). This is the method most analysts use when discussing performance differences between transfer and native students. A new and more promising method of calculating transfer success compares new transfers with returning natives and has two advantages over comparisons with new natives (Best & Gehring, 1993; Dupraw & Michael, 1995; Glass &

Harrington, 2002; House, 1989; Saupe & Long, 1997). Because in this comparison method both groups have already experienced first-year college shock, it neutralizes the retention factor that so affects first year students. A third method for measuring transfer success compares returning transfers to returning native students (Avakian, MacKinney, & Allen, 1982; Eimers & Mullen, 1997; Holahan, Green, & Kelly, 1983; House, 1989; Saupe & Long, 1997). These two groups are the most homogeneous; first-term retention factors are accounted for because both have been through their first year of college and have adjusted to an institution.

Porter (2002) conducted a study to measure performance of transfer students compared to native students by four different types: new natives, new transfers, returning natives, and returning transfers. Furthermore, Porter's study used four outcomes to measure native and transfer student success: retention after one year, graduation after one year, cumulative GPA after one year, and academic dismissal after one term. The student population consisted of all returning students registered in fall 1995 who enrolled as first-time full-time degree seeking in a subsequent fall semester at a public university. Using multiple or logistical regression, the four outcome measures were estimated two ways; one including only an indicator variable measuring whether or not the student was a transfer, and the second set of equations included credits earned as a control variable.

The results supported Porter's hypothesis that transfer students perform worse than native students at this particular institution on the four academic outcomes. However, less certain is the magnitude of the difference between transfer and native students. When the analysis focused on returning students rather than new students, the effect of integration problems on new transfers and new native students is minimized. Controlling for credits



earned makes native students and transfers more homogeneous. Even with that taken into account, Porter found that many differences between transfer and native students remain. Transfer students in this study were retained at rates 1% to 9% lower than native students; transfer students graduated at rates 2% to 8% lower than native students; transfer students earned GPAs 10% to 20% lower than native students, and transfer students were academically dismissed at rates 3% to 6% higher than native students.

One of the longest-standing community college to baccalaureate transfer studies is the Transfer Assembly Project, based at the Center for the Study of Community Colleges at the University of California at Los Angeles, and headed by Arthur Cohen. Since 1989, the project has collected data on transfer rates, initially for 18, and now 24 states. The most recent study, published in 2001, tracks transfer rates for students who first enrolled in college in 1984. The trend data show a dip in transfer rates in the 1980s and a gradual rise to the mid-1990s, changes that the authors attribute to overall economic conditions and the resulting emphasis of academic (as opposed to vocational) education within community colleges (Table 2.1).

McCormick and Carroll (1997) conducted a study that analyzed data drawn from the second follow-up of the 1990 Beginning Post-secondary Students (BPS) Longitudinal Study. Entitled "Transfer Behavior Among Beginning Postsecondary Student: 1989-94", the report described attendance and transfer patterns by students who first entered post-secondary education during 1989-1990. The authors found the following regarding transfer:

Table 2.1. Transfer assembly project: National transfer rates

Year students first enrolled in college	Number of participating colleges	A	B	C
		Number of entrants	Percent of column A completing 12+ credits within 4-years	Percent of column B transferring within 4-years
1984	48	77,903	50.5	23.7
1985	114	191,748	46.7	23.6
1986	155	267,150	46.7	23.4
1987	366	507,757	46.9	22.6
1988	395	522,758	45.5	22.1
1989	416	511,996	44.1	21.5
1990	417	543,055	47.1	21.8
1991	424	575,959	47.3	22.1
1993	345	293,149	50.7	23.4
1995	538	619,470	52.5	25.2

Source: Szelenyi, 2001. <http://www.highereducation.org/reports/transfer/transfer6.shtml> 9/16/02

1. One out of four community college students indicated in 1989-1990 that they were working toward a bachelor's degree (prospective transfers). Of this group, 39% transferred directly to a four-year institution by 1994.
2. Among community college beginners who transferred directly to a four-year institution, 65% transferred without a degree. About one out of three completed an associate's degree before transferring.
3. While one out of four community college transfers had received a bachelor's degree by 1994, another 44% were still enrolled at four-year institutions, for an overall persistence rate of 70%.
4. The bachelor's degree attainment rate was higher among the minority of community college transfers who completed an associate's degree before transferring. (p. vii)

The reaffirmation of a collegiate identity for the community college within the larger higher education framework defines transfer and articulation in its broadest sense (Deegan & Tillery, 1995). However, certain transfer variables have changed a great deal since the early years of the community college movement, when community colleges truly were junior

colleges that provided only the first two years of a four-year degree. Students who transfer from community colleges not only move from one academic level to another but also from one distinctively different institutional culture to another, usually to one that they describe as less nurturing than that of the community college (Richardson & Bender, 1986). Therefore, to improve transfer viability, transfer education must go beyond the search for academic parallelism in freshman and sophomore students at the two-and four-year levels by including intellectual, social, and cultural preparation for the baccalaureate environment (New directions for community college, 1988).

A final summary of national studies addressing transfer rates for community college students are presented in Table 2.2. Transfer has always been central to the mission of the community college. The majority of students have the baccalaureate degree as their goal when they enter the community college (Cohen, Brawer, & Benison, 1985). Given their broad participation at the community college level, minorities are unusually dependent on successful transfer for achieving their educational goals (American Council on Education, 1991). If we are to ensure the maximum benefit of the community college experience, especially for low-income and minority students, careful scrutiny, evaluation, and strengthening of all dimensions of institutional transfer activities are essential. Enhanced commitment to academic achievement and transfer is a key factor in honoring higher education's obligation to low-income and minority students who enter colleges and universities through the community college system (Palmer & Eaton, 1991).

Table 2.2. Average transfer rates emerging in national studies

Study source	Data	Cohort for which transfer rate applies	Mean transfer rate
Transfer Assembly (Cohen, 1991)	Students at 114 two-year colleges with minority enrollments of at least 20%	Students who enrolled at the colleges with no prior college experience in the fall of 1985 and who earned at least 12 college-level credits within 4 years	23%
National Effective Transfer Consortium (Berman and others, 1990)	Students enrolled at the 28 member institutions of NETC	Students who were enrolled at the colleges in the spring of 1988, who had completed at least six credits by the end of the spring 1988 term and who did not reenroll in the fall of 1988.	25%
Lee and Frank (1990)	High School and Beyond	1980 high school graduates who enrolled at a community college at some point in the first two years after high school graduation.	24%
Grubb (199a; 1991)	High School & Beyond	1980 high school graduates who started their postsecondary careers at two-year colleges	20%
Grubb (1990a; 1991)	NLS 72	1972 high school graduates who started their postsecondary careers at two-year colleges	29%
Adelman (1988)	NLS 72	1972 high school graduates who enrolled at a community college at any point through 1984	21%

Setting the National Agenda Academic Achievement and Transfer. A policy statement and background paper about transfer education.

Source: American Council on Education National Center for Academic Achievement and Transfer, 1991, p.26

### Minority student enrollment, retention and transfer

The community college has long prided itself on its egalitarian approach to higher education. The general community college literature agrees that community colleges remain the major entry way to higher education for the majority of underrepresented students currently attending post-secondary institutions. There is an abundance of literature that speaks to the value of community colleges in providing educational opportunities to minority students. Minorities, immigrants, students from low socioeconomic backgrounds, and other

non-traditional students are given the opportunity to initiate upward career and social mobility through the community college system. The open access, affordable, community location, and multiple paths leading to the work world, university transfer, and personal growth that the community college offers reaches the majority of citizens within each respective minority community (Cohen & Brawer, 2003; Harbour, Middleton, Lewis, & Anderson, 2003).

Given the broad participation at two-year institutions, minorities are more dependent than majority students on successful transfer for achieving a baccalaureate degree. Adelman (1989) contended that community colleges are the institutions where minority and low and medium income students will always be the most concentrated. Because community colleges enroll almost 50% of all minority students in the United States, the community college plays a large role in educational opportunity for these individuals. For many, transfer from a two-year to a four-year college is a requisite to educational advancement and to attainment of the social and economic benefits that those with baccalaureate degrees possess. Clearly, the individuals who stand to lose the most from the low community college transfer rates are students of color, who traditionally have used community colleges as a means to initiate college study (Rendon, 1993).

Community colleges will continue to serve as the major gateway to higher education for minorities, a phenomenon that converts transfer from a purely educational process into a social imperative (Avila and others, 1983). The growing number of minority students enrolled in higher education supports Avila's contention. Minority enrollment in higher education and specifically in community colleges is growing. Total minority enrollment at the nation's colleges and universities surged by 122% over the last 20 years, up from nearly 2

million in 1980-81, to 4.3 million in 2000-01. Minority enrollment in all educational institutions will continue to climb; according to the U.S. Bureau of Census, ethnic minorities represented 28% of the population in 1998, and by 2050, minorities are projected to account for 47% of the population (Aragon, 2001). Despite this significant gain, minority students continue to lag behind their White peers in the percentage of college age students enrolled in college (Minorities in Higher Education Status Report, 2003). In 1980, there was little difference among the proportions of White, Black, and Hispanic students attending college; 31.8% of White high school graduates, age 18 to 24 were enrolled in college, compared with 29.8% of Hispanics, and 27.6% of Blacks. By 2000, the proportion of White students attending college had grown to 44.2%, but the growth in Black and Hispanic student participation rates throughout higher education was only 39.4% and 36.5% respectively.

The growth of minority student enrollment in community colleges over the last twenty- five years is presented in Table 2.3. The percentage of minority enrollment grew from 19.6% of the total community college enrollment in 1976 to 34.6% in 2000. Much of this change can be attributed to the rising numbers of Hispanic and Asian or Pacific Islander students. The Hispanic enrollment increased from 5.4% of the total enrollment in 1976 to 14.2% in 2000, and Asian enrollment increased from 2% in 1976 to 6.8% in 2000. Black enrollment actually declines in the 1980s, but slowly began to rise again in the 1990s, and was slightly higher in 2000 than in 1976.

Table 2.3. Percentage distribution of total fall enrollment in degree-granting community colleges by race/ethnicity of student: 1976 to 2000

Race/Ethnicity	1976	1980	1990	1995	1996	1998	1999	2000
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White, non-Hispanic	79.3	78.7	75.7	69.1	79.4	78.8	75.7	69.0
Total minority	19.6	19.9	23.3	29.3	19.6	19.8	23.1	29.4
Black, non-Hispanic	11.1	10.4	10.0	11.3	10.9	10.1	9.6	11.1
Hispanic	5.4	5.6	8.1	11.1	5.5	5.8	8.2	11.2
Asian or Pacific Islander	2.0	2.8	4.1	5.7	2.1	2.8	4.2	5.8
Am Indian/Alaska Native	1.1	1.0	1.0	1.2	1.0	1.0	1.0	1.2
Nonresident alien	1.1	1.4	1.3	1.6	1.0	1.4	1.3	1.6

Note: Data from institutions that were accredited by an agency or association that was recognized by the U.S. Department of Education, or recognized directly by the Secretary of Education. Source: National Center for Education Statistics, Digest of Education Statistics, 2002.

With the continuing diversification of the student population of community colleges, problems concerning the educational attainment and retention of minority students persist (Sanchez p. 35). While in 1997, 22.8% of all associate degrees were awarded to minority students, a 7% increase from 1987, compared to their share of total student enrollment, minorities remain underrepresented in degree awards (Aragon, 2001). This reflects general trends throughout higher education, in which minority students tend to have lower persistence and graduation rates, as well as lower levels of academic preparedness and achievement, compared to their White counterparts (Jalomo, 1995).

However, concern is mounting that the very students community colleges purport to serve may be the students who appear to be the least served (Rendon, Justiz, & Resta, 1988; Weis, 1985). Unless more students of color receive a college-based education, they will be unable to both participate in and contribute to the nation's economic development and social well being (Rendon, 1993). If we are to ensure the maximum benefit of the community

college experience for minority students, especially, careful analysis and evaluation of all aspects of institutional transfer is essential.

The research on minority college student persistence is relatively young. Only within the past 15 years have researchers begun to study minority students: Allen (1984); Cabrera, Nora, and Castaneda (1993); Hurtado and Garcia (1994); Jalomo (1995); Mow and Nettles (1990); Nettles et al. (1985); Nora and Cabrera (1994); Nora and Rendon (1988, 1990); Nora, Attinasi, and Matonak (1990); Ogbu (1978; 1987); Rendon (1982; 1994); Thomas (1984); Tierney (1992, 1993); Valadez (1996); Wright (1998); all have conducted research specifically designed to analyze the enrollment and retention of minority students in higher education. This recent research not only lifts the knowledge base of student retention and development theories, it advances policy and practice in addressing the needs of minority students enrolled in higher education.

The early research on minority college students focused on Black enrollment, persistence, and performance in higher education. Since Blacks comprise the largest minority population in the United States, it was inevitable that most of the initial research would focus on that population. However, Black student enrollment has been faltering over the last decade, and researchers have turned to their minority populations to study (Nettles & Mow, 1990). With rapidly increasing numbers of Hispanic students, more attention is being devoted to understanding their college enrollment and persistence. In contrast, very little attention is devoted to the enrollment and persistence in higher education of Native American students, because they represent such a small percentage of minority college enrollment and in the population in general. There is little research on the Asian population for different reasons. There is a general belief by the American public that Asian students are well



represented and even over-represented in American higher education, and that they have achieved extraordinary academic success (Lee, 1991). However, the needs of the diverse groups within the Asian population is beginning to surface, and there is an emerging body of research addressing these differing needs.

Mow and Nettles (1990) undertook a comprehensive review of the trends and research literature in regard to minority student access to and persistence and performance in college. Although the review is now thirteen years old, the description of the literature and research methods presents a comprehensive summary of minority student research that continues to be relevant today. The review, in *Higher Education: Handbook of theory and research, Vol. VI*, attempted to describe the published research on minority college students, present evidence of the rates at which minority students enter, persist, and complete college, and to present evidence relating specific factors to access, persistence, and performance in college. The authors found that, in studying minority student enrollment and persistence in college, four research methods were most frequently used:

1. Descriptive and comparative studies. A large body of research on minority students is descriptive, primarily reporting on the proportion of each minority group is entering, persisting, graduating, or dropping out of college. Some report rates of access, enrollment, attrition, and degree attainment among minority groups. Comparative studies of minority students generally examined differences between minority and White students, or within the minority groups themselves.
2. Inferential studies. The research literature includes studies that employ correlation methods or regression analysis to examine the relationships between minority college characteristics and certain institutional factors.

3. Modeling. A more recent research method used in studying minority students is that of using predictive models to explain student performance and attrition.
4. Path analysis. The literature review also found that some researchers are beginning to use path analysis to conceptualize student attrition process.

The next section of the literature review focuses specifically on literature regarding the enrollment, persistence, and transfer rates of Black, Hispanic, Asian, and American Indian community college students.

### **Black student enrollment and transfer**

Since given the right by law to participate fully in higher education, Black students have gravitated toward community colleges as the main gateway into the world of higher education (Lewis & Middleton, 2003). Although Black students continue to be underrepresented in community colleges, the proportion served continues to increase. A higher proportion of Blacks attend college today than 20 years ago; in 2000, 31 % of 18-24-year-old Blacks were enrolled in colleges and universities, up from 19% in 1980. According to the U.S. Department of Education, nearly 1.5 million Blacks were enrolled in higher education at all levels in 2001. Fully 40%, or more than 604,000 Black students, were enrolled at the associate's level (Hamilton, 2003). Community colleges accounted for a large share of the degrees conferred to Black students. Of degrees conferred to Blacks in 2000, 28.8% went to students at the associate's level. In 2000, Black students accounted for 12% of the students enrolled in 2-year institutions, and 11% of those in four-year institutions. Black females were nearly two-thirds (63%) of the Black enrollment in colleges and

universities in 2000, a much higher proportion than Black males (37%)(Status and Trends in the Education of Blacks, 2003).

