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A Course-Based Model of Transfer Effectiveness of Community College Students Transferring to a Large, Urban University

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by

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Dedication

To my husband, John H. Stewart, and Kirsten, my daughter in heaven.

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Abstract

Florida's undergraduate organization of higher education is a 2 + 2 system in which students are encouraged to complete freshmen and sophomore years at a community college and then transfer to a state university. Florida statutes provide for a highly articulated educational system to facilitate seamless transition from one public institution to another. The researcher investigated the transfer function's effectiveness among community college students subsequent to enrollment at a large, urban, doctoral/research extensive university in Florida using a course-based model of transfer success. The research explored whether differences existed in academic performance in targeted upper-division undergraduate courses between native and Florida Community College System (FCCS) transfer students who completed prerequisite courses prior to transferring to the university.

Four upper-division courses were chosen specifically because many transfer students complete prerequisite coursework at a community college prior to matriculating at the university. A total of 764 native students and 1,053 FCCS transfer students were enrolled in at least one course of interest in fall 2002. Preliminary investigation of selected demographic characteristics identified statistically significant differences between these two groups. Native students were younger and more racially/ethnically

diverse; more native students were enrolled full time (for 12 or more credits) than transfer students.

Although first-term transfer students experienced transfer shock, university native students who were enrolled in three courses also experienced declines in fall 2002 GPA when compared to their previous GPA at the university. Statistically significant mean grade differences occurred between transfer and native students in three courses; transfers outperformed native students in two courses. Additional comparisons of fall 2002 term GPA between native and transfer students yielded no significant differences. Findings lend support to the effectiveness of Florida's community colleges in preparing students for upper-division undergraduate coursework, but that transition for some is not seamless, suggesting need for collaboration among universities and community colleges.

Chapter 1

Introduction

The opportunities provided by the higher education system in the United States are unlike any other in the world. The programs offered at the nation's colleges and universities as well as the students who attend them are characterized by diversity (U.S. Department of Education, 2008). Recent data from the National Center for Education Statistics indicated that over half of the first-time freshmen enrolled in public degree-granting institutions attend a two-year college, and the vast majority indicate that they intend to transfer to a four-year university (Provasnik & Planty, 2008). This university-parallel system (McQuay, 2000), in which students begin their postsecondary studies at a community college and then transfer to a four-year institution to earn their baccalaureate degree often is cited as a bridge to opportunity for all citizens (Knoell, 1996). It could be assumed that students who successfully navigate the community college system and subsequently transfer to a university would arrive with all the requisite skills to be successful learners. However, the large number of students who leave the university prior to graduation suggests that this is not always the case (Ishitani & DesJardins, 2002). On four outcome measures used to assess differences between transfer and native students at four-year universities, Porter (1999) found lower retention and graduation rates, lower grade point averages, and higher dismissal rates for transfer students when compared to their native counterparts. The one-year retention rates ranged from 1% to 9% lower, and the graduation rates were 2% to 8% lower among the transfer students. Although the cumulative grade point averages were only slightly lower among the transfer students (ranging from 0.1 to 0.2 of a grade point), they were

academically dismissed 3% to 6% higher than were native students.

When the doors of Joliet Junior College were opened in 1901, new opportunities were unlocked for high school graduates who otherwise might not have been able to attain a higher education (Martens, Lara, Cordova, & Harris, 1995; Witt, Wattenbarger, Gollattscheck, & Suppiger, 1994). Only slightly more than 100 years later, there are over 1,200 community colleges in the United States located in all 50 states. Although community colleges today offer a large variety of credit and non-credit courses, their mission to provide the first two years of postsecondary education remains at their core (Cohen & Brawer, 2003; Glass & Harrington, 2002).

The promise of the *open door* college, to offer high quality education at low cost to all who come knocking, has led to providing access to growing numbers of students who are unprepared for the rigors of higher education (Boylan, 1995). Data from the U.S. Department of Education (2004) showed that approximately 76% of postsecondary institutions, and virtually 100% of community colleges, offer at least one remedial course in reading, writing, or mathematics. An analysis of postsecondary transcripts revealed that 25% of university native students and 61% of students who began at a public two-year institution completed at least one remedial course at the postsecondary level. Of the students who first matriculated at a two-year college, 18% enrolled in a remedial reading course and 16% enrolled in at least one remedial mathematics course. In comparison, 5% and 7% of the university native students enrolled in remedial reading and mathematics, respectively (U.S. Department of Education, 2004).

Numerous authors (e.g., Oudenhoven, 2002; Spann, 2000; Toby, 2002; Zeitlin & Markus, 1996) claim that one of the most significant challenges facing higher education in the 21st century is the lack of preparedness of college students and their continued need for remediation. As higher education resources became scarcer during the 1990s,

the need for remediation at the postsecondary level stirred a loud public outcry that still can be heard in colleges and universities; in scholarly literature (Boylan, 1995; 1999); in the mass media (Cloud, 2002); and in the halls of local, state, and national political forums (Haeuser, 1993; Murray, 1997; Schrag, 2002; Trombley, 1998). Roueche and Roueche (1999) claimed that the discourse "is neither subtle nor mild-mannered; rather, it is critical, angry, and hostile" (p. vii). Oftentimes, colleges blame the high schools, high schools blame the middle schools, and middle schools argue that the elementary schools have not adequately prepared students (Ponessa, 1996).

In some states, legislators responded to public outrage by relegating remedial courses to community colleges (Abraham & Creech, 2000; Phipps, 1998). As a result of this mandate, but often of their own choice, many students begin their postsecondary educational careers at community colleges (Eaton, 1988; Kim, 2001). With the community colleges' emphasis on teaching rather than research and service, they have been described as a "safe haven" (Pascarella, 1999) for students to explore their interests and to determine if the baccalaureate is a reasonable and attainable goal. With Florida's extensive system of community colleges and its strong articulation agreements between the public two-year and four-year institutions, community colleges provide a convenient and low-cost alternative to prepare baccalaureate-seeking students for transfer. Community college administrators thus find themselves in a double bind—they are challenged to maintain high academic standards while providing almost unlimited access to students with varying academic skills (Grimes & David, 1999; Smittle, 1995).

Numerous studies indicate that students who begin their higher education in community colleges are significantly less likely than those who enter a four-year institution as freshmen ever to attain a baccalaureate degree (Dougherty, 1992; Pascarella, 1999). Evans (1993), however, warned that these findings are suspect and

that the results are not as dire as community college critics conclude. He noted that a common method of calculating transfer rates is flawed. Researchers often divide the number of students who transfer by the total enrollment of the sending institution. This formula therefore includes students who attended community colleges for reasons other than the intention to transfer as well as currently enrolled students who are not ready to transfer. Both critics *and* advocates of community colleges agree that there are a number of hurdles that community college students encounter on their path to the baccalaureate (Glass & Bunn, 1998).

Despite strong articulation agreements, many students who transfer from community colleges to four-year universities experience a difficult transition (Laanan, 2001). The term *transfer shock* was coined by Hills in 1965 to refer to the phenomenon in which community college transfer students often experience a decline in academic performance. Citing numerous studies that spanned four decades, Hills concluded that students often experience transfer shock typically ranging from 0.4 to 0.7 grade points, but their performance at the university tends to improve over time. Current research continues to document the existence of transfer shock but that most students' grade point averages rebound within several semesters (Keeley & House, 1993; Laanan, 2001). Other studies have reported that students who transfer from community colleges with the intention of earning a baccalaureate degree are less successful than students who entered the four-year institution as freshmen. Additionally, transfer students often take longer to earn their degree than native students (Pascarella, 1999).

Abundant research documents the existence of transfer shock and characteristics of the students who are most impacted by its deleterious effects (Cejda, Kaylor, & Rewey, 1998). However, these descriptive findings do not lend themselves to program improvement (Quanty, 2001). Rather than focusing on unchangeable demographic

characteristics of students, Quanty and his colleagues used a course-based approach to evaluate the effectiveness of prerequisite courses in preparing freshmen and sophomores for subsequent course work. If community colleges are effectively preparing students for transfer to a four-year university, students who complete prerequisite courses at a community college should perform as well as university native students in successive upper-division undergraduate courses. Since Florida's 2 + 2 higher education system encourages students to begin their undergraduate studies at community colleges, it is incumbent upon these institutions to provide the same high quality lower-division preparation that university native students receive.

Statement of the Problem

Despite the existence of strong articulation agreements between community colleges and four-year universities in Florida, students may experience difficulties adjusting to the rigors of upper-division institutions. This transition may lead to transfer shock, a decline in grade point average during the first term of enrollment at the university. Additionally, students who complete lower-division prerequisite courses prior to transferring may not be as well prepared for subsequent course work as students who entered at the university as freshmen. Although research indicates that transfer students often regain their previous grade point average, for others, the shock may result in student attrition and failure to earn the baccalaureate degree. Transfer students comprised approximately half of the undergraduate population at the university that was studied. However, comparative analyses had not been conducted to determine how transfer students perform relative to students who began their postsecondary education at the university.

Purpose and Significance of the Study

The purpose of this study was to investigate the effectiveness of the transfer

function among community college students subsequent to their enrollment at one of Florida's large, urban, doctoral/research extensive universities. Florida's organization of higher education at the undergraduate level is a 2 + 2 system in which students are encouraged to complete the freshman and sophomore years at a community college and then transfer to a state university. Although the state is at the national forefront of legislating strong articulation agreements between its public community colleges and four-year universities (LeMon & Pitter, 1996), research in other states indicates that students who begin at the community college and then transfer to complete their upper-division course work are less likely to attain the baccalaureate when compared to university native students (Dougherty, 1992). Additionally, transfer students who do complete the four-year degree often take longer to reach their goal than students who began their postsecondary education at the university (Pascarella, 1999). The Florida Department of Education adopted educational accountability measures that include a focus on *time to degree*. Students' progress toward degree completion would be tracked, and students who *languish* in the system would be penalized with higher tuition costs. However, 30% of the undergraduates at the university are enrolled on a part-time basis, and many are employed while pursuing their education (Kumar, 2003).

This study evaluated the effectiveness of the lower-division preparation of students who transferred to the university from its feeder institutions compared to university native students. The effectiveness of prerequisite courses completed at Florida public community colleges were compared to the same courses that were completed at the university using a course-based method similar to that developed by Quanty, Dixon, and Ridley (1999). Two upper-division undergraduate courses in the College of Arts and Sciences and two that are offered in the College of Business were chosen for investigation.

Table 1

Upper-Division Courses and Their Prerequisites by College

Upper-Division Course		Prerequisite Course(s)	
College of Arts and Sciences:			
ENC 3213	Professional Writing	ENC 1101/ ENC 1102	Composition I and Composition II **
PSY 3044	Psychological Science II	PSY 2012	Psychological Science I
College of Business:			
ACG 3103	Intermediate Financial Accounting	ACG 2021	Principles of Financial Accounting
ECO 3100	Managerial Economics	ECO 2023	Economic Principles

** *Note*. Students who have earned the Associate in Arts degree at a Florida community college must complete the course sequence ENC 1101/ENC 1102 or ENC 1101H/ENC 1102H (Honors sections) as part of the General Education core curriculum.

These upper-division courses were targeted specifically because transfer students often complete the prerequisite course(s) prior to transferring. Additionally, each course that was selected had only the above-listed lower-division course(s) as a prerequisite.

An academic history was extracted from the university's student database for all of the students who were enrolled in the chosen upper-division courses in fall 2002. Two separate grade distributions, one for university native students and the second for transfer students, were calculated across all sections of each of the upper-division courses. Transfer students who completed the prerequisite course(s) at the university were not included in this analysis. Similarly, native students who had not completed the prerequisite at the university also were excluded from the analysis.

Subsequent descriptive analyses were conducted to gain insights into the transfer experience of community college students at the university. The incoming (transfer) GPA was calculated for Florida public community college students who entered the university in fall 2002 and compared to their end-of-term GPA at the university to determine if they

experienced transfer shock. The GPA of these students also was calculated at the end of spring 2003 to determine if they recovered from any decline in GPA. Transfer students also were compared to university native students on a variety of academic achievement, educational effectiveness, and efficiency measures.

Research Questions

The research questions addressed by this study were:

1. Does academic performance in targeted upper-division undergraduate courses differ by type of institution at which the prerequisite course is taken?

2. To what extent do students who transfer to the university from community colleges experience transfer shock? If students do experience transfer shock, do they recover to pre-transfer GPA levels?

3. To what extent do community college transfer students differ from native students on measures of academic achievement (mean GPA and course completion rates)?

4. To what extent do community college transfer students differ from native students on measures of persistence, graduation rates, and time to degree?

Delimitations and Limitations of the Study

The following delimitations were made and limitations recognized as part of this study:

1. The study included students enrolled at only one university.

2. The study did not establish causal relationships.

3. The term *retention* in college was limited to the single institution and did not extend to enrollment toward degree completion at an institution to which a student might have subsequently transferred or to re-enrollment at the college after the data collection was completed.

Definition of Terms

The following definitions were used for purposes of this study:

Academic success—completion of coursework with a grade of *C* or better.

Articulation—the development and promotion of strategies that facilitate the transfer of students from one institution to another.

Associate in Arts (A.A.) degree—the two-year degree designed for transfer from a community college to a four-year, baccalaureate degree-granting institution.

Course completion rate—the percentage of students who completed a course with a grade of *A*, *B*, *C*, or *D* divided by all students who were enrolled in the course at the end of the drop/add period.

Doctoral/research extensive—one of the categories by which American colleges and universities are classified by the Carnegie Foundation for the Advancement of Teaching. Doctoral/research extensive institutions offer a variety of undergraduate and graduate programs through the doctorate and award 50 or more doctoral degrees annually in at least 15 disciplines. (http://www.carnegiefoundation.org/Classification/CIHE2000/defNotes/Definitions.html)

Full-time student—at the undergraduate level, a student who was enrolled for 12 or more credit hours at the university.

Graduation rate—for purposes of this study, the percentage of students who completed the baccalaureate degree by the end of spring 2005.

Institutional GPA—the mean grade point average for each student that includes only course work completed at the university.

Lower-division course—a course intended for freshmen and sophomores. In Florida's common course numbering system, a lower division course begins with the number *1* or *2*.

Lower-division status—a classification of student who is a freshmen or sophomore.

Native student—for purposes of this study, an undergraduate student whose initial enrollment in postsecondary education was at the four-year university. These students would be categorized as first-time-in-college students.

Nontraditional age student—an undergraduate student who was 25 years of age or older.

Part-time student—at the undergraduate level, a student who was enrolled for less than 12 credit hours at the university.

Persistence rate—the percentage of students in a term who enrolled in the subsequent term, excluding summer enrollments.

Retention rate—the percentage of a cohort of students who graduated or persisted at the institution.

Reverse transfer student—at the undergraduate level, a student who matriculates at a four-year institution and subsequently transfers to a community college to earn a degree or on a temporary basis to complete credits for transfer back to the university.

Time to degree—the total numbers of terms that had elapsed from entry into postsecondary education to completion of the baccalaureate degree.

Traditional age student—an undergraduate student who was 18 through 24 years of age.

Transfer GPA—the mean grade point average for each student that included all postsecondary course work completed prior to matriculation at the university.

Transfer shock—a decline in grade point average during the first term after transfer from a community college to a four-year institution. Hills (1965) coined the term

based on numerous studies that found 0.4 to 0.7 decrements in GPA during the first term after transfer.

Upper-division undergraduate course—a course intended for college juniors and seniors. In the Florida common course numbering system, upper-division undergraduate courses begin with the number *3* or *4*.

Upper-division status—a classification of student who is a junior or senior.

Organization of the Study

Chapter 1 provided an introduction to the community college system in the United States and to Florida's *2 + 2* system of postsecondary education in order to set the context for the study. The transfer process and potential negative consequences were highlighted. The first chapter included the statement of the problem, purpose and significance of the study, research questions that were investigated, delimitations and limitations of the study, definitions of key terms, and an outline of the organization of the research.

Chapter 2 included a review of literature related to the transfer function within higher education, focusing specifically on baccalaureate-seeking students who transfer from community colleges. The strands of literature that were reviewed trace the history of the community college and its place and importance in the educational structure in the United States, the process that students experience as they transition from the community college to a four-year institution, and the phenomenon of transfer shock.

