

**INDICATORS OF PERSISTENCE AND SUCCESS OF COMMUNITY
COLLEGE TRANSFER STUDENTS ATTENDING A LARGE, URBAN
UNIVERSITY IN PENNSYLVANIA**

A Dissertation
Submitted
to the Temple University Graduate Board

In Partial Fulfillment
of the Requirements for the Degree of
Doctor of Education

By
Margaret Ballard Munkittrick
January, 2009

ABSTRACT

The purpose of this study was to determine the extent to which completion of Temple University's Core-to-Core articulation agreement requirements improves transfer students' likelihood to persist and to obtain a baccalaureate degree . Additionally, demographic variables (age, gender, ethnicity, financial aid eligibility), pre-enrollment variables (transfer GPA, transferable credits, Core-to-Core participation, educational intent, class standing, and community college attended), and enrollment variables (enrollment status, GPA trend, credits per semester, number of semester enrollments, and final GPA) were examined in order to determine whether they had any validity in predicting baccalaureate degree attainment.

The study used an institutional case study design with historical data as the foundation for a multivariate analysis. The study population included 5419 students who transferred to Temple University between the Fall 1998 and Spring 2002 semesters. from one of eleven local community colleges that participated in Temple's Core-to-Core transfer program.

A causal-comparative methodology was used to study the two groups – persisters and non-persisters. Descriptive statistics provided a picture of each group of students, while Chi-square and logistic regression analyses were used to determine the demographic, pre-enrollment, and enrollment variables that had the strongest ability to predict academic persistence.

The Chi-square analyses presented a very detailed picture of the persisters and non-persisters. As a group, enrollment variables were the strongest predictors of baccalaureate degree attainment. However, the independent variables that were most

significant and also the most meaningful were the number of semesters for which a student registered, final GPA, enrollment status (full-time/part-time), average number of credits per semester, GPA trend, and financial aid eligibility.

A logistic regression analyses was then used to examine the predictive factors for baccalaureate degree attainment after eliminating several variables due to multicollinearity concerns and due to the complexity introduced with variables containing multiple nominal responses. The results were highly significant with 22.6% of the variance accounted for, indicating that the students who have a higher probability of graduating demonstrate a pattern of increasing GPA from initial transfer to graduation, have a higher transfer GPA, attend Temple University on a full-time basis, have taken advantage of Temple's Core-to-Core transfer program are eligible for financial aid, and are female.

ACKNOWLEDGMENTS

A special note of appreciation goes to my dissertation advisors, Dr. Corrinne Caldwell and Dr. Joseph DuCette, who set rigid deadlines and high standards for completing this work, but then stood by me every step of the way to ensure I wouldn't sabotage myself.

Dr. Caldwell, you believed in me even when I had stopped believing in myself. Your encouragement and support went far beyond what was reasonable to expect. Most of all, thank you for establishing deadlines and demanding that I meet them. Excuses were not tolerated. Failure was not an option. For that, I am deeply grateful.

Dr. DuCette, I could never have completed Chapters 4 and 5 without your guidance. In your office, on the phone, over email – you were always there to answer my questions and to raise new ones. You shared your expertise and your time with me. Don't ever underestimate what powerful gifts those are. Thank you.

David Moldoff, the person who single-handedly ignited my passion for transfer policy in higher education and then gave me the opportunity to be part of the team that created and delivered CEMC (Course Equivalency Management Center) to the market. I wish you success beyond your wildest dreams.

Chris Crawford is an amazing woman who has traveled this journey with me since August of 1999. She showed me how to laugh at myself when I needed to laugh; she listened when I needed to vent, and she offered wise counsel that helped me through many rough times. Chris, your support, encouragement, and sacrifices (i.e., approved

time off) have been of immense importance to me. I cannot imagine having done this without you.

Diane Seymour, my Sunday morning study buddy and my secret weapon against writer's block. Diane, you never let me get away with denial or procrastination. You showed up at my door, computer in one hand and doughnuts in the other, and forced me – no, dared me – to match you word for word in a writing competition. It was bizarre, but effective. Slowly, but surely, Chapter 2 was written. Thank you for modeling such good behavior, and thank you for being such a good friend.

Donna Herman, my neighbor and my guardian angel. Donna, what can I say? It was you who delivered meals to my door when I was too busy to cook. It was you who delivered medicine when I was too sick to get out of bed. And it was you who rented movies when I was at a breaking point. Your friendship is an invaluable gift for which I will be eternally grateful. You're the most generous and selfless person I have ever met. Thank you for being you.

And of course, my Mom & Dad. My accomplishment is due in part to a dream they had as a young couple that their baby daughter would one day go to college and amaze the world with her brilliance and her compassion. Even though we live hundreds of miles apart, you have been with me every step of the way. I always felt your encouragement, your confidence, your pride, and most of all, your love. Mom and Dad, thank you for believing in me and know as I receive my degree that you share this achievement with me. I love you. Forever and always.

To Mom and Dad,
Who never doubted in me or that this day would come, and

To Chris Crawford,
My boss, my mentor, my friend.
Whose unconditional and unwavering support made my dream possible.

TABLE OF CONTENTS

ABSTRACT	ii
ACKNOWLEDGMENTS	iv
LIST OF TABLES	ix
CHAPTER	
1. INTRODUCTION	1
Statement of the Problem.....	1
Purpose of the Study	3
Theoretical Framework.....	3
Research Questions	4
Definition of Terms.....	6
Limitation and Delimitations	9
Limitations	9
Delimitations.....	10
Methodology	11
Significance of the Study	11
2. REVIEW OF THE LITERATURE	13
Overview.....	13
Historical Foundations of the Community College	13
Early Development of Community Colleges.....	13
Reorganization and Redefinition	15
Current Status and Future Directions.....	21
Transfer and Articulation: A Policy Perspective	22
Historical Trends Shaping Transfer and Articulation Policies	23
The Role of the Student in Transfer and Articulation.....	26
The Role of the Institution in Transfer and Articulation	34
The Role of the State in Transfer and Articulation.....	45
Summary	52
3. METHODOLOGY	54
Introduction to the Study	55
Research Questions	56
Setting	57

	Demographics of the Sample	58
	Data Sources and Collection Procedures	58
	Research Design and Data Analysis	64
4.	RESULTS	66
	Description of the Sample.....	67
	Results of the Study	77
	Major Findings.....	93
	Chi-square Analyses	93
	Logistic Regression Analyses	101
	Summary	103
5.	CONCLUSIONS AND RECOMMENDATIONS.....	105
	Summary of Findings.....	105
	Overall Summary	109
	Limitations	110
	Future Research and Policy Recommendations.....	112
	BIBLIOGRAPHY	115

LIST OF TABLES

Table	Page
1. List of community colleges participating in Temple University's Core-to-Core transfer program	59
2. List of demographic variables.....	60
3. List of pre-enrollment variables.....	61
4. List of enrollment variables	63
5. Distribution of study population by age at time of admission.....	68
6. Distribution of study population by gender and ethnicity	69
7. Distribution of study population by economic status	70
8. Distribution of study population by transfer GPA.....	71
9. Distribution of study population by transfer credits	72
10. Distribution of study population by educational intent.....	73
11. Distribution of study population by class standing.....	74
12. Distribution of study population by community college	75
13. Distribution of study population by transfer program	76
14. Distribution of study population by degree attainment.....	77
15. Comparison of graduation rates by age	78
16. Comparison of graduation rates by ethnicity	79
17. Comparison of graduation rates by gender	80
18. Comparison of graduation rates by financial aid eligibility.....	80
19. Comparison of graduation rates by transfer GPA.....	81

20.	Comparison of graduation rates by transfer credits	82
21.	Comparison of graduation rates by educational intent	84
22.	Comparison of graduation rates by class standing.....	85
23.	Comparison of graduation rates by community college	86
24.	Comparison of graduation rates by transfer program	87
25.	Comparison of graduation rates by enrollment status.....	88
26.	Comparison of graduation rates by GPA trend.....	89
27.	Comparison of graduation rates by average credits per semester.....	90
28.	Comparison of graduation rates by final GPA.....	91
29.	Comparison of graduation rates by number of semester registrations.....	92
30.	Chi-square results for demographic variables.....	94
31.	Chi-square results for pre-enrollment variables.....	96
32.	Chi-square results for enrollment variables	97
33.	Ranked list of predictor variables based upon effect size.....	99

CHAPTER 1

INTRODUCTION

Statement of the Problem

Transfer students have become a major component of higher education not only because of their numbers but because students have begun to take an active approach to securing what they need. In 1995, forty percent of students entering college attended at least two institutions during the next six school years. Ten years later, that figure had risen to sixty percent (Ashby, 2005). The number of students who transfer is increasing, and the complexity of responding to those students' demands has become an increasingly important issue for higher education institutions. Not surprisingly, getting credit for past collegiate-level work is the main concern among transfer students.

Given that the typical transfer student is twenty-nine years old, female, and works part-time (American Association of Community Colleges, 2007a; Fredrickson, 1998), institutions are re-evaluating the support services they offer to this non-traditional, but growing, population. In particular, course-based (as opposed to student-based) studies of success – that is, tracking how well students who complete prerequisites at the community college perform as compared to students who transfer before completing their prerequisites – present opportunities for gaining a better understanding of transfer rates (Wellman, 2002).

Changing student attendance patterns, the availability of online courses, rising tuition, and an increasing need for skilled labor have all contributed to increased

competition among higher education institutions. To address these market forces, colleges and universities have developed a number of ways to facilitate transfer between two-year and four-year institutions. State Departments of Education have responded by establishing Transfer and Articulation Boards with a primary mission to recommend and implement statewide articulation agreements that will make transfer a more efficient and transparent process for students.

Successful transfer ultimately depends on the relationships institutions have with one another (Keith, 1996), as well as the prospective transfer student's social, psychological, and economic reasons for transferring (Lee & Frank, 1990). Surprisingly though, very little research focuses on the relationship between state policy and the effectiveness of transfer between two- and four-year institutions. It is possible for education systems, and institutions, to get locked into articulation agreements without realizing that these agreements may be based upon ideas that are fundamentally flawed. Without follow-up studies, colleges and universities rely heavily on anecdotal evidence and best practices which have not been empirically tested for their effectiveness as policy models. Even where states have access to student data and can monitor enrollments, transfers, and academic achievement, policy-makers have little or no knowledge of what works effectively from a state policy perspective (Bender, 1990; Prager, 1994). Where studies exist, they have contributed little to an understanding of how articulation agreements work at the institutional level to ensure transfer opportunities for community college students (Bender, 1990; D. M. Knoell, 1990).

Helping transfer students succeed is a necessity – for the students, for the institutions, for the states, and for the nation. Seeking information on the characteristics and transfer patterns of the students they serve, and understanding the impact of policy on the likelihood of transfer, will help institutions better understand the processes and services that need to be in place to ensure student success.

Purpose of the Study

The purpose of this study is to determine the extent to which completion of Temple University's Core-to-Core articulation agreement requirements improves transfer students' likelihood to persist and/or obtain a baccalaureate degree. Additionally, demographic variables (age, gender, ethnicity, financial aid eligibility), pre-enrollment variables (transfer GPA, transferable credits, Core-to-Core participation, educational intent, class standing, and community college attended), and enrollment variables (enrollment status, GPA trend, credits per semester, number of semester enrollments, and final GPA) will be examined in order to determine whether they have any validity in predicting Baccalaureate degree attainment.

Theoretical Framework

The theoretical framework is grounded in the literature on academic transfer and college student persistence. The basic assumption of the model is that there are relationships between completion of transfer credentials and persistence to the baccalaureate degree (Cejda & Rewey, 1998; Christie & Hutcheson, 2003; Cohen & Brawer, 2003b; Glass Jr & Harrington, 2002; Laanan, 2001; McCormick & Carroll, 1997; Popovich, 2005).

Many researchers have studied persistence of students in higher education. Those engaged in the study of transfer students suggest there are a multitude of factors involved in transfer and baccalaureate completion. For example, Astin (1993) related students' aspiration to transfer, academic preparation, commitment to college, age and other factors to their persistence to transfer and complete a bachelor's degree. Banks (1992) hypothesized that transfer rates were related to articulation agreements, tuition, college policies, expenditures per student, and other administrative factors. Pascarella and Terenzini (1991) found that students who are committed to graduating from a specific

institution are more likely to graduate from that institution. All of these theories have validity, but empirically establishing these relationships has proven problematic. Every transfer student has such a varied and multi-faceted experience that it becomes difficult to identify specific characteristics that can be consistently used to predict baccalaureate degree attainment. However, it is suggested by these studies that students who focus on the goal of completing their college education have a better chance of achieving it.