Lewis and Middleton (2003) conducted a detailed review of published researching the *Community College Journal of Research and Practice (CCJRP)* on Black student enrollment in community colleges. Their review provides insight into the Black experience in community colleges from 1990 through 2000. The review focused on three themes: student success, need for increased faculty diversity, and race and community college administration. Blau (1999) reported that enrollments among Black students are increasing faster in two-year institutions than in any other post-secondary sector. Blau's research notes that Black students are not transferring from community colleges to 4-year institutions at the same rates as their White counterparts. This is mainly attributed to Black students postponing their education due to financial and family reasons (Blau, 1999; Mason, 1998).

Lewis and Middleton's review of literature (2003) revealed certain themes across all the research. The first theme related to Black student success identified certain conditions that can be created at community colleges that will facilitate success among Black students. These conditions, or environmental factors, were explored to identify what they are and how they can aid Black students become more successful in community colleges.

One environmental factor that can help Black students increase their persistence at community colleges was an established child-care facility on campus (Blau, 1999). In the analysis, a statistically significant correlation was found between colleges with child-care facilities and Black student transfer rates. Blau (1999) noted that community colleges that provide child care facilities on campus increase the likelihood that Black students will transfer to four-year institutions.

One environmental factor that can assist Black community college students in obtaining success at the community college level, according to Lewis and Middleton (2003), is for Black students to use counselors to help identify educational goals (Mason, 1998). Mason (1998) reported that certainty of educational goals helped Black students to achieve higher levels of persistence. Black students often come to college without concrete ideas of their educational goals. Mason noted that “the clearer students were about what they wanted to be or to achieve, and the greater the depth of goal internalization, the more likely they were to persist” (p.758).

A third environmental factor identified to assist Black community college students is the value of outside encouragement. Kern (2000) noted that the educational experiences of Black students could be greatly enhanced by involving family members in the education process. In Kern’s (2000) research, Kennedy-King Community College initiated staff development for counselors to develop strategies for encouraging students to involve their families in their educational experiences. This environmental factor is supported in the student retention literature by researchers and documents that students whose family members are supportive of their educational goals are more likely to persist (Blau, 1999; Pascarella, 1980; Tinto, 1975).

Finally, the review of relevant literature on Black student community college enrollment, revealed that community colleges must be pro-active in their approach to help Black students succeed. Mason (1998) noted that advising, academic skills workshops and job placement seminars should be provided to Black students. Mason further noted that these workshops should be specifically focused on helping students improve study habits, reading and writing skills, library usage and computer literacy.

After a comprehensive review of literature of the Community College Journal of research and Practice, Lewis and Middleton (2003) posited that the small number of articles published in the last 10 years dealing with the Black student experience in community colleges was troubling. The researchers concluded that more study is needed to make a significant impact on the Black student experience at this level.

### **Hispanic student enrollment and transfer**

The review of literature on minority student enrollment and transfer revealed the largest body of research devoted to the Hispanic population. One likely reason is that students of Hispanic origin are the fastest-growing racial/ethnic group at community colleges (National Profile of Community Colleges: Trends and Statistics, 1999). By the year 2015, Hispanics will be the largest ethnic group in the United States (National Community Hispanic Council, 2003). In 1990, Hispanic students were enrolled in two-year higher education programs approximately twice as often as in four-year degree programs. In the fall of 1992, students of Hispanic origin comprised 9.3% of the enrollment in the nations' community colleges. In the fall of 1997, the percentage of Hispanic students had increased to 11.8% of the total community college student population (National Center for Educational Statistics, 1999d). By the fall of 2000, Hispanic students made up 14.2% of the community college enrollment nationwide (Digest of Educational Statistics, 2002). For Hispanics, transfer rates from community colleges to four year colleges and universities may be as low as 10%, although educational aspirations reported for this group reveal that 85% of Hispanic students attending a community college see that institution as the beginning step to the undergraduate degree (Rendon & Nora, 1997). Studies examining Hispanic students in

California, Arizona, Texas, and urban community colleges across the nation suggest that a high proportion of Hispanics who enroll in community colleges ultimately seek to transfer to four-year institution (Cohen, Brawer, & Bensimon, 1985; Rendon, Justiz, & Resta, 1998; Richardson & Bender, 1987). Yet, only 9% of Hispanic Americans age 25 and over had completed a bachelor's degree or higher, compared to almost 23% of the non-Hispanic population (National Center for Educational Statistics, 1993).

Darder, Torres, and Gutierrez (1997) noted that: "...despite thirty years of educational reforms, Latino students continue to lag behind students from the dominant culture ..." and "... the proportion of Latino students enrolled in colleges and universities and those who graduate from high school prepared for admission to higher education remains low. As a body of scholarly research begins to evolve, it appears that these facts have been chronic over at least the past thirty years" (p. xiii).

Rendon and Nora (1989) also addressed Hispanic student enrollment in community colleges. They found that retention rates of minority students appear to be slipping, and the transfer rates for Hispanics, a minority group that is disproportionately concentrated in community colleges, may be at an all time low.

While the relatively low percentage of Hispanic students graduating from college is attributable to the high attrition rates at the K-12 level, and the low numbers actually enrolling in college (ACE, 1997), it is also due to the failure of many Hispanic students once enrolled in an institution of higher education, to persist to degree completion. Numerous studies involving national (College Board News, 1998), state (Tierney & Hagedorn, 2002), and institutional (Nora, 2002; Nora & Garcia, 1999) data have shown that even within an extended time frame-five to six years, Hispanic students graduate from college at a rate that

is from one and a third times smaller than the rate for White students and one and a half times smaller than the rate for Asian students.

Nora and Rendon are two of the most prolific researchers on Hispanic student enrollment and retention in the community college. Nora (1993) extensively studied the factors that have been determined to have an impact on persistence and subsequent graduation for Hispanic students, and concluded that these factors fell within four major groupings: (1) educational goal commitments; (2) financial assistance; (3) social integration or experiences; and (4) institutional commitments or fit.

Additional research by Nora and associates (1995, 1996, 1997, 2000, and 2002) has identified other factors that are also instrumental in the successful retention and transfer of Hispanic students. Those factors include: (1) environmental pull factors; (2) perceptions of prejudice and discrimination; (3) academic performance; (4) support and encouragement by parents; (5) academic and intellectual development while in college; (6) pre-college psychosocial experiences; (7) attitudes related to remediation; (8) mentoring experiences; (9) student resiliency; and (10) spirituality on the part of students.

Further research by Rendon (2002) expanded on the factors that are instrumental in the successful retention of Hispanic students. In an article entitled, *Community College Puente: A validating model of education*, Rendon discussed the success of the Community College Puente, a program in California that was designed to enlarge the pool of Hispanic students who transferred from 2- to 4-year colleges and universities in California. Nearly 48% of Puente Program completers successfully transfer to a 4-year college or university, far exceeding any other calculations of Hispanic student transfer. Rendon (2002) credited this

success rate to the concept of validation, which is employed in the Community College Puente Program.

Rendon's (2002) study was designed to identify the validating elements in Community College Puente. There were three critical validating elements that emerged as a result of Rendon's analysis. First, validation of Hispanic students must occur in the classroom, both academic and interpersonal. Second, the counselor must act as a validating agent in pursuit of Hispanic students' academic goals and in their interpersonal skill development. Third, mentors serve as powerful validating agents for Hispanic students, serving as a bridge back to the community for Hispanic students. The Puente Program employed strategies that went beyond intellectual development to attend to social, emotional, and inner life skills of students.

Rendon and Valadez (1993) examined qualitative indicators of Hispanic student transfer. The researchers studied the attitudes of college administrators, staff, and faculty with regard to Hispanic student achievement and transfer to four-year institutions. Five major themes that focused on the factors influencing the transfer of Hispanic community college students to four-year institutions emerged from the investigation: (a) importance of the family; (b) economic considerations; (c) knowledge of the system; (d) cultural understanding; and (e) relationships with feeder schools and senior institutions.

Regarding transfer, Rendon and Valadez (1993) found that once students were admitted to community colleges, they were faced with a host of problems. Minority student "impact programs" with limited enrollment opportunities created a barrier for students with aspirations for transferring to four-year schools. Varying general education requirements also created barriers to transfer. The data in this study suggested that the relationships



between high schools, “feeder” two-year schools, and “receiver” four-year institutions were strained and at times uncooperative. The researchers found that improving communication among these institutions would lead to stronger alliances and collaborative efforts, yet they often fall short of meeting the students’ and communities’ needs.

Jalomo’s (1995) study of Hispanic first-year community college students found that involvement was difficult for students who found the transition to college troublesome or whose background characteristics did not fit the traditional student profile found on most college campuses today. Moreover, Jalomo (1995) found that students required the assistance of cultural translators, mediators, and role models in order to survive or succeed in their first semester in college.

In summary, the path to a four-year college for many Hispanic students begins at a community college. They are drawn to community colleges because the colleges represent a convenient, accessible, and relatively affordable means for beginning their college careers. For many Hispanic students, however, community colleges represent the end to, rather than the beginning of, their academic life. Because community colleges will, in all likelihood, remain significant entry points for Hispanic college students, the challenge will be to devise ways to clear the pathway toward the baccalaureate. The challenge will be met when data clearly demonstrate that more Hispanic students are transferring and emerging from their community-college experience well-prepared to fulfill what currently seems to be an elusive goal—to earn a Bachelor’s degree (Rendon & Valadez, 1993).

### **Asian student enrollment and transfer**

The media often portray Asian Americans as the model minority, which refers to the stereotype of Asian Americans who have achieved extraordinary success academically as well as economically (Chan, 1991). The general public believes that Asian Americans are well represented or over-represented in higher education (Lee, 1991). However, contrary to this stereotype, many Asian Americans are undereducated. Higher dropout rates and academic failure have been reported for Laotians, Southeast Asians, Filipinos, and Samoans (U.S. Commission of Civil Rights, 1992). Other Asian groups, such as Cambodian and Hmong refugees, are not only under-represented in higher education in the United States, but they face serious difficulties coping with their new environments, such as cultural differences and language problems (Yang & Rendon, 1994).

Because of the disparity between the myth and the truth, the model minority stereotype has resulted in a lack of studies addressing low academic achievement among Asian American students (Kim, Rendon, & Valadez, 1998). Other researchers agree that few studies have examined the performance and persistence of Asian students (Malaney & Shively, 1995). Mow and Nettles (1990) maintained that because studies have shown that Asian students have higher rates of access, persistence, and performance than other minority groups, the perceived need for research on this population is not as strong. Asian students' grades and graduation rates tend to be higher than those of their White counterparts at some institutions. While this is true, Asian students are still likely to suffer from problems of cultural adjustment and racism, especially on predominately White campuses where their expectations may not match their experiences (Asamen & Berry, 1987; Chew & Ogi, 1987; Loo & Rolison, 1986). Asian students generally have lower English language proficiency

and higher quantitative skills than White students, which may lead to stereotyping and stigmatization of Asian students (Mow and Nettles, 1990).

Yang and Rendon (1994) undertook one of the first comprehensive studies to gather, analyze, and compare data on the characteristics of Asian students enrolled in the North Carolina Community College System (NCCCCS). The intent of the researchers was to develop a profile of the Asian community college student, and to determine if there were significant differences between the Asian students and the general population in the NCCCS. The study found that there were some significant differences between the Asian and general student populations, primarily in educational aspirations. The primary education goal for 31% of the Asian students was to prepare for transfer to four-year colleges, compared to 21% of the general population of students. The researchers concluded that more studies focusing on Asian students in community colleges need to be conducted, and further study of the impact of community colleges on Asian students and the factors that influence Asian student retention and transfer needs to occur.

Kim, Rendon, and Valadez (1998) conducted a study to examine differences among six Asian ethnic groups and factors related to Asian students' educational aspirations. The study intended to fill a void in the literature about Asian students in general, and specific subgroups in the Asian population. The researchers used data from the First Follow-Up Survey of the 1988 National Education Longitudinal Study, and followed students from six major Asian American ethnic groups: Chinese, Filipinos, Japanese, Koreans, Southeast Asians (Vietnamese, Laotian, Cambodian, and Thai, and South Asians (Asian Indian and Pakistani). The findings clearly indicated that Asian Americans are not homogeneous in terms of academic performance, educational aspirations and attainment, and socioeconomic

characteristics. In fact, the researchers found that the most apparent fact about Asian American students is the diversity among them.

Because of the lack of research, the perceived view that Asian students are the “model minority”, and the great diversity among the Asian American ethnic groups, it is critical to include Asian students in persistence and transfer studies to identify the factors that inhibit or contribute to their success.

### **Native American student enrollment and transfer**

From the research on minority student enrollment in higher education, we know the least about American Indians, and what is published is not very illuminating. American Indians are found to have higher dropout rates in higher education than Blacks and Whites, possibly because they, like Hispanics, are more likely to attend two-year institutions (Mow & Nettles, 1990). There are some studies of Native American’s college experiences, mostly based on very small samples of students. Most research on American Indian students’ performance in higher education is related to high-school performance. Patton (1972) found that high school preparation and grades appears to have an effect on American Indian students’ college persistence and performance. Like Hispanic students, the research indicated that American Indians appear to have difficulty making the cultural adjustment from high school to college (Mow and Nettles, 1990).

Another study compared communication between 14 American Indian male students with 11 male White students (Kennan, 1980), and found that American Indian students tend to avoid interaction in college whenever possible, but will communicate if placed in a situation where it is required. However, Kennan (1980) found that the way in which

American Indian males chose to communicate was different than their White counterparts. The author attributed this difference to the fact that American Indians, fearful of losing their Indian values as a result of acculturation and college education, employ strategies of avoidance.

The lack of substantive research on the enrollment, persistence and success of American Indians in higher education is discouraging. Unless the factors that affect their success are ascertained, it will be difficult to increase the numbers of American Indian students participating in higher education and gaining the necessary skills to improve their economic and social welfare.

### **Transfer of Minority Students from Community Colleges to Baccalaureate Degree-granting Institutions**

Research dedicated specifically to the transfer of minority students from community colleges to four-year institutions is limited. Dr. David Pierce, past executive director of the American Association of Community Colleges (cited in Chenoweth & Manzo, 1998), acknowledged that there is a real paucity of data on the actual numbers of minority students that begin at community colleges and eventually transfer to a four year institution. Alison Bernstein, vice president of the Ford Foundation, who closely tracks the issue of community colleges transfers, claimed that it is difficult to get reliable national data on minority transfer rates because they are studied inconsistently (cited in Chenoweth & Manzo, 1998).

Three major transfer studies included data specifically addressing the transfer rates of minority students compared to White students. In the first research, a major longitudinal study of transfer rates, the College Board examined the enrollment rates for first-year degree-

seeking minority students in 1984 and again in 1995 (College Board News, 1999). Table 2.4 displays the enrollment rates for minority students in each of those years.

In the second study, Michael T. Nettles of The College Fund/UNCF's Frederick D. Patterson Institute analyzed the degree attainment and persistence patterns of those that began their postsecondary education in community colleges. Nettles' study focused on the database provided by the Office of Educational research and Improvement: Postsecondary Students: Five Years Later (1994). Nettles followed the entire cohort of students who entered postsecondary institutions in 1989-90, and noted that half the students started at two-year colleges whereas 42% began at four-year colleges, while the rest attended private, for-profit institutions. Of those, 60% of the four-year students had achieved a degree whereas 38.4% of the two-year students had achieved a degree. Nettles also found that the degree-attainment figures differed significantly between Whites and African Americans and other minority students.

Table 2.4. Minority enrollment: Percent of degree-seeking, first-year students

Institution	Percentage	
	1984	1995
Four-year	13.8	20.2
Two-year	15.9	18.0

Source: College Board News (1999). *Reaching the top*. New York: The College Board.

The third research was conducted in 1989 by the Center for the Study of Community Colleges based on a grant from the Ford Foundation to assist the nation's two-year colleges in defining their transfer rates and obtaining data to support these definitions. For many years the Foundation has supported the progress of minority students toward their

baccalaureate degrees. For this project, the Center invited 240 colleges, nearly one-fifth of the two-year colleges in the country, to participate in the Assembly. Each of the 240 colleges had at least a 20% minority enrollment. One hundred fourteen colleges in 27 states participated, and were asked to provide three data elements: (1) the number of their students, disaggregated by ethnicity, who had entered the college in fall 1984 with no prior college experience; (2) of those, the number that had stayed at the institution long enough to attain at least 12 college credits; and (3) the number of that group who, within four years of initial enrollment, had entered a senior institution.