Chapter 3 provided a description of the research design, population that was studied, procedures for data collection, and the analyses that were completed and the rationale for their use.

Chapter 4 presented results of the data analysis by research question.

Chapter 5 summarized the study, included conclusions based on the data that

were collected, provided implications of the findings, and made recommendations for future research.

Chapter 2

Review of Related Literature

The purpose of this study was to investigate the effectiveness of the transfer function among community college students subsequent to their enrollment at one of Florida's large, urban, doctoral/research extensive universities. Chapter 2 includes a review of literature related to the transfer function within higher education, focusing specifically on baccalaureate-seeking students who transfer from community colleges. The strands of literature that were reviewed trace the history of the community college and its place and importance in the educational structure in the United States and in Florida; the community college to university transfer function; and the phenomenon of transfer shock. The course-based transfer effectiveness model is discussed.

The Community College in the United States

Until the mid 1800s, higher education in the United States was organized in the European liberal arts tradition that provided opportunities primarily for wealthy young men (Cross, 1976). In the latter half of the nineteenth century, however, a number of social, political, and demographic transformations began to lay the groundwork for the establishment of the first junior college in 1901. According to Deegan and Tillery (1985), increasing industrialization and mechanization, growing high school completion rates, and the emergence of universities as research institutions converged to change the thinking about higher education in this country. To these reasons, Cohen and Brawer (2003) added that a change in the definition of adolescence led to a protracted need for "custodial care for the young" (p. 1).

Cohen and Brawer (2003) claimed that while all of these factors could explain the phenomenal growth in higher education, and community colleges in particular, similar circumstances in other countries did not lead to an institution like the American community college. Unlike other societies that divested responsibility for training and acculturation across a variety of social institutions including the family, the workplace, and religious organizations, these roles came to be ascribed to public schools. Community colleges assumed these new roles easily "because they had no traditions to defend, no alumni to question their role, no autonomous professional staff to be moved aside, no statements of philosophy that would militate against their taking on responsibility for everything" (Cohen & Brawer, 2003, p. 3).

Joliet Junior College, commonly recognized as the first American public junior college, was founded as a "postgraduate high school program" (Townsend, 2001b) to provide two years of instruction leading to an Associate in Arts (A.A.) degree (Albertson & Wattenbarger, 1998). As designed by J. Stanley Brown, the Superintendent of Joliet High School, and William Rainey Harper, the President of the University of Chicago, the function of Joliet Junior College was to provide transfer education for students who might not otherwise be prepared for the rigors of higher education (Hutcheson, 1999). Thus, students could extend their high school education in preparation for transfer to an upper-division college. Other universities that adopted this two-year model included Stanford University, led by its first president David Starr Jordan, and the University of California Berkeley, developed by President Benjamin Ide Wheeler and Alexis Lange, Dean of the School of Education (Callan, 1997). Consequently, junior colleges initially were viewed either as a two-year extension of high school or the first two years of college (Witt, Wattenbarger, Gollattscheck, & Suppiger, 1994).

According to Callan (1997), "These and other leaders of major universities seem

to have had mixed motives: a laudable motive to widen educational opportunity coincided with a wish to control university enrollment by relegating freshmen and sophomores to the high schools" (p. 100). They believed that public pressure to increase enrollment would lower academic standards and divert attention from their strong research missions. By consigning lower-division students to other institutions, the universities could satisfy the public's demand for postsecondary education while maintaining their own high academic standards. Berkeley's leaders achieved this goal by establishing articulation agreements to admit students as juniors after they successfully completed a prescribed curriculum at other colleges. This two-year program led to a *junior college certificate* that eventually became the Associate of Arts degree. During the first half of the twentieth century, the term *junior college* continued to be used to refer to this "peculiarly American invention" (Brint & Karabel, 1989, p. v).

The decades following World War II and continuing through the 1970s ushered in a new philosophy of educational opportunity to burgeoning populations of college students. On June 22, 1944, President Franklin D. Roosevelt signed into law the *Servicemen's Readjustment Act of 1944* (commonly known as the *G.I. Bill of Rights*). Thousands of veterans returning from World War II took advantage of the generous educational benefits provided by the G.I. Bill. These benefits included costs for tuition, books, and fees as well as a subsistence allowance for up to 48 months, based on years of military service. In the late 1940s, returning war veterans comprised 10% of the college population in this country. This enrollment growth coincided with major growth in the size of existing college campuses and in the number of new campuses that were established (Brint & Karabel, 1989).

By the mid 1960s, the first wave of the Baby Boom generation graduated from high school, providing a second influx of new students. Also during the 1960s, the civil

rights movement opened previously closed avenues of access to higher education for even more Americans. A decade later, the pool of students who were eligible to enroll in institutions of higher education reached an historical high. Not only were there record numbers of young people, the percentage of students who graduated from high school reached 75% in 1960 (Cohen & Brawer, 2003). Among these graduates were students who, prior to the civil rights movement, would have been denied access to most institutions of higher education. Beginning in the 1960s, growth in the number of community colleges to accommodate these students was unprecedented. Hundreds of new community colleges were established, placing a college education within commuting distance of a vast majority of individuals throughout the country (Eaton, 1992).

In only 100 years, the network of community colleges grew from this single institution to over 1,100 colleges across all 50 states (American Association of Community Colleges, n.d.). In 1920, the same year that the American Association of Junior Colleges was founded, junior colleges enrolled less than 2% of college freshmen (Brint & Karabel, 1989). The American Association of Community Colleges reported that, in 2008, community colleges enrolled 41% of all first-time freshmen and 46% of all undergraduates. Community colleges enrolled over 11.5 million students, 6.5 million of whom were enrolled in for-credit programs (American Association of Community Colleges, n.d.).

Florida's Community College System

The foundation and underlying philosophy of Florida's current network of public community colleges can be traced back to 1933 when Palm Beach Junior College (PBJC), now Palm Beach Community College, held its first classes. PBJC retained the distinction of being the only public two-year college in Florida until 1947 when St. Petersburg Junior College (now St. Petersburg College) was transformed from a private

two-year college to a public institution under the aegis of the Pinellas County school board. In 1948, the State Board of Education granted permission to four county school boards in Florida's rural panhandle to assume control of the then-private Chipola Junior College (renamed Chipola College in 2003). In that same year, Pensacola Junior College was founded under the control of the Escambia County School Board (Albertson & Wattenbarger, 1998). In October 1949, the presidents of these four institutions jointly formed the Florida Association of Public Junior Colleges, renamed the Florida Association of Community Colleges in 1971 (http://www.facc.org/general.htm).

In 1955, growing interest in the establishment of junior colleges led the Florida Legislature to create a workgroup, the Community College Council, to develop a strategic plan for the state. Two years later, the Council issued its report, *The Community Junior College in Florida's Future*, that laid out plans for a state-wide public community college system. Although the vision began to take shape in 1957, it was not completed until 1972 when Pasco-Hernando Community College was added as the final link in the chain of 28 public community colleges. The system was designed to put a community college within easy commuting distance of 99% of the state's residents (Albertson & Wattenbarger, 1998).

Until 1968, the community colleges were governed by their local school districts. However, in that year, the Florida legislature established a governance structure in which local boards of trustees that are appointed by the governor oversee the colleges (Holcombe, 1997). Although the boards of trustees ensured local representation, the lack of a centralized voice in the state capital, Tallahassee, led to disproportionate funding across the colleges. A unified structure was implemented by the state legislature with the establishment of the Community College Coordinating Board in 1979. An Articulation Coordinating Committee also was established to provide a seamless system

of education for students transferring from community colleges to public universities within the state. In 1983, the State Board of Community Colleges (SBCC) replaced the Community College Coordinating Board. The intent of the legislature was to give the new board a stronger mandate to develop system-wide coordination for planning purposes (Holcombe, 1997).

Florida's higher educational system is often referred to as a 2 + 2 design in which students begin their freshmen and sophomore years at the community college and then transfer to a university for their junior and senior years. Prior to 1995, general education requirements varied widely across the universities and community colleges. As state legislators became increasingly accountable to taxpayers for educational expenditures in the 1990s, legislation was passed to "streamline the undergraduate experience" (LeMon & Pitter, 1996, p. 3). State legislation mandates a uniform number of credits at the associate's and bachelor's degree levels (60 and 120, respectively) of which 36 must be in a general education core. All students who earn an Associate of Arts degree are guaranteed entry to a public four-year university, although not into specific high-demand programs or into programs with additional requirements (Wellman, 2002).

According to the Florida Department of Education (2008), the 28 public community colleges offered courses at 177 sites and over 2,000 other locations including churches, schools, and community centers during 2007-2008. In 2006-2007, annual student headcount was 769,932. Approximately 248,000 students were enrolled in an Associate in Arts degree program, and 33,836 A.A. degrees were awarded. Other programs offered included Associate in Science degrees; College Credit and Vocational Certificates; College and Vocational Preparatory, Adult and Secondary, Continuing Workforce Education; Life Long Learning; and Recreation and Leisure. To serve the needs of their local communities, the colleges also offer countless apprenticeship and

employment-related courses, classes for senior citizens, and courses categorized as meeting *other personal objectives*.

In fall 2007, of students who were enrolled in college credit programs in one of Florida's public community colleges, the mean age was 25; 62% were attending on a part-time basis; 60% were female; and 41% were an ethnic minority. Tuition costs for these students remained low, despite recent increases. Student fees of $530 million accounted for only 32.2% of community college funding; an additional $1 billion came from general revenue appropriations; and $115 million was Florida lottery funding (Florida Department of Education, 2008).

The Community College in the 21st Century

In only one century of history, the community college looks very different than it did at its conception. Today, most community colleges across the country provide a large variety of programs and services to best meet the needs of the constituents in their districts (McQuay, 2000). Griffith and Connor (1994) claimed that "Because most community colleges are comprehensive in nature—offering transfer, vocational, remedial, and general education programs, and community activities—they are flexible enough to respond quickly to changes in . . . educational needs . . . " (p. xiii). To these functions, a *reverse transfer* phenomenon has been occurring with more regularity in which upper-division students return to the community college to complete some of their coursework (Townsend, 2001a; 2001b). Based on longitudinal data collected by the National Center for Education Statistics (McCormick & Carroll, 1997), approximately 13% of students at two-year colleges would be classified as reverse transfers. Townsend and Dever (1999) asserted, however, that this definition of reverse transfer is too limiting. Even within the subset of undergraduate students who begin at a four-year college, there are two major types of reverse transfers: "temporary reverse transfers" who earn several credits at the

community college with the intention of transferring them back to the university and those who stay for a longer period of time, often earning a certificate or degree. To these two types, they added that there are growing numbers of postbaccalaureate reverse transfer students who enroll at the community college for a variety of reasons including career development/change or simply for personal enrichment. Changing demographics in the United States also have altered the populations of students who avail themselves of higher educational opportunities, and the diversity of students is likely to increase in the future (Snyder, Tan, & Hoffman, 2004).

Community colleges enroll students who attend both part time and full time; are of *traditional* and *non-traditional* age; students who work, often 40 hours or more per week; parents who require child care in order to attend classes; individuals who intend to pursue degrees above those at the community college and others who take courses only for their own personal interests (Monroe, 1977). As ethnic minority groups continue to constitute a larger percentage of the population in this country, they also are enrolling in college in higher numbers. Within this latter group are growing numbers of first-generation college students, many of whom were not born in this country. Especially among the high school graduates who will enter community colleges in the future will be growing numbers of ethnically and economically diverse students (Phelan, 2000).

The hallmark of the community college today has been the promise to all individuals that they can improve their quality of life (Nielsen, 1991). In fact, according to Henry and Smith (1994), one of the primary *responsibilities* of public community colleges in this country is to assure that the door of opportunity remains open to all. A recent national survey found that nearly all public two-year institutions have open admissions; any high school graduate may enroll, regardless of academic preparation; and specialized programs often are designed for adult students who never completed

secondary school. Community colleges offer courses at times, in locations, and in formats designed for the convenience of students. Most offer courses during the day, evenings, and on weekends; in locations ranging from branch campuses to high schools to store fronts; and in a variety of distance learning modes, including TV and online courses. In addition to providing access to an environment that can assist students adjust to the academic rigors of college life, Eaton (1992) claimed that the success of community colleges has revolved around their ability to be responsive to the needs of their constituents, their low cost, and their willingness to be "different from the rest of higher education" (p. 1). Nevertheless, the increasing diversity of students leads to challenges for community colleges if they are to continue to function as "Democracy's Open Door" (Griffith & Connor, 1994).

The Transfer Function

The missions of community colleges today encompass a variety of functions including workforce training and programs of general interest to their local communities, but the primary role remains to provide the first two years of college education in preparation for transfer to a four-year institution (Cohen & Brawer, 2003; Glass & Harrington, 2002). Nationally, 42% of community college students reported that they intended to earn a bachelor's degree (Sullivan & Phillippe, 2005). However, Dougherty (1987, 1992) concluded that a "baccalaureate gap" exists whereby community college students who intended to earn the baccalaureate earned approximately 11% to 19% fewer bachelor's degrees than university native students. The gap in baccalaureate attainment has been shown to be even larger for minority students (Gebel, 1995).

Concern regarding the effectiveness of the transfer function is not focused only on students' ability to achieve their educational goals but on subsequent economic advancement (Lee, 2001). Educational level and socioeconomic status have been found

to be positively correlated; as educational level increases so does the median income level and vice-versa. Conversely, as educational level increases, unemployment rates decline (Gebel, 1995). Gebel stated that this concern "further intensifies with regard to minority students, who disproportionately utilize community colleges as an initial avenue for entry into higher education" (p. 5).

In many cases, community college students have no option other than transferring to another institution in order to earn the baccalaureate (Laanan, 2001; Palmer, 2001). For many low-income and minority students, the transfer function "plays the most critical role in providing initial access . . . to the baccalaureate degree" (Laanan, 1996, p. 1). In light of this pivotal role, the transfer function has been researched extensively but with conflicting results and often critical conclusions (Alfonso, 2006; Kinnick et al., 1998).

The research has primarily centered around four major themes: articulation, transfer rates, the effects on baccalaureate attainment of beginning postsecondary study at a community college, and performance after transfer (Kinnick et al., 1998). Although this study focused on the performance of community college students after transfer to a four-year university, a brief summary of each of these strands of research was provided as they specifically relate to post-transfer success.

Articulation

Articulation refers to ongoing communication and formal agreements between sectors of the educational system that facilitate the transfer process for students. Since there is no national standard for articulation, agreements range from informal arrangements between institutions to legislated, highly detailed statewide mandates (Wynn, 2002). The vast majority of research related to the effectiveness of articulation efforts has been conducted at the state level to inform policy making (Kinnick et al.,

1998) and at the individual institution level for programmatic reform (Kozeracki, 2001). Research related to the transfer function often is cross-sectional and focused on enrollments rather than having a longitudinal focus on outcomes (Palmer, 2001). Quanty (2001) and Kozeracki (2001) also claimed that the research methods that typically have been used to evaluate the transfer process are only descriptive and do not provide data that can be used to bring about reform.

One notable study was conducted by Ignash and Townsend (2000) to determine the number of states that had developed articulation agreements and the nature of these agreements at the beginning of the 21st century. A short survey was sent by email to the executive directors of higher education within all 50 states; follow-up telephone calls were made to non-responding state agencies yielding a total response rate of 86% (43 states). They concluded that although states had made progress toward well-articulated transfer programs, there was work that remained to be done. Thirty-three of the states had developed articulation agreements that facilitated vertical transfer, but only 21 included transfer within two-year institutions, 22 addressed movement between four-year institutions, and 19 incorporated reverse transfers. Ignash and Townsend (2000) classified Florida's system of articulation as "fairly strong" in its inclusion of vertical and horizontal agreements between and among community colleges and universities but lack of reverse transfer agreements.

Quanty (2001) argued that most research paradigms used at the institutional level have focused on the wrong unit of analysis. Documenting the demographic characteristics of students can identify problems but not suggest solutions. Faculty and administrators cannot change the age, gender, ethnicity, or work status of students; they can, however, change the content of courses. Shifting the unit of analysis from the student to individual courses, Quanty and his colleagues developed the Course-Based

Model of Transfer Success (CBMTS). The CBMTS system was designed to track university courses having prerequisites that can be met at either a community college or at a four-year institution. Their data indicated that, in most cases, community college courses offered comparable preparation but also highlighted instances where students who completed the prerequisite course at the university significantly outperformed the community college transfers. This course-based approach was able to "transform an intractable situation such as the *transfer problem* into a set of clearly delineated opportunities" (p. 3) to improve articulation efforts.