In theory, fulfilling the requirements of an articulation agreement can be one of the ways that a student could demonstrate his or her commitment to attaining a baccalaureate degree. If the agreement works as intended, it should provide a direct way for transfer students to obtain their goals. Providing a guaranteed admission to the university upon completion of a transfer program should encourage students to use them and institutions to maintain them. It is important to evaluate these programs and their contribution to streamlining the transfer process.

Research Questions

This study seeks to determine whether completion of Temple's Core-to-Core program requirements before transfer has a positive correlation to academic persistence and baccalaureate degree attainment. This study has a secondary interest in understanding whether identified admissions-available demographic, pre-enrollment, and enrollment variables also have value in predicting academic persistence and baccalaureate degree attainment.

The first set of research questions concerns the description of the persisters and non-persisters and the ways in which these two groups differ according to selected demographic, pre-enrollment, and enrollment variables:

1. Do proportions of persisters and non-persisters differ significantly according to demographic variables of age, ethnicity, gender, and financial aid eligibility?
2. Do proportions of persisters and non-persisters differ significantly according to pre-enrollment variables of transfer GPA, transferable credits, educational intent, class standing, community college attended, and Core-to-Core participation?
3. Do proportions of persisters and non-persisters differ significantly according to enrollment variables of enrollment status, GPA trend, credits per semester, number of semesters, and final GPA?

The second set of questions, treats predictor variables jointly within the categories of demographic, pre-enrollment, and enrollment variables.

4. Do demographic variables of age, ethnicity, gender, and financial aid eligibility have significant effects on persistence at Temple University?
5. Do pre-enrollment variables of transfer GPA, transferable credits, educational intent, class standing, community college attended, and Core-to-Core participation have significant effects on persistence at Temple University?
6. Do enrollment variables of enrollment status, GPA trend, credits per semester, number of semesters, and final GPA have significant effects on persistence at Temple University?

Finally, this study seeks to understand whether the existence of Temple's Core-to-Core articulation agreement increases the probability that a student will obtain a baccalaureate degree.

Definition of Terms

2-Plus-2 Transfer. A variation of “block transfer” (defined below) that describes a 2-year to 4-year transfer pattern, commonly identified by the presence of a formal articulation agreement that identifies a 2-year “core” that, upon successful completion, will articulate to specified baccalaureate program requirements.

Articulation. 1) A systematic coordination between institutions of higher education to ensure the efficient and effective movement of students among those institutions, while guaranteeing the students’ continuous advancement in learning (Bender, 1990); 2) “articulation refers to the range of processes and relationships involved in the systematic movement of students between and among postsecondary institutions. The goal of articulation is to promote [the] problem-free transfer of courses from one institution to another” (Wright, 1996); 3) “the movement of students – or, more precisely, the students’ academic credits – from one point to another” (Cohen & Brawer, 2003b).

Articulation Agreements. The formal agreements reached between individual colleges and universities about course equivalency and undergraduate requirements that facilitate a smooth transition for students and eliminates duplication of course content from one education experience to another (Just & Adams, 1997).

Associate Degree. An academic program representing a level of academic development and performance reflected in student learning outcomes sufficient to move on to upper division collegiate work or to enter directly into specific occupations in the workplace.

Associate in Applied Science Degree. An associate degree program designed to lead directly to employment in a specific career but may be recognized by some baccalaureate degree granting institutions for transfer credits.

Associate in Arts Degree. A transfer degree that emphasizes the arts, humanities, or social sciences.

Associate in Science Degree. A transfer degree that emphasizes agriculture, engineering and technology, mathematics, or the natural sciences.

Block Transfer (also known as Core-to-Core). Block transfer is the process whereby a block of credits is granted to students who have successfully completed a certificate, diploma or cluster of courses that is recognized as having an academic wholeness or integrity, and that can be related meaningfully to a degree program or other credential.

Classic Transfer (also known as Traditional Transfer or Vertical Transfer). Describes a 2-year to 4-year transfer pattern; i.e., students have earned college credits before applying for admission to a baccalaureate institution.

Course Applicability. Establishing that a transferred course can be “applied” in a program, either to fulfill a required elective, a free elective, or a requirement, i.e. ART 101 is applicable, but ENG 056 (remedial course) is not.

Course Articulation. Establishing that a transferred course will fulfill a specific program requirement.

Course Equivalency. Establishing a relationship between a specific course or combination of courses to another, i.e. ENG 101 at College A is equivalent to COMP 115 at College B.

Degree Audit. An internal advising document that typically includes both degree and program requirements and an extract of the academic history of the student. A typical degree audit program matches the requirements for the student’s degree and program with the courses that the student has completed and is currently taking. A degree audit frequently includes additional information such as the student’s academic status, test scores, and proficiencies completed.

General Education Core. The core curriculum in the liberal arts, humanities, natural or physical sciences, and social sciences that all undergraduates of an institution of higher education are required to complete before receiving a degree.

Gypsy transfers (also known as multiple transfers). Students who transfer multiple times among numerous institutions. Kearney, Townsend, and Kearney (1995) coined the term “multiple transfer” to represent bachelor’s degree graduates who attend three or more institutions.

Home Institution. The institution in which the student is currently matriculating and will award the degree.

Lateral Transfer (also known as Horizontal Transfer). Describes a 2-year to 2-year, or a 4-year to 4-year transfer pattern.

Native Student. Refers to a student whose initial college enrollment was at a given institution of higher education and who has not transferred to another institution of higher education since that initial enrollment.

Policy. A purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern (Foundation of Public Policy and Higher Education, p. 173)

Receiving Institution. The institution to which a student intends to transfer and which evaluates and grants credit for previously completed coursework.

Reverse Transfer. Describes a 4-year to 2-year transfer pattern, i.e., students attending baccalaureate institutions transfer to a community college. Depending on their goals, these students may or may not complete their baccalaureate degree.

Sending Institution (also known as Source Institution or Feeder Institution). The institution from which a student is transferring and where his/her initial coursework was completed.

Swirling Transfer. Students who have been admitted to a degree program at a baccalaureate institution and take courses at alternate college(s) to be transferred and applied toward their baccalaureate degree.

Transfer. 1) the mechanics of credit, course, and curriculum exchange (Kintzer & Wattenbarger, 1985); 2) mechanisms used by institutions to facilitate admission, credit recognition, and related services for transfer students (Bender, 1990).

Transfer Student. A student who seeks to move from one institution to another expecting credit recognition for coursework successfully completed and expecting to be treated equitably with all other students (Bender, 1990)

Limitation and Delimitations

Limitations

Five limitations to the study have been discovered. First is the limitation of the causal-comparative research methodology. Basic causal-comparative research involves starting with an effect and seeking possible causes by trying to identify cause-effect relationships (Gay, 1992). Causal-comparative research is used to study events that have already taken place, reflected in this study the the two groups' status as persisting (earned bachelor's degree or still enrolled) or non-persisting (no longer enrolled at Temple University). It is important to remember that in causal-comparative research the relationships established are "at best tenuous and tentative," and the relationship that is established is not necessarily a causal one, but the results can be used to facilitate decision-making (Gay, 1992, p. 293).

Second, the articulation agreement referred to in this study is specific to Temple University and not applicable statewide. Furthermore, the articulation agreement is only relevant to the eleven community colleges who have entered into the agreement with

Temple University. This is done for practical reasons since the number and variety of articulation agreements across the state is large and unwieldy. However, examining the transfer students at one institution should allow for some statewide inferences.

Third, not surveying the transfer students limits the information to previously collected data, which do not include student or staff perceptions of the transfer process. The effects of outside factors such as employment and family responsibilities will remain unanswered by this study since the only way to ascertain that type of information would be by administering a survey or conducting qualitative research.

Fourth, the data examined in this study were based on incomplete records for some students. Although some of the statistical procedures accommodated missing values for some variables, more complex analyses required the omission of entire student records because they contained missing values for some variables.

Fifth, previous transfer student research suggests that six or seven years minimum are required to evaluate transfer rates (Dougherty, 1992; Grubb, 1991). Other research indicates that by eight years, 95% of students in a cohort being studied had either graduated or dropped out permanently (Porter & Gebel, 1993). These studies suggest that the six to nine year period addressed in this research is sufficient time to make conclusions about the success or failure of a transfer program. It is hoped that from this study will emerge some visible trends that will help in future decision making and planning regarding the articulation process.

Delimitations

This study will only consider the student population who transferred from eleven selected Pennsylvania-based, public community colleges to a local, multi-campus, public research institution serving more than 34,000 students annually. The university is a comprehensive university offering both undergraduate and graduate degrees. The

transfer student population will be further limited to students who have at least three transfer credits. The number of sending community colleges will help to mitigate the limitations imposed on the student population. Even so, the results may not be generalizable to all universities.

Methodology

This study will be based on an institutional case study design using historical data as the foundation for a multivariate analysis. It will examine the university persistence and graduation rates of transfer students who entered the university between the Fall 1998 and Spring 2002 semesters by evaluating their enrollment status as of the Spring 2008 semester.

Significance of the Study

Even though much has been written about the transfer function in higher education, empirically-based data and research studies remain limited. The current literature on course- and student-transfer is primarily focused on the number of student transfers, first semester GPA, or characteristics of transfer students, but not on graduation rates. While the success of the initial transfer process is important, it has been proposed that the real definition of success for a community college transfer is baccalaureate degree attainment (Adelman, 1992). More studies focusing on the attainment of a baccalaureate degree by community college transfer students are needed.

The proposed study is significant because it focuses on community college students who have already achieved transfer to a four-year university and then examines academic and personal factors, as well as policy impact, in an effort to identify predictive relevance to baccalaureate degree completion. Additionally, the study has merit because it:

1. investigates predictive factors which advisors, faculty, and administrators can utilize in advising students.
2. provides admissions officers at four-year institutions with additional information to assist in the selection process of community college transfer applicants.
3. contributes to the ongoing debate among educators, policy-makers, and the public over effective transfer policy in higher education.
4. contributes to a better understanding of degree-completion success criteria for transfer students at four-year institutions.

CHAPTER 2

REVIEW OF THE LITERATURE

Overview

America's community colleges enroll approximately 10 million students each year (Laanan, 2001), many of whom intend to transfer to a four-year institution (Carpenter, 1991). Pressure is being exerted on community colleges to increase the numbers of their students who graduate from four-year institutions (Evelyn, 2002). Yet of those students who enroll at community colleges and declare their intent to complete a bachelor's degree, only 13% actually do so (Berkner, He, & Citaldi, 2002).

Historical Foundations of the Community College

Early Development of Community Colleges

Early in American history, the primary purpose of higher education was to train ministers, lawyers, military and political leaders. However, as we moved into the nineteenth century, the demand for – and therefore the numbers of - institutions of higher education in the United States began to increase steadily (Goldin & Katz, 1999). This increase can be primarily attributed to the Morrill Land Grant Act of 1862, one of many pieces of legislation passed during the Civil War's 37th Congress (Brubacher & Rudy, 1997; Geiger, 1999). The Morrill Land Grant Act gave scrip in the form of federal land to each of the states “for the endowment, support and maintenance of at least one college

where the leading object shall be — without excluding other scientific and classical studies and including military tactics — to teach branches of learning as are related to agriculture and mechanic arts” (Nevins, 1962).

States could use their Morrill funds in several different ways. Several states, such as Nebraska, established their first institution. Others, such as Wisconsin, chose to distribute the money among their existing state institutions. And some states, such as Michigan, established an additional university. The Act expanded opportunities for low-cost college education for common people, firmly established the principle of federal support for education, and expanded the college curriculum to more practical concerns (Geiger, 1999; Monroe, 1972).

As the higher education system evolved, several 19th and 20th century college and university educators proposed that the first- and second-years or collegiate work should be offered by a new institution called the “junior college.”(Cohen & Brawer, 1996). The intent was to relieve the university of the primary responsibility for the general education curriculum, allowing them to instead focus their efforts on research. Although the two-year college movement was later referred to as the “people’s colleges” (Brint & Karabel, 1989a), the original intent was not to increase access to a college education. Instead, the initial purpose was to relegate general education courses to a junior division with the intention that only a few qualified students would advance to the upper division or senior coursework at a university (Brint & Karabel, 1989b; Cohen & Brawer, 1996; Dougherty, 2001).