The Transfer Assembly's goals were to promulgate a valid definition of transfer rates and to assist community, technical, and junior colleges in collecting the data needed to calculate their own transfer rates (Cohen, 1991). However, differences in transfer rates among ethnic groups emerged as a critical piece of information. The differences among the ethnic groups (White, Hispanic, and Black) were large: of the students receiving 12 or more credits, 19.6% of the Black, 18.2% of the Hispanics, and 27% of the Whites transferred within four years. However, the study concluded that the factors that influence transfer rates—articulation agreements, 2 + 2 programs, transfer centers, the proximity of neighboring universities—have similar effects on students of any ethnicity. The research on transfer rates of minority students is in its infancy, and is valuable to the study of minority students in higher education

### Summary

Research on minority students over the past several decades has provided valuable insights into their rates of participation, persistence, and performance in the nation's higher

education system. There is a substantial body of descriptive studies that inform about the proportion of Blacks, Hispanics, Asians and American Indians attending, achieving, and leaving college. There is beginning to emerge a volume of research addressing the reasons for lower rates of success in higher education among minority students. Empirical studies based on classical theories of college attendance, persistence, and performance such as those developed by Tinto (1975) are particularly helpful in explaining the factors related to lower rates of attendance, persistence and graduation among minority students. For example, in *Reworking the student departure puzzle*, John M. Braxton (Ed.) (2000), and Rendon, Jalomo, and Nora reviewed the research of Tinto's student departure theory (1975, 1987, 1993), and attempted to determine what kind of theoretical foundation and methodological approaches that are needed to more fully understand and facilitate the retention process for minority students. They concluded that a new, more coherent vision of minority student persistence has failed to evolve. Continued calls for accountability, both at the national and state levels, will require community colleges to more closely track enrollment, retention, and transfer data for all students. The future credibility of community colleges as viable members of the higher education community will be determined, to some extent, by their ability to preserve the tenants of access while still providing high quality outcomes related to student achievement, retention, and transfer. More specifically, community colleges will need to determine how to raise above the historic levels the number of students, particularly minority and disadvantaged students, who successfully transfer to senior institutions.

Following is a summary of the findings of the literature review related to community colleges regarding historical perspective; transfer function; minority student enrollment and retention; and transfer to baccalaureate institutions:



1. The debate continues as to whether community colleges are fulfilling their mission of democratizing education for all students;
2. Several major studies have set the transfer rate of community college students between 20% and 30%;
3. Minority students are enrolling in community college rates, yet their persistence and transfer rates continue to lag behind White students; and
4. Numerous studies have attempted to determine reasons for poor persistence rates of minority students enrolled in community colleges.

### CHAPTER 3. METHODOLOGY

The purpose of this study was to determine if the minority students enrolled at DMACC as probable transfer students transferred to Iowa State University at the same rate as White students, and to determine if there were any differences in the enrollment, within-term course retention, fall-to-spring persistence, and success after transfer of male and female students in each of the minority groups at DMACC. This chapter outlines the methodology used to compare DMACC's minority student population with the minority population from DMACC's eleven county service area, minority student within course retention during their first term at DMACC compared to White students, minority student persistence rates from their first semester at DMACC into the next term compared to White students, minority student transfer rates compared to White students, and minority success rates at ISU upon transfer compared to White students.

The literature suggests that while the enrollment rates of minority students in the nation's community colleges continues to increase, the persistence rate and ultimate transfer to baccalaureate degree granting colleges and universities is much lower than that for White students. The study focused only on the minority population at Des Moines Area Community College and subsequent transfer to Iowa State University. The rationale for the narrow focus is threefold. First, DMACC has the largest minority population of any of the community colleges in the state and the larger population sample allows for more statistically significant results of the analysis. Second, small numbers of DMACC students transfer in the state to colleges and universities other than ISU. An analysis of these low transfer rates would likely prohibit any statistically significant analysis. Third, the only reliable data

available was between DMACC and ISU. Although the results of the study cannot be generalized to the statewide population, the data are useful to DMACC because it describes the population of students who transfer to Iowa State University, the primary choice of DMACC students wishing to pursue a four-year degree. The chapter is divided as follows: (1) Study Population; (2) Research Design; (3) Data Collection; and (4) Data Analysis.

### **Study Population**

DMACC students for this study were identified as credit-earning, transfer-bound students. To attempt to limit the population studied to students intending to transfer, DMACC students included had to be enrolled in one of the following four courses considered as gateway courses for transfer students: English 117, Composition I; Math 115, Finite Mathematics; Psychology 101, General Psychology; or Spanish 101, Elementary Spanish I. Enrollment in these courses is the most practical indicator of students' intention to transfer to a four-year institution, rather than to pursue a vocational degree. A student's declaration of a major on the application form is not a reliable indicator of their transfer intent.

Three similar but distinct student populations and one ISU student population were examined as part of this study. For comparison with census data, this study used an average number of all students served by DMACC in fall terms from fall 1998 through fall 2002. There were an average of 3,079 students served by DMACC who met the criteria for this study. The second DMACC population used to examine within-term course retention and fall-to-spring persistence included 6,915 first-time full-time students attending DMACC in any fall terms from fall 1997 to fall 2002 who also met the criteria for the study. Within-term course retention used the 39,371 courses taken by the 6,915 students. The third

population used to examine transfer rate to ISU included all 9,641 students who were first-time full-time students for any term between fall 1997 and spring 2003. The single ISU population included 2,632 ISU students who had previously attended and earned credits at DMACC from summer 1998 through spring 2003.

### **Research Design**

Unlike parametric tests that make assumptions regarding the normality and homogeneity of variance for examined populations, nonparametric tests, and, in this case, the Chi-square test, are used when these assumptions are not met. The Chi-square test was selected for this study because the variables to be examined in this study were nominal rather than ordinal. This study compared expected frequencies calculated from DMACC's White student population with actual frequencies for DMACC's minority population. According to the null hypotheses, the proportions for observed and expected results between groups should show no statistical difference.

### **Data Collection**

The data collection was comprised of four data sets necessary to fully answer the three questions posed by the study. The first research question was: Are there significant differences between the enrollment, with-in term course retention, and fall-to-spring persistence rates of minority and White students at Des Moines Area Community College? To answer the first research question, the analysis focused on DMACC's enrollment of minority students. Data collection included: the rate of enrollment compared to Census 2000 data, the number of courses dropped or retained by students, and the number of students persisting from their initial fall term into the next spring term, compared to their White peers.

To determine the rate at which minority students enrolled at DMACC, compared to the minority population in DMACC's eleven-county service area, the Census 2000 data were used. Data were gathered from the U.S. Census Summary File, P12A. To compare DMACC's enrollment of minority students to the percentage of minorities in the Area 11 service population, the average number of students by gender and race for the fall terms 1998 through 2002 were compared to Census 2000 data. Table P12-Sex by Age from the Census 2000 Summary File 1 (see Appendix) was used to determine the percentage by race and gender of people 18 years old and older from DMACC's eleven county service area. These counties were Audubon, Boone, Carroll, Dallas, Guthrie, Jasper, Madison, Marion, Polk, Story, and Warren.

To analyze the percentage of each race/ethnic population enrolled at DMACC compared to the 2000 Census data, the race identification portion of the DMACC student application form was analyzed. DMACC requires students to indicate one of five races: White, Black, Asian, Hispanic, or Native American. The students may also elect to not respond to the question regarding race/ethnicity. Those choosing not to respond were excluded from the study. There was one inconsistency between the DMACC and the U.S. Census race data. The 2000 census allows respondents to identify a combination of up to four races. Hispanic is not considered a race, according to the United States Census Bureau, but is considered an ethnicity. Census respondents could select up to four races, and then indicate separately if they were of Hispanic origin.

To compensate for this discrepancy in reporting, for this study only those Census respondents were used who had indicated one race. Because the percentage of respondents in DMACC's eleven county service area who responded with two or more races was small

(.82%, or 4,213 out of 513,265), the respondents who selected one race were used because they more closely matched DMACC's data. The Hispanic ethnicity of Census respondents was compared to the Hispanic race retrieved from the DMACC records. Because there was no clear solution to remedy this discrepancy in self-reporting, all Census vs. DMACC Hispanic data were less homogeneous than the data for other race categories.

A smaller, but more manageable inconsistency between the Census and DMACC data was in the Asian and Pacific Islander groups. DMACC classifies Asian and Pacific Islander in one race category whereas the Census 2000 data include separate reporting categories for Asian and Pacific Islanders. To compensate for this difference, the two separate categories in the Census data were collapsed into one category to more closely resemble DMACC's single race category.

The second set of data related to the first research question examined student within-term course retention and fall-to spring persistence while at Des Moines Area Community College. Two sets of data were retrieved from the institutional administrative database, SCT Banner, and the Institutional Research Office at DMACC. First, an analysis was completed of within-term course retention of first time full time students attending beginning their studies at DMACC in any term from fall 1997 through fall 2002 and also enrolled in one of the four gateway transfer courses. Within-term retention was defined by whether a student completed or withdrew from a course. Students earning an F grade were considered to have completed the class. This analysis looked at within-term course retention by each of the defined races at DMACC, and by gender.

The second set of data analyzed to measure student persistence at DMACC consisted of examining the fall to spring return rate of the first-time full-time students enrolled in at

least one of the four identified gateway courses. These data included all first-time full-time DMACC students attending in any of the fall terms 1997 to 2002. Students were only considered persisters if they completed with a grade for at least one course in the spring term, immediately following their initial fall term enrollment. The fall-to-spring persistence rate was also analyzed by race and gender.

The second research question was: Are there significant differences in the transfer rate of minority and White students from Des Moines Area Community College to Iowa State University? To answer that question, the analyses included all first-time, full-time DMACC students meeting the gateway course criteria and attending DMACC any time from fall term 1997 through spring 2003. Unlike the within-term course retention and fall-to-spring persistence portions of this study, which required a logical fall-to-spring progression, students included in this portion of the study were not limited to fall terms. This was necessary to be able to track as many students to ISU as possible. These DMACC students were then compared to the transfer student file that the College receives from the Registrar's Office at ISU each term. This file contains information for all current ISU students who had previously attended DMACC. Transfer files for each term from summer 1998 through summer 2003 were received. If a student attended ISU at any term later than they had attended DMACC, that student was considered a transfer student. This definition was necessary so that any student dual enrolled at ISU and DMACC, or attending summer only at DMACC and ISU during the spring and fall were eliminated from the study. These transfer data were analyzed by race and by gender.

The third research question was: Are there significant differences in the success of minority students and White students after transfer to ISU? To answer this question, the

analysis included all students enrolled at ISU that had an earned GPA at DMACC prior to enrolling at ISU between the years 1998 and 2002. Success was defined as a student having earned 24 or more credits at ISU with a cumulative GPA of 2.0 or better, or having earned a baccalaureate degree. This measure of success is consistent with measures used in national transfer studies. Although this population contained many of the same students as the population studied to determine transfer rate, this population was not limited by any time span for attendance at DMACC and included all DMACC transfer students regardless of when they earned credits at DMACC. These data were also analyzed by race and by gender. Ideally, this analysis would have included the number of credits earned at DMACC prior to transferring to ISU, but there were not enough data to conduct this test. Cell size in the Chi-square analysis would have been too small.

### **Data Analysis**

Four assumptions regarding the data must be adhered to in order to make valid interpretations of the data using Chi-square analysis. The first assumption is that all observations must be randomly and independently selected for each group. Because no sampling techniques were used for this study and all members of the student population for the time period studied were included in the study, creating a random and independent sample is not a concern of this study.

The second assumption is that all categories analyzed in a Chi-square test must be mutually exclusive and observations may appear in only one category for each Chi-square test. All students included in this study had indicated only one race and resided in a single category exclusively. All other categories examined were also mutually exclusive with one



observation per student. Although the 2000 Census data used as part of this analysis allowed multiple race designations, only those respondents claiming one race were included in this study.

The third assumption regarding Chi-square tests is that all observations are measured as frequencies. All Chi-square tests in this study were based on actual observations of individual people and their membership in the groups studied. The final assumption regarding Chi-square test analysis is that expected cell size cannot be less than five when there is one degree of freedom. Since the Chi-square tests conducted had one degree of freedom, all tests where the expected cell size was less than five were indicated, and no Chi-square information was provided for these comparisons. A threshold of  $p=.05$  was used for all Chi-square analyses. This threshold was selected because it is a common threshold used in social science research, and indicates an acceptable 5-in-100 chances that the Chi-square is due to chance.

## CHAPTER 4. RESULTS

The purpose of this study was to determine if the minority students enrolled at DMACC as probable transfer students transferred to Iowa State University at the same rate as White students, and to determine if there were any differences in the enrollment, within-term course retention, fall-to-spring persistence, and after transfer success rates of male students and female students in each of the minority groups at DMACC.

The objective of the study was to compare the enrollment, within-term course retention, fall-to-spring-term retention, and transfer rate to ISU of minority and White students enrolled at DMACC to determine if there were significant differences between White students and minority students, and between male and female White and minority students. More specifically, the objectives were to determine if minority students:

1. Enroll at DMACC at the same rate at which they are represented in the population of the college's service district.
2. Are more or less likely than White students to persist in courses during their first term.
3. Are more or less likely than White students to return during the spring term immediately following their first fall term at DMACC.
4. Are more or less likely than White students to transfer from DMACC to ISU.
5. Are more or less likely to succeed at ISU upon transfer as defined by having earned at least 24 credits with a cumulative GPA  $\geq 2.00$  or earned a baccalaureate degree.

Although DMACC cooperates with ISU and the other public universities to track the number of students who transfer, and receives reports of the GPAs of these students upon transfer and for subsequent terms of enrollment, there exists no data analysis of how well the

minority student population from DMACC performs after transfer. This study attempted to analyze the data regarding minority student enrollment and persistence at DMACC and subsequent transfer to ISU.

### Research Questions

Three research questions guided the investigation:

1. Are there significant differences between the enrollment, within-term course retention, and fall-to-spring persistence rates of minority and White students at Des Moines Area Community College?
  - a. What is the percentage of minority students who enroll at DMACC compared to the percentage that exists in DMACC's service area population?
  - b. What is the rate at which minority students are retained in the courses they register for during their first term at DMACC compared to White students?
  - c. What is the rate at which minority students persist from fall to spring term at DMACC compared to White students?
  - d. Is there any difference in male and female minority students in their enrollment, within-term course retention, and fall-to-spring persistence rates at DMACC?
2. Are there significant differences in the transfer rate of minority and White students from Des Moines Area Community College to Iowa State University?
  - a. What is the rate at which minority students transfer to ISU from DMACC compared to White students?
  - b. Are there differences in the rate at which male and female minority students transfer to ISU?

3. Are there significant differences in the success of minority students and White students after transfer from DMACC to ISU?
  - a. What is the rate at which minority students succeed at ISU as measured by having earned 24 credits at ISU with a cumulative GPA of  $\geq 2.00$  or having earned a baccalaureate degree compared to White students?
  - b. Is there a difference in the success rate (as defined in 3.a) at ISU of male and female minority students?

### **Characteristics of the Participants**

This study examined the enrollment, within-term course retention, fall-to-spring persistence and ISU transfer rates for the following minority populations: Black, Hispanic, Asian, and American Indian, as well as for White students. The number of American Indian students attending DMACC and transferring to ISU is so low that in many cases, the cell size was simply too small to apply any statistical analysis. In addition to examining the enrollment, within-term course retention, fall-to-spring persistence and ISU transfer rates of each of the minority groups listed above, the data was further analyzed by gender. In each of the research questions, an analysis was conducted for each minority group and White students, by gender.

For the first research question, the study examined the population of minority students at DMACC by averaging the number of minority students meeting the gateway course criteria of this study for the fall terms 1998 through 2002, and comparing that number to the 2000 U.S. Census population numbers for the service area of DMACC. Census data

consisted of the population of 18 years old and older who indicated only one race category on the 2000 Census.