The Associate in Arts degree program at Florida community colleges is designed to provide the first two years of college course work, that parallel the freshmen and sophomore levels at public universities, for students who intend to transfer to a university to earn a baccalaureate degree. The general education core includes 36 credit hours of coursework in the following areas: communications (9 credits); humanities (9 credits); mathematics (6 credits); sciences (6 credits); and social sciences (6 credits). Students are required to complete an additional 24 credits in elective courses, and they are advised to complete any university prerequisite courses as part of this elective sequence.

The state's 2 + 2 articulation system has several legislatively mandated components that facilitate the vertical transition of students from its community colleges to public universities. According to LeMon and Pitter (1996), this articulation agreement has made it difficult for students to enter one of the state universities as a first-time-in-college student. A statewide articulation agreement guarantees admission to an upper-division institution to students who complete the Associate in Arts degree. Students are not, however, guaranteed admission into specific institutions or into limited-access and teacher certification programs or majors that require an audition (Section 1007.23, Florida Statutes). Section 1007.24 of the Florida Statutes directs that there be a

statewide common course numbering system that insures the comparability of courses offered at community colleges and upper-division institutions. Students who have successfully completed the 36-credit general education core at a community college cannot be required to take additional general education course work after transferring to a university. Section 1007.25 of the Florida Statutes additionally mandates the identification of prerequisite courses for all baccalaureate programs; these courses and acceptable substitutions are maintained by the state Department of Education in a centralized database.

Susskind (1996) cautioned that articulation involves far more than the existence of agreements or the number of students who make the transition between two-year and four-year institutions. "Articulation [also] involves admission, exclusion, readmission, counseling, curriculum planning, and course and credit evaluation" (pp. 4-5). Despite formal articulation agreements and highly regulated systems that dictate the numbers of courses and credits that must be accepted by the receiving institution, differences in attitudes and cultures may impose barriers for students (Manzo, 2004; Susskind, 1996).

Transfer Rates

The percentage of students who transfer from a two-year to a four-year institution is commonly used as an accountability measure within the community college sector. However, as Kinnick et al. (1998) and Townsend (2002) pointed out, studies of transfer rates that are based on the assumption that students' college attendance proceeds in a linear, vertical fashion are seriously flawed. Adelman (1999) reported that institutional *convenience* has become the "governing filter of choice" for today's students. The *learning any time, anywhere* catchphrase marketed by online educational programs captures part of the spirit of Adelman's (1999) definition of convenience; to the idea of location and time, he adds that students also shop for educational opportunities by

subject and cost. He concluded that, “It is thus not surprising to find students filling their undergraduate portfolios with courses and credentials from a variety of sources, much as we fill our shopping bags at the local mall” (p. 39). The reality of the attendance patterns of many students has been characterized as *swirling* (Bach et al., 2000; Bailey, 2003; Borden, 2004; de los Santos & Wright, 1990), in which students move back and forth between two-year and four-year institutions, and *double dipping*, whereby students are enrolled simultaneously at a community college and a four-year university (de los Santos & Wright, 1990).

In an empirical study of the linear model of transfer, Piland (1995) found that prior to transferring to the university, many students had attended multiple institutions, had stopped out, and many had attended part time. On the basis of these findings, he called the assumption of vertical transfer “a myth.” The findings of Kinnick et al. (1998) confirmed those of Piland (1995). Their research combined the resources of an urban university and three community colleges to investigate the transfer patterns between their institutions. They reported that students attended these institutions as if they were part of a single, unified system despite their four disparate governance, financial, and curricular structures. Among the multiplicity of patterns that characterized student attendance, two varieties pointed out by the authors included students *concurrently* attending: a) two or all three of the community colleges, and b) one or two community colleges and the university.

Townsend (2002) claimed that the foremost difficulty in calculating transfer rates has been the lack of consensus regarding a definition. In order to calculate a transfer rate, both the denominator (the total number of students who could have transferred) and the numerator (those who actually did transfer) must be determined. Banks (1990) argued for a consistent definition of transfer citing the inherent problems in evaluating

research findings when some studies compare transfers to total headcount and others to full-time equivalencies. An approach that some researchers have taken, limiting the denominator only to students who are enrolled in a transfer program (usually defined as those pursuing an A.A. degree), is becoming increasingly problematic. Growing numbers of students enrolled in A.S. and vocational/technical programs are also transferring to four-year institutions. Townsend (2002) claimed that a narrow definition of the transfer function, including only those students who begin postsecondary education at the community college and subsequently transfer to a university, "devalues or ignores" many other types of transfer students.

Recognizing that the lack of a common definition of transfer rate led to unfounded speculation about the numbers of community college students who transfer to upper-division institutions, the Center for the Study of Community Colleges (CSCC) embarked on a project to establish a standard definition and collect data based on this criterion (Hirose, 1994). The CSCC's Transfer Assembly project's definition of the potential transfer pool (the denominator) included all first-time-in-college students who entered a community college in the fall semester and who completed a minimum of twelve college credits within four years. The numerator included the number of students in this pool who transferred to a university by the following fall. Initially, 48 community colleges provided data for the 1984 entering cohort of students; 50.5% of these students had completed twelve or more credits by the spring of 1988, and 23.7% had transferred to an upper-division institution. Hirose (1994) reported that at the end of the fifth year of data collection, 395 community colleges participated in the project and provided data for over 500,000 students. Half of the 1988 cohort of students had earned at least twelve credits and 22.1% had transferred to a senior institution. It is important to note that the Transfer Assembly project's definition did not exclude students who took vocational or technical

courses, because a growing number of transfer students are not enrolled in a traditional associate degree transfer track, and many students don't complete the associate's degree prior to transferring.

Porter, Hogan, and Gebel's (2000) longitudinal study that tracked the progress of community college students in a state with a strong 2 + 2 system supported the findings of the Transfer Assembly. Across five years of data analysis, 24.6% of the community college students transferred to a university, but less than 8% completed an associate's degree before transferring. Only 5.7% of all students earned an associate's degree, and 81.1% took more than two years to complete it. An additional 5.8% were co-enrolled at the community college and university, most often for one semester. Their findings also indicated that many of the community college students stopped out for one or more semesters. They concluded that when a community college and a university are located in close proximity, students exhibit "an unusual array of student transfer behavior" (p. 3).

Although recent data indicated that women were in the majority in community college enrollments, they were less likely to transfer to a four-year institution and, of those who do transfer, women were less likely to earn the baccalaureate degree (Surette, 2001). Surette (2001) tested several hypotheses that might explain this gender difference in transfer rates. Although marital status, presence of young children in the home, and occupational choice differentially affected transfer rates for women and men, these variables did not fully explain the difference.

Borden (2004) contended that while states are working to improve educational access and convenience and simultaneously containing costs, they also are increasing students' propensity to "swirl." New consortia of universities that provide distance courses and entire degree programs online permit additional numbers of learners "to swirl from the comfort of home" (p. 15). Yet, in spite of the reality that students transfer

between institutions and across sectors with increasing frequency, many educational policies and accountability measures continue to be based on the assumption that students enter college immediately after high school and proceed toward the baccalaureate in a vertical, linear pattern.

Baccalaureate Attainment

During the decades of the 1960s and 1970s, when the Baby Boom generation came of age and the Civil Rights movement increased the diversity of students who attended institutions of higher education, a debate began that juxtaposes access and excellence (Richardson, 1988; Roueche & Baker, 1993; Roueche & Roueche, 1999). On one side stand those who believe that access, at any cost, is critical to the functioning of a democratic society (Spann, 2000; Vaughan, 2004), while the opposition claims that open access and excellence are mutually exclusive (Roueche & Baker, 1993). Hailed by advocates as "Democracy's Open Door," community colleges promise "that every adult of whatever age is welcome to college without qualifying by virtue of high school grades, test scores, or previous cultural advantages" (Griffith & Connor, 1994, p. xii). Yet it is precisely this openness that leads detractors to criticize community colleges for their lack of rigor (Carlan & Byxbe, 2000). Jencks and Reisman (1968) referred to the community college as the "anti-university college," with the implication that open access leads to a decline in academic standards. Over the past several decades, the rise in the numbers of students who are enrolling in college without adequate preparation has added fuel to the fire (Almeida, 1991; Bandy, 1985). Critics of today's system of higher education claim that increasing access to post-secondary education has led to a devaluation of intellectual standards in which even unmotivated students find it difficult to fail (Toby, 2002). Cronholm (1999) claimed that by admitting students who are underprepared for college-level work has led to a lowering of academic quality and to grade inflation, a

practice that she deemed a “grievous error.”

Critics of the community college also contend that these institutions serve to lower students’ educational aspirations and diminish the likelihood that students will ever earn a bachelor’s degree (Bernstein, 1986; Brint & Karabel, 1989). These detractors assert that community colleges serve to open the “front door” for many students to access higher education but help to funnel students based on a social stratification system (Karabel, 1972, 1986). Karabel (1986) claimed that community colleges appear to be the gateway to higher education for low-income and minority students but become the *gatekeepers* to the baccalaureate by tracking these students into vocational programs. He asserted that enrollment growth in community colleges “may paradoxically lead to an increase in inequality of educational opportunity” (p. 16).

Clark (1960) coined the term *cooling out* to explain what he saw as the community colleges’ purpose to assist academically underprepared students lower their expectations and to rechannel their goals. He claimed that the socializing agents (faculty, administrators, and peers) and administrative procedures of the community college work together to lower students’ educational aspirations. Similarly, Zwerling (1976) claimed that the “hidden function” of community colleges is to maintain a stratified society in which students from lower socioeconomic strata are funneled into programs and careers that limit upward mobility.

During the 1970s and 1980s, detractors claimed that 70% to 75% of students who begin their postsecondary education at a community college indicate that they aspire to earn a bachelor’s degree or higher, but few succeed (Brint & Karabel, 1989; Karabel, 1972, 1986; Pincus, 1980; Zwerling, 1976). Since that time, a copious amount of research has been conducted controlling for a variety of factors that are hypothesized to explain the discrepancy between students’ hopes and reality. Although recent research

indicates less of a cooling out effect, the general consensus remains that students who enter the community college are less likely to successfully achieve a bachelor's degree (Kinnick & Kempner, 1988; Romano, 2004). Other studies found that the attainment of a baccalaureate degree is influenced less by the type of institution that students first attend than it is by entering or delaying entry into postsecondary education after high school (Kempner & Kinnick, 1990; Nunley & Breneman, 1988). Advocates for the community college respond that many students who attend community colleges never *intend* to pursue the baccalaureate.

In 1985, Kinnick and Kempner (1988) surveyed a sample of individuals who had been high school seniors in 1974 and for whom data had been collected during their senior year regarding their future educational plans. An analysis of only those students who had indicated that they aspired to earn a baccalaureate degree showed that students who first entered a community college were less likely to have attained a baccalaureate degree, especially those who reported low parental income. They highlighted one remarkable finding: 51% of students whose high school grade point average was *below* 3.0 but who first entered postsecondary education at a university had earned a baccalaureate; only 37% of students whose high school GPA was *above 3.5* but who had attended a community college had completed a four-year degree. The disparity was even more striking among low-income students: 45% who began at a university completed the baccalaureate compared to 8% who entered at a community college. They concluded that their findings supported Karabel's social stratification thesis.

While Pascarella and his associates do not claim that one of the functions of the community college is to lower students' aspirations, their research (Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1998) lends support to the existence of a cooling out

effect. They found that, after controlling for many confounding variables, community college students who initially aspired to a baccalaureate degree were 20% to 30% more likely than four-year university students to lower their expectations by the end of their sophomore year. In an analysis of national *High School and Beyond Survey* longitudinal study data, McCormick (1997) reported that 45% of the students who first enrolled at a community college planned to earn a bachelor's degree. However, they were 60% less likely to maintain this level of aspiration than students who began postsecondary education at a four-year institution. He concluded, "For bachelor's degree seekers choosing between a community college and a four-year institution, enrolling at a community college may well have negative consequences on their long-term attainment prospects" (p. 17).

Pascarella (1999) provided a comprehensive review of the literature and concluded that students who aspire to the baccalaureate but enter at the community college are 15% less likely to complete the bachelor's degree *in the same period of time* as those who began at a four-year institution. He went on to qualify this conclusion by speculating that "it may simply be that substantial numbers of students who initially enter two-year colleges for the ostensible purpose of obtaining a bachelor's degree have unclear or underdeveloped educational plans to begin with" (p. 11). Romano (2004) tested Pascarella's conjecture that community college students may be unclear about their educational future. On an entering student survey, undergraduates were asked to respond to the question, "What is the highest level of education you plan to attain?" (planned at the college or anywhere). Over 71% of the cohort who entered the college in 1985 replied that they planned to attain a bachelor's degree or higher. However, subsequent focus groups revealed that students were unclear whether they were to respond to what they wanted to do or what they realistically could expect to do.

Beginning in fall 1987, the entering student questionnaire included three questions that included asking students what they would like to do, what they expected to do, and how likely it was that they would accomplish what they expected to do. Although 73.3% replied that they would like to earn at least a bachelor's degree, only 50.6% answered that they expected to earn a bachelor's degree or higher. Despite Romano's finding that the wording may be the key, the students were asked in the context of completing a bachelor's degree in four or five years of college.

Alfonso (2006) claimed that while community colleges increase access to higher education, "this increased educational *opportunity* does not necessarily result in increased educational *attainment*" (p. 874). Many studies have found that students who begin their postsecondary education at a community college are much less likely to attain the bachelor's degree than those who enter at a four-year institution even when controlling for a myriad of variables that are thought to explain this *baccalaureate gap*. Researchers have attempted to determine the relationship between baccalaureate attainment and a variety of variables. Using a sample from the National Center for Education Statistics NLS-72 data set, Velez (1985) studied the effects of student and institutional characteristics on degree completion among these students who were high school seniors in 1972. Although there was a significant difference in completion rates between the two groups of students, he found that living and working on campus greatly increased the probability that students who started at a two-year college would complete a bachelor's degree. Adelman's (1999) national study of high school students who were tracked from tenth grade to age 30 found that the most important variables in predicting baccalaureate attainment were continuous enrollment, first year college grades, and transferring—especially transferring from a community college to a four-year institution. Yet for many students who intend to pursue a baccalaureate degree, beginning their

undergraduate work at a community college and subsequently transferring to another institution is the only option (Susskind, 1996).

Post-Transfer Performance

Community colleges are often criticized for inadequately preparing students for transfer to four-year universities (Dougherty, 1992, 1994; Susskind, 1996). Notwithstanding the fact that community college graduates who complete the Associate in Arts degree have met all the requirements for transfer to upper-division course work, there is controversy over their ability to be academically successful (Diaz, 1992). There is a belief among some university administrators that community college courses are not as academically challenging as those at the four-year institution. The perception is that community college faculty cover less and easier material in class, make assignments and give examinations that require less writing, and grade students relative to their peers rather than to an objective standard. Courses offered at the two-year institution "are often not up to university standards of instruction" (Dougherty, 1992, p. 203) and, therefore, admitting these students to the four-year institution is a risky business (Diaz, 1992; Manzo, 2004).

Although the A.A. degree, and more recently the A.S. degree, has been considered the appropriate track for community college students who wish to transfer to a four-year institution, studies have documented that many students transfer without completing an associate's degree or were enrolled in a technical or vocational track prior to transferring (Fredrickson, 1998; Townsend, 2001a). For example, Curtis (2002) followed the progress of students who attended a community college in Virginia and subsequently transferred to an upper-division institution in the state. He found that approximately 40% of the students who applied for transfer admission had not been enrolled in "transfer" programs at the community college. One year after transfer, 79% of

the students were in good academic standing at the university, but there were large differences at several institutions between graduates and those students who transferred prior to graduation from the community college. Overall, 82.6% of the community college graduates were in good standing after one year compared to 76.3% of the non-graduates.