The junior college concept was initially proposed by Henry Tappan, president of the University of Michigan in the 1850’s (Cohen & Brawer, 1996), while William Rainey Harper, president of the University of Chicago, and David Starr Jordan, president of Stanford, continued to promote the concept throughout the late 1890’s (Dougherty, 1992). Harper and Jordan believed that “all should have a fair chance to be educated to

the limits of their abilities” while preserving the elite universities for the “fittest” students (Wagoner, 1985).

The first known use of the term “junior college” is credited to William Rainey Harper when he used the name to describe the lower division curriculum at the University of Chicago (Deegan & Tillery, 1985). In 1892 Harper separated the University of Chicago into two divisions, “junior” and “senior”, in an effort to distinguish between the first two-years and second two-years of undergraduate study. Therefore, the two-year college was originally created as a separate organization within the university and not as a separate institution (Brint & Karabel, 1989b) . In 1900, the University of Chicago began to award an associate’s degree for students who completed the first two-years of coursework in the junior division (Brint & Karabel, 1989a; Dougherty, 1994). The associate degree was intended to be a terminal degree for students who, though not well suited for more specialized university work, desired collegiate coursework. Shortly thereafter, in 1901, Joliet Junior College became the first public junior college in the nation (American Association of Community Colleges, 2003a). However, junior colleges were slow to gain acceptance. By 1910, there were only three public junior colleges operating in the country.

Even so, state interest in these emerging colleges was growing. Educational leaders of that time believed that a broader curriculum which was both “cultural and utilitarian” was a necessary role for the junior college to play (Thornton, 1972). By the end of World War I, the idea of the junior college had spread nationally, but confusion over its purpose had become evident.

Reorganization and Redefinition

During the early 1900’s, the establishment of several influential national commissions, private organizations, and accrediting associations focused further attention

on the role of the junior college. The earliest of these groups was the Committee on Secondary School Studies, appointed by the National Education Association (NEA). Popularly known as the Committee of Ten, one of its most significant outcomes was the widespread adoption of the Carnegie unit that led to formulas for credit transfer. By 1917, the North Central Association (NCA) adopted a set of standards and published a list of eight accredited junior colleges.

In 1920, leaders of 175 junior colleges met to create the American Association of Junior Colleges (AAJC) as a forum for discussion of mutual problems. Arguments on behalf of a terminal (occupational) education were raised at these early gatherings of the AAJC. Brick (1965) described these discussions and noted that, “the AAJC was aware that it had to take a leadership role in directing the movement for terminal education” (p. 120). These debates over the role of the junior college in higher education led to the adoption in 1921 of its definition as “as institution offering two years of instruction of strictly collegiate grade” (Brick, 1964).

As a result, the curriculum of the junior college began to shift from a pure transfer mission to include technical training (Levine, 1986). The technical programs included vocational and general education, and began the transformation of the junior college from an institution primarily concerned with transfer to one also concerned with guiding and preparing students as semi-professionals (Brint & Karabel, 1989b; Wagoner, 1985).

The next major shift came in the early 1930’s. After the stock market crash of 1929, American’s economy fell from prosperity to poverty. By the end of 1931, 12 million Americans were unemployed. University enrollments fell every year from 1929 through 1935 (Friedel, 1976). This period, however, became an era of rapid expansion for junior colleges because they offered an alternative to being unemployed and an economical way to get a college education (Callan, 1997). Junior colleges filled the needs of students too poor to travel away from their local communities for an education. The

demand for occupational and terminal programs also grew rapidly as people opted for training that would make them as attractive as possible for the jobs available.

Therefore, junior college enrollment more than tripled during the depression years from 1932 until 1939 (Eelis, 1943). Although junior colleges continued to serve both the transfer and the terminal functions, the contrasting purposes of the two distinctive missions prompted the emergence of the vocationally-focused junior college during the depression. As a result, by the end of the 1930's, over 70% of the nation's junior colleges offered at least one type of terminal program (Brint & Karabel, 1989a). However, they had not lost sight of the value of the transfer function as an important goal. According to Brint and Karabel (1989), "Two out of three of the colleges were secular, and the vast majority (both public and private) were liberal arts institutions that emphasized curricula that could be transferred with credit to senior colleges" (p. 31).

By the 1940's, the terminal function of junior colleges was seen as the most dominant function by professional educators (Levine, 1986). But the public junior college had emerged as a predominantly vocational institution. There were now 610 junior colleges nationwide, averaging about 400 students each. And with the conclusion of WWII rapidly approaching, the stage was set for massive expansion.

In 1944, the passage of the Serviceman's Readjustment Act (better known as the GI Bill) guaranteed that the federal government would pay for tuition, books, and fees for all honorably discharged veterans at any approved educational institution. Veterans supported by the G.I. Bill enrolled heavily in the junior colleges following World War II (Wagoner, 1985). By the fall of 1946, veterans comprised almost half of the enrollment in junior colleges. Moreover, about 60% of the nation's junior colleges were filled to capacity and could not accommodate additional students (Reed, 1971).

As the junior colleges were transforming, governance structures were evolving as well. Rather than being defined and governed by state education bodies which oversaw

public secondary education, local boards were given legal authority to levy taxes and establish programs and standards. By the late 1940's, junior colleges enjoyed solid funding which was garnered from federal, state and local tax sources. The junior colleges were thriving as they benefited from stable funding and substantial influence in their communities (Deegan & Tillery, 1985).

By the 1960's the junior college began to have its own identity and became a respectable community institution. It abandoned the word "junior" and substituted "community." Knoell (1982) believed that use of the word community attested to their local orientation and their desire to be free of the "junior" partnership connotation, especially since community colleges were expanding vocational program offerings and shifting the emphasis away from transfer.

It was during this same timeframe that the community college system entered another growth period fueled by the baby boom generation. The baby boom generation began to graduate high school and to continue their education at the postsecondary level. Parents of this generation recognized that the most desirable jobs required a college degree, and therefore encouraged their children to pursue higher education (Ginzberg, 1979). This phenomenon of more students, a higher proportion of which desired advanced education, created the greatest period of growth in community college history. Community colleges underwent rapid expansion, and enrollment increased about 200% in the 1960's (Ginzberg, 1979).

Universal schooling and equality of opportunity became key components of America's postwar "meritocracy" (Brint & Karabel, 1989a). The 1960's are referred to as the golden era of expansion for the new community colleges – institutions that were considered more comprehensive than technical schools or junior colleges ever were (Brint & Karabel, 1989a; Wagoner, 1985).

Although the growth of community college systems was rapid, Dougherty (1994) noted that it was uneven with variations in the rate of growth across the states. He attributed those variations to the social, economic and political environments in each of the states. There was criticism throughout the 1950's and 1960's of the community colleges' role in channeling lower ability students to occupational programs and away from the transfer curriculum. This process was termed "cooling out" and was described by Burton Clark in his book *The Open Door College* in 1960. According to Clark and other analysts of the time, this was a common practice whereby students who were deemed academically unprepared were not allowed into specific programs and courses (Karabel, 1972). However, another and perhaps bigger threat to equal opportunity was seen as the students' inability to smoothly transfer their credits from one institution to another (Deegan & Tillery, 1985).

In the 1970's, community colleges began as an intermediate step between high school and the 4-year institution, providing remedial education as well as pre-baccalaureate courses for transfer. And as the demand and need for greater access to higher education grew in the United States, the number of two-year schools also increased (Cohen & Brawer, 1996; Dougherty, 1992; Phelan, 1999). In an effort to meet as many educational needs as possible, the community college system offered programs to support transfer, work force preparation, remedial education, and adult continuing education.

By the mid-1970's the percentage of students in terminal programs then popularly known as vocational and technical education had reached parity with that in the collegiate transfer programs. The number of young people seeking admission to college was decreasing because of rising costs, a less-than-promising job market, elimination of the draft, and an unwillingness of schools to expand graduate programs in excess of the numbers that could be placed. Changing market forces contributed to a renewed interest

in the value of a two-year technical degree and an increase in the number of non-traditional students enrolling in community colleges (Brint & Karabel, 1989b).

The dawning of the 1980's brought an increase in postsecondary enrollment after several years of steady decline in the late 1970's. This growth was somewhat attributable to a recession, and community colleges benefited as students chose 2-year colleges over more expensive 4-year institutions (Gernhart, 1981). Successful lobbying of Congress to make several changes favorable to 2-year institutions was also important to the continued success of the community college system. Most notable of these efforts was the Higher Education Act of 1987, which made several changes to Pell Grant calculations that greatly increased the amount of financial aid funding available to community college students.

However, the literature began to document the decline of the transfer function in community colleges, citing decreased enrollments in the liberal arts and increased enrollments in vocational programs (Barkley, 1993; Kissler, 1982; Knoell, 1982). Using data from a longitudinal study of 1972 and 1980 high school graduates in the United States, Grubb (1991) found decreasing numbers of associate degree graduates who transferred into baccalaureate programs. Pincus and Archer declared that the transfer function was "in crisis" (1989, p. 1). And Pascarella and Terrenzini (1991) suggested that local, state, and federal entities should cooperate to improve the "apparently moribund transfer function of the two-year college" (p. 643).

It became apparent in the 1980's that community colleges had become predominantly vocational institutions. "Yet the triumph of vocationalism, and the concomitant weakening of academic transfer programs, has brought in its wake a serious crisis of institutional legitimacy" (Brint & Karabel, 1989b, p. 135). With the rise of public interest in accountability and academic standards for educational institutions, community college programs came under closer scrutiny, with some legislators

questioning the advisability of providing public support for institutions that did not contribute to higher transfer rates and numbers of graduates with baccalaureate degrees (Brint & Karabel, 1989b).

There were at least three reasons for ensuring that the transfer function remained important to the mission of the community colleges. One reason is the community colleges' collegiate status within higher education – preparing students academically to compete at universities is a large part of their credibility as institutions of higher education. Secondly, a baccalaureate degree is a component of many community college students' educational aspirations; as many as 47% of traditional age students have a baccalaureate degree as their goal (McCormick & Carroll, 1997). Thirdly, the role community colleges have in providing access to higher education for those who might not otherwise gain it obligates them to insure they can open the doors. For those students traditionally excluded from attaining postsecondary education, the transfer function of the community college provides an accessible, affordable, collegiate experience (Brint & Karabel, 1989a; Cohen, 1999; Grubb, 1991). Clearly, community colleges had become an integral part of the higher education landscape, but in their efforts to be all things to all people, the community college itself contributed to a blurring of its educational mission (Callan, 1997).

Current Status and Future Directions

Today, community colleges can be characterized by open admissions, equal opportunity and diversity. There is no typical two-year college any more than there is a typical four-year college. Significant diversity in the size, institutional type, and mission of two-year colleges is common.

According to statistics from the National Profile of Community Colleges: Trends and Statistics, almost half of all first-time college freshmen attend community colleges

nationally (Phillippe & Patton, 2000). The American Association of Community Colleges (2004) reports that in 2001 there were 1,173 community colleges, enrolling 10.4 million students (5.4 million credit and 5 million non-credit) equaling 44% of all U.S. undergraduates and 45% of all first-time freshmen. The Chronicle of Higher Education, 2003-2004 Almanac Issue indicates that in Fall 2000 there were 1,752 two-year colleges (p. 14) and in 2001, there were 13,155,393 undergraduate students of which 5,948,431 (45%) were enrolled at two-year institutions (p. 2). The average age of the community college student was approximately 29 years; women account for 58% of community college enrollments; and men make up 42% of community college enrollments (American Association of Community Colleges, 2004).

According to the National Center for Education Statistics (2003), the number of students enrolled both part-time and full-time, the number of students at 2- and 4-year institutions and the number of male and female undergraduates are all projected to reach a new high each year until 2012. It is surprising that such a statement can be made about a section of American higher education that, for all practical purposes, did not exist before the 1920's (Baker, 1994; Cohen & Brawer, 1996). This represents an historical shift, and given the mobility of today's students, emphasizes the need for a transfer function that is smooth and painless for all involved.

Transfer and Articulation: A Policy Perspective

Historically, transfer and articulation practices have been somewhat arbitrary and have varied randomly among institutions (Knoell & Medsker, 1965). Although these practices continued to vary among states, Bender reported that in the 1980's the formulation of transfer and articulation guidelines began to shift from the control of local educational policy makers to state-level public policy makers (Bender, 1990). Involvement of State Boards of Education in transfer and articulation became more

pronounced as the need for students' access to 4-year institutions increased. This review of literature examines the history of the academic transfer function, emerging articulation policies and practices, and barriers to the articulation process.