For the second research question, the study examined the within term course retention rates, and fall-to-spring persistence of minority and White students at DMACC. Within-term retention included 39,371 courses taken by 6,915 DMACC first-time full-time students meeting the gateway course requirements of this study and attending fall terms from fall 1997 through fall 2002. Fall-to-spring persistence looked at these same 6,915 students who met the criteria for this research question. The third research question examined 2,632 ISU students who had previously earned credits at DMACC from the summer of 1998 through spring 2003.

### **Hypotheses**

Twelve hypotheses were formulated for this study:

1. DMACC serves a lower percentage of male minority credit earning transfer-oriented students 18 years old and older than exist in the general population of DMACC's eleven county service area.
2. DMACC serves a lower percentage of female minority credit earning transfer students 18 years old and older than exist in the general population of DMACC's eleven county service area.
3. DMACC does not serves the same proportion of male and female minority credit earning transfer-oriented minority students than exist in the 18 year old and older total population of DMACC's 11 county service area.

4. The within-term course retention and fall-to spring persistence rates for first-time, full-time male minority credit-earning transfer oriented students is significantly less than the within-term course retention and fall-to-spring persistence rates for first-time full-time male credit-earning transfer-oriented White students.
5. The within-term course retention and fall-to spring persistence rates for first-time, full-time female minority credit-earning transfer oriented students is significantly less than the within-term course retention and fall-to-spring persistence rates for first-time, full-time female credit earning transfer-oriented White students.
6. The within-term course retention and fall-to-spring persistence rates for first-time full-time male credit earning transfer-oriented students is significantly different than the within-term course retention and fall-to-spring persistence rates for first-time, full-time female credit earning transfer-oriented students.
7. A significantly smaller percentage of male minority credit earning transfer-oriented students transfer from DMACC to Iowa State University than do male credit earning transfer-oriented White students.
8. A significantly smaller percentage of female minority credit earning transfer-oriented students transfer from DMACC to Iowa State University than do credit earning transfer-oriented White female students.
9. A significant difference exists between the rate male and female DMACC credit earning transfer-oriented students transfer to Iowa State University.
10. Upon transfer to Iowa State University, male minority students succeed at a lower rate than male White students.

11. Upon transfer to Iowa State University, female minority students succeed at a lower rate than female White students.
12. Upon transfer from DMACC to Iowa State University, significant differences exist between the rate of success of male and female students.

### **Results**

The Statistical Package for the Social Science (SPSS) was used for interpreting the data in this study. Descriptive statistics include frequency, percentage of minority population compared to White population, and Chi-square comparisons by gender for each of the research questions.

#### **Demographic data**

Tables 4.1-4.5 represent demographic information about the participants in the study. The intent of this demographic data is to show the general size of the groups utilized for this study. As issues and problems are identified in this study, Tables 4.1-4.5 will give an indication of the number of students affected.

Table 4.1 depicts the total population of minorities at DMACC compared to the number in the Census 2000 data for the 11-county DMACC service area. The DMACC population by gender and race represented a five-year average for fall terms 1998 to 2002 of all first-time full-time students at DMACC that enrolled in at least one of four gateway transfer courses identified earlier. The average size of this population group was 3,079. That number was compared with the 2000 Census data for the 18 year old and older population for the eleven county service area for DMACC. Both the DMACC average and the Census 2000

Table 4.1. DMACC total population of first-time, full-time students enrolled in at least one gateway course compared to the number in the Census 2000 data for the 11-county DMACC service area

Ethnicity	DMACC		Census	
	Male	Female	Male	Female
White	1,139	1,611	228,895	247,770
Black	59	71	6,840	6,742
Hispanic	24	34	7,550	5,778
Asian	68	62	5,720	5,510
Am. Indian	7	6	550	554
Gender total	1,295	1,784	249,555	266,354
Total	3,079		515,909	

data exhibited a predominately White population, with approximately 10% or less minorities in the populations.

Table 4.2 depicts the number of students, by race and by gender, who were enrolled at DMACC as first-time full-time students, taking at least one of the four gateway courses, in any of the fiscal years 1998-2002 and who dropped a gateway course. Courses were

Table 4.2. Number of students, by race and by gender, that were enrolled at DMACC as first-time full-time students, taking at least one of the four gateway courses, in any of the fiscal years 1998-2002, and who dropped a gateway course

Ethnicity	Courses dropped		Courses completed	
	Male	Female	Male	Female
White	1,941	2,472	13,910	17,234
Black	162	133	612	539
Hispanic	48	55	255	345
Asian	164	176	634	549
Am. Indian	4	11	42	85
Gender/Status total	2,319	2,847	15,453	18,752
Status total	5,166		34,205	
Total			39,371	



considered dropped only if the student withdrew. Students who earned an F were considered to have completed the course. This is a cumulative number, i.e., the total number of students (unduplicated) with these characteristics who dropped and completed a gateway course from 1998 to 2002.

Table 4.3 depicts the number of students, by race and gender, which persisted from fall to spring term in any of the 5 years tested, 1998 through 2002. This group is a subset of the student population in Table 4.2, and represents the total number of students from the population that persisted from fall term to spring term in any of the years of the study.

Table 4.3. Number of students, by race and gender, which persisted from fall to spring term in any of the 5 years tested, 1998 through 2002

Ethnicity	Persisting students		Students not persisting	
	Male	Female	Male	Female
White	2,200	2,839	601	631
Black	98	98	25	22
Hispanic	35	56	15	14
Asian	106	101	30	19
Am. Indian	5	12	1	7
Gender/Status total	2,444	3,106	672	693
Status total	5,550		1,365	
Total			6,915	

Table 4.4 depicts the total number of students that transferred to ISU between spring of 1998 and summer of 2003 that were considered first-time, full-time in one of the four gateway transfer courses. The students in this population group enrolled at DMACC during either a fall or a spring term during the timeframe of the study. For comparison purposes, the table indicates those transferring or not transferring.

Table 4.4. Number of students that transferred to ISU between spring of 1998 and summer of 2003 that were considered first-time, full-time in one of the four gateway transfer courses

Ethnicity	Students transferring		Students not transferring	
	Male	Female	Male	Female
White	394	367	3,469	4,412
Black	5	8	296	184
Hispanic	6	8	71	93
Asian	24	26	180	159
Am. Indian	0	1	10	28
Gender/Status total	429	410	3,926	4,876
Status total	839		8,802	
Total	9,641			

Table 4.5 depicts the total number of students who transferred to ISU from DMACC from 1998 through 2003, who had earned 24 or more credits at ISU with a cumulative GPA of 2.0 or better, or graduated with a baccalaureate degree. For comparison purposes, the table indicates those who were successful or not successful.

Table 4.5. Total number of students who transferred to ISU from DMACC and earned 24 or more credits at ISU with a cumulative GPA of 2.0 or better, or graduated

Ethnicity	Successful		Not successful	
	Male	Female	Male	Female
White	837	842	313	323
Black	15	18	13	14
Hispanic	8	27	8	4
Asian	99	80	30	8
Am. Indian	0	0	0	3
Gender/Status total	959	957	364	352
Status total	1,916		716	
Total	2,632			

### **Chi-square analysis on each hypothesis**

The number of minority and White students was compared as it exists in different categories because no mean or other nominal data exist for analysis. The Chi-square test provides an excellent tool for determining whether one's expectation for how the data distribute according to the selected categories matches with the actual distribution.

*Null hypothesis 1: No difference exists between the percentages of male minority students 18 years old and older in the total population of DMACC's eleven county service area, and DMACC's credit earning transfer-oriented student body.*

The Chi-square analysis of the male minority population at DMACC compared to the total service area population is summarized in Table 4.6. The analysis showed that there were significant differences in DMACC enrollment compared to the general population for three of the four minority groups. At DMACC during the 1998-2002 years, the average percentage of Black males enrolled each year was 4.92% of the student population. Black males 18 years old and older accounted for 2.90% of the Census 2000 population. The Chi-square test result comparing the two groups was significant at ( $p < .05$ ). The average percentage of Hispanic males was 2.06% of the total DMACC student population; the 18 year old and older Hispanic male population in the 2000 Census was 3.19%. The Chi-square test result comparing the two groups was significant at ( $p < .05$ ). The average percentage of Asian males was 5.63% of the total DMACC student population. Asian males 18 years old and older accounted for 2.44% of the Census 2000 population. The Chi-square test result comparing the two groups was significant at ( $p < .05$ ).

Table 4.6. Male minority population at DMACC compared to the total service area population

	Minority group as a percentage of the sum of minority group plus White group			
	Black	Hispanic	Asian	Am. Indian
DMACC	4.92	2.06	5.63	0.44
Census	2.90	3.19	2.44	0.24
%-point dif	2.02	-1.13	3.19	0.20
P-value	< 0.0001*	0.0287*	< 0.0001*	—

\* $\chi^2$  level of significance =  $p < .05$

In summary, DMACC served a significantly greater percentage of Black male and Asian males than existed in the general population of the college service area. Conversely, DMACC served a significantly smaller percentage of Hispanic males than existed in the general population of the college service area. There was not a large enough population of American Indians to conduct a Chi-square test. Since there was a significant difference in each of the three minority populations served by DMACC and those that exist in the general population, null hypothesis 1 was rejected.

*Null hypothesis 2: No difference exists between the percentages of female minority students 18 years and older in the total population of DMACC's 11 county service area and DMACC's credit earning transfer-oriented student body.*

The Chi-square analysis of the female minority population at DMACC compared to the total service area population is summarized in Table 4.7. The analysis showed that there were significant differences in the DMACC enrollment compared to the general population for the Black females and Asian females, but not for Hispanic females. As with the male population, the population size for the American Indian females was too small to perform an analysis. At DMACC during the 1998-2002 fiscal years, the average percentage of Black

Table 4.7. Female minority population at DMACC compared to the total service area population

	Minority group as a percentage of the sum of minority group plus White group			
	Black	Hispanic	Asian	Am. Indian
DMACC	4.22	2.07	3.71	0.37
Census	2.65	2.28	2.18	0.22
%-point dif	1.57	-2.21	1.53	0.15
P-value	< 0.0001*	0.5657	< 0.0001*	–

\* $\chi^2$  level of significance =  $p < .05$

females was 4.22% of the total student population. Black females 18 years old and older accounted for 2.65% of the 2000 Census population. The Chi-square test results comparing the two populations was significant at ( $p < .05$ ). The average percentage of Hispanic females at DMACC was 2.07% of the total student population. Hispanic females 18 years old and older accounted for 2.28% of the 2000 Census population. There was no significant difference at the ( $p < .05$ ) level. The average percentage of Asian females was 3.71% of the total student population. Asian females 18 years old and older accounted for 2.18% of the 2000 census population. The Chi-square test result comparing the two populations was significant at ( $p < .05$ ).

In summary, Black females and Asian females enroll at DMACC in greater numbers than they exist in the general population of DMACC's service area; Hispanic females enroll at statistically the same rate as they exist in the general population. Two of the three minority populations tested enrolled at DMACC at a higher percentage than existed in the general population; therefore null hypothesis 2 was rejected.

*Null hypothesis 3: No difference exists between the percentage of male and female minority students 18 years old and older in the total population of DMACC's eleven county service area, and DMACC's credit earning student body.*

The Chi-square analysis of the percentage of the total female population, the White female population, and the female minority population at DMACC compared to their existence in DMACC's service area is presented in Table 4.8. In the total student body during the timeframe of the study, DMACC served a greater percentage of females than existed in the Census 2000 data. An average of 57.94% of the total DMACC student population during the five years of the study was female, compared to the percentage of

Table 4.8. Percentage of the total female population, the White female population, and the female minority population at DMACC compared to their existence in DMACC's service area

Ethnicity	Percent female		% -point difference	P-value
	DMACC	Census		
ALL	57.95	51.63	6.31	<.0001*
White	58.58	51.98	6.60	<.0001*
Black	54.62	49.64	4.98	0.2598
Hispanic	58.62	43.35	15.27	0.0192*
Asian	47.69	49.07	-1.38	0.7556
Am. Indian	54.55	50.18	4.37	0.7734

\* $\chi^2$  level of significance =  $p < .05$

females in the 2000 Census data, which was significantly less, at 51.63%. The Chi-square test results for that analysis were significant at ( $p < .05$ ).

The average percentage of the White female population during the five-year period was 58.58%; the percentage of females 18 years and over in the U.S. Census was only 51.98%. This difference was also statistically significant at ( $p < .05$ ). The Hispanic female

student population was 58.62%, compared to the Hispanic female population in the 2000 Census, which was 43.35%. DMACC serves a significantly higher Hispanic female population than exists in the general population. The difference was significant at the ( $p < .05$ ) level of analysis.

The comparison of the Black, Asian, and American Indian female ratios yielded different results. The percentage of Black females at DMACC (54.62%) was not statistically different than the percentage in the general population (49.64%). The percent of Asian females at DMACC was 47.69%; the Census 2000 Asian female population was 49.07%. The American Indian population at DMACC was also consistent with the general population. American Indian women comprised 54.55% of the DMACC American Indian population, while 50.18% of the general American Indian population is comprised of women.

There was not a significant difference in the percentage of Black, Asian, and American Indian men and women enrolled at DMACC compared to the percentage in the general population. However, a significantly higher percentage of Hispanic females than males enrolled in DMACC than in the general population, which negates the hypothesis that DMACC serves the same percentage of male and female minority students that exist in the general population. Therefore, Null Hypotheses 3 was rejected.

*Null hypothesis 4: No differences exist in the within-term course retention rates and the fall-to-spring persistence rates between first-time, full-time male minority credit earning transfer-oriented DMACC students and first-time full-time male credit earning transfer-oriented White DMACC students.*

The Chi-square analysis of the within-term course retention rates and fall-to-spring term persistence rates of White male students compared to male minority students is presented in Tables 4.9a and 4.9b. This hypothesis was divided into two criteria: the

analysis of within-term course retention, and the analysis of persistence from fall to spring term. Within-term retention was dealt with first. Within-term course retention was defined as persisting in courses enrolled during an entire college term. Within-term course retention was measured by the number of courses dropped by White males and minority males.

The Chi-square analysis was conducted on the percentage of courses dropped by White male students compared to male students in each of the minority groups during their first term at DMACC (Table 4.9a). The percentage of courses dropped by White males was 12.25%. Black males dropped 20.93% of their courses during their first term at DMACC. This was a significant difference at the ( $p < .05$ ) level of analysis. Hispanic males dropped 15.84% of their classes during the first term at DMACC, though close at  $p = .0591$ , this difference was not significant at the  $\alpha = .05$  level. Asian males dropped 20.55% of their classes during the first term at DMACC, once again significant at ( $p < .05$ ). Only American Indian males did not drop classes at a higher rate than White males. This analysis clearly illustrates that minority male students, with the exception of the American Indian population, do not complete classes at the same rate as White males during their first term at DMACC.

Table 4.9a. Percentage of courses dropped by White male students compared to male students in each of the minority groups during their first term at DMACC

	Comparison of each minority group to White student group				
	White	Black	Hispanic	Asian	Am. Indian
Percent of courses dropped	12.25	20.83	15.84	20.55	8.70
%-point dif from White	–	8.68	3.59	8.30	-3.55
P-value	–	<.0001*	0.0591	<.0001*	0.4632

\* $\chi^2$  level of significance =  $p < .05$



The second criterion in Null Hypothesis 4 was persistence rate from fall to spring term. The Chi-square analysis of the students enrolled in a given fall term semester that persisted to the spring term immediately following, and enrolled in at least one of the gateway transfer courses compared White males students to male students in each of the minority groups (Table 4.9b). White male students persisted to the spring term at a rate of 78.54%. Black male students persisted at a rate of 79.67%. There was no significant difference between White and Black males at the ( $p < .05$ ) level. Hispanic males persisted at a rate of 70.00%. Again, there was no significant difference at the ( $p < .05$ ) level. Asian males persisted at a rate of 77.94%, which was not significant at the ( $p < .05$ ) level. American Indian males persisted at a rate of 83.33%, but the sample size was too small to conduct an analysis. There was no statistical significance in the rate of persistence between White males and any of the male minority groups.