Fredrickson (1998) claimed that vocational and transfer programs were traditionally separate functions of the community college, each serving distinct groups of students who had different educational goals. Vocational programs were designed to prepare students to enter the workforce rather than to transfer to earn a baccalaureate degree. An analysis of students who transferred from a North Carolina community college to one of the state's public universities in 1993 demonstrated, to the contrary, that 30% of the transfer students had been enrolled in a vocational/technical program at the lower division. Black students were twice as likely to have transferred from a technical program as from a transfer track. Fredrickson's investigation demonstrated that the technical students earned higher grades after transferring than did the transfer track cohorts, but the latter students persisted at a higher rate than the technical group.

If the academic preparation provided by transfer track programs parallels that of the freshman and sophomore years at universities, then community college graduates should perform as well in upper-division undergraduate course work as their university-native peers (Susskind, 1996). However, Dougherty (1992) concluded that community college students encounter a variety of hurdles to the baccalaureate at three stages: during the first years of college; at transfer to a four-year institution; and in persisting to degree completion. A vast body of research has documented the environmental, social, and psychological difficulties as well as academic challenges that transfer students encounter during their first semester at the four-year institution (Laanan, 2001; Rhine,

Milligan, & Nelson, 2000; Townsend, 1995). Since many first-generation, low-income, minority, and non-traditional age students begin their undergraduate studies at community colleges, the fact that they must transfer in order to complete the baccalaureate degree places them at additional risk of not achieving their goal (Palmer, 2001).

Even as the research has established that many transfers experience a decline in GPA at the university, two factions disagree on how to interpret the results. Advocates for the community college maintain that most students recover to their pre-transfer level while critics contend that time to graduation and graduation rates do not compare favorably to those of native students. The term *transfer shock* is often used to refer to the decline in GPA that many transfer students experience when they transition to the upper-division institution (Keeley & House, 1993; Laanan, 2001).

Transfer Shock

Hills (1965) is credited with coining the term *transfer shock* in his seminal review of research from 1928 through 1964 that predominantly demonstrated that transfer students experience a decline in grade point average from 0.30 to 0.50 during their first semester after transfer. He also presented findings from 12 of 43 four-year colleges that were currently under study by Knoell. He reported that while transfer shock occurred at all 12 institutions, the GPA of students who persisted for at least two years was higher than that of their first term after transfer and concludes that “recovery is more than complete” (p. 207). Knoell’s published findings (Knoell & Medsker, 1965) confirmed the transfer shock phenomenon but also found that 62% of the transfer students graduated within three years after entering the four-year institution and another 9% were still enrolled; 10% had been dismissed for academic reasons.

Recent studies continue to corroborate Knoell and Medsker’s findings and have

added comparisons to native students. Glass and Harrington (2002) conducted a study in which they randomly chose equal numbers of community college transfer students and native students at a large public university. An analysis of the mean GPAs of two cohorts of students showed that the incoming transfer students' GPA was higher in both years (3.01 compared to 2.94 in 1996 and 3.09 versus 2.85 in 1997); the latter difference was statistically significant. However, at the end of the first term of upper-division course work, the mean semester GPA of the transfer students' was significantly lower than that of the native students in 1996 (2.57 and 2.98 for the transfer students and native students, respectively) and was lower, although not statistically significant, in 1997 (2.72 compared to 2.82).

Many studies do find indications that transfer shock occurs but that most students recover and go on to earn their baccalaureate degrees. Al-Sunbul (1987) compared the academic achievement of 60 native students and 60 community college transfer students who were enrolled at the University of Nebraska-Lincoln during the first term of the 1985-1986 academic year. He reported that the mean overall GPA for transfers was *higher* than that of the native students (2.90 compared to 2.69) but that these means were not significantly different. However, he found that the overall GPA of the transfer students had declined from 3.31 at the time of their transfer from the community college. This decrease of 0.41 was statistically significant.

Although Al-Sunbul's conclusion that ". . . transfer students at the University of Nebraska achieve as well as native students" (p. 7) is often cited as evidence of the effectiveness of community colleges in preparing students for transfer, his findings are methodologically suspect. Native students were randomly selected from a roster of students who were still enrolled at the university the following term; it is unclear whether the same method was used to select the transfer students. At the least, native students

who had not returned to the university and, perhaps, transfer students who had dropped out following their first term at the university were excluded from the potential sample. Additionally, it appears that the 2.90 GPA reported for transfer students included their grades earned at the community college and the single semester after transferring. If this assumption is correct, the full extent of transfer shock would be masked by the inclusion of the high community college GPA.

Soltz (1992) surveyed former Johnson Community College (Kansas) students who were identified as having transferred to four-year universities. Students who had earned at least six credit hours at the college were included in the study; approximately half (48%) had earned between 6 and 25 credit hours and were still classified as freshmen. Only 12% had earned an associate's degree prior to transferring. More than three-fourths of the students who responded indicated that transfer preparation had been their primary reason for attending the community college. Their overall GPA at the community college was 3.00, but the average GPA at the transfer institutions was 2.59. Although he found differences in GPA by major, Soltz reported that the students' community college GPA was higher than that after transfer across all majors. Data were not reported regarding differences by number of pre-transfer credits earned.

Head (1993) reported a similar decline in GPA among students who transferred from Piedmont Virginia Community College to one of the public four-year colleges and universities in the state. As mandated by the State Council of Higher Education for Virginia, the senior institutions submitted follow-up data for 306 students who had transferred from the community college. Slightly more than 44% of the transfers had earned a degree prior to transferring. The analyses showed that the community college overall GPA of 3.267 declined to 2.813 after transfer. Unlike other studies that have found lower academic achievement among early transfers, Head reported that the GPA

of graduates was 2.801 while that of the non-graduates was 2.821. With the exception of two majors, the GPAs earned after transfer were lower than those at the community college.

Other studies of transfer shock have compared the academic performance of transfer students and university native students and included longitudinal analyses to determine the extent to which students recover from transfer shock. Richardson and Doucette (1982) compared the cumulative GPA of community college transfer students and native students at Arizona's two largest state universities for five academic years. Although the community college students experienced considerable transfer shock during their first upper-division semester, the researchers stated that these students did recover over time and "performed nearly as well" as the university native students. Their results also indicated that the transfer students who had completed two years at the community college prior to transferring earned bachelor's degrees at approximately the same rate as the native students.

Graham and Hughes (1994) studied variables that might affect academic performance of community college students after transfer to an upper division institution. They found the variables that best predicted academic performance were whether or not the students had earned an associate's degree prior to transfer, incoming GPA, where they planned to live, whether they had sought faculty assistance outside of class at the community college, and their expectations concerning their GPA. They analyzed first and second semester GPAs and second year GPAs. Adult transfer students experienced transfer shock but not as much as younger transfer students. They also found differences by major with those in business and science experiencing the most transfer shock, lowest cumulative GPA, and graduation rates. The adult transfers' GPA dropped from 3.19 at transfer to 3.00 in the first term after transfer; among the traditional-

aged transfers, their GPA dropped from 2.92 at transfer to 2.49 at the end of their first term at the university. However, the majority of the transfer students had not completed an associate's degree.

Curtis (2002) also found clear evidence of differential transfer shock based on completion of an associate's degree prior to transfer: average GPA dropped from 3.05 at the community college to 2.45 at the end of the first year of transfer. The difference between the graduates and non-graduates was even more marked. Although the community college GPA was similar prior to transfer (3.17 for graduates and 3.12 for non-graduates), post-transfer GPA dropped to 2.53 for graduates and 2.39 for non-graduates.

Preston (1993) and his colleagues analyzed GPAs and course completion rates to measure the success of students who transferred from Brazosport Community College (Texas) to four-year universities in Texas. Overall, there was a decrease in GPA from 2.757 at the community college to 2.471 at the two universities that were reported—a difference of only -0.286. However, among the students who transferred to UT-Austin, their community college GPA of 3.304 was in sharp contrast to the university GPA of 2.256. The researchers then calculated course completion rates by dividing the number of credit hours completed (with grades of *A*, *B*, *C*, *D,* or *F*) by the total number of credit hours attempted (including all graded courses plus withdrawals and incomplete courses). The course completion rates at both universities also were lower than those at the community college. Preston reported that the analyses of GPA and course completion by number of credit hours completed at the community college were "counter-intuitive." The overall university GPA of early transfers was higher than that of students who had completed 46 or more credits. Similarly, the students who had completed 46+ credits at the community college had the lowest course completion rates.

Despite a plethora of research into the phenomenon of transfer shock, Cohen and Brawer (2003) claimed that the reasons for it are still not well understood. Hills (1965) concluded that it is incumbent upon good academic advisors to warn students who intend to pursue baccalaureate degrees that they are likely to experience transfer shock and that they are not likely to graduate in the same amount of time as would native students. Conversely, Rhine, Milligan, and Nelson (2000) place the onus on both community colleges and universities to implement policies and programs to alleviate transfer shock rather than accept that it will occur.

Summary

Many students begin their postsecondary education at community colleges either by choice (Eaton, 1988) or out of necessity (Cohen & Brawer, 2003). Florida's 2 + 2 system of higher education is designed to encourage students seeking baccalaureate degrees to complete their freshmen and sophomore years at a community college prior to transferring to an upper-division institution. However, research indicates that transfer students experience difficulties as they transition to the four-year university and are at risk of not achieving their educational goals. The first semester after transfer appears to be critical to these students' academic success at the university.

The phenomenon of transfer shock, in which transfer students experience a decline in GPA during the term in which they matriculate at the university, has been studied extensively and is substantiated by a preponderance of the literature (Keeley & House, 1993). The research findings are conflicted regarding the ultimate academic success of transfer students, but it is often the case that transfer students take longer to complete the baccalaureate than do their university native peers (Pascarella, 1999).

An increasing majority of undergraduate students who are enrolled at the institution at which this study was conducted transfer from one of several community

colleges that are within a 50-mile radius of one of the university's campuses. With few exceptions, these students have completed the requirements for an associate's degree prior to transferring. Preliminary analyses were conducted to determine if transfer shock occurred among the community college students and, if so, did they recover to their previous level. Additionally, the time to degree for both transfer and native students was explored. This study also evaluated the effectiveness of the lower-division preparation of students who transferred from its feeder institutions using a course-based model of transfer success. It provided additional insights into the effectiveness of prerequisite courses completed by university native students by tracking them longitudinally.

Chapter 3

Methods

The purpose of this study was to investigate the effectiveness of the transfer function among community college students subsequent to their enrollment at one of Florida's large, urban, doctoral/research extensive universities. Chapter 3 describes the research design, university and campus populations, procedures involved in data collection, and the data analyses that were undertaken.

Research Design

The research evaluated the effectiveness of the lower-division preparation of students who transferred from its feeder institutions using a course-based model of transfer success. It attempted to determine if there were differences in academic performance in targeted upper-division undergraduate courses between students who completed prerequisite courses prior to transferring to the university and native students. Additional descriptive analyses were conducted to gain insights into the transfer experience of community college students at the university to assist in the advising process. The incoming (transfer) GPA was extracted for these transfer students and compared to their first semester GPA at the university to determine if they experienced transfer shock. The GPA of these students also was calculated at the end of the next term to determine if they recovered from any decline in GPA. Transfer students also were compared to university native students on a variety of academic achievement, educational effectiveness, and efficiency measures.

The research questions addressed by this study were:

1. Does academic performance in targeted upper-division undergraduate courses differ by type of institution at which the prerequisite course is taken?

2. To what extent do students who transfer to the university from community colleges experience transfer shock? If students do experience transfer shock, do they recover to pre-transfer GPA levels?

3. To what extent do community college transfer students differ from native students on measures of academic achievement (mean GPA and course completion rates)?

4. To what extent do community college transfer students differ from native students on measures of persistence, graduation rates, and time to degree?

The variables of interest in this study cannot be manipulated; therefore, the research is an ex post facto design (Gall, Gall, & Borg, 2003). The suitability of this design is attested to by Tuckman (1999) who stated that such co-relational studies are a useful first step in exploratory data analysis.

Population

The population of interest for this study included students who were enrolled in one or more of four targeted upper-division undergraduate courses that have prerequisites often completed by transfer students prior to matriculating at the university. The population included only undergraduates who were enrolled in Intermediate Financial Accounting (ACG 3103), Managerial Economics (ECO 3100), Professional Writing (ENC 3213), and/or Psychological Science (PSY 3044) and who were included in the student data course file on August 30, 2002, the official drop/add benchmark for reporting student data to the state of Florida in fall 2002. These courses were identified as having a single prerequisite course or, in the case of Professional Writing, the course

sequence English Composition I and English Composition II. The courses of interest and their prerequisites are listed in Table 1.

The University

The university was founded in 1956 and held its first classes in 1960 with an enrollment of 1,997. The third largest university in the state, it enrolled over 43,000 students in spring 2009 across its four campuses. The Carnegie-designated doctoral/research extensive university is one of the 11 public four-year universities in the State University System (SUS). The original, and largest, campus is located in a metropolitan area of over a million residents. Three regional campuses serve students in surrounding counties. Courses also are offered at numerous satellite locations including a downtown center, a community college campus, and several public schools. The university offers undergraduate and graduate programs in more than 200 major concentrations. The university is accredited by the Southern Association of Colleges and Schools and completed its third 10-year reaccreditation process in 2005.

Undergraduates comprised over 74% of the university's enrollment in fall 2002, the term in which students were enrolled in the courses that were the focus of this study. The primary service area includes 10 counties on the Gulf coast of Florida, and approximately 77% of the undergraduates' home state was Florida at the time of their admission. This population was racially diverse; those who were classified as a racial minority represented over 31% of the undergraduates whose race was reported at the fall 2002 drop/add benchmark. Among the undergraduates, 67% were enrolled full-time (12 or more credits) at the drop/add benchmark. The ages of these students were calculated as of the first day of classes in fall 2002. The age distribution ranged from 16 to 80 years; their mean and median ages were 23.8 years and 21.6 years, respectively. Approximately 59% of the undergraduates were female. The mean age of the females

was only very slightly higher than the males; the mean ages were 23.86 and 23.80 years. However, the median age of males was slightly higher than among the females—21.8 years versus 21.5 years, respectively.

Data Collection

The researcher, who served as the Director of Institutional Research and Effectiveness at one of the university's regional campuses, extracted data from the student data course files that are submitted to the state at four benchmark dates during each term. The data were extracted and analyzed using SAS Version 9.1. Demographic data were analyzed for all undergraduates to set the context for the research; additional course-based analyses were conducted for native students and Florida Community College Transfer students who were enrolled in fall 2002 in four targeted upper-division undergraduate courses. Two courses in the College of Arts and Sciences and two in the College of Business were chosen for investigation. These courses were chosen specifically because many transfer students who enroll in them complete the prerequisite coursework at a community college prior to matriculating at the university.

Academic history was extracted from the student database for all of the students who were enrolled in any of the targeted courses. The university's student data course files are submitted to the State Department of Education four times during the term and are the institution's official benchmark data. Each data element is programmatically checked and edited prior to being submitted. Edit messages range from *informational* to *critical*. Critical errors restrict the data from being uploaded and must be corrected prior to submission. The Department of Education subsequently compiles the files from each university and forwards the data sets to the Integrated Postsecondary Education Data System.

The native and FCCS transfer students were tracked longitudinally, allowing for

three complete years of enrollment data to determine the retention and graduation rates for each group. The incoming (transfer) GPA was extracted for the transfer students and compared to their first semester GPA at the university to determine if these students experienced transfer shock. Native students served as a comparison group. Their fall 2002 GPA was compared to their GPA at the university prior to that term to ascertain if they experienced a similar decline. The GPA of both groups of students was calculated at the end of spring 2003 to determine if they recovered from any decline in GPA.

Data Analysis

The first analyses were descriptive in nature, calculating numbers and percentages of the population of undergraduate students at the university in fall 2002 and for the students in the four targeted courses by gender, race/ethnicity, age, and transfer and enrollment status. Subsequent analyses were conducted to answer each of the research questions as detailed below.

Research Question 1

Does academic performance in targeted upper-division undergraduate courses differ by type of institution at which the prerequisite course is taken?