Historical Trends Shaping Transfer and Articulation Policies

McDowell's 1919 dissertation was the first national study of junior colleges and the collegiate function (as cited in Kintzer, 1996). Although the focus of the research was on the examination of the emergence of junior colleges, he suggested that the collegiate function, which was defined as meeting the entrance requirements of professional schools, was rated important by public junior college administrators.

During the 1920's, the writings of Koos became very influential. His classic multi-volume work, *The Junior College* (Koos, 1924), strongly affected how junior colleges and senior colleges viewed each other, and how they were each viewed by society. Koos also conducted the first research on the success of junior college graduates who transferred to universities, finding that junior college students perform as well as students initially enrolling at universities (Koos, 1924). Shortly thereafter, in 1931, Walter Crosby Eells documented the growth and curriculum of the public junior college, as well as its role in increasing access to higher education, in a book also entitled *The Junior College* (Eells, 1931). Eells' book became a very important text on the early development of the public junior college (American Association of Community Colleges, 2007b).

The transfer process between 2-year and 4-year institutions gained increased attention in 1957, when a Joint Committee on Junior and Senior Colleges (established by the American Association of Junior Colleges) was charged with studying articulation practices and problems of transfer students. With the rapid growth of the junior college movement and increasing student enrollments, the committee recognized the need for

research on transfer performance as well as research on policies and practices affecting transfer students. Investigation into the process of how 2-year and 4-year colleges were working together locally and on a statewide basis in solving problems of articulation and coordination became an important aspect of the study (Knoell & Medsker, 1965).

Knoell and Medsker furthered the understanding of transfer by examining the articulation and coordination efforts of forty-three colleges in ten states. As a result of that study, *The Junior College: Progress and Prospect*, provided the most complete analysis of public 2-year college systems since Eells' (1931) *The Junior College*, 30 years before. It provided a comprehensive profile of the top 15 states by enrollment, representing more than 75% of the nation's 2-year college students. According to Knoell and Medsker, the transfer and articulation processes in many states and in many institutions were inadequate. They called attention to inadequacies regarding information exchange, orientation, counseling, advising, and other articulation services. They stressed that, unless 2-year and 4-year institutions considered the solution of transfer and articulation in the context of interdependence, there would be no workable process (Childers, 2004; Knoell & Medsker, 1965; Medsker, 1960; Popovich, 2005). The Knoell and Medsker study raised national interest in the issues of articulation and state coordination and by the end of their study, states lined up to respond with formal proposals to their legislatures (Bender, 1990).

Over the next two decades, societal requirements and attitudes changed significantly, with higher education being regarded by many as "a right", and a growing recognition that real improvement in income and long term career advancement occurs when one acquires a college degree - particularly a baccalaureate degree. (Caldwell, 2005; D. Knoell, 1990; Nowak, 2004). This recognition, combined with increased access to community colleges, resulted in a gradual shift in transfer and articulation responsibility from the hands of local educational policy makers (admissions officers and

registrars) to state level public policy makers (Bender, 1990). This was precipitated by the public's opinion that students who transferred from one college to another were being treated unfairly. Legislatures subsequently took action due to analysis of testimony at legislative hearings and committee reports that seemed to validate the public's perception by offering examples of "...unfairness to transfer students and to taxpayers when both must pay the price of repeating coursework already successfully completed or when students are required to take more courses than native students at the same institution." (Bender, 1990, p. 168). As a result, by 1989, legislatures in 13 states had considered bills or passed resolutions related to transfer and articulation (Bender, 1990).

The 1990's continued to present a number of challenges in the transfer function arena: increased public demand for accountability in higher education (Alfred, Ewell, Hudgins, & McClenney, 1999; Bender, 1990; Doucette & Hughes, 1990); decline in transfer rates (Bradburn & Hurst, 2001; Dougherty, 1994; Grubb, 1991; Nora, 2000); absence of a consistent definition of transfer and lack of a consistent formula to arrive at transfer rates (Banks, 1990; Bradburn & Hurst, 2001; Cohen & Brawer, 1996; Wellman, 2002); a broadening of student diversity in terms of enrollment pattern, education and career goals among those who seek both transfer and employment opportunities (Bender, 1990); serious reduction of budgets in higher education (Cohen & Brawer, 1996; Wellman, 2002); increased needs for computer technology: and an expansion of interest in assessing the effectiveness of community colleges (Cohen & Brawer, 1996). Based on those challenges, efforts to improve transfer and articulation policies and practices became critical to maintaining transfer as an essential community college mission during this decade.

Today, most states have some type of coordinating body or bodies to oversee the activities of higher education – particularly concerning the articulation of courses and programs to aid students in transfer (Ignash & Townsend, 2000; Kintzer, 1989). In some

states, these coordinating boards or councils involve all systems of higher education in the state and may be comprised of separate boards for both universities and community colleges. In other states, all public higher education is coordinated by a single board which oversees both two-year and four-year institutions. These different structures of higher education affect the methods and policies that states enact to coordinate and articulate their respective systems.

In addition to having some state level authoritative body, most states also have some type of formal articulation agreements; however the authority and enforcement of these agreements vary widely from state to state (Bender, 1990; Ignash & Townsend, 2000; Kintzer, 1989). Unfortunately, most states have articulation policies and practices that reflect the governance and higher education culture of their own state, but fail to address the complexities associated with facilitating out-of-state transfer requests.

Therefore, in spite of good intentions, articulation is still viewed as a barrier to the transfer process. In a recent survey of administrators and faculty of universities, articulation was ranked the number one barrier to transfer and community colleges ranked it number two behind reliable advising (AACC & AASCU, 2004). This is not a positive reflection on the work that has been done, but it does underscore why state level policy has become necessary.

The Role of the Student in Transfer and Articulation

The number of students entering the higher education system in America increased dramatically during the last half century. Prior to World War II, only one in seven, or 14%, went to college. But with the passage of the GI Bill of Rights and the expanded financial aid funding associated with it, individuals who were previously unable to pursue higher education were now able to consider college as a practical option for improving their career opportunities. Inarguably, the GI Bill, also known as the

Servicemen's Readjustment Act of 1944, had the greatest impact on student enrollment and human capital development since the passage of the Morrill Acts almost 100 years earlier. In fact, "more than 2.2 million veterans attended college under the GI Bill." (American Association of Community Colleges, 2007b). As a result, by the late 1990's, 28% of all American adults had completed four years of college (National Center for Education Statistics, 2005).

Along with this increase in college attendance came increased demand for local post-secondary education options. In 1948, the Truman Commission suggested the creation of a network of public, community-based colleges to serve those demands. By the 1960's, an additional 457 community colleges had opened their doors – more than the total previously in existence. Since then, the number of community colleges has steadily grown. Today, there are 1,202 two-year colleges located in every state except DC, serving 11.6 million students who represent 46% of the total U.S. student enrollment. Since 1901, over 100 million people have attended community colleges (American Association of Community Colleges, 2006; Phillippe & Patton, 2000).

Not surprisingly, the number of students transferring from two- to four-year colleges also grew during this period (Cohen & Brawer, 2003a). Although transfer students are an increasingly large percentage of the college student population, making up nearly half of the student body at some four-year institutions (Davies & Casey, 1999; Kodama, 1999; Laanan, 2001), reliable statistics on national, or even state-level, transfer enrollment data are not available. However, in an attempt to better understand trends in enrollment patterns, the National Center for Educational Statistics (NCES) tracked entering students over two multi-year periods (1989-1994 and 1995-2000) and, in the most recent research; found that approximately one-third of them had transferred at some point during their college careers. Predictably, more students at two-year than at four-year colleges had transferred (approximately 42% and 23%, respectively). Approximately

40% of the students who began in 1995 had attended at least two institutions during the six-year period (Berkner et al., 2002).

In 1997, the National Center for Education Statistics released a report “Transfer Behavior Among Beginning Postsecondary Student: 1989-1994”, that included several interesting observations:

- 39% of community college students reported an intent to transfer.
- Students attending community college full-time were twice as likely as part-time students to transfer to a four-year college within five years.
- The average length of time spent at the community college was 20 months.
- Of those who transferred, 65% transferred without obtaining an Associate’s degree, and of those, only 17% went on to earn a Bachelor’s degree.
- Of those who transferred, 33% transferred after receiving an Associate’s degree, and of those, 43% went on to earn a Bachelor’s degree.

So who is the typical transfer student? According to the American Association of Community Colleges (2007), the typical transfer student is a 29-year old, employed, white female who commutes to school and takes classes on a part-time basis. But the reality is that transfer students do not fit neatly into any pre-defined category (Kozeracki, 2001). In fact, having previous college credits and a change in institution may be the only similarities these students share. “Transfer students may be men or women, traditional age college students (18-24) or adult learners, and come from a wide range of economic, educational, ethnic, and cultural backgrounds. They may have different reasons for transferring to a particular college or university, and different expectations for what the college experience should be” (Nowak, 2004).

Not surprisingly, even enrollment patterns vary greatly within this diverse group of students. At one time, it was commonly assumed that “the transfer student” was a young person who, for reasons of finance or convenience, attended a local two-year

college before transferring to a four-year university. Today, the “2-plus-2” or classic transfer pattern (also known as vertical) is only one of many. As our society has become increasingly mobile, other transfer patterns began to emerge (Bradburn & Hurst, 2001; Lee & Frank, 1990; Palmer, Ludwig, & Stapleton, 1994).

Lateral transfer (also known as horizontal transfer) - those who transfer from a two-year to another two-year school or from a four-year to another four-year school – represent 32% of the transfer student population (Cataldi & Cataldi, 2005). Half of them (16% overall) transfer from a 2-year college to another 2-year college; and the other half (16% overall) transfer from a 4-year university to another 4-year university (Adelman, 1999; Ashby, 2005; Cataldi & Cataldi, 2005). According to Bogart and Price (1993) students use lateral transfer as a way to meet their own specific educational needs prior to transferring to the university where they intend to complete a baccalaureate (Bogart, Price, & Arizona State Board of Directors for Community Colleges, 1993; Cejda, 1999).

Reverse transfer - those who transfer from a four-year to a two-year school - represent an estimated 16 to 20% of community college enrollments nationwide (Townsend, 2000; Winter, Harris, & Ziegler, 2001). An early nationwide study (Heinze & Daniels, 1970) found that 9% of all community college students were reverse transfers. A decade later, Hudak reported a reverse transfer population of 16%—an increase of 7% in just over a decade (Hudak, 1983). Other studies conducted during that timeframe estimated the reverse transfer population to range between 5 and 13% (Hogan, 1986; Mitchell & Grafton, 1985; Ross, 1982; Slark, 1982). In a more recent five-year study conducted by the National Center for Education Statistics it was found that 13% of students who started at a four-year college in 1989-1990 transferred to a “less than four-year institution” (National Center for Education Statistics, 1995). Several studies conducted through the 1990’s reported little growth in the reverse transfer rate. However, because many community colleges may not identify all of the reverse transfer students in

their populations, it is believed that these students may well be undercounted (Delaney, 1995; Quinley & Quinley, 2000; Townsend & Dever, 1999). It should also be noted that recent research suggests that this population represents two distinct, and divergent, groups: undergraduate reverse transfer students and post-baccalaureate undergraduate reverse transfer students (Townsend & Dever, 1999). Whereas research in the 1970's and 1980's focused more on the undergraduate reverse transfer student, attention in the 1990s shifted to post-baccalaureate undergraduate reverse transfer student. The only statistic about the extent of the post-baccalaureate undergraduate reverse transfer student nationally is from the High School and Beyond / Sophomore cohort (1980–1993) database. Adelman found that 1.8% of students in this database had earned eighteen or more credit hours at a community college after first receiving a baccalaureate degree (Adelman, 1998). However, the American Association of Community Colleges has estimated the post-baccalaureate undergraduate reverse transfer student population to be between 10 to 20 percent of current community college students (as cited in Gose, 1997).

Swirling transfer (also known as double-dipping) – those who are co-enrolled in two or more schools simultaneously – was first coined by Alfredo de los Santos and Irene Wright in 1990 to characterize the back-and-forth, multi-institutional attendance pattern displayed by many transfer students (Borden, 2004; de los Santos & Wright, 1990). Less than 15 years later, 15% of enrolled seniors reported that they had taken courses from another institution to complete their degree requirements sooner; and 17% had done so to take easier required courses. (The National Survey of Student Engagement, 2005).