Although the persistence criteria in Null Hypothesis 4 were retained, there were significant statistical differences in the within course retention criteria of the Hypothesis. Therefore, Null Hypothesis 4 was rejected.

Table 4.9b. Fall-to-spring persistence rate of White male students compared to male students in each of the minority groups

	Comparison of each minority group to White student group				
	White	Black	Hispanic	Asian	Am. Indian
Fall-to-spring persistence rate	78.54	79.67	70.00	77.94	83.33
%-point dif from White	–	1.13	-8.54	-0.60	4.79
P-value	–	0.7646	0.1457	0.8674	–

$\chi^2$  level of significance =  $p < .05$

*Null hypothesis 5: No differences exist in the within-term course retention rates and the fall-to-spring persistence rates between first-time, full-time female credit earning transfer-oriented minority DMACC students and first-time, full-time female credit earning transfer-oriented White DMACC students.*

The Chi-square analysis of the within-term course retention rates and fall to spring persistence rates of White female students compared to minority female students is presented in Tables 10a and 10b. This hypothesis, like Null Hypothesis 4, was divided into two criteria. Within-term course retention was defined as persisting in courses enrolled during an entire college term, and was measured by the number of courses dropped by White females and minority females. The Chi-square analysis was conducted on the percentage of courses dropped by White female students compared to female students in each of the minority groups during their first term at DMACC (Table 10a). White females dropped 12.54% of their courses; Black females dropped 19.79% of their courses. This difference was significant at the ( $p < .05$ ) level of analysis. Hispanic females dropped 13.75% of their courses, which was not significant at the ( $p < .05$ ) level. Asian females dropped 24.28% of their courses, which was also significant at the ( $p < .05$ ) level. American Indian females dropped 11.46% of their courses, which was not significant at the ( $p < .05$ ) level.

Table 4.10a. Percentage of courses dropped by White female students compared to female students in each of the minority groups

	White	Comparison of each minority group to White student group			
		Black	Hispanic	Asian	Am. Indian
Percent of courses dropped	12.54	19.79	13.75	24.28	11.46
%-point dif from White	–	7.25	1.21	11.74	-1.08
P-value	–	<.0001*	0.4715	<.0001*	0.7486

\* $\chi^2$  level of significance =  $p < .05$

The second criterion in Null Hypothesis 5, persistence rate from fall to spring term was measured identically to Null Hypothesis 4, except that it measured female instead of male persistence (Table 4.10b). White female students persisted to the spring term at a rate of 81.82%. Black female students persisted at a rate of 81.67%. There was no significant difference between White and Black female persistence rates at the ( $p < .05$ ) level. Hispanic females persisted to the spring term at a rate of 80.00%. Again, there was no significant difference between the rate of persistence of Hispanic females and White females at the ( $p < .05$ ) level of analysis. Asian females persisted at a rate of 84.17%, slightly higher than the persistence rate of White females, but still not statistically significant at the ( $< .05$ ) level. American Indian females persisted at a rate of 63.16%, but the sample size was too small to conduct a Chi-square analysis. There was no statistical significance between the persistence rates of the White female students and the female students in each of the minority groups.

Although the persistence criteria in Null Hypothesis 5 were retained, there were significant differences in the within term course retention of White female students and Black and Asian female students. Therefore, Null Hypothesis 5 was rejected.

Table 4.10b. Fall-to-spring persistence of White female students compared to female students in each of the minority groups

	Comparison of each minority group to White student group				
	White	Black	Hispanic	Asian	Am. Indian
Fall-to-spring persistence rate	81.82	81.67	80.00	84.17	63.16
%-point dif from White	–	-0.15	-1.82	2.35	-18.66
P-value	–	0.9668	0.6968	0.5108	–

$\chi^2$  level of significance =  $p < .05$

*Null hypothesis 6: No differences exist in the within-term course retention rates and the fall-to-spring persistence rates between first-time, full-time male credit earning transfer-oriented DMACC students and first-time, full-time female credit earning transfer-oriented DMACC students.*

The Chi-square analysis of the female population compared to the male population in within-term course retention and fall-to-spring persistence rates is summarized in Tables 4.11a and 4.11b. For the first criterion in the Null hypothesis 6 (Table 4.11a), within-term course retention for all students, male students dropped 13.05% of their courses, compared to 13.18% by female students, which was not statistically significant at the ( $p < .05$ ) level. For the White student population, male students dropped 12.25% of their courses, compared to 12.54% by female students, also not statistically significant at the ( $p < .05$ ) level. For the Black student population, male students dropped 20.93% of their courses, compared to 19.79% by the female students; also not statistically significant at the ( $p < .05$ ) level. Hispanic male students dropped 15.84% of their courses, and Hispanic females dropped 13.75% of their courses. Asian male students dropped 20.55% of their courses, compared to Asian females, who dropped 24.28% of their courses. There was not a statistically significant

Table 4.11a. Within-course retention rates by White male and female students compared to male and female students in each of the minority groups

Ethnicity	Percent dropped		% -point difference	P-value
	Male	Female		
ALL	13.05	13.18	-0.13	0.6983
White	12.25	12.54	-0.29	0.3952
Black	20.93	19.79	1.14	0.5921
Hispanic	15.84	13.75	2.09	0.4374
Asian	20.55	24.28	03.75	0.0813
Am. Indian	8.70	11.46	-2.76	—

$\chi^2$  level of significance =  $p < .05$

difference in courses dropped between males and females for White, Black, Hispanic and Asian students ( $p < .05$ ). The sample size was too small to conduct a Chi-square analysis on American Indian students.

For the second criteria in Null Hypothesis 6, persistence rate from fall to spring term, males persisted at a rate of 78.43% and females persisted at a rate of 81.76% (Table 4.11b). This was statistically significant at the ( $p < .05$ ) level. White male students persisted at a rate of 78.54%, and White females persisted at a rate of 81.82%. This difference was also statistically significant at the ( $p < .05$ ) level of analysis. Persistence rates for Black males and females, Hispanic males and females, and Asian males and females were not statistically significant at the ( $p < .05$ ) level. The American Indian sample size was too small to conduct a Chi-square analysis.

Although the within-term retention criteria in Null Hypothesis 6 was retained, there were statistically significant differences in the fall-to-spring persistence rates for the entire population and for the White male and female students. Therefore, Null Hypothesis 6 was rejected.

Table 4.11 b. Fall-to-spring persistence rates by White male and female students compared to male and female students in each of the minority groups

Ethnicity	Percent persisting		% -point difference	P-value
	Male	Female		
ALL	78.43	81.76	-3.33	0.0005*
White	78.54	81.82	-3.28	0.0012*
Black	79.67	81.67	-2.00	0.6943
Hispanic	70.00	80.00	-10.00	0.2071
Asian	77.94	84.17	-6.23	0.2064
Am. Indian	83.33	63.16	20.17	-

\* $\chi^2$  level of significance =  $p < .05$

*Null hypothesis 7: No difference exists between the rate male minority credit earning transfer-oriented DMACC students transfer to Iowa State University and the rate male White credit earning transfer-oriented students transfer to Iowa State University.*

The Chi-square analysis of the White male students transfer rates to ISU compared to the transfer rates of each minority group is presented in Table 4.12. The analysis revealed significant differences in transfer rates for only the Black male population. For the years 1997 through summer 2003, 10.20% of the White male students who were enrolled at DMACC as first-time, full-time students in at least one of the gateway transfer courses transferred to ISU. During the same time frame, only 2.49% of the Black male students transferred. The Chi-square analysis comparing Black and White male students was significant at the ( $p < .05$ ) level. Hispanic males transferred at a rate of 7.79%, and Asian males transferred at a rate of 11.76%; neither statistically significant at the ( $p < .05$ ) level. There were no American Indian males students in the sample. Since there was a significant difference in the rate at which White males and Black males transferred, Null hypothesis 7 was rejected.

Table 4.12. Transfer rates from DMACC to ISU for White male students compared to transfer rates of male students in each of the minority groups

	Comparison of each minority group to White student group				
	White	Black	Hispanic	Asian	Am. Indian
Percent of students transferring	10.20	2.49	7.79	11.76	0.00
%-point dif from White	–	-7.71	-2.41	1.56	–
P-value	–	0.0003*	0.4886	0.4730	–

\* $\chi^2$  level of significance =  $p < .05$

*Null hypothesis 8: No difference exists between the rate female credit earning transfer-oriented minority DMACC students transfer to Iowa State University and the rate female credit earning transfer-oriented White students transfer to Iowa State University.*

The Chi-square analysis of the White female student transfer rates to ISU compared to the minority student transfer rates is presented in Table 4.13. During the years 1997 through summer 2003, 7.68% of the White female students who were enrolled at DMACC as first-time, full-time students in at least one of the gateway transfer courses transferred to ISU. During that same timeframe, 4.17% of the Black female students transferred to ISU, which was not statistically significant at the  $p=.05$  level. The Hispanic female students actually transferred at a higher rate than White female students; 7.92% of the Hispanic students transferred to ISU, although the rate was not statistically significant at the ( $p<.05$ ) level. The only significant difference in the transfer rate comparison of White and minority female students was the comparison with the Asian students: 14.05% of the Asian female students transferred to ISU. This difference was significant at the ( $p<.05$ ) level of analysis. The sample size for the American Indian population was not large enough to conduct a Chi-square analysis. Because the Asian female students transferred to ISU at a significantly higher rate than White students, Null Hypothesis 8 was rejected.

Table 4.13. Transfer rates from DMACC to ISU for White female students compared to transfer rates of female students in each of the minority groups

	Comparison of each minority group to White student group				
	White	Black	Hispanic	Asian	Am. Indian
Percent of students transferring	7.68	4.17	7.92	14.05	3.45
%-point dif from White	–	-3.51	0.24	6.37	-4.23
P-value	–	0.0707	0.9282	0.0016*	–

\* $\chi^2$  level of significance =  $p<.05$

*Null hypothesis 9: No difference exists between the rate male and female DMACC credit earning transfer-oriented students transfer to Iowa State University.*

The Chi-square analysis of the male student transfer rates compared to the female student transfer rates is presented in Table 4.14. This analysis compared all male and female students, and male and female students by White students and minority group. There were significant differences in the overall transfer rate of all males and females, and in the transfer rate of White males and females to ISU. There were no significant differences in the transfer rates of Black, Hispanic, and Asian male and female students. Overall, male students transferred from DMACC to ISU at a rate of 9.85%, and females transferred at a rate of 7.76%. This was statistically significant at the ( $p < .05$ ) level of analysis. For the White student population, male students transferred at a rate of 10.20%, and females transferred at a rate of 7.68%. This difference was also statistically significant at the ( $p < .05$ ) level of analysis. Black males students transferred to ISU at a rate of 2.49%, and Black female students at a rate of 4.17%. Hispanic males transferred at a rate of 7.79%, and Hispanic females students at a slightly

Table 4.14. Transfer rates of male and female DMACC credit-earning students transferring to ISU

Ethnicity	Percent transferring		% -point difference	P-value
	Male	Female		
ALL	9.85	7.76	2.09	0.0003*
White	10.20	7.68	2.52	<.0001*
Black	2.49	4.17	-1.68	0.3522
Hispanic	7.79	7.92	-0.13	0.9748
Asian	11.76	14.05	-2.29	0.5005
Am. Indian	0.00	3.45	-3.45	—

\* $\chi^2$  level of significance =  $p < .05$



higher rate of 7.92%. Asian males transferred at a rate of 11.76%, and Asian females at a higher rate of 14.05%. There was not a large enough sample size of American Indians to conduct a Chi-square analysis. There were statistically significant differences in the transfer rates between males and females overall, and in the rates of White males and females, with White males transferring at a significantly higher rate. Therefore, Null Hypothesis 9 was rejected.

*Null hypothesis 10: Once transferred from DMACC to Iowa State University, no difference exists between the rate of success of male minority and White students.*

The Chi-square analysis of the percentage of successful minority males students at ISU compared to White males students is presented on Table 4.15. The rate of success of White male students at ISU after transferring from DMACC was 72.78%, while the rate of success for Black males at ISU was 53.57%. The Chi-square test results were significant at the ( $p < .05$ ) level. The rate of success for Hispanic males was only 50.00%, also significant at the ( $p < .05$ ) level in the Chi-square test. Asian males were more successful at ISU than White males, with a success rate of 76.74%. However, it was not statistically significant at the ( $p < .05$ ) level. There was a significant difference in the rate of success for both Black

Table 4.15. Transfer success rates from DMACC to ISU for White male students compared to success rates of male students in each of the minority groups

	Comparison of each minority group to White student group				
	White	Black	Hispanic	Asian	Am. Indian
Rate of success at ISU	72.78	53.57	50.00	76.74	0.00
%-point dif from White	–	-19.21	-22.78	3.96	–
P-value	–	0.0248*	0.0427*	0.3355	–

Note: Transfer success is defined as 24 credits accumulated, cumulative GPA = >2.0, and graduation  
 $\chi^2$  level of significance =  $p < .05$

males and Hispanic males compared to White males, and no significant difference in the rate of success for Asian males compared to White males. There was no evidence in the research data that any American Indian males have transferred to ISU from DMACC. Two of the three minority populations tested succeeded at a significantly lower rate at ISU than White males; therefore, Null Hypothesis 10 was rejected.

*Null hypothesis 11: Once transferred from DMACC to Iowa State University, no difference exists between the rate of success of female minority students and the rate of success of female White students.*

The Chi-square analysis of the percentage of successful minority female students at ISU compared to White female students is presented in Table 4.16. There was a significant difference in the rate of success of Black females and of Asian females compared to White females, but no significant difference in the success rate of Hispanic females compared to White females. The rate of success of White female students at ISU after transferring from DMACC was 72.27%, and for Black female students, 56.25%. The Chi-square test results were significant at the ( $p < .05$ ) level. The rate of success of Hispanic females was 80.95%, higher than that of White females, but not significant at the ( $p < .05$ ) level. The rate of success

Table 4.16. Transfer success rates from DMACC to ISU for White female students compared to success rates of female students in each of the minority groups

	Comparison of each minority group to White student group				
	White	Black	Hispanic	Asian	Am. Indian
Rate of success at ISU	72.27	56.25	80.95	90.91	0.00
%-point dif from White	–	-16.02	8.68	18.64	–
P-value	–	0.0468*	0.3778	0.0001*	–

Note: Transfer success is defined as 24 credits accumulated, cumulative GPA = >2.0, and graduation  
 \* $\chi^2$  level of significance =  $p < .05$

of Asian females was 90.91%, significantly higher at the ( $p < .05$ ) level than that of White female students. For the female American Indian population, there were only three records found that met the criteria for the Hypothesis. Because two of the three minority populations tested succeeded at a significantly different rate at ISU than White females, Null Hypothesis 11 was rejected.

*Null Hypothesis 12: Upon transfer from DMACC to Iowa State University, no difference exists between the rate of success of male and female students.*

The Chi-square analysis of the rate of success of the male and female population at ISU is presented in Table 4.17. For the total population that transferred to ISU from DMACC, 72.49% of the male students and 73.11% of the female students were successful, which was not a significant difference at the ( $p < .05$ ) level. There was also no significant difference in the success rate of White male and White female students, who succeeded at a rate of 72.78% and 72.27%, respectively. In addition, there was no significant difference in

Table 4.17. Transfer success rates from DMACC to ISU for male and female White students compared to success rates of male and female students in each of the minority groups

Ethnicity	Percent transferring		% -point difference	P-value
	Male	Female		
ALL	72.49	73.11	-0.62	0.7197
White	72.78	72.27	0.51	0.7843
Black	53.57	56.25	-2.68	0.8352
Hispanic	50.00	80.95	-30.95	0.0463*
Asian	76.74	90.91	-14.17	0.007*
Am. Indian	0.00	0.00	0.00	—

Note: Transfer success is defined as 24 credits accumulated, cumulative GPA =  $> 2.0$ , and graduation  
 \* $\chi^2$  level of significance =  $p < .05$

the rate of success between Black male students and female students once transferred to ISU. The rate of success for Black males was 53.57%, and for Black females, a slightly higher rate of 56.25%. Conversely, there were significant differences in the success rates between Hispanic males and females, and between Asian males and females. Hispanic males were successful at a rate of 50.00%, whereas Hispanic females were successful at a much higher rate of 80.95%, statistically significant at the ( $p < .05$ ) level. Asian females were also significantly more successful than Asian male students. Asian males were successful at a rate of 76.74%, Asian females at a rate of 90.91%, which was statistically significant at the ( $p < .05$ ) level. There were no data available to test the difference between male and female success rates of American Indian students. Because there were significant differences between the success rate of male and female students at ISU in two of the groups tested, Null Hypothesis 12 was rejected.