A list of all students who were enrolled in the four targeted upper-division courses in fall 2002 was compiled from the university's student course files as of the drop/add benchmark. The final course grades from the student files as of the end-of-term benchmark were merged with the previously extracted file. Each of the identified courses had a single prerequisite course or course sequence. Native students who had not completed the prerequisite at the university were excluded from further analysis. Additionally, data for transfer students who completed the prerequisite after transferring to the university were excluded from analysis. Subsequently, grade distributions were calculated separately for native and transfer students for each upper-division course.

Mean grades were calculated for native and transfer students separately for each course. All grades of W and other missing grades were eliminated from this analysis. Independent-samples *t* tests were calculated to determine if there were differences by student type. For this and all subsequent analyses, significance tests were performed using a 95% confidence interval.

The final course grades were categorized as either *successful* or *unsuccessful*. Using Quanty, Dixon, and Ridley's (1999) methodology, student grades of *A*, *B*, and *C* were considered as successful. Grades of *D* and *F* as well as *I* (incomplete) and withdrawals were categorized as unsuccessful. Data for transfer students who completed the prerequisite after transferring to the university were excluded. University native students who did not have a grade in the prerequisite course at the university also were excluded from analysis. For each upper-division course, a chi-square analysis was conducted to determine if observed differences between transfer and native students were statistically significant.

A simultaneous multiple regression analysis was then conducted to examine the relationship between course grade and predictor variables course load, student age, gender, race/ethnicity, class level, and student type. Course load was defined as the number of credit hours attempted at the university during fall 2002. Gender and race/ethnicity were dichotomously coded as: male = 0 and female = 1 for gender; and White = 0, minority = 1 for race/ethnicity. Class level was coded as freshmen = 1, sophomore = 2, junior = 3, and senior = 4. Student type was coded as native = 0 and FCCS transfer = 1.

Research Question 2

To what extent do students who transfer to the university from community colleges experience transfer shock? If students do experience transfer shock, do they

recover to pre-transfer GPA levels?

Each of the courses of interest was analyzed separately to determine if first-term FCCS transfer students experienced transfer shock, a decline in fall 2002 GPA when compared to their incoming GPA. A further analysis was conducted to determine if native students experienced a similar change. The difference in native GPA was calculated as fall 2002 term GPA minus institutional GPA prior to fall 2002. Independent-samples *t* tests were calculated to determine if these difference scores varied by native and transfer status.

A 2 (student type) x 3 (time) repeated-measures ANOVA was calculated for each of the courses separately to determine whether native students and first-term transfer students exhibited similar patterns in change scores.

Research Question 3

To what extent do community college transfer students differ from native students on measures of academic achievement (mean GPA and course completion rates)?

The mean term GPAs were calculated for the FCCS transfers and native students. Independent-samples *t* tests were conducted to determine if there was a difference in the fall 2002 term GPA of the two groups of students.

The ratio of attempted course credits to credits earned was calculated for transfer and native students. Independent-samples *t* tests were conducted to determine if there were significant differences in the completion rates of the two groups of students.

Research Question 4

To what extent do community college transfer students differ from native students on measures of persistence, graduation rates, and time to degree?

The percentages of degrees earned by first-term FCCS transfer students who entered the university as juniors and who had completed an Associate in Arts degree

prior to transferring were compared to native students who had achieved junior status in fall 2002. A logistic regression was performed to determine variables that were potentially related to graduation for the transfer students. The dependent variable was coded as 0 to indicate that a student did not graduate and 1 to indicate that the student did complete the baccalaureate degree. The predictor variables included age, gender, racial/ethnic minority status, and transfer GPA. For purposes of this analysis, the categorical variables of gender and minority status were coded as: male = 0, female = 1; and minority status: White = 0, minority = 1.

The mean number of terms from entry into postsecondary education until graduation was calculated separately for the native students and the community college students who had graduated by the end of spring term 2005. A review of literature indicated that transfer students take longer to complete the baccalaureate degree. Therefore, a one-tailed independent groups *t* test was used to determine if there was a significant difference in time to graduation between the two groups.

Chapter 4

Results

The purpose of this study was to investigate the effectiveness of the transfer function among community college students subsequent to their enrollment at one of Florida's large, urban, doctoral/research extensive universities. Chapter 4 includes the findings of the analyses related to the four research questions that were posed and a discussion of the results.

The following research questions were examined:

1. Does academic performance in targeted upper-division undergraduate courses differ by type of institution at which the prerequisite course is taken?

2. To what extent do students who transfer to the university from community colleges experience transfer shock? If students do experience transfer shock, do they recover to pre-transfer GPA levels?

3. To what extent do community college transfer students differ from native students on measures of academic achievement (mean GPA and course completion rates)?

4. To what extent do community college transfer students differ from native students on measures of persistence, graduation rates, and time to degree?

Summary of Data Analyses

To set the context for the study, the first analyses were descriptive in nature, ascertaining numbers and percentages of the population of undergraduate students at the university in fall 2002 and of the native and FCCS transfer students in the four

targeted courses by gender, race/ethnicity, age, and transfer and enrollment status.

In fall 2002, the university's unduplicated student headcount at the drop/add benchmark (August 30) was 39,170. Of these, 29,127 were classified as undergraduates, representing 74.36% of the total enrollment. The demographic profile of the undergraduate students in fall 2002, displayed in Table 2, indicates that approximately 59% of the students were female (59.24% of the undergraduates whose gender was reported). Although a majority of the undergraduates were White, other races constituted approximately one-third of the total undergraduate enrollment. African-American/Black students were the second highest racial group at 12.33%. A preliminary analysis of the ages of the undergraduates revealed that one birth year was erroneously reported as 2001; this student's age was recoded as missing data. The majority of the undergraduates were under the age of 24. However, approximately 29% of the undergraduates were 24 years of age or older, students who are more likely to leave college without completing a degree (Bean & Metzner, 1985).

As shown in Table 3, 19,574, or over two-thirds (67.20%) of the undergraduates, were attending on a full-time basis; that is, they were enrolled for 12 or more credit hours. Florida has a 2 + 2 system of higher education in which students are encouraged to take the first two years of their undergraduate preparation at a public community college and subsequently transfer to an upper-division university to complete a baccalaureate degree (Goff, 2003). In light of this practice, an unanticipated finding was that nearly one-fourth (24.20%) of the students were classified as freshmen. More than half (61.84%) of the students were classified as upper-level undergraduates (juniors and seniors) at the drop/add benchmark. There were 7,834 students (26.90%) who were classified as juniors, and 10,177 (34.94% of the undergraduates) had achieved senior standing. Approximately half (49.47%) of the undergraduates were admitted as first-time-in-college

Table 2

Demographic Characteristics of Undergraduate Students at the Fall 2002 Drop/Add Benchmark

Variable	Frequency	%
Gender		
Female	17,212	59.09
Male	11,842	40.66
Not reported	73	0.25
Race/ethnicity		
Asian	1,692	5.81
Black	3,592	12.33
Hispanic	3,130	10.75
Native Indian	126	0.43
Non-resident Alien	450	1.54
White	19,602	67.30
Not reported	535	1.84
Age Group		
Less than 18 years	430	1.48
18-21.9	15,579	53.49
22-23.9	4,645	15.95
24-23.9	4,681	16.07
30-23.9	2,454	8.43
40-23.9	1,019	3.50
50 and above	313	1.07
Not reported/erroneous	6	0.02

Note. Total undergraduates enrolled at university = 29,127.

Table 3

Frequency and Percentage of Undergraduate Student Enrollment Characteristics at the Fall 2002 Drop/Add Benchmark

Variable	Frequency	%
Classification		
Freshmen	7,048	24.20
Sophomore	4,068	13.97
Junior	7,834	26.90
Senior	10,177	34.94
Enrollment Status		
Full time	19,574	67.20
Part time	9,553	32.80
Admission Type at Latest Admission		
Early Admit	63	0.22
First-Time-in-College	14,409	49.47
Florida Community College Transfer	8,992	30.87
Other Undergraduate Transfer	5,663	19.44

Note. Total undergraduates enrolled at university = 29,127.

(FTIC) students upon their latest admission. Less than one-third (30.87%) had transferred from a Florida community college, and 19.44% were admitted as *other undergraduate transfer* students.

For each of the four courses that were chosen for the study, the students' status at the time of their latest admission to the university is displayed in Table 4. The purpose of this research was to determine the effectiveness of the academic preparation of students who transfer from one of Florida's public community colleges to the university. Therefore, only transfer students who were designated as *Florida Community College Transfers* were included in this study. Students classified as *First-Time-in-College* (FTIC or native students) served as a comparison group. The percentages of community college transfers varied from 37.86% in Psychological Science II (PSY 3044) to 51.88% in Managerial Economics (ECO 3100). The largest percentage of native students was enrolled in Psychology (42.68%); Intermediate Financial Accounting (ACG 3103) enrolled the smallest percentage of native students (23.48%).

Demographic data for the native and FCCS transfer students enrolled in each of the four targeted courses were next analyzed to determine if there were any differences in enrollment patterns. The analyses were limited only to students who were enrolled as of the drop/add benchmark. Females comprised 59.09% of the total undergraduate population at that benchmark. In comparison, females were underrepresented in Economics and Professional Writing (ENC 3213) and among the native students who were enrolled in Accounting. At the other extreme, over 80% of the students enrolled in Psychology were female. The gender distributions across all four courses by native and transfer status are shown in Table 5. Chi-square analyses with one degree of freedom were conducted to determine if the gender distributions were significantly different for native students and FCCS transfers. Students whose gender was reported as unknown

Table 4

Frequency and Percentage of Admission Type of Undergraduate Students Enrolled in Targeted Courses at the Fall 2002 Drop/Add Benchmark

Variable	Frequency	%
ACG 3103 Intermediate Financial Accounting (*n* = 264)		
Early Admit	0	0.00
First-Time-in-College	62	23.48
Florida Community College Transfer	111	42.05
Other Undergraduate Transfer	91	34.47
ECO 3100 Managerial Economics (*n* = 933)		
Early Admit	0	0.00
First-Time-in-College	251	26.90
Florida Community College Transfer	484	51.88
Other Undergraduate Transfer	198	21.22
ENC 3213 Professional Writing (*n* = 576)		
Early Admit	1	0.17
First-Time-in-College	212	36.81
Florida Community College Transfer	246	42.71
Other Undergraduate Transfer	117	20.31
PSY 3044 Psychological Science II (*n* = 560)		
Early Admit	1	0.18
First-Time-in-College	239	42.68
Florida Community College Transfer	212	37.86
Other Undergraduate Transfer	108	19.29

Table 5

Frequency and Percentage of Gender Distribution of Native and FCCS Transfer Students Enrolled in Targeted Courses at the Fall 2002 Drop/Add Benchmark

Variable	Total Freq.	Total %	Native Freq.	Native %	FCCS Transfer Freq.	FCCS Transfer %	X^2 [a]
ACG 3103 Intermediate Financial Accounting (*n* = 173)							2.24
Female	109	63.01	35	56.45	74	66.67	
Male	62	35.84	27	43.55	35	31.53	
Not reported	2	1.16	0	0.00	2	1.80	
ECO 3100 Managerial Economics (*n* = 735)							0.77
Female	343	46.67	112	44.62	231	47.73	
Male	389	52.93	139	55.38	250	51.65	
Not reported	3	0.41	0	00.0	3	0.62	
ENC 3213 Professional Writing (*n* = 458)							1.46
Female	217	47.38	94	44.34	123	50.00	
Male	241	52.62	118	55.66	123	50.00	
Not reported	0	0.00	0	0.00	0	0.00	
PSY 3044 Psychological Science II (*n* = 451)							0.53
Female	373	82.71	201	84.10	172	81.13	
Male	77	17.07	38	15.90	39	18.40	
Not reported	1	0.22	0	0.00	1	0.47	

Note. *N* = 1,817.
[a] None of the differences were statistically significant.

(coded as 'X' in the student data file) were eliminated from the analyses. None of the differences were statistically significant ($p > .05$).

Table 6 provides the racial/ethnic profiles of the students enrolled in each of the targeted courses. White students comprised 67.30% of the undergraduate population at the drop/add benchmark. Minority (non-White) students were overrepresented among the native students in all four courses. The transfer students more closely mirrored the overall undergraduate population; the percentages of White transfer students ranged from 66.67% in Accounting to 71.07% in Economics. Among the university native students, the smallest percentage of White students was in Economics (54.98%). A 2 x 4 (native/transfer status x racial/ethnic group) chi-square analysis was conducted. The racial/ethnic groups were recoded as Black, Hispanic, White, and Other. Students whose racial/ethnic group was unknown (coded as 'X' in the student data file) and non-resident aliens were eliminated from the analyses. Asian and Native American/Alaska Native students were recoded as *Other*. Although the difference was not statistically significant in Accounting, $X^2(1, n = 167) = 3.14$, $p > .05$, the racial/ethnic distributions were significantly different by native versus transfer status in each of the other three courses: Economics, $X^2(1, n = 708) = 24.18$, $p < .0001$, Cramer's $V = 0.18$; Professional Writing, $X^2(1, n = 438) = 20.94$, $p < .001$, Cramer's $V = 0.22$; Psychology, $X^2(1, n = 438) = 11.48$, $p < .01$, Cramer's $V = 0.16$. These results indicate that more native students were from a minority racial/ethnic group than were the transfer students. The obtained effect sizes determined by Cramer's measure of association indicate that although the differences between native students and FCCS transfers were statistically significant, the magnitude of the differences was small.

At the drop/add benchmark, 54.96% of all undergraduates were less than 22 years old. An analysis of student age groups showed that a majority of the native

Table 6

Frequency and Percentage of Race/Ethnicity Distribution of Native and FCCS Transfer Students Enrolled in Targeted Courses at the Fall 2002 Drop/Add Benchmark

Variable	Total Freq.	Total %	Native Freq.	Native %	FCCS Transfer Freq.	FCCS Transfer %	X^2
ACG 3103 Intermediate Financial Accounting (*n* = 173)							3.14
Asian	11	6.36	3	4.84	8	7.21	
Black	19	10.98	6	9.68	13	11.71	
Hispanic	23	13.29	12	19.35	11	9.91	
Nat. Amer./AK Nat.	0	0.0	0	0.00	0	0.00	
Non-resident Alien	0	0.0	0	0.00	0	0.00	
White	114	65.90	40	64.52	74	66.67	
Not reported	6	3.47	1	1.61	5	4.50	
ECO 3100 Managerial Economics (*n* = 735)							24.18 ****
Asian	66	8.98	28	11.16	38	7.85	
Black	79	10.75	42	16.73	37	7.64	
Hispanic	80	10.88	35	13.94	45	9.30	
Nat. Amer./AK Nat.	1	0.14	0	0.00	1	0.21	
Non-resident Alien	19	2.59	6	2.39	13	2.69	
White	482	65.68	138	54.98	344	71.07	
Not reported	8	1.09	2	0.80	6	1.24	
ENC 3213 Professional Writing (*n* = 458)							20.94 ***
Asian	37	8.08	25	11.79	12	4.88	
Black	67	14.63	45	21.23	22	8.94	
Hispanic	42	9.17	18	8.49	24	9.76	
Nat. Amer./AK Nat.	1	0.22	0	0.00	1	0.41	
Non-resident Alien	8	1.75	2	0.94	6	2.44	
White	291	63.54	119	56.13	172	69.92	
Not reported	12	2.62	3	1.42	9	3.66	
PSY 3044 Psychological Science II (*n* = 451)							11.48 **
Asian	24	5.32	13	5.44	11	5.19	
Black	67	14.86	48	20.08	19	8.96	
Hispanic	61	13.53	34	14.23	27	12.74	
Nat. Amer./AK Nat.	4	0.89	1	0.42	3	1.42	
Non-resident Alien	6	1.33	2	0.84	4	1.89	
White	282	62.53	138	57.74	144	67.92	
Not reported	7	1.55	3	1.26	4	1.89	

Note. *N* = 1,817.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

students were under the age of 22 across all four courses in the study. The percentages ranged from 75.30% in Economics to 94.14% in Psychology. Among the transfer students, only about one-fifth were less than 22 years old in Accounting (21.62%), Economics (22.31%), and Professional Writing (21.95%). Psychology enrolled the largest percentage of these young students; 38.68% of the students were younger than 22 years (one student was eliminated from the analyses due to an erroneous birth year in the data set). The numbers and percentages of students by age categories in all four courses are displayed in Table 7. The categories are not expressed in equal intervals; rather, they were chosen to represent age groups of students who typically would have graduated from high school and completed college in 4 years (less than 18 years and 18-21.9 years); completed in 6 years, a length of time that is becoming more typical in higher education (22-23.9 years); subsequently in 5-year and 10-year increments as the numbers in each category declined and the oldest category, *50 years and above*, that included very few students.