Gypsy transfer (also known as multiple transfer) – Kearney, Townsend, and Kearney coined the term “multiple transfer” to represent bachelor's degree graduates who attended three or more institutions (Kearney et al., 1995). Adelman (2003) and McCormick (2003) identified nearly a dozen different educational pathways involving multi-institutional attendance. These pathways range from “excursions,” in which

attendance at the second or third institution is temporary and includes only a small number of credits, to “migration,” which involves a permanent transition from one school to another across the two-year and four-year sectors. In some cases, students alternate attendance among multiple institutions (known as “fragmentation,” “discovery,” or “rebounding”), while in others, they attend schools in sequence (called “serial transfer”) (Adelman, 2003; McCormick, 2003). Unfortunately, regardless of the pathway, research indicates that attending multiple institutions is negatively correlated with completion of a bachelor’s degree. (Adelman, 1999; Cataldi & Cataldi, 2005). Adelman (1999) further reported that the odds of receiving a bachelor’s degree were reduced by nearly half if a student attended multiple institutions. On a cautionary note, “multiple transfer” is inconsistently defined in the transfer literature. Much of the research on students who attend multiple institutions has focused on those who make a permanent transition from one institution to another – in other words, only two schools are involved (Bradburn & Hurst, 2001; McCormick & Carroll, 1997). In *“The Road Less Traveled: Students Who Enroll in Multiple Institutions”*, students who have attended two institutions are included in the research sample, though the data do identify those students who have attended more than two institutions.

Regardless of the transfer pattern – classic, lateral, reverse, swirling, or gypsy - the related issues associated with serving transfer students are challenging. The 2002 National Survey of Student Engagement (NSSE) found that transfer students “are generally less engaged across the board in learning activities.” (Hayek, 2002). And, transfer students are less likely to graduate with a bachelor’s degree (Berkner et al., 2002). Many of these students enter with significant at-risk factors, e.g., lapse in time prior to entering college, GED or other diploma alternative, part-time status, or poor high school academic preparation (Greene & Greene, 2002).

One of the barriers that students experience is the actual transfer of credit hours. Brint and Karabel (1989b) cited evidence that four-year institutions are less willing to admit community college transfers and prefer to admit freshmen, especially if the transfers are from vocational programs and/or largely minority community colleges. Other barriers encountered by transfer students at the four-year school include the practice of admitting transfer students but not offering financial aid packages at a similar level to new freshmen and continuing students and denying admission based on insufficient room in the major desired. In fact, a sizeable number of transfer students lose credits when transferring to the senior institution (Cohen & Brawer, 1996). Richardson and Bender (1987) reported from a study of nine urban universities that among community college transfer students, 58% reported losing credits and 29% reported losing 10 or more credits. Also, 25% indicated that even when given credit, the courses were not accepted towards their majors. For 11% this loss represented 10 or more credits in their major. The potential loss of a full semester's coursework is obviously a major barrier to successful transfer.

After transferring, the academic performance of transfer students remains hard to predict and can fluctuate greatly. According to Laanan, "Even with the abundance of research, conflicting results have been reported, ranging from the drop in GPA, called transfer shock, to an increase in GPA after transfer, sometimes called transfer ecstasy" (Laanan, 2001, p. 7). Furthermore, while senior transfer students may "appear to be performing academically on par with non-transfer students in that they report comparable grades and similar degree of academic challenge" (Laanan, 2001, p. 22); they were less involved in the other four (of five) benchmarks of positive student engagement: active and collaborative learning, student-faculty interaction, enriching educational experiences, and a supportive campus environment (The National Survey of Student Engagement, 2005).

With more students expected to enter 4-year universities via community colleges, many receiving institutions are re-examining their recruitment and retention efforts, including orientation, mentoring, advising, scholarships, and residential housing. However, ensuring transfer students' success by providing appropriate interventions can be a challenging endeavor. Hughes and Graham (1992) identified class attendance at the community college as the sole variable predictive of the academic success rate of students who transfer, while other studies have identified several other variables, including educational aspirations, involvement on campus, quality time with faculty, external factors including jobs and families, socioeconomic background, personal adjustment, the availability of learning communities, and campus climate (Hughes & Graham, 1992; Laanan, 2001; National Survey of Student Engagement, 2002). Obviously, the 4-year university, in and of itself, has limited ability to affect many of these conditions.

Therefore, two-year institutions must also focus their attention on the transfer function in an effort to enhance opportunities for their students' success after they transfer (Gose, 1997) and to increase the number of their students who earn a baccalaureate degree (Berkner et al., 2002). The challenge for two-year institutions is to facilitate transfer for those students who wish to do so, and to prepare them to make the transition successfully. Greene and Greene (2002) suggest that "if we have to choose one word and one strategy that matters most for retention, it is counseling...[including] mental health services, financial aid advising, career and graduate placement counseling, internship selection, course and major advising, and residential life improvement" (Greene & Greene, 2002, p. 22).

Not surprisingly, it is unlikely that any one entity can solve the problem alone. Research suggests that collaborative efforts between institutions are essential, including such initiatives as enhanced communication between sending and receiving schools, the

presence of transfer specialists on both campuses, and articulation agreements. Course-based (as opposed to student-based) transfer evaluations (Quanty, Dixon, & Ridley, 1999) and statewide performance norms for institutions as they pertain to articulation policies (Wellman, 2002) present opportunities for improving student transfer rates.

Admittedly, the transfer process is complex, involving the sending institution, the receiving institution, and the student. “While we know much about transfer students, much remains to be learned. We can only hope that the transfer phenomenon has become sufficiently important to postsecondary education that research in new and broader areas will be undertaken” (Jacobs, 2004, p. 17). By understanding this group of students and by working to increase its retention and graduation rates, a more cost-effective and efficient higher education system can emerge.

The Role of the Institution in Transfer and Articulation

Early in the evolution of the two-year college, transfer to upper division schools was acknowledged as a key component of their mission. However, during the 1980s, the literature began to find evidence of a decline in the transfer function of community colleges, citing decreased enrollments in the liberal arts and increased enrollments in vocational programs (Barkley, 1993; Kissler, 1982; Knoell, 1982). Using data from a longitudinal study of 1972 and 1980 high school graduates in the United States, Grubb also found decreasing numbers of associate degree graduates who transferred into baccalaureate programs (Grubb, 1991). In 1989, Pincus and Archer declared that the transfer function was “in crisis” (p. 1). And in 1991, Pascarella and Terrenzini suggested that local, state, and federal entities should cooperate to improve the “apparently moribund transfer function of the two-year college” (p. 643).

The transfer and articulation problem has challenged higher education for decades. However, it was during the 1990’s that the reported ineffectiveness of the

transfer function caused two-year and four-year institutions to focus their attention on the issue (Dougherty, 1992; Wright, 1996). Unfortunately, the problem continued to escalate as students, more than ever before, gained unfettered access to a “supermarket” of courses, often without regard to geographic boundaries. According to David M. Moldoff, Founder and Chief Executive Officer of AcademyOne, a Pennsylvania-based company launched in 2004 to address how institutions can align curriculum models, improve coordination across institutional boundaries, and streamline college transfer processing, “Changing student attendance patterns, the availability of online courses, blended learning and other instructional options allowed students to customize course schedules that fit their personal schedules and family responsibilities - thereby contributing to the transfer challenge” (as cited in Munkittrick, 2005, p. 2).

Transfer and articulation issues, because they involve multiple institutions, are complex and controversial to address. Questions of academic freedom and integrity, course rigor, educational levels of instructors, differences in accreditation standards, and “turf” disputes often lead to adversarial relationships. Articulation requires negotiation and perseverance and often reflects the commitment of one persistent individual or department. It is time-consuming and demanding to set up an initial agreement; and difficult to maintain its accuracy and currency over time. Therefore, effective transfer remains a function of both sending and receiving institutional policies, practices, and culture (Kinnick & Kempner, 1988); and requires institutions to work together cooperatively to facilitate early academic advising and the movement of students from one institution to the other (Zamani, 2001).

The history of published material on transfer and articulation describes many types of transfer arrangements, ranging from simple program-specific agreements to complex documents involving many types of transfer applicants and a wide variety of educational and non-educational organizations (Kintzer, 1996). However, many of these

agreements raise as many questions as they answer; questions regarding requirements for transfer students versus native students, access to limited program areas at the four-year institution, loss of credit due to attendance at a two-year institution, and transcript evaluation inconsistencies.

Transfer and articulation policies reflect core values in American higher education and beliefs about who should have access to higher education opportunities (Barry & Barry, 1992). Unfortunately, the literature indicates that questions regarding the focus and quality of a community college education still exist. Several research studies conducted over a 25-year period found that the quality of community college education was and continued to be controversial and widely debated (Bender & Ross, 1997; Brint & Karabel, 1989b; Carlan & Byxbe, 2000; Cohen, 1989; Dougherty, 1994; Parnell, 1986; Susskind, 1997; Zwerling, 1976, 1986). McGrath and Spear (1991) chronicled a crisis resulting from a lack of academic rigor in the community college classroom. Brint and Karabel (1989b) argued that the community college was not a springboard to four-year institutions but instead curbed ambition and diverted students from attending four-year colleges. Vaughan (1992) found that community college faculty were regarded as inferior educators because four-year college faculty commanded more respect as scholars than did two-year college faculty.

Not surprisingly, it was also reported that bias in favor of native students and against transfer students existed in four-year institutions (Ignash, 1993; Prager, 1991; Williams, 1992). Furthermore, Prager (1991) found that prejudice against transfer students existed even when the student had attended a two-year branch campus of a four-year university. She discovered that internal transfer was affected by many of the same biases that affected the relationship of two- and four-year institutions, including elitist judgments about two-year students and programs, enrollment caps favoring baccalaureate-track students, subjective transcript evaluations, and capricious rulings on

program completion requirements. Prager (1991) further noted that some colleges endorsed transfer-inhibiting practices related to articulation, including: failure of those in authority to enforce articulation policies; forcing branch campus students to reapply for admission; or requiring curriculum sequences at the two-year campus to be similar, if not identical, to the first two years of the four-year track. As an example, in 1993, Pitzer College, citing budget constraints and lack of adequate funds, declined to provide financial aid to any student transferring in from another college (Chronicle of Higher Education, 1993).

Another concern for students who transfer to four-year institutions pertains to “limited access” programs where the number of qualified applicants exceeds the number who can be enrolled. The University of Florida, for example, admitted 51.1% of its native students but only 26.9% of community college transfer students into limited access programs. Admissions figures for students meeting or exceeding minimum requirements were 95% for native students and 86% for associate degree transfer students, but native students were 2.74 times more likely than transfer students to be admitted even when they did not meet minimum program standards (Williams, 1992).

But the challenges don’t stop there. The AcademyOne Advisory Council, an advisory and advocacy group comprised of distinguished leaders in higher education who are knowledgeable, innovative, and passionate about transfer issues (AcademyOne Inc., 2004), identified several other barriers to institutional acceptance and adoption of transfer-friendly approaches, including:

- Enrollment Erosion: Many four-year institutions fear that if it is too easy for students to begin their education in a community college, many more will choose to do so making it more difficult to meet their freshman and sophomore enrollment goals.

- Curricular Alignment: Some courses taken at the community college (science courses in particular) do not universally apply to all programs offered by the four-year university; especially if the course is considered a required course in the program. For example, biology may be accepted by the Department of Social Sciences, but not by the Department of Environmental Sciences. Also, a three-credit science course will not fulfill the requirement for a four-credit science w/lab course.
- Specialized Accreditation: Several program-specific accreditation associations have restrictions that prohibit schools from offering (and therefore accepting) major courses delivered within the lower division.
- Agreement Maintenance: Each articulation agreement is institution-specific and requires considerable time and effort to negotiate thereby constraining the number of agreements that an institution can, or wants to, establish. Thereafter, each agreement requires annual review because institutions frequently review their courses and there is no vehicle for communicating any changes to the other participating institutions. (Applegate et al., 2006)

Implementation of best practices for the transferability of courses takes place at the institutional level. However, aligning transfer articulation policies and practices remains a struggle between many two-year colleges and four-year universities as they strive to serve the academic and career aspirations of community college students (Townsend, 2002).

In *Transfer Making it Work: A Community College Report*, recommendations were presented for strengthening transfer programs. First, key administrators and faculty from two- and four-year colleges should meet periodically to discuss curriculum, teaching strategies, and outcomes. Second, as a part of a continuing process, articulation agreements should be developed by both faculty and administrators at participating

institutions and should be communicated to all faculty, students, and counselors. Third, two- and four-year colleges should encourage state and local coordinating and governing boards to adopt policies that guarantee places in four-year colleges for two-year graduates. Fourth, community colleges should communicate relevant data to four-year receiver colleges so that they may identify and recruit students for transfer. Fifth, performance data from four-year receiver colleges should be shared with two-year feeder colleges. Sixth, community college catalogs should identify transfer courses. Seventh, two-year and four-year colleges should exchange faculty and staff, particularly in transfer-related courses. Finally, students should be encouraged to take lower division courses at four-year colleges while enrolled at a two-year college. (Donovan, Schaier-Peleg, & Forer, 1987).