## CHAPTER 5. SUMMARY, DISCUSSION, AND RECOMMENDATIONS

### Summary

Despite enrollment gains at DMACC, and the other community colleges in Iowa, minority students are still under-represented at the two-year level. The purpose of this study was to determine if the minority students that enrolled at DMACC as probable transfer students transferred to Iowa State University at the same rate as White students, and to determine if there were any differences in the enrollment, within-term course retention, fall-to-spring persistence, and success after transfer rates of male students and female students in each of the minority groups at DMACC.

The objectives of the study were to compare the enrollment, within-term course retention, and fall-to-spring term retention and transfer rate to ISU of minority and White students enrolled at DMACC to determine if there were significant differences among the race/ethnic backgrounds or between male and female minority students. Specifically, the study assessed if there were significant differences: (a) between the enrollment, within-course retention, and fall-to-spring persistence rates of minority and White students; (b) in the transfer rate of minority and White students from DMACC to ISU; and (c) in the success of minority students and White students after transfer from DMACC to ISU.

### Findings

The findings indicated that enrollment of minority students at DMACC is increasing, and Black and Asian students enroll in greater numbers than exist in the central Iowa population. This reflects national enrollment trends, and it is encouraging that Black and Asian students are increasingly using DMACC as their entry point for higher education.

Conversely, Hispanic students, particularly males, enroll at DMACC at lower rates than they exist in the central Iowa population. This is particularly disturbing as the Hispanic population is the fastest growing population in Iowa (Iowa Department of Education, 2003) and in the nation (Digest of Educational Statistics, 2002).

The most significant finding in the study was in the comparison of minority students to White students in within-course retention during the first term of enrollment at DMACC. With the exception of Hispanic females, all minority students dropped courses at a significantly higher rate than did their White peers. Not only did minority students drop courses at a higher rate, the drop rates were nearly double that of White students. These initial findings indicate that the first term at DMACC is a difficult adjustment period for minority students. However, once students persisted past the first term of enrollment at DMACC, the differences in persistence between minority and White students were minimal. The study found that there was no statistically significant difference in fall-to-spring persistence rates between any of the minority populations, or between males and females.

When examining the transfer rates of minority students and White students differences again emerged among the populations, and were not completely consistent with national trends. Black males had the lowest transfer rate of all students, only transferring at a rate of 2.49%, and Black females transferred at a rate of 4.17%, also lower than the other minority populations. Asian females had a transfer rate of 14.05%, significantly higher than any other students, and Asian males transferred at a rate of 11.76%, also higher than the other populations. In a departure from national trends, Hispanic students transferred at rates similar to White students.

Finally, the findings were mixed regarding success after transfer. Black males and females, and Hispanic males were less successful at ISU than White students. Only Asian females were more successful after transfer to ISU than were White females. Over 90% of the Asian female transfer students were successful at ISU, which was significantly higher than any other population, male or female.

The findings of this study reflect the existing quantitative research on minority enrollment, persistence and success in higher education. Minority students tend to use community colleges as the gateway to higher education in greater proportions than do White students (Adelman, 1989; Cohen & Brawer, 2003; Harbour, Middleton, Lewis & Anderson, 2003; Lewis & Middleton, 2003; Rendon & Nora, 1997; Yang & Rendon, 1994). This is reflected in the minority student enrollment at DMACC, particularly at the Urban campus, where 26% of the student population is minority, the largest percentage of minority student population of any higher education institution in Iowa.

The findings regarding the differences in within-course retention during the first term of enrollment are also consistent with the research. Several studies examined the persistence rates of minority students in higher education, and found that minority students generally do not adjust as well to college and consequently persist at a lower rate than do White students (Asamen & Berry, 1987; Chew & Ogi, 1987; Nora, 1993; Jalomo, 1995; Loo & Rolison, 1986; Rendon, 2002; Rendon & Nora, 1989; Tierney & Hagedorn, 2002). The findings in the current study regarding the within course retention at DMACC for minority students were significant. The first term of enrollment at DMACC appears to be the one that is the largest barrier to success for many minority students. This finding requires immediate attention. The research on the transfer function of the community college in general, and of minority

students specifically, concludes that significant barriers exist for students who use community colleges as the entry point for a baccalaureate education (Blau, 1999; Laanan, 1996; Lee, Mackie-Lewis, & Marks, 1993; McCormick & Carroll, 1997; Mason, 1998; Nora, 1993; Porter, 2002; Rendon, 1993; Rendon & Valadez, 1993; Richardson & Bender, 1986).

An examination of each of the minority populations that enrolled at DMACC (excluding American Indians when there were not large enough numbers to conduct an analysis) also reflected the existing literature. Black males transferred to ISU and experienced success after transfer at a significantly lower rate than their White peers, which is consistent with national trends and findings (Status and Trends in the Education of Blacks, 2003; Blau, 1999; Mason, 1998). Black females also transfer at a significantly lower rate, and Black females and Hispanic males succeeded after transfer at a significantly lower rate than their White peers, also reflecting the current literature on minority enrollment and transfer in community colleges (Rendon & Nora, 1989; Jalomo, 1995; Mason, 1998). The research findings that Asian females transferred to and succeeded at ISU at a significantly higher rate than their White peers also reflect the national trend for this population (Chan, 1991; Lee, 1991).

The finding in the study regarding transfer rates of Hispanic students did not reflect the literature reviewed about Hispanic student performance. There is a wealth of research regarding Hispanic student transfer, and the difficulties in adjustment after transfer (Rendon & Nora, 1989; Nora, 2002; Nora & Garcia, 1999; Tierney & Hagedorn, 2002, and others). This study found no statistical differences in the transfer rates of the Hispanic and the White populations at DMACC. Also, this study found that Hispanic females actually succeed at a higher rate than did their White peers upon transfer to ISU. Since this was a focused study of



a small population of transfer-oriented students and those who transferred only to ISU, one cannot draw definitive conclusions about the transfer rates. This finding requires further research.

### **Conclusions**

This study applied 12 hypotheses to examine the enrollment, persistence, and transfer of minority students at DMACC compared to White students. The extensive review of literature would support the rejection of each of the Null Hypothesis, which assumed there was no difference between White students and Black, Hispanic, Asian, and American Indian students, or between males and females regarding enrollment, within-course retention, fall-to-spring persistence rates, transfer rates, and rates of success at ISU. While each of the null hypotheses was rejected at some level of significance, the study revealed differences within the minority groups, and between males and females in their performance at DMACC, and subsequent transfer and performance at ISU. Several conclusions can be drawn, with the understanding that further analysis should be conducted.

1. In general, minority students enrolled at DMACC in larger numbers than they exist in the population of the area. These enrollment trends support the literature that suggests that minority students begin their higher education experiences at community colleges in greater numbers than do White students. A point of concern was the low percentage of Hispanic students, both male and female, who enrolled at DMACC as transfer-bound students. While the literature suggests that Hispanics, more than other minority groups, use the community college system as the gateway to higher education, this analysis of Hispanic student enrollment at DMACC suggests

otherwise. The college must examine in greater depth the Hispanic student enrollment, particularly of male students, to determine why more are not choosing to attend DMACC. The issue of recruiting more Hispanic students is particularly important, because this study revealed that Hispanic students fared better overall than the other minority populations in within-course retention, fall-to-spring persistence, transfer to ISU, and success after transfer.

2. Black and Asian students dropped courses at an alarmingly high rate during their first term at DMACC when compared to White students. Because the study only examined the number of students dropping courses, not the reasons for the dropped courses, it is not possible to draw any definitive conclusions about the factors contributing to the high drop rate. However, the literature on minority student adjustment to college and persistence rates would suggest that minority students come to college under-prepared (Mason, 1998; Rendon & Valadez, 1993) and, therefore, drop out during their first term, and that the culture shock of moving from a familiar culture to a predominately White culture causes minority students to fail (Jalomo, 1995).
3. Despite high within-course attrition rates during their first term at DMACC for Black and Asian students, once minority students were successful in their first term courses, there were no significant differences in the persistence to second term rates of any of the minority populations compared to White students. Again, it is difficult to draw conclusions without further data, but the data suggest that once minority students make it through the adjustment of the first term of enrollment at DMACC, they persist into the second term at the same rate as White students.

4. Black males transferred to ISU at very low rates, and those who did transfer tended to succeed at a significantly lower rate than their White peers. The transfer rate (2.49%) and ISU success rate (53.57%) of Black males is discouraging, although it reflects the literature on minority student enrollment, which indicates that Black male enrollment in higher education is declining (Roach, 2001). Although definitive conclusions cannot be drawn on the basis of this study, DMACC and ISU should work cooperatively to provide better support to Black males to increase the transfer and success rates. Although Black females transfer to ISU at a higher rate than do Black males (4.17%), their success rate at ISU (56.25%) is also significantly lower than that of White students. Black student success at ISU needs to be further examined.
5. The transfer rate of all Hispanic students and Asian males was not significantly different from the transfer rate of White students, although the population size in this study was very small. However, the transfer rate of Asian females to ISU was significantly higher than that of White females, and once at ISU, they succeeded at a rate of 90.91%. It is interesting to note that Asian females drop courses during their first term at DMACC at a significantly higher rate than their White peers. Yet, once they persisted to their second term, their success rate climbed dramatically. A more comprehensive study is required to determine the reasons for the high success rate of Asian females transferring to and succeeding at ISU compared to the other minority populations.

6. American Indian students enrolled, persisted, and transferred at such a low rate that there were not enough data to draw valid conclusions about how well this population succeeds at DMACC or upon transfer to ISU.

### **Limitations**

It is important to note that, despite significant differences in the performance of minority students and White students at DMACC during their first term in their transfer rates and in success after transfer to ISU, limitations exist due to the fact that the population in the study was narrowly defined. The following limitations should be taken into consideration when drawing conclusions from findings in this study.

1. This study was limited to first-time, full-time students only who were enrolled in one of four gateway courses leading to the AA degree. It is unknown how many minority students attend DMACC part-time with the intent to transfer, or how many enroll in courses other than the four gateway courses who also have transfer as a goal. The enrollment, within-course retention rates, and fall-to-spring term persistence rates of the part-time students or those enrolled in courses other than the gateway courses are unknown.
2. The data in this study only reflect the transfer rates to ISU, and the results cannot be generalized to any other college or university.
3. The study was quantitative and no attempt was made to determine reasons for differences between White students and minority students in the enrollment, within-course retention, fall-to-spring persistence, transfer to ISU, and success after transfer.

### **Recommendations**

Based on the finding of this study, the following recommendations are made for further study and for practice.

#### **Recommendations for further study**

1. This study should be replicated on a statewide basis, including all community colleges as well as the three Regent universities. One of the major limitations of this study was the inability to measure success using another variable, that of success upon transfer to ISU by the number of credits a student transferred from DMACC. It is strongly recommend to add this as a factor in a statewide study. Conducting a statewide study on the enrollment, persistence, and transfer of minority students is now possible because of the recent affiliation of the community college system with the National Student Clearinghouse, enabling consistent collection and analysis of statewide data.
2. The results of this study provide valuable data on the number of minority students who enroll, persist, and transfer to ISU from DMACC. The data generate more questions that should be addressed in additional studies at DMACC. First, an expansion of the quantitative study that applies analysis of variance could include several different factors, including part-time as well as full-time students, an analysis by student age, and by ACT or Compass scores. Regression or predictive studies could also be conducted that include qualitative factors, such as perceptions of adjustment to college, perceived preparedness for college, knowledge and use of

college support services, importance of higher education to the student and family, and other factors that affect the quality of a student's college experience.

3. Valuable information could be derived from a more in-depth study of the within-term course retention hypothesis. There was such a dramatic difference in the rate at which minority students and White students dropped courses during their first term at DMACC, that further analysis of this phenomenon is required. It would be useful to examine the specific courses dropped by each of the minority groups to determine if there is any consistency in the types of courses dropped.
4. The results of this study call for further examination of the enrollment, persistence and transfer rates of Black males. Among the minority populations, Black males had the lowest within term course retention rate, the lowest rate of transfer to ISU, and the lowest rate of success at ISU. Clearly, this population is in trouble, and further analysis of the reasons for the low success rate is necessary, particularly as national statistics report that progress for Black males in higher education has either stagnated or increased only slightly from year to year over the last decade (Roach, 2001).
5. The results of this study also call for additional study of the female Asian population at DMACC. Asian females dropped courses during their first term at DMACC at the highest rate of any of the minority groups. Yet, this group persisted to the next term at a higher rate than any of the other minority groups, and transferred to and succeeded at ISU at rates significantly higher than any of the other minority groups. Further analysis of the Asian female population, including international students and immigrants, to determine the factors contributing to the low within-term course retention rate is warranted.

6. The review of literature revealed that, nationally, Hispanic students are the most rapidly growing population in the nation (Digest of Education Statistics, 2002) and in Iowa's community colleges (Iowa Department of Education, 2002). Yet, male Hispanic students enrolled in transfer-oriented classes at DMACC at a significantly lower rate than exist in the population, and Hispanic females enrolled at a lower rate, although not statistically significant. Further analysis is warranted to determine why Hispanic students are not enrolling at DMACC, if they are enrolling only as part-time students or if they are enrolling in vocational instead of transfer programs.

### **Recommendations for practice**

Based on this study, the following recommendations are made for practice at DMACC. Although further analysis is warranted to answer questions of why minority students enroll, persist, and transfer to ISU at rates different than White students, the results of this study clearly reveal concerns, and call for DMACC to implement steps immediately. The following recommendations will be brought before the DMACC Executive Cabinet:

1. Create a Minority Student Affairs work group that is assigned the task of developing specific strategies to identify and provide support services to minority students at DMACC. This study examined only a specific population of first-time full-time students who were transfer-oriented. Specific services must be designed for this population, as there are clear concerns about their success rate. However, the work group must take a broader look at all minority students at DMACC, and create a comprehensive set of services that provide support to minority students who enroll at DMACC with many different purposes and needs. This work group should report to

the diversity work group, one of eight that comprise the college's Strategic Planning Council.

2. Hire a minority student advisor at DMACC. This advisor should have the specific responsibility to develop the following programs and services for minority students:
  - a. A Freshman Year Experience (FYE) program for high-risk minority students who are entering DMACC. Students will be selected for the FYE program on the basis of their high school GPA, their ACT or Compass scores, and others factors. Specifically, the FYE experience will include activities to improve retention during the first term of enrollment at DMACC.
  - b. As a part of the FYE program, create a faculty-advising program to provide support and guidance to the students as they progress through their DMACC program, and specifically in their first term of enrollment.
  - c. In conjunction with ISU, create a transfer orientation program for minority students who express the desire to transfer to ISU. The orientation program may include campus visits, financial aid seminars, meetings with ISU advisors and faculty, and other experiences designed to make transfer less overwhelming.
3. Create a DMACC/ISU minority student task force to address the transfer of minority students to ISU and their success after transfer. While it is important for each institution to address problems with minority student retention, strengthening cooperative programs to improve transfer is equally critical. The task force should study best practice programs in minority student transfer at other institutions, and make recommendations to DMACC and ISU. The Regents have a target minority population enrollment that only the University of Iowa met in FY 2003 (Iowa Board



of Regents, 2003). Improving transfer rates of minority students from DMACC can increase the minority enrollment at ISU.