The mean ages of the native and transfer students were calculated for each course. Since students could be enrolled in more than one of the courses, the results were analyzed using an independent-samples *t* test for each course separately. The analyses revealed a significant difference in each of the courses with FCCS transfers being older than the native students. The results for each course follow: Accounting (for native students, $M = 21.35$, $SD = 1.41$; for transfer students, $M = 27.69$, $SD = 7.90$). The observed difference between means was -6.34, and the 95% confidence interval for the difference between means extended from -8.34 to -4.34. The effect size was computed as $d = 0.99$. In Economics (for native students, $M = 21.56$, $SD = 1.61$; for transfer students, $M = 26.42$, $SD = 5.79$). The observed difference between means was -4.34, and the confidence interval ranged from -5.07 to -3.61. The effect size was $d = 0.91$.

Table 7

Frequency and Percentage of Age Group Classifications of Native and FCCS Transfer Students Enrolled in Targeted Courses at the Fall 2002 Drop/Add Benchmark

Variable	Total Freq.	Total %	Native Freq.	Native %	FCCS Transfer Freq.	FCCS Transfer %	*t*
ACG 3103 Intermediate Financial Accounting (*n* = 173)							-8.23 ****
Less than 18 years	0	0.00	0	0.00	0	0.00	
18-21.9	74	42.77	50	80.65	24	21.62	
22-23.9	31	17.92	9	14.52	22	19.82	
24-29.9	41	23.70	3	4.84	38	34.23	
30-39.9	14	8.09	0	0.00	14	12.61	
40-49.9	11	6.36	0	0.00	11	9.91	
50 and above	2	1.16	0	0.00	2	1.80	
ECO 3100 Managerial Economics (*n* = 735)							-15.40 ****
Less than 18 years	0	0.00	0	0.00	0	0.00	
18-21.9	297	40.41	189	75.30	108	22.31	
22-23.9	177	24.08	47	18.73	130	26.86	
24-29.9	183	24.90	13	5.18	170	35.12	
30-39.9	61	8.30	2	0.80	59	12.19	
40-49.9	13	1.77	0	0.00	13	2.69	
50 and above	4	0.54	0	0.00	4	0.83	
ENC 3213 Professional Writing (*n* = 458)							-11.81 ****
Less than 18 years	0	0.00	0	0.00	0	0.00	
18-21.9	235	51.31	181	85.38	54	21.95	
22-23.9	98	21.40	26	12.26	72	29.27	
24-29.9	84	18.34	4	1.89	80	32.52	
30-39.9	25	5.46	1	0.47	24	9.76	
40-49.9	13	2.84	0	0.00	13	5.28	
50 and above	3	0.66	0	0.00	3	1.22	
PSY 3044 Psychological Science II (*n* = 451)							-10.68 ****
Less than 18 years	3	0.67	2	0.84	1	0.47	
18-21.9	304	67.41	223	93.31	81	38.21	
22-23.9	59	13.08	11	4.60	48	22.64	
24-29.9	50	11.09	1	0.42	49	23.11	
30-39.9	25	5.54	1	0.42	24	11.32	
40-49.9	6	1.33	1	0.42	5	2.36	
50 and above	3	0.67	0	0.00	3	1.42	
Missing / error	1	0.22	0	0.00	1	0.47	

Note. *N* = 1,817.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

For Professional Writing (native students, *M* = 21.36, *SD* = 1.82; for transfer students, *M* = 26.94, *SD* = 6.39). The observed difference of means was -5.03, and the confidence interval was -5.92 to -4.14. The effect size was determined to be *d* = 1.04. Of the four courses, the difference of means was least in Psychology at -3.99 (for native students, *M* = 20.16, *SD* = 2.50; for transfer students, *M* = 24.15, *SD* = 6.12). The confidence interval ranged from -5.67 to -3.97. The effect size was calculated as *d* = 1.06. According to Cohen's (1992) guidelines for *t* tests, the effect size for each course was large.

Table 8 includes the numbers and percentages of the students' grade level classification at the drop/add benchmark for native students and FCCS transfers who were enrolled in the four courses of interest. A small number of graduate students were enrolled in each of the courses: Accounting (*n* = 20), Economics (*n* = 13), Professional Writing (*n* = 6), and Psychology (*n* = 5). However, only students who were classified as freshmen, sophomores, juniors, or seniors were included in the study. There was substantial variation in the grade level classification of students across the four courses with students in Accounting and Economics primarily having achieved junior or senior standing since the College of Business Administration is an upper-division limited-access college. On the other hand, a majority of the native students enrolled in Psychology were freshmen or sophomores, and approximately half of the native students enrolled in Professional Writing had lower-division status. Many of the FCCS transfers had completed their freshmen and sophomore levels at the community college; most of these students were classified as juniors or seniors at the drop/add benchmark. The percentages ranged from 100.00% in Accounting to 94.81% in Psychology.

Due to the small number of students who were classified as freshmen, the results were analyzed using 2 x 2 chi-square tests with freshmen and sophomores categorized as lower-division and juniors and seniors categorized as upper-division. The results

Table 8

Frequency and Percentage of Grade Level Classification of Native and FCCS Transfer Students Enrolled in Targeted Courses at the Fall 2002 Drop/Add Benchmark

Variable	Total Freq.	Total %	Native Freq.	Native %	FCCS Transfer Freq.	FCCS Transfer %	X^2
ACG 3103 Intermediate Financial Accounting (*n* = 173)							[a] ****
Freshmen	0	0.00	0	0.00	0	0.00	
Sophomore	12	6.94	12	19.35	0	0.00	
Junior	117	67.63	43	69.35	74	66.67	
Senior	44	25.43	7	11.29	37	33.33	
ECO 3100 Managerial Economics (*n* = 735)							130.40 ****
Freshmen	6	0.82	6	2.39	0	0.00	
Sophomore	64	8.71	61	24.30	3	0.62	
Junior	430	58.50	124	49.40	306	63.22	
Senior	235	31.97	60	23.90	175	36.16	
ENC 3213 Professional Writing (*n* = 458)							141.36 ****
Freshmen	10	2.18	9	4.25	1	0.41	
Sophomore	103	22.49	98	46.23	5	2.03	
Junior	223	48.69	79	37.26	144	58.54	
Senior	122	26.64	26	12.26	96	39.02	
PSY 3044 Psychological Science II (*n* = 451)							238.45 ****
Freshmen	93	20.62	93	38.91	0	0.00	
Sophomore	103	22.84	92	38.49	11	5.19	
Junior	207	45.90	37	15.48	170	80.19	
Senior	48	10.74	17	7.11	31	14.62	

Note. *N* = 1,817.

[a] Fisher's Exact Test was used to test the significance between the groups enrolled in ACG 3103.

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

indicated that there were significant differences in all four courses with more native students enrolled at the lower-division level than were transfer students. There were no freshmen or sophomores enrolled in Accounting; therefore, a Fisher's Exact Test was calculated for this course. The results for each course were: Accounting ($p < .0001$, Fisher's Exact Test), Phi = 0.37; Economics, $X^2(1, n = 735) = 130.40$, $p < .0001$, Cramer's $V = 0.42$; Professional Writing, $X^2(1, n = 458) = 141.36$, $p < .0001$, Cramer's $V = 0.56$; Psychology, $X^2(1, n = 451) = 238.45$, $p < .0001$, Cramer's $V = 0.73$. The obtained effect sizes for these 2 x 2 analyses indicated that there was a moderate relationship between class level and transfer/native status in Accounting and Economics and a strong relationship in Professional Writing and Psychology.

The part-time/full-time status of the students is shown in Table 9. The university defines a full-time student as one who is enrolled in 12 or more credits per semester at the institution. The course load in which a student was enrolled at the drop/add benchmark was used to determine this status during the fall 2002 term. If a student was enrolled concurrently at the university and another institution, only the credit hours at the university were used in determining this status. Across all four courses, a majority of the students were enrolled on a full-time basis. The smallest percentages of full-time students were enrolled in the two courses in the College of Business. Among the native students, over 80% were enrolled full-time; the percentages ranged from 83.87% in Accounting to 92.47% in Psychology. Fewer transfer students were enrolled on a full-time basis; the percentages varied from 57.66% in Accounting to 69.92% in Professional Writing. There were statistically significant differences across all four courses with more native students enrolled on a full-time basis. A 2 x 2 chi-square analysis was calculated for each course: Accounting, $X^2(1, n = 173) = 12.37$, $p < .001$, Cramer's $V = 0.27$; Economics, $X^2(1, n = 735) = 38.65$, $p < .0001$, Cramer's $V = 0.23$; Professional Writing,

Table 9

Frequency and Percentage of Time Status of Native and FCCS Transfer Students Enrolled in Targeted Courses at the Fall 2002 Drop/Add Benchmark

Variable	Total Freq.	Total %	Native Freq.	Native %	FCCS Transfer Freq.	FCCS Transfer %	X^2
ACG 3103 Intermediate Financial Accounting (*n* = 173)							12.37 ***
Full time	116	67.05	52	83.87	64	57.66	
Part time	57	32.95	10	16.13	47	42.34	
ECO 3100 Managerial Economics (*n* = 735)							38.65 ****
Full time	510	69.39	211	84.06	299	61.78	
Part time	225	30.61	40	15.94	185	38.22	
ENC 3213 Professional Writing (*n* = 458)							31.38 ****
Full time	365	79.69	193	91.04	172	69.92	
Part time	93	20.31	19	8.96	74	30.08	
PSY 3044 Psychological Science II (*n* = 451)							54.60 ****
Full time	357	79.16	221	92.47	136	64.15	
Part time	94	20.84	18	7.53	76	35.85	

Note. *N* = 1,817.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

$X^2(1, n = 458) = 31.38$, $p < .0001$, Cramer's $V = 0.26$; Psychology, $X^2(1, n = 451) = 54.60$, $p < .0001$, Cramer's $V = 0.35$. Although all of the analyses were statistically significant, the effect sizes indicate that there was only a slight relationship between part-time/full-time status and whether the students were university natives or FCCS transfers in Accounting, Economics, and Professional Writing. The relationship was stronger (a moderate effect) in Psychology.

Florida Statute 1007.22(3) (2008) stipulates that "Public postsecondary educational institutions serving the same students in a geographic and service area are encouraged to establish appropriate interinstitutional mechanisms to achieve cooperative planning and delivery of academic programs and related services . . . ." Best practices suggest that strong 2 + 2 agreements would mitigate differences between native students and those who began their postsecondary education at a community college and subsequently transferred to a four-year institution to complete the baccalaureate degree. Nevertheless, differences in the admissions standards at the university and the open-door access of public community colleges in Florida could not be ignored in the development of the hypothesis and research questions.

Research Question 1

Does academic performance in targeted upper-division undergraduate courses differ by type of institution at which the prerequisite course is taken?

A list of all students who were enrolled in the four targeted upper-division courses in fall 2002 was extracted from the university's student data course files as of the drop/add benchmark. The final course grades as of the end-of-term benchmark were appended to the data set for those students who had been enrolled at the drop/add benchmark. Students who added late were not included in the analyses. Each of the identified courses had a single prerequisite course or course sequence.

The university uses a grading system in which an *A* equates to 4.00 points in calculating the students' grade point average, and an *F* grade is assigned 0.00 points. Since fall 2002, the university has allowed faculty to use a plus/minus grading system with the highest grade of *A*+ having a value of 4.00. Students who withdraw from a course after the end of the drop/add period are awarded a grade of *W*. An incomplete grade is permitted in limited circumstances in which only a small amount of work remains to be completed and the work that had been completed was deemed to be satisfactory.

The grade distributions for each of the courses of interest are displayed in Table 10. An inspection of the students' grades revealed that none of the courses exhibited a normal distribution, and none of the distributions looked alike. The grades in Professional Writing were highly skewed to grades of *A* and *B*, and only 3.71% of the students earned grades of *W*. At the other extreme, only 8.67% of students in Accounting received an *A* grade, and 37.57% of students withdrew from the course after the drop/add benchmark.

Mean grades in each course were calculated for native and transfer students separately using the university's grading scale: *A*+ = 4.00, *A* = 4.00, *A*- = 3.66, *B*+ = 3.33, *B* = 3.00, *B*- = 2.66, *C*+ = 2.33, *C* = 2.00, *C*- = 1.66, *D*+ = 1.33, *D* = 1.00, *D*- = 0.66, and *F* = 0.00. All grades of *W* and other missing grades were eliminated from this calculation. The results indicated that there were statistically significant differences in all courses except Economics. In Accounting and Psychology, the transfer students outperformed the native students while the reverse was true in Professional Writing. The results for each course follow. Accounting (for native students, $M = 2.27$, $SD = 1.10$; for transfer students, $M = 2.69$, $SD = 0.93$). The observed difference between means was -0.42, and the 95% confidence interval for the difference between means extended from -0.82 to -0.02. The effect size was computed as $d = 0.99$. Economics (for native

Table 10

Frequency and Percentage of Grade Distribution of Native and FCCS Transfer Students Enrolled in Targeted Courses at the Fall 2002 Final Benchmark

Variable	Total Freq.	Total %	Native Freq.	Native %	FCCS Transfer Freq.	FCCS Transfer %	*t*
ACG 3103 Intermediate Financial Accounting (*n* = 173)							
A	15	8.67	5	8.06	10	9.01	-2.08 *
B	47	27.17	10	16.13	37	33.33	
C	28	16.18	15	24.19	13	11.71	
D	10	5.78	4	6.45	6	5.41	
F	5	2.89	3	4.84	2	1.80	
W	65	37.57	25	40.32	40	36.04	
Other	3	1.73	0	0.00	3	2.70	
ECO 3100 Managerial Economics (*n* = 735)							0.09
A	129	17.55	46	18.33	83	17.15	
B	152	20.68	48	19.12	104	21.49	
C	189	25.71	64	25.50	125	25.83	
D	51	6.94	20	7.97	31	6.40	
F	44	5.99	14	5.58	30	6.20	
W	162	22.04	58	23.11	104	21.49	
Other	8	1.09	1	0.40	7	1.45	
ENC 3213 Professional Writing (*n* = 458)							2.50 *
A	220	48.03	113	53.30	107	43.50	
B	167	36.46	72	33.96	95	38.62	
C	30	6.55	13	6.13	17	6.91	
D	4	0.87	2	0.94	2	0.81	
F	9	1.97	1	0.47	8	3.25	
W	17	3.71	7	3.30	10	4.07	
Other	11	2.40	4	1.89	7	2.85	
PSY 3044 Psychological Science II (*n* = 451)							-3.57 ***
A	79	17.52	32	13.39	47	22.17	
B	111	24.61	58	24.27	53	25.00	
C	121	26.83	64	26.78	57	26.89	
D	57	12.64	40	16.74	17	8.02	
F	40	8.87	28	11.72	12	5.66	
W	37	8.20	16	6.69	21	9.91	
Other	6	1.33	1	0.42	5	2.36	

Note. Other grades included *I* (incomplete), *M* (no grade submitted by instructor), and missing data.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

students, *M* = 2.43, *SD* = 1.15; for transfer students, *M* = 2.42, *SD* = 1.15). The mean grades were virtually identical in this course. The observed difference between means was 0.01; the confidence interval ranged from -0.19 to 0.21. Professional Writing (for native students, *M* = 3.43, *SD* = 0.66; for transfer students, *M* = 3.24, *SD* = 0.89). The observed mean difference was 0.19, and the confidence interval ranged from 0.04 to 0.34. The effect size was determined to be *d* = 0.24. Psychology (for native students, *M* = 2.14, *SD* = 1.24; for transfer students, *M* = 2.56, *SD* = 1.13). The observed difference between means was -0.42, and the confidence interval varied from -0.66 to -0.19. The effect size was calculated as *d* = -0.35. Using Cohen's (1992) guidelines for *t* tests, all of these effect sizes were small.