In an effort to become “transfer-friendly”, many institutions throughout the United States adopted strategies to make the transfer process more transparent to the student. (*College Credit Mobility: Can Transfer of Credit Policies be Improved?*, 2005). From their experiences, much can be learned about the advantages and subsequent challenges associated with implementing a particular transfer strategy. A few of the most common include the use of articulation agreements, transfer course databases, common core (block transfer), transfer guides, and transfer portals.

Articulation agreements are custom arrangements that have been established on a course-by-course, department-to-department or institution-to-institution basis. These voluntary agreements between two-and four-year institutions are not new. In fact, they have existed between some institutions for forty years or more (Bender, 1990). However, there has been an increase in the use of formal articulation agreements between community colleges and universities – in some cases because of the intervention of state boards of higher education. Common characteristics of these agreements include a list of transferrable general education courses, identification of conditional admissions

requirements, and notification of advising resources that are available to the student. One long-standing example of this type of arrangement can be found in Arizona. Maricopa Community College System and Arizona State University have negotiated mutual interdependence. The Maricopa Community Colleges rely on Arizona State University to provide opportunities for their graduates to complete baccalaureate degree programs, and Arizona State University relies on the Maricopa Community Colleges to prepare transfer students for enrollment in their upper-division programs (Maricopa Community Colleges, 2007). The challenge associated with these types of agreements is that they are almost always institution-specific and therefore require considerable time and effort to negotiate. Once negotiated, each agreement requires annual review because institutions frequently revise their curriculum and there is no vehicle for quickly and reliably communicating those changes to the other participating institutions. Ultimately, the time and effort needed to negotiate and manage these agreements results in an arbitrary constraint on the number of agreements that an institution can, or wants to, establish.

Transfer Course Databases are used by some higher education institutions to document the courses that have been “*accepted*” from other institutions. The intent is to make the evaluation of future transcripts that contain the same courses easier and more consistent. Arizona State University developed ACETS (Arizona Course Equivalency Tracking System) to allow sending institutions, such as the Arizona public community colleges, to submit course equivalency request forms, notifications of editorial changes, and course deletions directly to ASU (Arizona State University, 2007). Texas State University created an automated system that allows admissions counselors to submit electronic transcripts for review directly against their course equivalency database. And the University of Cincinnati developed a course equivalency routing system that lets admissions counselors to send equivalency proposals to faculty for evaluation, and then documents those decisions in an equivalency database (Munkittrick & L'Orange, 2006).

While these efforts are commendable, they fail to achieve their intended results because a) the evaluation occurs after the student submits a transcript, providing no advising capabilities directly to the student; b) the courses in the database come from transcripts and are therefore representative of college curricula from which the institution typically receives its transfer students. If a student doesn't come from one of those schools, then a custom evaluation is still necessary; and c) if changes to a course occur (i.e., numbering, pre-requisites, course description), there is no proactive notification to the university and therefore, course evaluations can become out-of-date and inaccurate. In addition to the barriers identified above, these technologies can be expensive to build and maintain. And typically, their utility is confined to the institution that funded the technology and therefore, does not encourage or support participation from other institutions.

Common Core refers to a common set of courses designed to transfer “as a whole” to fulfill specific graduation requirements at a prospective institution that recognizes the “core”. As a general rule of practice, a common core fulfills the general education component of the receiving institution’s academic requirements. In some cases, the completion of an Associate’s degree is recognized by a four-year university in much the same way as a common core and accepted in lieu of the first two years of study. However, unless pre-negotiated, obtaining an Associate’s degree does not usually guarantee junior standing. Even though it is reasonable for a student to assume that obtaining an Associate degree would result in junior standing at a four-year institution, it is usually not the case. To eliminate the confusion, Florida institutions were among the first to ensure transfer and full acceptance of an Associate degree awarded by the state’s community colleges. Transfer agreements based on the attainment of the Associate degree were expected to simplify the articulation process for all involved. However, the arrangement did not eliminate two major problems. First, many professional programs, such as engineering, had prerequisites that had to be completed in order to receive junior

standing. Those courses were not part of the community college curriculum, thus reducing the value of the guarantee that receipt of the Associate degree appeared to offer. The second problem was the increased number of students with Associate of Applied Science degrees who wished to complete Baccalaureate degrees. The agreements governing transfer and the acceptance of credit were not applicable to students with AAS degrees except for the general education portion of their programs, and therefore those students often lost credits when they transferred. In addition to the challenges that Florida experienced, other problems can be encountered with this approach. They include such issues as: a) the effectiveness of a common core is directly affected by the number of four-year institutions who recognize it, b) it is typically limited to a 2-year to 4-year transfer pattern, c) it does not translate across state boundaries, d) if course changes aren't regularly communicated, the curricula quickly becomes stale and outdated, and e) if students don't complete the core in its entirety, a custom evaluation of the student's transcript will still be required (Applegate et al., 2006).

Transfer guides are a vehicle for describing transfer requirements and helping students navigate the transfer process at a specific institution. They are often available for download from a school's website, or can be picked up from the school's admissions office. Wichita State University produces a transfer guide for each of the twenty-two community colleges located in the state of Kansas. On average, each guide is thirty-two pages long and, among other information, identifies the lower division courses that can be taken and transferred to each of five different Baccalaureate degree programs. The guides are available on Wichita State's website and from the advising centers located at each of the twenty-two participating community colleges. In addition, Wichita State University will mail a copy upon request (Wichita State University, 2007). Transfer guides are an useful way to communicate admissions information to prospective transfer students. However, because of the nature of print media, transfer information –

particularly course equivalencies – can become quickly outdated and inaccurate. As an example, if a prospective transfer student visited the website of a major university in Washington to determine how a particular course would transfer; it was possible for that student to get three different answers. In a review of that university’s publicly available course equivalencies, it was discovered (though already known) that the information posted online in their Course Equivalency Tables, through their Washington Course Applicability System, and via their Transfer Admissions Planning Guide contained different sets of data which led to inconsistencies in the equivalency information being presented (Stanley, 2006). In addition to the difficulty in keeping transfer guides up-to-date, it is expensive to print, mail, and distribute multiple transfer guide versions. Also, they are time-consuming and labor-intensive to create and maintain.

Transfer portals are websites designed to provide prospective transfer students and other stakeholders with self-service access to an institution’s transfer resources and information. With the expanded use of technology and increased political pressure at the state level, a great deal of progress has been made by colleges and universities in the use of computers for the collection, storage, and analysis of transfer student data and related course and program information (Berman, Curry, Nelson, & Weiler, 1990; Newman, 1987; Rodriguez, 1994; Russell, 1999; Walleri, 1990; WICHE, 1985). For example, Miami-Dade Community College uses an Advisement and Graduation Information System (AGIS) to monitor students’ progress toward their degree goals and to alert counselors and students to changes in general education requirements. Additionally, many institutions throughout the United States use third-party systems such as the Course Applicability System (CAS) available from the Miami University of Ohio, or the Course Equivalency Management System (CEMC) offered by AcademyOne to provide their students and faculty with web-based access to course equivalency data. In spite of these efforts to provide real-time access to transfer information via the web, adoption is often

surprisingly slow. Barriers to better use of available technology may include the fear of counselors that they will be replaced or that their role will somehow be diminished by the technology. Or, it might be related to the perceived inadequacy of the student and course information stored in the databases and the resulting fear associated with misadvising a student (Applegate et al., 2006; D. M. Knoell, 1990). Furthermore, the value of the information is often dependent upon the number of institutions participating in the service. Obviously, the value of the “*network*” increases with the number of participating institutions. With that said, research indicates that institutions recognize that real-time access to transfer data provides important and convenient support for students who wish to understand the impact of various transfer options between and among institutions (Welsh & Kjørlien, 2001).

Although it is clear that two-year and four-year institutions are working to improve transfer, current literature suggests that the complexity of the transfer process may continue to get in the way of community college students attaining their baccalaureate degrees (Turner, 1992). Palmer stated that transferring “is a tough bureaucratic task” for students (as cited in Watkins, 1990, p. A37). Olivas notes that “negotiating transfer constantly appears to be an impediment to baccalaureate completion by students...” (1979, p. 177). Organizational theorists Pressman and Wildavsky (1973) document the fact that organizational processes often look simple and straightforward, but they can break down at any number of steps in the process. And as Cicarelli noted, “...lawmakers who seek to help students fulfill their educational aspirations with the least possible time and money may well intervene... if those who manage public institutions cannot solve the articulation problem, those who help finance them will” (1993, p. 2).

The Role of the State in Transfer and Articulation

According to the National Center for Public Policy in Higher Education “the policies of state government have historically been the foremost device for steering higher education in the U. S.” (Jones, Ewell, & McGuinness, 1998). But state legislators and academic leaders have not always agreed on the significant issues for higher education or on how those issues should be resolved.

Although transfer itself has been a long-standing issue in the history and mission of community colleges, state-level attention on transfer and articulation is relatively new (Bender, 1990; D. Knoell, 1990). Beginning in the 1980’s, increased state involvement and changes effected by governing and coordinating boards became key issues of concern in the governance, management, and leadership of American higher education institutions (Berdahl, 1987; Fincher, 1987). Primarily because of rising costs, minority access and affirmative action, and perceptions of declining quality in undergraduate education, the state’s role in higher education became a serious topic of discussion by state politicians, scholars, and practitioners (Bender, 1990; Hines, 1988). As a result, long-standing support for institutional autonomy began to erode under increased public demands for accountability (Berdahl & McConnell, 1994; Carnevale, Johnson, & Edwards, 1998).

Even through education professionals do not typically think of higher education in political terms, public higher education does, in fact, operate in a political environment. One group, consisting of faculty and professional staff, view transfer and articulation primarily as education processes for assisting students in their progress toward a baccalaureate degree. The other group, made up of legislators and education officials, are primarily interested in protecting the public’s interests. Whether transfer and articulation are viewed as issues in states’ overall efforts to restructure higher education, or as catalysts for “unleash[ing] a quiet revolution” in higher education systems (Schmidt, 1997), colleges and universities can expect increased attempts by legislators to regulate

transfer and articulation through public policies, not necessarily to advance or improve education per se, but to hold institutions accountable, to accomplish other social goals, and to use education as a means to satisfying constituents (Leslie & Routh, 1991; Mercer, 1994; Sabloff, 1997).

Driven primarily by financial, rather than academic interests, states are facing increased public demands to hold colleges accountable for productivity and efficiency of operations (Berdahl & McConnell, 1994). Taxpayers have recognized that without effective transfer and articulation policies, the public potentially pays twice for the same education (Bender, 1990; Chenoweth, 1998). The states' reactions to those demands for accountability resulted in the creation of various public policies designed to balance quality, diversity, and budgetary efficiency (Finifter, Baldwin, & Thelin, 1991). Specifically, legislatures enacted policies focused on improving student outcomes, reducing the need for remediation, and monitoring performance indicators for funding purposes (Carnevale et al., 1998). And in an attempt to further balance quality, access, and efficiency, many states initiated statewide transfer and articulation policies to encourage students to begin their education at lower-cost community colleges (Cohen & Brawer, 1996; Fountain & Tollefson, 1989; Mercer, 1992; Schmidt, 1997). In fact, "nearly every state can certify it has a policy statement on transfer of credit for students moving from two-year to four-year institutions" (Bender, 1990, p. 8).

Transfer rates, therefore, became one of the benchmarks for accountability in state funding. "Many legislators believe poor transfer and graduation rates are caused by students who lose ground because their credits do not transfer" (Cicarelli, 1993, p. 2). Therefore, they are creating formulas for reporting transfer rates and establishing performance indicators for assessing transfer student success (Kintzer, 1996).

Increased state involvement in higher education policy issues does not bode well for the traditionally autonomous institution. Despite higher education's voluntary efforts

at streamlining the transfer process, state legislators continued to be concerned about the transfer and articulation process. With state budgets tightening and with transfer students taking longer to graduate, constituents at all levels are increasingly concerned about the taxpayer price for the perceived inefficiencies of higher education. Ultimately, what were seen as unfair practices towards transfer students made their way into legislative hearings which resulted in articulation becoming a state level, public policy process (Bender, 1990).