4. Assign a recruiter to work specifically with the Hispanic population in DMACC's service delivery area. This advisor should work not only with the area high schools in recruiting Hispanic students, but also with the Hispanic Resource Center in Des Moines to identify strategies for better recruitment of Hispanic students of all ages to DMACC.
5. Re-examine the Upward Bound program at DMACC to determine if it is meeting its goal of preparing minority youth in central Iowa for college. Assign a staff member from the High School Program Department the responsibility of working with Upward Bound staff and Des Moines Public Schools to develop recruitment programs for minority students that include an assessment of readiness for college and specific programs designed to prepare students for college level work.
6. As a part of the college-wide faculty and staff development program, develop a program that addresses the unique needs of minority students both in and out of the classroom, paying specific attention to the needs of Black males. Faculty and staff need more information and better tools to adequately serve the needs of minority students.
7. The final recommendation addresses the broader issue of an improved transfer process for all students moving from DMACC to ISU, and more generally from all the Iowa community colleges to the Regent universities. Several economic and societal factors are forcing greater cooperation between two- and four-year colleges in Iowa. Rising tuition costs at the Regent universities are causing more students to

begin their education at a community college, and more students will expect a seamless transfer process. While the transfer process has certainly improved between the community colleges and the Regent universities, it could be improved. The 2+2 Council should explore the possibility of expanding the number of transfer credits allowed from community colleges to the universities, in general, and the number from technical programs, specifically. Several other states have effective transfer models that increase the numbers of community college transfer students to the state university system, providing the universities with well-prepared students at the upper division level, and the students with a seamless transition of credits. In addition, ISU and DMACC should continue to bring faculty and other staff together to develop articulation agreements for programs other than the AA degree. Specifically, faculty and staff from the College of Business should develop stronger articulation agreements. More students from DMACC who graduate with AS or AAS degrees in the business or information technology fields are choosing to continue their education at ISU. A clear plan for transfer of credits and articulation of degrees should be developed for these students.

8. Share these recommendations with community leaders and campus advisory board members to gain input and support for programs and services for minority students.

### **Conclusion**

A greater percentage of minority students attend DMACC than exist in the minority college-age population in central Iowa. This is consistent with community college enrollment throughout the country; community colleges serve as the primary gateway to

higher education for minority students. Because minority students are more dependent than White students on successful transfer for achieving the social and economic benefits of a baccalaureate degree, community colleges must be particularly diligent in providing support to minority students in meeting their educational goals.

The findings from this study of minority students at DMACC are disturbing, and call for immediate action. DMACC is the largest of the community colleges in Iowa, enrolls the largest percentage of minority students in all of higher education in the state, and has the largest percentage of minority residents in the state in its service delivery region. Yet, this study revealed that the minority student population at DMACC did not perform as well as White students while at DMACC, or when they transfer to ISU. Quite simply, the results of this study indicated that the college is not effectively meeting the educational needs of the minority student population that enrolls with an intent to transfer to complete a baccalaureate degree. If Iowa is to become a more diverse state, expanding the minority population base is not enough. Iowa must provide more opportunities for minority students to access higher education at all levels, which will, in turn, open the door to more social and economic prosperity for minority citizens. DMACC must do more to address its responsibility to the communities it serves by striving to enroll, retain, and graduate more minority students.

A premier researcher in minority student enrollment in community colleges, Rendon (1993), summarized the importance of the community college as the entry point to higher education for millions of students that desire a better life.

The community college is a critical institution for students of color. It is not only a place to learn; it is a place that matters. It matters because the community college represents hope, opportunity, and for many minority and majority students, once last chance to succeed. The rate of community college transfer should be improved not simply because it is politically expedient to

do so. More students should transfer because a college that is founded on democratic ideals and egalitarian notions of equal opportunity for all should stay on track with its founding mission. More importantly, if the community college transfer function is neglected and allowed to decline, students of color, as well as students from low socioeconomic backgrounds, will be left with no alternatives for initiating an education leading to a bachelor's degree. The prize will be lost, and all of society will be poorer.

## APPENDIX: CENSUS DATA ON DMACC'S ELEVEN COUNTY SERVICE AREA

## U.S. Census Bureau: Detailed Tables

Website: <http://factfinder.census.gov/servlet/DTTTable?Ts=72883357873>P12A. SEX BY AGE (WHITE ALONE) [49] – Universe: People who are White alone  
Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

	Iowa County										
	Audubon	Boone	Carroll	Dallas	Guthrie	Jasper	Madison	Marion	Polk	Story	Warren
Total:	6,773	25,838	21,178	38,609	11,195	36,313	13,818	31,237	330,917	72,898	39,889
Male:	3,251	12,626	10,326	18,993	5,520	18,184	6,823	15,491	159,597	37,006	19,379
Under 5 yr	195	797	659	1,591	328	1,164	498	980	11,764	1,805	1,361
5 to 9 yr	231	895	739	1,539	376	1,348	547	1,136	11,506	1,874	1,462
10 to 14 yr	279	947	887	1,455	390	1,283	534	1,188	11,393	2,075	1,585
15 to 17 yr	171	669	598	950	259	819	367	747	6,649	1,279	982
18 & 19 yr	57	354	326	462	126	395	195	527	4,171	2,979	656
20 yr	25	172	109	181	50	205	62	315	2,013	2,117	339
21 yr	19	147	98	165	40	187	58	239	1,912	2,181	302
22 to 24 yr	71	391	324	510	142	605	174	526	6,237	3,892	649
25 to 29 yr	117	759	519	1,155	251	1,168	370	893	12,174	2,714	1,007
30 to 34 yr	181	772	606	1,483	298	1,229	428	900	13,130	2,020	1,240
35 to 39 yr	223	933	769	1,704	434	1,489	519	1,158	13,855	2,063	1,586
40 to 44 yr	238	1,080	914	1,675	439	1,535	544	1,238	13,347	2,297	1,596
45 to 49 yr	251	1,020	762	1,423	451	1,375	523	1,142	12,185	2,336	1,525
50 to 54 yr	189	851	569	1,237	362	1,213	479	964	10,525	1,877	1,314
55 to 59 yr	177	597	478	886	309	934	338	778	7,614	1,296	977
60 & 61 yr	62	224	171	287	114	305	128	258	2,486	426	361
62 to 64 yr	112	331	245	413	182	465	178	395	3,122	672	439
65 & 66 yr	69	204	138	202	101	299	94	231	1,998	371	291
67 to 69 yr	78	289	259	356	179	408	160	308	2,713	528	389
70 to 74 yr	185	440	393	498	262	694	201	544	4,229	770	486
75 to 79 yr	141	360	346	369	186	492	185	471	3,252	644	387
80 to 84 yr	115	230	253	264	130	352	125	294	2,008	453	244
85 yr +	65	184	164	188	111	220	116	259	1,296	337	201
Female:	3,522	13,212	10,852	19,616	5,675	18,129	6,995	15,746	171,320	35,892	20,510
Under 5 yr	194	736	592	1,448	272	1,065	471	955	11,042	1,752	1,316
5 to 9 yr	246	820	765	1,413	349	1,185	467	1,041	11,038	1,796	1,435
10 to 14 yr	256	956	852	1,384	369	1,253	533	1,091	10,560	1,878	1,578
15 to 17 yr	170	516	552	851	261	777	301	674	6,336	1,237	915
18 & 19 yr	56	338	224	396	104	377	151	558	4,323	2,845	666
20 yr	16	146	92	162	44	160	58	274	2,228	1,796	363
21 yr	16	149	80	151	35	152	66	214	2,110	1,754	279
22 to 24 yr	72	467	316	551	146	550	185	518	7,131	2,885	588
25 to 29 yr	150	681	493	1,306	227	926	380	834	12,837	2,183	1,081
30 to 34 yr	175	765	571	1,570	295	1,150	454	907	13,223	1,923	1,340
35 to 39 yr	214	1,004	781	1,758	429	1,411	523	1,145	14,106	2,139	1,722
40 to 44 yr	241	1,018	847	1,676	397	1,396	563	1,181	13,941	2,346	1,706
45 to 49 yr	202	1,016	755	1,467	389	1,282	553	1,090	12,698	2,319	1,530
50 to 54 yr	197	809	554	1,271	378	1,162	411	883	11,162	1,846	1,337
55 to 59 yr	195	669	493	837	306	925	342	739	8,284	1,388	1,063
60 & 61 yr	71	219	205	302	134	373	135	278	2,713	481	337
62 to 64 yr	104	332	242	454	185	526	167	417	3,682	662	463
65 & 66 yr	65	205	199	229	141	295	109	239	2,269	396	292
67 to 69 yr	117	332	307	366	159	476	161	363	3,407	620	402
70 to 74 yr	210	556	567	575	309	851	216	632	5,454	1,014	560
75 to 79 yr	178	516	487	560	272	703	259	621	4,936	918	583
80 to 84 yr	174	397	435	417	234	554	213	496	3,804	802	461
85 yr +	203	565	443	472	240	580	277	596	4,036	911	494

U.S. Census Bureau; Census 2000

P12B. SEX BY AGE (BLACK OR AFRICAN AMERICAN ALONE) [49] – Universe: People who are Black or African American alone  
Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

	Iowa County										
	Audubon	Boone	Carroll	Dallas	Guthrie	Jasper	Madison	Marion	Polk	Story	Warren
Total:	10	95	38	300	14	309	12	134	1,113	1,463	108
Male:	5	58	18	171	11	268	10	85	8,949	798	57
Under 5 yr	2	4	5	20	3	10	0	3	949	47	3
5 to 9 yr	1	3	2	10	1	6	1	3	994	39	4
10 to 14 yr	1	7	1	15	3	7	1	4	895	45	7
15 to 17 yr	0	13	1	5	0	4	1	2	439	26	3
18 & 19 yr	0	3	1	2	0	6	1	2	263	87	3
20 yr	0	1	1	2	0	9	0	1	133	56	2
21 yr	0	0	1	2	0	16	0	0	134	50	1
22 to 24 yr	0	0	0	11	0	26	0	2	381	110	2
25 to 29 yr	0	5	1	27	1	50	0	1	653	104	5
30 to 34 yr	0	6	0	16	1	29	0	7	717	71	7
35 to 39 yr	1	2	1	15	0	34	1	6	682	49	3
40 to 44 yr	0	6	1	12	1	31	1	12	649	39	3
45 to 49 yr	0	4	2	8	0	20	2	14	543	23	5
50 to 54 yr	0	1	0	15	0	7	0	8	405	21	3
55 to 59 yr	0	1	1	7	0	7	0	4	283	15	2
60 & 61 yr	0	0	0	0	0	3	0	1	100	3	1
62 to 64 yr	0	1	1	0	0	1	1	2	131	0	1
65 & 66 yr	0	0	0	0	0	1	0	2	98	3	0
67 to 69 yr	0	0	0	0	0	0	0	0	110	2	0
70 to 74 yr	0	1	0	0	1	1	1	4	160	2	0
75 to 79 yr	0	0	0	2	0	0	0	3	118	5	1
80 to 84 yr	0	0	0	1	0	0	0	3	69	1	1
85 yr +	0	0	0	1	0	0	0	1	40	0	0
Female:	5	37	20	129	3	41	2	49	9,164	665	51
Under 5 yr	1	4	3	25	1	4	0	9	838	59	7
5 to 9 yr	1	5	5	10	0	3	0	5	930	58	7
10 to 14 yr	0	3	4	8	1	5	0	5	895	36	1
15 to 17 yr	0	4	3	5	0	5	0	1	446	23	4
18 & 19 yr	1	2	0	1	0	2	0	1	300	73	1
20 yr	0	0	0	1	0	0	0	0	144	37	4
21 yr	1	0	0	2	0	1	0	0	147	40	1
22 to 24 yr	0	1	0	7	0	3	0	2	370	82	4
25 to 29 yr	0	1	1	13	0	2	0	5	680	56	3
30 to 34 yr	0	5	1	16	0	3	1	4	668	62	4
35 to 39 yr	1	2	1	7	1	3	0	2	691	42	1
40 to 44 yr	0	4	1	8	0	3	1	2	649	32	1
45 to 49 yr	0	1	0	6	0	2	0	4	540	19	3
50 to 54 yr	0	2	0	9	0	1	0	4	447	22	3
55 to 59 yr	0	1	0	1	0	0	0	1	284	9	0
60 & 61 yr	0	0	0	1	0	0	0	1	121	3	1
62 to 64 yr	0	0	0	1	0	0	0	0	153	1	1
65 & 66 yr	0	0	0	1	0	1	0	0	126	4	0
67 to 69 yr	0	1	0	0	0	0	0	0	133	0	0
70 to 74 yr	0	1	1	3	0	1	0	0	195	5	0
75 to 79 yr	0	0	0	1	0	1	0	0	182	0	2
80 to 84 yr	0	0	0	3	0	1	0	2	120	0	1
85 yr +	0	0	0	0	0	0	0	1	105	2	2

U.S. Census Bureau; Census 2000

**P12C. SEX BY AGE (AMERICAN INDIAN AND ALASKA NATIVE ALONE) [49] –**  
**Universe: People who are American Indian and Alaska Native alone**  
 Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

	Iowa County										
	Audubon	Boone	Carroll	Dallas	Guthrie	Jasper	Madison	Marion	Polk	Story	Warren
Total:	6	53	22	62	6	81	38	61	1,001	128	71
Male:	2	29	11	23	4	47	16	32	487	63	38
Under 5 yr	0	2	0	0	0	0	2	2	38	3	2
5 to 9 yr	0	1	0	2	0	2	3	1	47	4	4
10 to 14 yr	0	2	1	1	1	1	5	3	42	3	1
15 to 17 yr	0	1	1	2	0	2	0	0	20	1	2
18 & 19 yr	0	1	1	3	1	5	0	3	22	6	2
20 yr	0	0	0	1	0	2	0	1	9	5	2
21 yr	0	0	0	0	0	3	0	1	11	1	2
22 to 24 yr	1	2	1	1	0	2	0	2	15	4	0
25 to 29 yr	0	1	0	2	0	4	0	3	42	11	3
30 to 34 yr	1	4	1	2	0	3	2	2	53	9	3
35 to 39 yr	0	2	3	3	0	5	1	1	43	8	5
40 to 44 yr	0	5	0	2	2	7	1	3	35	5	3
45 to 49 yr	0	5	1	1	0	4	2	1	33	1	6
50 to 54 yr	0	1	0	3	0	4	0	2	36	2	1
55 to 59 yr	0	1	0	0	0	1	0	3	13	0	1
60 & 61 yr	0	0	0	0	0	0	0	1	3	0	0
62 to 64 yr	0	1	0	0	0	1	0	0	6	0	0
65 & 66 yr	0	0	0	0	0	0	0	1	3	0	0
67 to 69 yr	0	0	1	0	0	0	0	0	2	0	0
70 to 74 yr	0	0	1	0	0	0	0	2	8	0	1
75 to 79 yr	0	0	0	0	0	0	0	0	3	0	0
80 to 84 yr	0	0	0	0	0	1	0	0	2	0	0
85 yr +	0	0	0	0	0	0	0	0	1	0	0
Female:	4	24	11	39	2	34	22	29	514	65	33
Under 5 yr	0	0	0	4	0	1	1	2	34	6	2
5 to 9 yr	0	4	2	3	0	0	2	1	47	4	3
10 to 14 yr	0	3	4	4	0	2	3	4	37	2	3
15 to 17 yr	1	3	1	2	0	4	3	5	24	2	0
18 & 19 yr	0	1	0	2	0	1	2	1	21	3	1
20 yr	0	0	0	0	0	0	0	0	15	2	2
21 yr	0	1	0	1	0	1	0	0	11	2	0
22 to 24 yr	1	1	0	0	0	2	1	0	22	6	3
25 to 29 yr	0	1	0	5	0	2	1	3	43	7	3
30 to 34 yr	0	1	0	4	0	5	2	3	49	7	2
35 to 39 yr	1	3	1	2	0	1	2	2	53	5	5
40 to 44 yr	0	0	1	2	0	6	1	1	40	6	3
45 to 49 yr	1	3	1	4	1	1	2	3	39	3	3
50 to 54 yr	0	1	0	2	0	4	0	1	29	3	0
55 to 59 yr	0	1	1	3	1	2	1	2	16	2	3
60 & 61 yr	0	0	0	1	0	0	0	0	4	1	0
62 to 64 yr	0	0	0	0	0	1	0	0	6	0	0
65 & 66 yr	0	0	0	0	0	0	0	0	7	0	0
67 to 69 yr	0	1	0	0	0	1	0	0	5	1	0
70 to 74 yr	0	0	0	0	0	0	0	0	4	1	0
75 to 79 yr	0	0	0	0	0	0	0	1	5	1	0
80 to 84 yr	0	0	0	0	0	0	1	0	1	0	0
85 yr +	0	0	0	0	0	0	0	0	2	1	0