Further analyses were conducted to determine if there were differences in the success of native students when compared to transfer students. Grades of *A*, *B*, and *C* were coded as *successful*; grades of *D*, *F*, *I*, and *W* were coded as *not successful*. Native students who did not have a grade in the prerequisite course at the university were excluded from further analysis. Data for transfer students who completed the prerequisite after transferring to the university also were excluded from analysis. Students who were enrolled in a non-degree or audit status were eliminated from all analyses. The numbers and percentages of students who were successful in each targeted course by native versus Florida community college transfer status are shown in Table 11. A chi-square test of independence with one degree of freedom was conducted for each course. The differences were statistically significant only in Psychology with the FCCS transfers outperforming the native students.

A multiple regression analysis was then conducted to examine the relationship between course grade and the predictor variables course load, student age, gender, race/ethnicity, class level, and student type. Course load was defined as the number of

Table 11

Frequency and Percentage of Success Rates in Targeted Courses by Native and FCCS Transfer Students at the Fall 2002 Final Benchmark

Group	Frequency	% Successful	X^2
ACG 3103 (*n* = 159)			0.40
Native (*n* = 60)	29	48.33	
FCCS Transfer (*n* = 99)	53	53.54	
ECO 3100 (*n* = 635)			0.28
Native (*n* = 225)	144	64.00	
FCCS Transfer (*n* = 410)	271	66.10	
ENC 3213 (*n* = 412)			2.23
Native (*n* = 170)	159	93.53	
FCCS Transfer (*n* = 242)	216	89.26	
PSY 3044 (*n* = 373)			6.44 **
Native (*n* = 171)	107	62.57	
FCCS Transfer (*n* = 202)	151	74.75	

Note. *n* = 1,579.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

credit hours attempted at the university during fall 2002. Gender and race/ethnicity were dichotomously coded as follows: male = 0, female = 1 for gender; and White = 0, minority = 1 for race/ethnicity. Class level was coded as freshmen = 1, sophomore = 2, junior = 3, senior = 4. Student type was coded as native = 0, FCCS transfer = 1. A preliminary investigation calculating bivariate correlations was conducted for each course. Means, standard deviations, and Pearson correlation coefficients are shown in Tables 12 through 15.

None of the predictor variables were significantly correlated with course grade in Economics. For the other three courses, student type (native or transfer) was significantly related to the criterion. Multiple regression analyses were then conducted in which course grades were regressed on the linear combination of course load, age, gender, race, class level, and student type for each course separately.

The regression equation accounted for approximately 7% of the variance in ACG 3103, $F(6, 86) = 2.02$, $p > .05$. Summary statistics are shown in Table 16. Only class level was statistically significant.

The simultaneous regression equation accounted for only 1% of the observed variance in Economics, $F(6, 482) = 1.15$, $p > .05$. None of the predictors were statistically significant. Results of the regression analysis are presented in Table 17.

Approximately 8% of the observed variance in grades in Professional Writing was accounted for by the six predictor variables, $F(6, 369) = 5.43$, $p < .0001$, adjusted $R^2 = 0.07$. The beta weights displayed in Table 18 indicate that student type was the strongest predictor of course grade; the direction of the relationship indicates that native students achieved higher course grades than transfer students. All of the predictors were statistically significant with the exception of student's class level.

Table 12

Means, Standard Deviations, and Intercorrelations for Predicting Course Grade in Intermediate Financial Accounting (ACG 3103)

			Intercorrelations					
Variable	*M*	*SD*	Grade	Load	Age	Gender	Race	Class
1. Grade	2.55	0.99						
2. Load	11.03	3.38	.03					
3. Age	25.34	7.33	.13	-.47****				
4. Gender			-.05	-.12	.08			
5. Race			-.07	.15	-.20	.03		
6. Class	3.13	0.51	.26*	-.32**	.45****	.15	-.11	
7. Type			.22*	-.42****	.45****	.19	-.07	0.42****

Note. $n = 93$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 13

Means, Standard Deviations, and Intercorrelations for Predicting Course Grade in Managerial Economics (ECO 3100)

			Intercorrelations					
Variable	*M*	*SD*	Grade	Load	Age	Gender	Race	Class
1. Grade	2.43	1.14						
2. Load	11.39	2.99	-.00					
3. Age	24.26	4.99	.06	-.40****				
4. Gender			.06	-.06	.06			
5. Race			-.04	.09*	-.03	.13**		
6. Class	3.21	0.59	-.02	-.15***	.31****	.08	-.01	
7. Type			-.01	-.28****	.39****	.02	-.13**	0.23****

Note. $n = 489$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 14

Means, Standard Deviations, and Intercorrelations for Predicting Course Grade in Professional Writing (ENC 3213)

			Intercorrelations					
Variable	*M*	*SD*	Grade	Load	Age	Gender	Race	Class
1. Grade	3.32	0.79						
2. Load	12.22	2.69	.13*					
3. Age	24.03	5.66	.04	-.38****				
4. Gender			.13*	-.01	.06			
5. Race			-.11*	.12*	-.13*	.10		
6. Class	3.02	0.74	.01	-.21****	.37****	.04	-.12*	
7. Type			-.11*	-.36****	.44****	.05	-.17***	0.54****

Note. $n = 376$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 15

Means, Standard Deviations, and Intercorrelations for Predicting Course Grade in Psychological Science II (PSY 3044)

			Intercorrelations					
Variable	*M*	*SD*	Grade	Load	Age	Gender	Race	Class
1. Grade	2.32	1.23						
2. Load	12.27	3.14	.06					
3. Age	22.52	4.79	.10	-.43****				
4. Gender			.01	-.06	.04			
5. Race			-.20***	.06**	-.06	-.03		
6. Class	2.57	0.89	.21***	-.23****	.46****	.01	-.01	
7. Type			.20***	-.30****	.46****	.01	-.10	0.63****

Note. $n = 333$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 16

Summary of Multiple Regression Analysis for Variables Predicting Course Grade in Intermediate Financial Accounting (ACG 3103)

Predictor	*B*	*SE B*	*β*	*t*
Course Load	.06	.03	.19	1.62
Age	.01	.02	.01	0.08
Gender	-.24	.23	-.11	-1.02
Race	-.13	.23	-.06	-0.57
Class Level	.45	.23	.24	1.99*
Student Type	.43	.25	.21	1.74

Note. $n = 93$. $R^2 = .07$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 17

Summary of Multiple Regression Analysis for Variables Predicting Course Grade in Managerial Economics (ECO 3100)

Predictor	*B*	*SE B*	*β*	*t* [a]
Course Load	.01	.02	.03	0.64
Age	.02	.01	.10	1.83
Gender	.15	.10	.07	1.48
Race	-.14	.11	-.06	-1.24
Class Level	-.10	.09	-.05	-1.03
Student Type	-.07	.12	-.03	-0.59

Note. $n = 489$. $R^2 = .01$.
[a] None of the predictors were statistically significant.

Table 18

Summary of Multiple Regression Analysis for Variables Predicting Course Grade in Professional Writing (ENC 3213)

Predictor	*B*	*SE B*	*β*	*t*
Course Load	.04	.02	.15	2.67**
Age	.02	.01	.13	2.17*
Gender	.23	.08	.15	2.91**
Race	-.26	.09	-.15	-3.02**
Class Level	.05	.06	.05	0.85
Student Type	-.29	.10	-.18	-2.77**

Note. $n = 376$. $R^2 = .08$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

The regression equation for Psychology accounted for 11% of the variance in course grades, $F(6,326) = 6.72$, $p < .0001$, adjusted $R^2 = 0.09$. Summary statistics are displayed in Table 19. Three predictors were statistically significant: course load, race/ethnicity, and class level. Racial/ethnic group was the strongest predictor with White students outperforming minority students.

The six predictor variables made different contributions to the regression equations calculated for each of the courses. Although transfer versus native status was significantly correlated with course grade in three of the four courses, it emerged as a significant predictor only in Professional Writing. Table 20 provides a summary of the predictors and their significance levels in each course.

Research Question 2

To what extent do students who transfer to the university from community colleges experience transfer shock? If students do experience transfer shock, do they recover to pre-transfer GPA levels?

Each of the courses of interest was analyzed separately to determine if there were differences in the amount of transfer shock experienced by the new transfer students. The variable of transfer shock was calculated as first-term institutional GPA minus transfer GPA. Thus, a negative score indicated that the student earned a lower GPA at the end of the first term at the university when compared to incoming GPA. The scores were then categorized in ranges of 1.0 GPA points. A further analysis was conducted to determine if native students experienced a similar change in GPA during the fall 2002 term. The change in native GPA was calculated as fall 2002 term GPA minus institutional GPA prior to fall 2002. A negative score indicated that the student earned a lower GPA in the fall term than in previous terms at the university.

Table 19

Summary of Multiple Regression Analysis for Variables Predicting Course Grade in Psychological Science II (PSY 3044)

Predictor	*B*	*SE B*	*β*	*t*
Course Load	.06	.02	.15	2.63**
Age	.01	.02	.03	0.44
Gender	-.04	.17	-.01	-0.25
Race	-.51	.13	-.20	-3.85****
Class Level	.21	.10	.15	2.20*
Student Type	.29	.17	.12	1.71

Note. $n = 333$. $R^2 = .11$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 20

Significance of Predictors to Course Grade in Multiple Regression Analyses

Predictor	ACG 3103	ECO 3100	ENC 3213	PSY 3044
Course Load			**	**
Age			*	
Gender			**	
Race/ethnicity			**	****
Class Level	*			*
Student Type			*	

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

First-term transfer students in all four courses experienced a decrease in fall 2002 GPA compared to their transfer GPA. Among the native students, only those enrolled in Professional Writing did not have a drop in GPA; the increase within this group was only 0.02 points. The changes in GPA for each course are displayed in Table 21. The largest percentage of students who experienced at least some decline was in Accounting (64.42%); the native students experienced a larger decline than did the transfer students. In Economics, 59.63% of first-term transfer students experienced a drop in GPA. Independent-samples *t* tests indicated that the differences were statistically significant only in Economics (for native students, $M = -0.10$, $SD = .65$; for transfer students, $M = -0.33$, $SD = 0.86$) and Psychology (for native students, $M = -0.22$, $SD = 0.66$; for transfer students, $M = -0.43$, $SD = 0.95$). For Economics, the observed difference between means was 0.23, and the 95% confidence interval for the difference

Table 21

Frequency and Percentage of Range of Differences Between Fall 2002 Term GPA and Prior GPA by Course

Variable	Total Freq.	Total %	Native Freq.	Native %	FCCS Transfer Freq.	FCCS Transfer %	*t*
ACG 3103 Intermediate Financial Accounting (*n* = 104)							-0.28
More than -3.00	3	2.88	2	3.33	1	2.27	
-2.01 to -3.00	1	0.96	0	0.00	1	2.27	
-1.01 to -2.00	6	5.77	1	1.67	5	11.36	
-0.01 to -1.00	57	54.81	36	60.00	21	47.73	
0	1	0.96	1	1.67	0	0.00	
0.01 to 1.00	32	30.77	20	33.33	12	27.27	
1.01 to 2.00	4	3.85	0	0.00	4	9.09	
2.01 to 3.00	0	0.00	0	0.00	0	0.00	
3.01 and higher	0	0.00	0	0.00	0	0.00	
ECO 3100 Managerial Economics (*n* = 386)							2.90 **
More than -3.00	1	0.26	0	0.00	1	0.62	
-2.01 to -3.00	12	3.11	4	1.78	8	4.97	
-1.01 to -2.00	36	9.33	16	7.11	20	12.42	
-0.01 to -1.00	159	41.19	92	40.89	67	41.61	
0	11	2.85	7	3.11	4	2.48	
0.01 to 1.00	161	41.71	103	45.78	58	36.02	
1.01 to 2.00	6	1.55	3	1.33	3	1.86	
2.01 to 3.00	0	0.00	0	0.00	0	0.00	
3.01 and higher	0	0.00	0	0.00	0	0.00	
ENC 3213 Professional Writing (*n* = 233)							0.70
More than -3.00	0	0.00	0	0.00	0	0.00	
-2.01 to -3.00	6	2.58	2	1.18	4	6.35	
-1.01 to -2.00	7	3.00	2	1.18	5	7.94	
-0.01 to -1.00	87	37.34	66	38.82	21	33.33	
0	4	1.72	4	2.35	0	0.00	
0.01 to 1.00	124	53.22	95	55.88	29	46.03	
1.01 to 2.00	3	1.29	1	0.59	2	3.17	
2.01 to 3.00	0	0.00	0	0.00	0	0.00	
3.01 and higher	2	0.86	0	0.00	2	3.17	
PSY 3044 Psychological Science II (*n* = 305)							2.24 *
More than -3.00	3	0.98	0	0.00	3	2.24	
-2.01 to -3.00	13	4.26	5	2.92	8	5.97	
-1.01 to -2.00	26	8.52	12	7.02	14	10.45	
-0.01 to -1.00	149	48.85	87	50.88	62	46.27	
0	3	0.98	2	1.17	1	0.75	
0.01 to 1.00	104	34.10	60	35.09	44	32.84	
1.01 to 2.00	7	2.30	5	2.92	2	1.49	
2.01 to 3.00	0	0.00	0	0.00	0	0.00	
3.01 and higher	0	0.00	0	0.00	0	0.00	

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

between means extended from 0.08 to 0.38. The effect size was computed as d = .30. For Psychology, the observed mean difference was 0.21, and the confidence interval was 0.03 to 0.39. The effect size was d = .23. Using Cohen's (1992) guidelines for t tests, both of these effect sizes were small.

A 2 (student type) x 3 (time) repeated-measures ANOVA was calculated for each of the courses separately to determine whether native students and first-term transfer students exhibited similar patterns in GPA over time. For these analyses, time 1 was defined as incoming GPA for transfer students and institutional GPA prior to fall 2002 for native students; time 2 was fall 2002 GPA; and spring 2003 term GPA constituted time 3.

Table 22 summarizes the results for Accounting. The student type x time interaction was not significant, $F(2, 184) = 0.19$, $p > .05$. However, the analysis revealed a significant effect for time, $F(2, 184) = 4.37$, $p < .05$. Post hoc contrasts showed that spring 2003 GPA was significantly lower than incoming GPA for transfer students and previous GPA for native students, $F(1, 92) = 10.37$, $p < .01$. Fall 2002 GPA was not significantly different than time 1, $F(1, 92) = 3.21$, $p > .05$ or time 3, $F(1, 92) = 1.43$, $p > .05$.

A preliminary investigation of Economics indicated that there was a significant interaction effect between student type and time, $F(2, 714) = 3.62$, $p < .05$ and a significant effect for time, $F(2, 714) = 9.15$, $p < .0001$. The results of the analysis are displayed in Table 23.

The results for Professional Writing indicated that there were no main effects or interaction effects. The summary statistics are shown in Table 24.

There was no significant interaction effect in Psychology. However, there were significant main effects for student type, $F(1, 273) = 8.72$, $p < .01$ and for time, $F(2, 546) = 12.37$, $p < .0001$. The results of this analysis are displayed in Table 25.

Table 22

Summary of Repeated-Measures ANOVA for Intermediate Financial Accounting (ACG 3103)

Source	*df*	*SS*	*MS*	*F*
Between Subjects	93	83.91		
Group (G)	1	0.71	0.71	0.79
Residual between	92	83.20	0.90	
Within Subjects	188	69.40		
Time (T)	2	3.13	1.57	4.37*
G x T Interaction	2	0.38	0.19	0.53
Residual within	184	65.89	0.36	
Total	281	153.51		

Note. $n = 143$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 23

Summary of Repeated-Measures ANOVA for Managerial Economics (ECO 3100)

Source	*df*	*SS*	*MS*	*F*
Between Subjects	358	409.59		
Group (G)	1	2.62	2.62	2.30
Residual between	357	406.97	1.14	
Within Subjects	718	238.80		
Time (T)	2	2.99	2.99	9.15****
G x T Interaction	2	2.37	1.18	3.62*
Residual within	714	233.44	0.33	
Total	1,076	648.39		

Note. $n = 638$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 24

Summary of Repeated-Measures ANOVA for Professional Writing (ENC 3213)

Source	*df*	*SS*	*MS*	*F* [a]
Between Subjects	224	249.31		
Group (G)	1	1.21	1.12	1.01
Residual between	223	248.10	1.11	
Within Subjects	450	138.19		
Time (T)	2	1.77	0.89	2.90
G x T Interaction	2	0.20	0.10	0.32
Residual within	446	136.22		
Total	674	387.50		

Note. $n = 583$.
[a] None of the analyses were statistically significant.