So the question is no longer whether states will be more aggressive in encouraging transfer and articulation in higher education, but to what extent, in what form, and for whom. The impact on limited state budgets, the implications for the economic stability and competitiveness of the states, and the obligations of states to their citizens to guarantee educational opportunities are simply too urgent to delegate this responsibility to the ad hoc, accidental, voluntary arrangements that colleges may or may not entertain depending on their own particular interests or circumstances (Center for Community College Policy, 2000; Cohen & Brawer, 1996; Townsend & Twombly, 2001).

Researchers have suggested that more formalized state transfer and articulation policies lead to better transfer opportunities for students. The involvement of the state in transfer and articulation, according to Rifkin, not only assures better transfer opportunities for the students but also contributes to the improvement of the quality of education through the coordination of resources and the participation of each sector in the education process (Rifkin, 2000). Bender concurs, though he notes that development of a single articulation policy to cover all types of institutions is probably not possible. One confounding factor is the unique way in which each state administers its community college system. Some state systems employ consolidated governing boards (Alaska and Hawaii) or Boards of Regents (Georgia and Massachusetts) that are responsible for all

public postsecondary institutions. Other states such as Pennsylvania, Vermont, and Maine have little or no system authority at the state level (Bender, 1990).

Depending on each state's structure for governance and coordination of higher education and the place of community colleges in that structure, they have developed different approaches for addressing transfer and articulation issues. Keith (1996) examined historical documents and the legislative initiatives that established states' systems of community colleges and found that transfer opportunities (i.e., articulation agreements) are defined by the organization, governance, and coordination of the system. For example, if community colleges are viewed as extensions of high school, they come under local education authority; but if they are viewed as part of the higher education system, authority is passed to the state, and transfer and articulation can be centralized at the state level (Keith, 1996).

Across the nation, a majority of states have instituted policies to facilitate transfer (Education Commission of the States, 2001). Thirty-nine states were identified as having some form of legislation pertaining to the transfer of credit between postsecondary institutions, and forty states had established statewide articulation agreements. This is a marked increase over the eight states that had "formal and legally based guidelines and policies" and twenty-five states that had "state system policies" as reported by Kintzer in 1996 (Kintzer, 1996). In five short years, the number of states that had state system policies increased by fifteen.

At the turn of the century, two landmark studies were undertaken in an effort to better understand the role of state-level involvement on transfer performance. Ignash and Townsend based their study on a survey of existing state-level transfer programs in all 50 states. Wellman, wanting to dig a little deeper into cause-and-effect, selected six states that represented both ends of the spectrum for retention and degree completion as identified in *Measuring Up 2000*, the state-by-state report card for higher education

released by the National Center for Public Policy and Higher Education (National Center for Public Policy in Higher Education, 2000).

Ignash and Townsend (2000) found that a majority of statewide general education policies were initiated between 1985 and 1995, primarily to facilitate transfer between and among postsecondary institutions. Of those:

- Thirty-four of the 43 states responding to the survey reported as having some type of statewide transfer articulation policies in place.
- Nine states surveyed (Delaware, Maine, Michigan, New York, Pennsylvania, South Carolina, Tennessee, Texas, and Wisconsin) reported no statewide policies.
- Agreements in seven states (California, Connecticut, Florida, Idaho, Illinois, North Dakota, and Washington) included both public and private institutions.
- The top three states nationally in community college enrollments (California 20%, Florida 6%, and Illinois 6%) had statewide transfer policies in place.
- Six states limit transferability to the A.A. and only one state transfers A.A.S. degrees.
- Of the 33 statewide articulation agreements in effect in 1999, 11 cover transfer only from 2-year to 4-year institutions (Ignash & Townsend, 2000).

Wellman (2002) selected six states based upon their ratings on retention and degree completion measures. Three of the states selected received high grades on retention and degree completion (Florida, New York, and North Carolina) and three received low grades (Arkansas, New Mexico, and Texas). The research showed that there was little difference between the high performing and low performing states in many of their basic approaches to transfer policy. All gave considerable attention to the academic policy aspects of transfer, and had comparable policies in place concerning core curriculum, articulation agreements, transfer of credit, and statewide transfer guides

(including web-based catalogs). The key difference between the three high and low performing states seemed to be in the type of statewide governance structure for higher education. Arkansas, New York, and North Carolina had stronger statewide governance capacities. All of the high performing states did a better job of using data as a tool to improve transfer performance, including giving state-level feedback to campuses about their performance relative to their peers. As a result of this research, Wellman proposed the following best-practice recommendations:

- develop baseline information about statewide transfer performance,
- clarify state policy and plans for transfer, and set goals and measures for performance,
- identify and invest in core resources for transfer at the institutional level,
- perform statewide transfer policy audits, to ensure that policies are consistent and that performance measures do not inadvertently discourage transfer,
- make sure that articulation and credit transfer agreements are in place,
- focus state policy change on low-performing institutions,
- use financial aid as a tool to promote transfer; and
- include private institutions in transfer planning and performance accountability (Wellman, 2002).

Interestingly, Wellman's research, though 10 years after the fact, supports a 1990 report published by the American Association of Community and Junior Colleges (AACJC) that called on state legislators to require reports on transfer and articulation to:

- ensure that the intent of statewide policy is achieved,
- provide incentives for collaborative efforts between institutions to increase transfer rates of underrepresented groups,
- create comprehensive student information systems to support data exchanges and monitor student performance, and

- examine financial aid programs for transfer students to determine whether or not corrective action is needed (Bender, 1990).

Ultimately, effective policy-making requires good information. Although states are becoming more active in academic issues, “the systematic collection, storage, retrieval, and analysis, and dissemination of information has not been a high priority of legislative budgets... Although many states have recognized this problem, few have taken positive steps to solve it” (Bender, 1990). Even where states have access to student data and can monitor enrollments, transfers, and academic achievement, policy-makers have little or no knowledge of what works effectively from a state policy perspective (Bender, 1990; Prager, 1994).

Of course, state attempts to impose a system of public higher education poses a formidable confrontation with bureaucracy (Robertson & Frier, 1996). In a document edited for the American Association of Community and Junior Colleges, Bender (1990) explained why the phenomenon of transfer and articulation is so complex: “The nation’s 50 states are dissimilar in size, geography, economy, demographics, and postsecondary education delivery systems, yet they are often described as the same in generalizations or national norms reported by researchers, policymakers, and the national and local press.” (Bender, 1990). Because of this effort to “normalize” very unique and diverse experiences, studies of states’ efforts to address transfer issues through public policy have contributed little to an understanding of how those mandates actually work at the institutional level to ensure transfer opportunities for community college students (Bender, 1990; D. Knoell, 1990).

Finally, discussions that seem glaringly absent in the literature, are the inability for many state-specific transfer approaches to serve the needs of out-of-state students interested in transfer; and the inability of institutions to align their curricula with other institutions whose political or geographic constructs are different than their own. How

will states eliminate barriers of institutional type (2-year, 4-year, public, private, for-profit, nonprofit) and geographic location (state, regional, national, international)? In other words, once states have encouraged (or mandated) that the colleges and universities in each state cooperate and implement transfer-friendly policies and practices; who will make the states do the same?

Summary

It appears that American higher education has the transfer issue well in hand. In reality, the problem is only growing in its intensity, creating real issues for students and their parents, who see investments in time and financial resources being wasted when credits, which would appear to be fully transferable, are deemed not to be.

Many of the transfer practices that are currently in place are fragmented and isolated efforts – constrained by pre-existing policies and procedures. Postsecondary institutions, state governments, and the various education sectors within each state all play critical roles in solving the transfer problem, but there has been minimal effort to identify strategies that would facilitate interstate, or even international, transfer approaches. While there are many initiatives focused on student transfer, there is still a gap in transfer agreements between four-year to four-year institutions, between regionally and nationally accredited institutions, across state lines, and among for-profit and nonprofit institutions. Improving articulation to increase transfer is a complex task not likely to be resolved by state initiative alone – primarily because state policies ultimately are implemented at the system and institutional levels. The need is to develop sound collaborations among diverse colleges and universities, thus maximizing transfer of academic credit between programs, institutions, and from professional training experiences.

In 1999, a U.S. Department of Education report provided some interesting data, summarized by Adelman, where he stated, “Degree completion is the true bottom line for college administrators, state legislators, parents, and most importantly, students – not retention to the second year, not persistence without a degree, but completion” (p. V)

CHAPTER 3

METHODOLOGY

As discussed in Chapter 2, the transfer student's pre-college background characteristics, community college experiences, and university experiences play an important role in his or her successful degree attainment. According to Tinto (1975), there are three areas that are instrumental in student retention. He believed that student entry characteristics (e.g., family background, individual attributes, pre-college academic experience) and academic and social integration into the higher education institution were the keys to student retention.

Other researchers further tested Tinto's theory of student leaving (as did Tinto, 1982; Tinto, 1987, 1993), usually adapting the variable selection based on Tinto's work. Bean and Metzner (1985) developed a conceptual model of departure for non-traditional commuter students, citing the external environment as the main reason for non-traditional student attrition. Since non-traditional students and community college students are understood not to be as affected by social integration, new models for student attrition were developed that focused on some of the same variables (e.g., student entry characteristics and academic integration) and included a different set of variables.

Stahl and Pavel (1992) tested Bean and Metzner's (1985) model on community college students, and after adjusting the variables to fit the community college population, they created the community college retention model. Because the transfer student population includes students from all the sub-populations, many of the variables used by Tinto (1975), as well as those used by Bean and Metzner (1985) and Stahl and

Pavel (Stahl & Pavel, 1992) are important to any study of degree attainment of transfer students within the practical bounds of the particular study.

Introduction

The purpose of this research was to determine the extent to which completion of Temple University's Core-To-Core (C2C) articulation agreement requirements improved transfer students' likelihood to persist and to obtain a baccalaureate degree. Additionally, demographic variables (age, ethnicity, gender, financial aid eligibility), pre-enrollment variables (transfer GPA, transferable credits, educational intent, class standing, community college attended, and Core-to-Core participation), and enrollment variables (enrollment status, GPA trend, credits per semester, semester registrations, and final GPA) were examined in order to determine the extent to which they could be used as predictors of baccalaureate degree attainment.

The dependent variable in this study was the dichotomous outcome: either the students persisted and attained the bachelor's degree (or were still enrolled), or they were no longer enrolled at Temple University.

This study examined the following two groups of students:

- Persisters: students who received their bachelor's degree from Temple University by Spring 2008 or were enrolled at Temple University during the Spring semester of 2008;
- Non-persisters: students who had discontinued their enrollment at Temple University before or during the Spring semester of 2008 and before they had received their bachelor's degree.

Research Questions

The first set of research questions concerned the description of the persisters and non-persisters and the ways in which these two groups differed significantly according to each of the listed variables (see Tables 2 to 4) considered independently:

1. Do proportions of persisters and non-persisters differ significantly according to demographic variables of age, ethnicity, gender, and financial aid eligibility?
2. Do proportions of persisters and non-persisters differ significantly according to pre-enrollment variables of transfer GPA, transferable credits, educational intent, class standing, community college attended, and Core-to-Core participation?
3. Do proportions of persisters and non-persisters differ significantly according to enrollment variables of enrollment status, GPA trend, credits per semester, number of semesters, and final GPA?

The second set of questions treats predictors jointly within the categories of demographic, pre-enrollment, and enrollment variables.

4. Do demographic variables of age ethnicity, gender, and financial aid eligibility have significant effects on persistence at Temple University?
5. Do pre-enrollment variables of transfer GPA, transferable credits, educational intent, class standing, community college attended, and Core-to-Core participation have significant effects on persistence at Temple University?
6. Do enrollment variables of enrollment status, GPA trend, credits per semester, number of semesters, and final GPA have significant effects on persistence at Temple University?

Setting

The Core is Temple University's general education program for all undergraduate students. It guides students in taking a set of courses, many of them chosen by the student from lists of approved courses. Together, the components of the Core are intended to provide the intellectual skills and the knowledge needed for academic success in college and, in combination with the specialized skills and knowledge acquired in a major field of study, a useful education for a student's career, citizenship, and personal life.

The Core-to-Core transfer program allowed students who entered Temple in the Fall of 1998 or after who held an Associate in Arts (AA) or Associate of Science (AS) degree from one of the eleven participating community colleges to meet all University core requirements except for two writing intensive courses to be taken at Temple. The Core-to-Core transfer articulation agreement provided accurate curricular information for prospective transfer students and their academic advisors by lining up a community college's associate degree requirements with Temple University's baccalaureate degree requirements. It indicated which courses students needed to take during their associate program in order to be prepared for the Temple baccalaureate program into which they intended to transfer. Over the period of this study, transfer articulation agreements were negotiated and implemented with eleven of the local community colleges. They included Bucks County Community College, Burlington County College, Camden County College, Delaware County Community College, Gloucester County College, Harrisburg Area Community College, Lehigh Carbon Community College, Mercer County Community College, Montgomery County Community College, Northampton Community College, and Community College of Philadelphia.