U.S. Census Bureau; Census 2000

P12D. SEX BY AGE (ASIAN ALONE) [49] – Universe: People who are Asian alone  
 Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

	Iowa County										
	Audubon	Boone	Carroll	Dallas	Guthrie	Jasper	Madison	Marion	Polk	Story	Warren
Total:	13	57	73	282	16	162	25	331	9,858	4,080	156
Male:	5	26	31	134	9	74	7	152	4,884	2,235	67
Under 5 yr	2	2	6	18	1	8	0	19	417	139	7
5 to 9 yr	1	2	3	12	1	5	1	15	365	100	8
10 to 14 yr	1	2	3	15	3	7	2	19	390	84	11
15 to 17 yr	0	6	0	5	1	8	1	16	250	45	8
18 & 19 yr	0	1	0	3	0	2	0	5	160	135	4
20 yr	0	1	0	1	0	2	0	1	84	105	0
21 yr	0	0	1	0	0	0	0	2	80	112	0
22 to 24 yr	0	0	1	0	0	5	0	4	277	362	6
25 to 29 yr	0	4	3	10	1	7	1	8	576	415	3
30 to 34 yr	1	2	1	19	0	8	1	14	533	299	6
35 to 39 yr	0	0	3	13	1	3	1	12	446	161	5
40 to 44 yr	0	0	1	10	1	7	0	11	308	91	3
45 to 49 yr	0	2	6	11	0	5	0	4	246	59	3
50 to 54 yr	0	0	1	2	0	3	0	7	223	47	0
55 to 59 yr	0	2	1	5	0	0	0	5	180	35	1
60 & 61 yr	0	1	0	5	0	1	0	1	58	9	0
62 to 64 yr	0	0	0	2	0	0	0	5	78	13	1
65 & 66 yr	0	0	0	2	0	0	0	0	46	6	0
67 to 69 yr	0	0	0	1	0	0	0	2	56	6	0
70 to 74 yr	0	0	1	0	0	1	0	1	62	5	1
75 to 79 yr	0	1	0	0	0	1	0	0	29	4	0
80 to 84 yr	0	0	0	0	0	1	0	1	7	3	0
85 yr +	0	0	0	0	0	0	0	0	13	0	0
Female:	8	31	42	148	7	88	18	179	4,974	1,845	89
Under 5 yr	1	1	3	14	1	6	0	10	465	132	4
5 to 9 yr	1	2	4	12	0	10	1	24	391	84	15
10 to 14 yr	4	5	6	14	1	11	2	22	371	76	9
15 to 17 yr	0	5	1	7	0	5	1	8	248	61	6
18 & 19 yr	0	2	4	3	0	3	0	9	152	102	4
20 yr	0	1	0	1	0	0	0	2	77	80	2
21 yr	0	1	0	2	0	1	0	0	74	71	2
22 to 24 yr	0	0	1	7	0	3	3	3	301	229	2
25 to 29 yr	0	5	2	22	0	6	1	16	566	356	6
30 to 34 yr	0	0	6	11	1	7	3	25	498	235	8
35 to 39 yr	1	1	7	17	1	7	2	17	391	150	13
40 to 44 yr	1	4	0	10	1	6	2	12	282	81	5
45 to 49 yr	0	1	3	6	0	6	1	8	313	57	5
50 to 54 yr	0	1	2	8	0	3	1	8	262	52	1
55 to 59 yr	0	0	0	7	0	1	1	4	177	31	4
60 & 61 yr	0	1	1	1	0	1	0	0	66	7	0
62 to 64 yr	0	0	0	2	1	4	0	1	86	16	1
65 & 66 yr	0	0	1	1	0	2	0	4	43	4	1
67 to 69 yr	0	0	0	2	1	1	0	2	61	7	0
70 to 74 yr	0	1	1	0	0	3	0	3	72	6	0
75 to 79 yr	0	0	0	0	0	0	0	1	30	2	0
80 to 84 yr	0	0	0	1	0	1	0	0	33	2	0
85 yr +	0		0	0	0	1	0	0	15	4	1

U.S. Census Bureau; Census 2000



P12E. SEX BY AGE (NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE) [49] – Universe: People who are native Hawaiian and Other Pacific Islander alone  
Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

	Iowa County										
	Audubon	Boone	Carroll	Dallas	Guthrie	Jasper	Madison	Marion	Polk	Story	Warren
Total:	0	0	10	18	5	19	3	12	209	25	18
Male:	0	0	0	10	0	7	2	5	92	13	10
Under 5 yr	0	0	0	0	0	2	0	1	9	2	0
5 to 9 yr	0	0	0	2	0	0	0	0	7	0	1
10 to 14 yr	0	0	0	0	0	0	0	0	2	0	2
15 to 17 yr	0	0	0	2	0	0	0	0	3	1	0
18 & 19 yr	0	0	0	1	0	0	0	0	5	1	1
20 yr	0	0	0	0	0	0	0	0	1	2	1
21 yr	0	0	0	0	0	0	0	0	1	2	0
22 to 24 yr	0	0	0	0	0	1	0	1	9	0	1
25 to 29 yr	0	0	0	2	0	2	0	0	16	2	0
30 to 34 yr	0	0	0	0	0	1	1	0	8	1	1
35 to 39 yr	0	0	0	2	0	0	1	1	10	2	0
40 to 44 yr	0	0	0	0	0	0	0	0	5	0	0
45 to 49 yr	0	0	0	0	0	0	0	1	5	0	0
50 to 54 yr	0	0	0	0	0	0	0	0	3	0	1
55 to 59 yr	0	0	0	0	0	0	0	0	3	0	1
60 & 61 yr	0	0	0	0	0	0	0	0	0	0	0
62 to 64 yr	0	0	0	0	0	0	0	0	1	0	0
65 & 66 yr	0	0	0	0	0	0	0	0	0	0	0
67 to 69 yr	0	0	0	0	0	0	0	0	2	0	0
70 to 74 yr	0	0	0	0	0	0	0	1	2	0	1
75 to 79 yr	0	0	0	0	0	0	0	0	0	0	0
80 to 84 yr	0	0	0	1	0	0	0	0	0	0	0
85 yr +	0	0	0	0	0	1	0	0	0	0	0
Female:	0	0	1	8	5	12	1	7	117	12	8
Under 5 yr	0	0	0	1	0	0	0	0	18	1	2
5 to 9 yr	0	0	0	2	0	2	0	0	11	0	1
10 to 14 yr	0	0	0	1	0	1	0	0	2	0	1
15 to 17 yr	0	0	0	0	0	0	0	1	1	0	1
18 & 19 yr	0	0	0	0	0	0	0	0	4	2	0
20 yr	0	0	0	1	1	0	0	2	1	0	1
21 yr	0	0	0	0	1	2	0	0	4	1	0
22 to 24 yr	0	0	0	0	1	3	0	1	20	3	0
25 to 29 yr	0	0	0	0	2	2	0	0	15	2	1
30 to 34 yr	0	0	1	0	0	0	0	1	10	2	0
35 to 39 yr	0	0	0	2	0	1	1	0	7	0	0
40 to 44 yr	0	0	0	0	0	0	0	0	5	0	0
45 to 49 yr	0	0	0	0	0	0	0	1	7	0	1
50 to 54 yr	0	0	0	0	0	0	0	1	3	0	0
55 to 59 yr	0	0	0	0	0	0	0	0	2	1	0
60 & 61 yr	0	0	0	0	0	0	0	0	1	0	0
62 to 64 yr	0	0	0	0	0	0	0	0	1	0	0
65 & 66 yr	0	0	0	1	0	0	0	0	0	0	0
67 to 69 yr	0	0	0	0	0	0	0	0	1	0	0
70 to 74 yr	0	0	0	0	0	0	0	0	0	0	0
75 to 79 yr	0	0	0	0	0	0	0	0	2	0	0
80 to 84 yr	0	0	0	0	0	1	0	0	2	0	0
85 yr +	0	0	0	0	0	0	0	0	0	0	0

U.S. Census Bureau; Census 2000

P12F. SEX BY AGE (SOME OTHER RACE ALONE) [49] – Universe: People who are Some other race alone  
 Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

	Iowa County										
	Audubon	Boone	Carroll	Dallas	Guthrie	Jasper	Madison	Marion	Polk	Story	Warren
Total:	2	67	43	1,135	48	98	27	71	8,299	478	118
Male:	0	38	21	634	32	59	15	35	4,640	286	62
Under 5 yr	0	6	3	95	5	6	3	2	595	25	4
5 to 9 yr	0	8	3	63	4	5	0	2	441	20	5
10 to 14 yr	0	6	3	44	1	3	2	3	350	14	5
15 to 17 yr	0	1	1	30	1	4	0	2	240	10	4
18 & 19 yr	0	0	1	23	1	1	0	4	184	38	5
20 yr	0	1	0	22	0	3	0	1	123	23	1
21 yr	0	0	2	10	2	0	0	1	124	20	2
22 to 24 yr	0	3	3	42	2	4	1	6	368	30	4
25 to 29 yr	0	2	1	77	4	4	2	3	654	43	8
30 to 34 yr	0	2	2	75	2	6	2	4	495	27	4
35 to 39 yr	0	5	1	53	5	13	3	2	379	9	7
40 to 44 yr	0	1	0	46	3	3	0	1	233	15	4
45 to 49 yr	0	1	0	21	0	1	0	1	160	4	1
50 to 54 yr	0	1	1	12	1	3	0	2	119	5	2
55 to 59 yr	0	0	0	14	0	2	1	0	61	1	2
60 & 61 yr	0	0	0	3	1	0	0	0	22	1	1
62 to 64 yr	0	0	0	2	0	0	0	1	24	1	0
65 & 66 yr	0	0	0	0	0	0	0	0	12	0	1
67 to 69 yr	0	0	0	1	0	0	0	0	16	0	1
70 to 74 yr	0	1	0	0	0	0	0	0	13	0	0
75 to 79 yr	0	0	0	0	0	0	0	0	13	0	0
80 to 84 yr	0	0	0	1	0	1	1	0	7	0	0
85 yr +	0	1	0	0	0	0	0	0	7	0	1
Female:	2	29	22	501	16	39	12	36	3,659	192	56
Under 5 yr	0	7	3	78	2	4	3	1	557	21	9
5 to 9 yr	0	1	4	59	2	5	1	3	460	15	3
10 to 14 yr	0	4	1	48	3	7	1	6	316	13	5
15 to 17 yr	0	1	5	24	0	3	1	3	208	6	3
18 & 19 yr	0	1	0	11	0	0	0	3	140	14	2
20 yr	0	0	0	6	0	0	1	3	80	9	1
21 yr	0	0	1	10	2	1	0	2	83	14	0
22 to 24 yr	0	1	2	27	2	2	2	2	257	25	2
25 to 29 yr	1	2	2	60	1	3	2	2	388	25	4
30 to 34 yr	0	1	2	59	2	3	0	3	320	17	3
35 to 39 yr	1	6	2	39	1	3	0	1	268	11	3
40 to 44 yr	0	1	0	33	0	3	0	3	171	9	5
45 to 49 yr	0	1	0	13	1	2	0	1	126	5	5
50 to 54 yr	0	0	0	19	0	1	0	0	102	3	3
55 to 59 yr	0	1	0	9	0	0	0	3	61	3	3
60 & 61 yr	0	0	0	5	0	1	0	0	16	0	0
62 to 64 yr	0	0	0	0	0	0	0	0	25	0	1
65 & 66 yr	0	1	0	0	0	0	0	0	10	1	0
67 to 69 yr	0	0	0	0	0	1	0	0	22	1	0
70 to 74 yr	0	1	0	0	0	0	0	0	20	0	0
75 to 79 yr	0	0	0	1	0	0	1	0	17	0	0
80 to 84 yr	0	0	0	0	0	0	0	0	5	0	3
85 yr +	0	0	0	0	0	0	0	0	7	0	1

U.S. Census Bureau; Census 2000

P12H . SEX BY AGE (HISPANIC OR LATINO ALONE) [49] – Universe: People who are Hispanic or Latino  
 Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

	Iowa County										
	Audubon	Boone	Carroll	Dallas	Guthrie	Jasper	Madison	Marion	Polk	Story	Warren
Total:	33	218	115	2,199	120	375	105	257	16,490	1,238	441
Male:	16	114	52	1,237	66	213	53	113	8,967	693	233
Under 5 yr	2	20	4	175	12	25	7	7	1,206	58	22
5 to 9 yr	3	15	5	125	7	28	10	11	889	35	34
10 to 14 yr	3	19	4	92	3	16	6	16	729	34	23
15 to 17 yr	0	10	1	62	2	10	1	9	422	25	20
18 & 19 yr	0	1	2	53	2	9	0	8	345	82	14
20 yr	0	1	1	39	0	13	0	4	211	40	6
21 yr	0	2	3	18	3	1	0	2	232	41	4
22 to 24 yr	1	4	7	79	5	15	1	8	639	83	12
25 to 29 yr	0	9	6	137	5	16	4	5	1,146	98	19
30 to 34 yr	3	5	3	140	4	15	10	9	889	67	12
35 to 39 yr	1	9	7	119	6	22	5	9	707	39	16
40 to 44 yr	2	4	2	79	8	10	1	5	504	37	13
45 to 49 yr	0	5	2	46	1	6	1	6	337	20	8
50 to 54 yr	0	3	1	23	3	10	2	7	254	14	12
55 to 59 yr	0	1	0	22	1	9	1	4	142	9	5
60 & 61 yr	0	0	1	6	1	0	1	0	46	1	2
62 to 64 yr	0	1	0	3	0	1	1	0	61	2	3
65 & 66 yr	0	1	0	1	1	1	0	0	33	1	2
67 to 69 yr	0	0	1	3	0	1	0	1	46	1	2
70 to 74 yr	0	3	2	0	2	0	0	2	55	3	0
75 to 79 yr	0	0	0	0	0	4	0	0	50	2	1
80 to 84 yr	1	0	0	3	0	1	2	0	12	0	1
85 yr +	0	1	0	2	0	0	0	0	12	1	2
Female:	17	104	63	962	54	162	52	144	7,523	545	208
Under 5 yr	2	18	9	167	7	28	5	15	1,094	67	26
5 to 9 yr	2	7	9	107	11	18	1	13	944	33	30
10 to 14 yr	1	16	4	85	8	15	5	20	712	39	17
15 to 17 yr	1	2	5	42	1	7	9	14	408	23	9
18 & 19 yr	0	6	1	29	3	3	0	13	257	39	9
20 yr	0	1	0	18	0	0	1	5	158	21	4
21 yr	0	1	1	15	2	5	1	3	160	27	1
22 to 24 yr	0	6	4	46	6	8	2	4	466	623	8
25 to 29 yr	3	8	3	118	1	11	7	10	751	59	19
30 to 34 yr	3	6	5	116	5	17	3	8	648	43	12
35 to 39 yr	3	9	6	72	3	9	3	7	533	35	16
40 to 44 yr	0	4	2	59	1	13	3	11	376	34	20
45 to 49 yr	0	8	1	30	2	3	0	6	293	23	10
50 to 54 yr	0	4	1	26	0	6	5	5	235	15	6
55 to 59 yr	1	2	5	13	3	2	2	6	140	7	8
60 & 61 yr	0	1	0	8	0	1	1	1	43	1	2
62 to 64 yr	0	0	1	2	0	4	1	0	62	3	3
65 & 66 yr	0	1	1	3	0	0	0	0	34	1	0
67 to 69 yr	0	1	0	1	0	1	0	0	45	5	2
70 to 74 yr	0	2	3	1	0	2	1	1	70	4	3
75 to 79 yr	1	1	0	2	0	5	1	1	56	0	1
80 to 84 yr	0	0	2	0	1	1	1	0	18	2	4
85 yr +	0	0	0	2	0	3	0	1	20	2	3

U.S. Census Bureau; Census 2000

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