Table 25

Summary of Repeated-Measures ANOVA for Psychological Science II (PSY 3044)

Source	*df*	*SS*	*MS*	*F*
Between Subjects	274	454.53		
Group (G)	1	14.06	14.06	8.72**
Residual between	273	440.47	1.61	
Within Subjects	550	8.90		
Time (T)	2	7.90	3.94	12.37****
G x T Interaction	2	0.68	0.34	1.06
Residual within	546	0.32	0.32	
Total	824	463.43		

Note. $n = 382$.
* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Research Question 3

To what extent do community college transfer students differ from native students on measures of academic achievement (mean GPA and course completion rates)?

Mean term GPA for fall 2002 was calculated separately for native and transfer students in each course. The students' one-term GPA was similar in Accounting, Economics, and Psychology although, in all three cases, the transfer students earned higher GPAs. The highest term GPA was earned by the native students enrolled in Professional Writing (3.01); the lowest GPA was earned by native students in Psychology (2.55). Independent-samples *t* tests indicated that none of these differences were statistically significant. The results of the analyses are shown in Table 26.

The number of credit hours attempted by the native and transfer students was calculated for the two groups of students in each course separately. The number of credit hours attempted by both groups ranged from 3 to 19 although the mean number of credits attempted by the native students was higher across all four courses. The means ranged from 10.50 in Accounting to 11.52 in Professional Writing for the transfer students. The means for the native students ranged from 12.55 in Accounting to 13.49 in Professional Writing. Independent-samples *t* tests were calculated to determine if the differences between the transfers and native students were significant. The mean differences in all four courses were significant. The results of the analyses are shown in Table 27.

The ratio of courses attempted to courses completed in fall 2002 was then calculated for each group separately in each course. The results are displayed as percentages of courses completed in Table 28. Despite attempting more credit hours, the native students completed more credits in Economics, Professional Writing, and Psychology. The students who were enrolled in Accounting completed 79.02% of the

Table 26

Differences in Fall 2002 Mean GPA for Native and First-Term Transfer Students by Course

	n	*M*	*SD*	*t*	[a]
ACG 3103 Intermediate Financial Accounting (*n* = 104)				-0.39	
Native	60	2.90	0.79		
Transfer	44	2.97	0.96		
ECO 3103 Managerial Economics (*n* = 386)				-0.15	
Native	225	2.74	0.89		
Transfer	161	2.76	1.02		
ENC 3213 Professional Writing (*n* = 235)				1.59	
Native	170	3.01	0.70		
Transfer	65	2.78	1.05		
PSY 3044 Psychological Science II (*n* = 309)				-0.87	
Native	171	2.55	1.03		
Transfer	138	2.66	1.17		

[a] None of the differences were statistically significant.

Table 27

Differences in Credit Hours Attempted in Fall 2002 for Native and First-Term Transfer Students by Course

	N	*M*	*SD*	*t*	
ACG 3103 Intermediate Financial Accounting (*n* = 104)				3.27	**
Native	60	12.55	2.94		
Transfer	44	10.50	3.44		
ECO 3103 Managerial Economics (*n* = 386)				4.83	****
Native	225	12.68	2.58		
Transfer	161	11.32	2.89		
ENC 3213 Professional Writing (*n* = 235)				5.96	****
Native	170	13.49	2.14		
Transfer	65	11.52	2.56		
PSY 3044 Psychological Science II (*n* = 309)				6.07	****
Native	171	13.28	2.47		
Transfer	138	11.20	3.34		

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 28

Differences in Credit Hours Completed in Fall 2002 for Native and First-Term Transfer Students by Course

	N	% Completed	*SD*	*t*	[a]
ACG 3103 Intermediate Financial Accounting (*n* = 104)				-0.01	
Native	60	78.94	23.51		
Transfer	44	79.02	28.53		
ECO 3103 Managerial Economics (*n* = 386)				0.77	
Native	225	82.18	25.46		
Transfer	161	80.08	27.45		
ENC 3213 Professional Writing (*n* = 235)				1.73	
Native	170	86.56	19.84		
Transfer	65	79.97	28.07		
PSY 3044 Psychological Science II (*n* = 309)				0.11	
Native	171	78.83	27.60		
Transfer	138	78.45	33.54		

[a] None of the differences were statistically significant.

credits for which they enrolled; the native students in the same course completed 78.94% of the credits attempted. Independent-samples *t* tests indicated that none of the differences were statistically significant.

Research Question 4

To what extent do community college transfer students differ from native students on measures of persistence, graduation rates, and time to degree?

Two groups of students were chosen for comparison: first-term FCCS transfers who entered the university as juniors and who had completed an Associate in Arts degree prior to transferring (*n* = 296) and native students who had achieved junior status in fall 2002 (*n* = 232). Of the 296 transfer students, 137 (46.28%) had earned a bachelor's degree by the end of 2004, and an additional 63 (21.28%) earned a bachelor's degree within three years. Ninety-four transfer students had not earned a degree by the end of the study. Of the 232 native juniors, 152 (65.52%) had earned a bachelor's degree within two years, and 183 (78.88%) had achieved a degree by the end of fall 2005.

A logistic regression was performed to determine variables that were potentially related to graduation for the group of transfer students. The dependent variable was coded as 0 to indicate that a student did not graduate and 1 to indicate that the student did complete the baccalaureate degree. The predictor variables included age, gender, racial/ethnic minority status, and transfer GPA. For purposes of this analysis, the categorical variables of gender and minority status were coded as: male = 0, female = 1; and minority status: White = 0, minority = 1. Only transfer GPA was significantly related to whether or not a student had graduated. Students' age, gender, and minority status were not related. For every one unit increase in transfer GPA, the odds of graduating increased by 1.15.

Observations

The state of Florida compiles information for public community colleges and universities and provides statistics for accountability purposes, but data are not readily available to community colleges that permit them to track their students at the individual level. Aggregate data do not lend themselves to curriculum improvement across institutions, and elimination of the use of Social Security numbers, or any uniform student identifier, precludes ease of data sharing from one institution to another.

During the course of the study, the researcher did not have access to grades earned by transfer students prior to entry at the university. Additionally, the data set did not permit an analysis of courses by individual faculty members to determine if there were systematic differences in grading patterns that could explain the high withdrawal rates in the College of Business or the high percentages of *A* and *B* grades in Professional Writing.

Although the results of this study could be used to support previous research findings that community college students do experience transfer shock during the first term after entry to the university, evidence of a similar pattern of decline in GPA among the native students led to questions regarding the source of this drop in academic performance. Perhaps rather than transfer shock, the students experienced *junior shock* when they enrolled in upper-level course work.

Summary

The purpose of this study was to investigate the effectiveness of the transfer function among community college students subsequent to their enrollment at one of Florida's large, urban, doctoral/research extensive universities. This research evaluated the effectiveness of the lower-division preparation of students who transferred from its feeder institutions using a course-based model of transfer success. It attempted to

determine if there were differences in academic performance in targeted upper-division undergraduate courses between students who completed prerequisite courses prior to transferring to the university and native students. Additionally, an investigation was conducted to determine if public community college students experienced transfer shock when they matriculated at the upper-division research university and, if so, did their GPAs recover to pre-transfer level. The impact of enrollment at a community college on students' academic achievement, retention, graduation, and time to degree was compared to native university students.

The findings of this research provide evidence of the effectiveness of the 2 + 2 transfer function in Florida. The results could be interpreted as confirmation of transfer shock among the FCCS students; however, the fact that native students also experienced a decline in GPA in fall 2002 calls this interpretation into question. It appeared that rather than transfer shock, these students experienced junior shock when they enrolled in courses at the upper-division level.

Chapter 5

Summary, Conclusions, Implications, and Recommendations

The purpose of this study was to investigate the effectiveness of the transfer function among community college students subsequent to their enrollment at one of Florida's large, urban, doctoral/research extensive universities. Chapter 5 includes a summary of the study, conclusions drawn from the analyses, implications of the research, and recommendations for future investigation.

Summary

This research evaluated the effectiveness of the lower-division preparation of students who transferred from its feeder institutions using a course-based model of transfer success. It attempted to determine if there were differences in academic performance in targeted upper-division undergraduate courses between native students and FCCS students who completed prerequisite courses prior to transferring to the university. The investigation also explored whether FCCS students experienced transfer shock upon matriculating at the university and, if so, did they recover to pre-transfer levels. Comparisons to native university students were made to determine if they exhibited the same GPA patterns over time. Transfer students also were compared to university native students on a variety of academic achievement, educational effectiveness, and efficiency measures.

To accomplish this study, the researcher chose four courses for investigation. Two upper-division undergraduate courses in the College of Arts and Sciences and two that were offered in the College of Business were targeted specifically because transfer

students often complete the prerequisite course(s) prior to transferring. Additionally, each course that was selected had only one course, or a single course sequence, as a prerequisite. The incoming (transfer) GPA was extracted for these transfer students and compared to their first semester GPA at the university to determine if they experienced transfer shock. The GPA of these students also was calculated at the end of the following term to determine if they recovered from any decline in GPA. Native university students were used as a comparison group. The effect of lower-division enrollment at a community college was examined to determine if transfer students were adversely impacted in the areas of academic achievement, retention, graduation, and time to degree.

Conclusions

The conclusions that accrued from this research provide evidence that Florida's community colleges prepare students for success upon transfer to an upper-division institution. In most of the courses that were studied, there were no differences in the performance of native and transfer students. However, in one of the targeted courses, the transfer students performed better than did the native students.

Nevertheless, the consequences were not all positive when students did transfer. The results indicated that students experienced a moderate decline in GPA during their first semester at the university and, in some cases, the decline continued. Unexpectedly, the native students experienced a similar decline in GPA when compared to their previous GPA at the university. The findings suggested that students may experience *junior shock* when they enroll in courses at the upper-division level.

The course completion rates and mean term GPAs were similar for the transfer and native students, except that the transfer students attempted fewer course hours than the university native students.

The community college transfer students' rates of persistence were similar to those of the university natives. Since the transfer students had attempted fewer courses, their graduation rate after two years was lower than that of the university native students. At the end of three years, the transfer students had narrowed the gap slightly. Only incoming GPA predicted graduation rates for the transfer students.

Preliminary analyses revealed demographic anomalies that were unique to each course which led to additional analyses that included the variables of gender, race/ethnicity, and age. Each of these variables emerged as a predictor of course grades in at least one course.

Implications

The findings of this research have important implications for practice at the university and its feeder institutions. The research lends support for the strength of the articulation agreements that are in place between the university that was studied and the public community colleges in Florida. Students who transferred from the FCCS to the university entered with higher GPAs when compared to native students during their first semester as juniors. During their first term at the university, the transfer students performed as well as, or better than, the university native students in three of the four courses.

An unanticipated finding was the high percentage of withdrawals in both courses offered in the College of Business. Approximately 35% of students who were enrolled in Accounting withdrew during the term as had more than 21% of students in Economics. Since Intermediate Financial Accounting was a required course for all accounting majors, and Managerial Economics was a prerequisite for courses in the economics major, the time to degree would be extended for students who attempted but withdrew from these core courses.

Nevertheless, the findings also indicated that transfer is not entirely *seamless*. The transfer students' GPA declined during their first semester after transfer and, in some cases, continued to decline. Although follow up was not conducted with the non-returning students, there is the potential that they might not attain a bachelor's degree. The findings of a decline in GPA among the first-term FCCS transfer students were paralleled by a similar decline among the university natives. Based on these research findings, it is suggested that faculty, staff, and administrators at community colleges and at the university work at their own institutions and across institutions to facilitate a more seamless transition for the increasing numbers of transfer students. One suggestion is that transfer centers be created at the community colleges to prepare students prior to transfer and that advisors and counselors at the university receive specialized training to assist students after they transfer. It is imperative that the staff collaborate to ensure that students are prepared before they transfer and receive guidance after they enter the university. It is advisable that an early alert system be implemented at the university when students begin to experience difficulties, especially in courses that are foundational to their major. Students who are preparing to transfer should be advised of both the bad and good news: that there is a possibility that they may experience a decline in GPA during their first semester at the university but that many students recover and adjust to the university environment.

Faculty at both the sending and receiving institutions should collaborate to make certain that prerequisite courses completed at the community college provide a solid foundation for upper-division courses. Based on the finding of large percentages of students who withdrew from both courses in the College of Business, there appears to be an anomaly that impedes the success of students in these foundational courses. Whether this is a common occurrence or a unique finding of this research, a critical

implication for the university is that students will take longer to complete their degrees if they are required to repeat courses or to change majors.

In 2002, there was little data sharing between community colleges and the university other than at the aggregate level; the picture is little different in 2009. State accountability measures offer a modicum of insight into small numbers of students who have met a host of criteria for inclusion into the cohorts. No cross-institutional accountability measures convey sufficient information that can be used for program improvement. The course-based approach undertaken in this study demonstrates the need for collaboration between institutions not only at the college level but at the department level to ensure that lower-division courses adequately prepare students for success in junior- and senior-level courses.

Recommendations

This research used a quantitative method to determine the transfer effectiveness of community colleges that would yield data to make recommendations for program improvement. The findings and limitations of the research design lead to many avenues for future research.

The study was limited to a single public four-year university in the state of Florida. A more complete picture of the effectiveness of the preparation provided by community colleges would be gained by extending the research to all universities and community colleges in the state. Analyses were not conducted regarding individual community colleges. Studies to determine the unique contributions made by each of the 28 FCCS institutions would be illustrative. Analyses also could be undertaken regarding the effectiveness of lower-level preparation provided at private colleges. Research could be extended to other prerequisite courses across all departments and at all levels of these institutions. Although data were not available for this study to permit analysis of

individual faculty members' course grades, additional research could be conducted to determine whether there are unique grading patterns of faculty that impact student performance.

No follow up was conducted with students who left the university prior to graduation. It is unknown whether these students transferred to another institution and were ultimately successful in the goal of attaining a baccalaureate degree. Follow-up studies of these students would provide additional insight into the transfer function. Longitudinal studies conducted with students who graduated from the university could be informative.

This study focused on a single aspect related to the success of transfer students. The design of this study does not yield information that helps students transfer other than from an academic standpoint. Davies and Casey (1999) claimed that, "Very little [information about transfer experiences] is expressed directly by students in their own voices" (p. 60) and that many transfer students experience *campus culture shock* when transferring from a community college to a university. They may experience issues with parking, crowds, lines, and a lack of individual attention that they had not experienced before. Future research should be conducted using qualitative methods to explore the experiences of transfer students in depth from both the academic and non-academic perspectives. A current initiative that was led by Ignash (2008) and colleagues at several of Florida's community colleges is attempting to provide a rich picture of the transfer experience. However, a major limitation of the research has arisen from the difficulty of obtaining identifiable student-level data to determine relationships between transfer students' reported experiences and academic history. Similar to frustrations expressed by Arnold (2001), individual student data are difficult to obtain, even for institutional researchers who have legitimate need to determine their college's effectiveness.

Additional research on the three variables of age, gender, and race/ethnicity is warranted. Since each of these variables was found to be a significant predictor of course grade in at least one course, more in-depth research into these variables would provide useful information to the community college and university systems.

Due to limited numbers of Asian and Native American students who were enrolled at the university, future research should be conducted to determine if the findings of this study would be supported in these populations.

Since age differences were found to be significant and there appeared to be a relationship between age and time to graduation, additional research could explore factors that impact adults' learning in more depth.

Since a limited number of courses were chosen for inclusion in this study, additional research could be undertaken to determine if the results obtained from these selected courses were unique or commonly occurring. Replication of research related to these courses at a different point in time also should be explored.

Although aggregate data are available in Florida, there is not, at present, unit-level tracking readily available for Florida community colleges after their students transfer to four-year universities. Discussions are underway at the state level to develop a system that involves merging of a limited number of variables from the community college and SUS systems. Even if such a system is implemented, individual institutions will be able to conduct analyses only with the variables previously agreed upon. A statewide database would directly address some of issues and concerns raised in this study.

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