This study included all the above-named community colleges that participated in Temple University's Core-to-Core transfer program. Table 1 indicates the year in which

each community college entered into the formal articulation agreement with Temple University.

Demographics of the Sample

Temple University was chosen as the source for the sample because of the number of transfer students received each year. Each year, more than half of Temple's approximately 5,000 incoming undergraduates are transfers from other colleges and universities. To better facilitate successful transfer, Temple University began, in 1996, to negotiate articulation agreements with several local community colleges. After 10 years of activity, Temple wanted to better understand what, if any, impact the presence of an articulation agreement had on the academic persistence of its transfer students.

The research population for this study was defined as students who transferred to Temple University between the Fall 1998 and Spring 2002 semesters from community colleges that participated in the Core-to-Core articulation agreement with Temple University (see Table 1). Students with credits from a non-participating community college, private school, proprietary school, or four-year university were excluded.

Data Sources and Collection Procedures

Although this study concerned students who transferred to Temple University between the Fall 1998 and Spring 2002 semesters, these students were not actively involved as participants in the data collection process. Rather, all data examined in this study were collected during the application and enrollment processes at Temple University, and then recorded in the student information system for use by admissions officers, advisors, financial aid and other service personnel.

Table 1. List of community colleges participating in Temple University’s Core-to-Core transfer program (N=11)

Name	Effective Semester
Bucks County Community College	Spring 1998
Burlington County College	Fall 1999
Camden County College	Fall 1999
Community College of Philadelphia	Spring 1999
Delaware County Community College	Spring 1998
Gloucester County College	Spring 2001
Harrisburg Area Community College	Spring 2000
Lehigh Carbon Community College	Fall 2002
Mercer County Community College	Spring 2000
Montgomery County Community College	Spring 1998
Northampton Community College	Spring 2000

Working with Temple University’s Institutional Research office, a query was developed to obtain data about the students who met the selection criteria as identified in the previous section. The Institutional Research office produced the study sample by exporting the requested data from the institution’s student information system during the Spring semester of 2008. The data were exported in three data files – demographic variables, pre-enrollment variables, and enrollment variables. Information selected from these data files were merged according to student identification number into a single data set for analysis.

Table 2 identifies the specific data elements required to complete the analysis for describing persisters and non-persisters, and for determining whether the demographic

variables of age, ethnicity, gender, and financial aid eligibility were reliable predictors of transfer students' baccalaureate degree attainment. The student date of birth was used for computing student ages at time of admission to Temple University. This was calculated by subtracting the year of birth (located in the demographic data file) from the year of admission (located in the pre-enrollment data file), information that was not available as raw data. Eligibility for financial aid was used as a proxy for economic status.

Table 2. List of demographic variables

Demographic Variables	Research Question	Description
Student Identification Number	1, 2, 3 4, 5, 6	A unique identifier that distinctly identifies individuals in a group and allows the researcher to merge the data files.
Gender	1, 4	Male / Female / Not Reported
Race/Ethnicity	1, 4	American Indian / Hispanic / Asian / Caucasian / African American / Non-resident Alien / Other
Date of Birth	1, 4	Used to determine student age at time of admission
Financial Aid Eligibility	1, 4	Surrogate for socio-economic status

Table 3 identifies the specific data elements requested to complete the analysis for describing persisters and non-persisters, and for determining whether the pre-enrollment variables of transfer GPA, transferable credits, educational intent, class standing, community college attended, and Core-to-Core participation were reliable predictors of transfer students' baccalaureate degree attainment.

In the initial data set, the academic program in which each student initially enrolled was identified within the variable referred to as educational intent. This resulted in 129 distinct responses, too many upon which to run a reasonable analysis.

Table 3. List of pre-enrollment variables

Pre-Enrollment Variables	Research Question	Description
Student Identification Number	1, 2, 3 4, 5, 6	A unique identifier that distinctly identifies individuals in a group and allows the researcher to merge the data files.
Community College Attended	2, 5	Name and FICE code for the community college last attended by each transfer student
Total credits accepted for transfer	2, 5	Total number of community college credits accepted by Temple University
Admission Date	2, 5	Semester and year of admission to Temple University
Class Standing	2, 5	Class standing awarded at time of admission
Core-to-Core Participation	2, 5	Identification of students who have completed requirements for transfer via Temple's Core-to-Core transfer program
Transfer GPA	2, 5	Cumulative GPA as recorded on the incoming transcript and entered into Temple's student information system
Educational Intent	2, 5	Temple College or School associated with the intended major declared at time of admission

Therefore, using information published by the Admission's Office on Temple's website, the college or school in which each program was administered was identified and

manually entered into the data set. For records that included undeclared as a response, if the college or school was identified, then that college or school was associated with the undeclared record. For records that did not have a pre-selected college or school, then the record retained its undeclared status. After completing this process, twelve colleges were associated with 128 of the programs. Undeclared was included as the thirteenth viable response in order to address the number of undeclared responses within the data set.

Table 4 identifies the specific data elements requested to complete the analysis for describing persisters and non-persisters, and for determining whether the enrollment variables of enrollment status, GPA trend, credits per semester, semester registrations, and final GPA were reliable predictors of students' baccalaureate degree attainment. Enrollment status was determined by dividing total credits attempted by the number of enrolled semesters. A student was considered full-time if the calculation equaled 11.5 or greater. A student was considered part-time if the calculation equaled 11.4 or less. GPA trend was determined by comparing transfer GPA (pre-enrollment variable) to final GPA (enrollment variable). If the transfer GPA was lower than the final GPA, this was considered an increased GPA trend. If the transfer GPA was higher than the final GPA, this was considered a decreased GPA trend.

Table 4. List of enrollment variables

Enrollment Variables	Research Question	Description
Student Identification Number	1, 2, 3 4, 5, 6	A unique identifier that distinctly identifies individuals in a group and allowed the researcher to merge the data files.
Semester of admission	3, 6	Semester and year of admission
Baccalaureate degree completion	3, 6	Indication of whether a student graduated from Temple
Date of degree	3, 6	Semester and year that the baccalaureate degree was awarded
Graduation major	3, 6	College or School associated with graduation major
Credits earned at Temple	3, 6	Includes total credits earned at Temple
Total credits earned	3, 6	Includes the total of earned Temple credits and awarded transfer credits
Total credits attempted	3, 6	Includes total credits attempted at Temple and also includes number of credits registered for by semester
Final GPA	3, 6	GPA as of graduation or last semester enrolled
Last semester completed	3, 6	Semester and year of last enrollment at Temple

Research Design and Data Analysis

This study was conducted using the causal-comparative research methodology. This design allowed the researcher to determine the cause or reason for any differences demonstrated between the two groups (persisters and non-persisters). Causal-comparative research involves starting with an effect and seeking possible causes by trying to identify cause-effect relationships (Gay, 1992). Causal-comparative research is used to study events that have already taken place, reflected in this study by the two groups' status as persisting (earned bachelor's degree) or non-persisting (no longer enrolled at Temple University). The effects, either persisting or not persisting, and the relationship the independent variables such as demographic characteristics, pre-enrollment descriptors, and enrollment descriptors had on the outcome were examined in this study.

The data for the fifteen predictor variables were analyzed using the Statistical Program for the Social Sciences (SPSS) for Windows. SPSS offers a variety of descriptive and inferential statistical techniques appropriate for educational research.

Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to describe the characteristics of persisters and non-persisters. One-way analysis of variance (ANOVA) was used to test the differences between group means.

Differences between persisters and non-persisters on the predictor variables were examined by the use of chi-square analysis, a nonparametric test that examines significant differences in frequency (counted vs. measured) data. "Chi-square is an interesting nonparametric test that allows you to determine if what you observe in a distribution of frequencies would be what you would expect to occur by chance" (Salkind, 2000, p. 256). "Chi-square is used to determine if the number of occurrences

across categories is random” (Salkind, p. 265). This is the appropriate test when the data involve nominal data categories as yes/no or male/female (Gay, 1992).

Since a combination of variables usually results in a more accurate prediction than any one variable, prediction studies often use multiple regression analysis (Gay, 1992). These tests use more than one variable, each known to be individually predictive, to make a more accurate prediction. According to Gay (1992), the use of multiple regression is valuable because of both its versatility and precision. It can be used with data representing any scale of measurement, and it can be used in causal-comparative research. It determines whether variables are related and to what degree they are related.

Logistic regression was used to deal with the dichotomous dependent variable in this study – the attainment of a bachelor’s degree. College outcomes such as persistence and graduation are the product of many factors in which both student and institutional characteristics interact (Pascarella & Terenzini, 1991), and these outcomes are naturally divided into two groups, such as attends or not, persists or not, attains a degree or not. Logistic regression is one of only a few statistical techniques that can be used to study the dichotomous nature of these types of outcomes measures (Cabrera, 1994). Logistic regression is used to deal with dichotomous dependent variables, such as the dependent variable in this study, attainment of a bachelor’s degree. One example of a study where logistic regression was used is the 1989 work completed by F. K. Stage validating Tinto’s model of college persistence (as cited in Cabrera, 1994). Logistic regression is a good technique of analyzing information to be used in policy questions with dichotomous outcomes with an emphasis on practical applications (Cabrera, 1994).

CHAPTER 4

RESULTS OF THE STUDY

This study focused on the examination of persistence and graduation rates of students who transferred using Temple University's Core-to-Core program as compared to those who transferred through the more traditional transfer process of transcript evaluation. Additionally, this study investigated the predictive value of demographic, pre-enrollment, and enrollment variables upon the persistence of transfer students at Temple University.

A chi-square analysis for each independent variable was performed to determine whether differences between the persister and non-persister groups were due to chance or whether any of the independent variables were statistically significant for predicting baccalaureate degree attainment. Significance at the .05 level was considered the base criterion for concluding that the difference between students who graduated and those who did not graduate was statistically significant.

Because of the large sample size ($N= 5419$), an effect size was also calculated in order to determine whether the differences between persisters and non-persisters were not only statistically significant, but also important or meaningful.

Finally, a step-wise multiple regression analysis for the set of variables was performed to determine the significance of the predictor variables upon achievement of a

baccalaureate degree. For this analysis, significance at the .05 level was considered the base criterion for entry of a variable into the regression equation.

Description of the Sample

The students of interest in this study were those who transferred to Temple University between the Fall 1998 through the Spring 2002 semesters from selected community colleges that participated in Temple University's Core-to-Core transfer program. This resulted in a sample set of 5419 students. The sample was collected by the Department of Institutional Research at Temple University and provided to the researcher in three separate data files. Upon receipt, the researcher used the student identification numbers to merge the data files into one comprehensive data set representing the demographic, pre-enrollment, and enrollment characteristics of the 5419 transfer students included in the study. Other than the student identification number, no personally identifiable information was included in the data set.

The status of the students in this study was as of the Spring 2008 semester when the data were extracted. All students in the study were admitted to Temple University having earned three or more credit hours at the sending community college. The data revealed that 1043 (19.2%) of these transfer students entered Temple University through one of the Core-to-Core transfer programs and 4376 (80.8%) entered Temple through the traditional transfer process of transcript evaluation.

Table 5 displays the age distribution of the study population at time of admission to Temple University. Ages in the sample ranged from a low of 17 to a high of 75. Six records did not report date of birth and therefore the age calculation could not be made

and was not included in the analysis. Of the 5,413 individuals remaining in the sample with data on age available, more than three-quarters, 83.6%, were represented in a thirteen-year span covering ages 17 through 30. More than half, 54.7%, fell within the age group from 21 through 25. The mean age for all transfer students within this study population was 25.5.

Table 5. Distribution of study population by age at time of admission (N = 5,419)

Variable	Category	<i>n</i>	%
Age	17 - 20	853	15.7
	21 - 25	2965	54.7
	26 - 30	718	13.2
	31 - 35	308	5.7
	36 - 40	216	4.0
	41 - 45	173	3.2
	46 - 50	111	2.0
	> 50	69	1.3
	Missing	6	.1
Totals		5419	100.0

Table 6 displays the distribution of the study population by gender and ethnicity. Over the four year period covering the Fall 1998 semester through the Spring 2002 semester, eight hundred twenty-four more women transferred to Temple University than men. In one case, gender was not reported and therefore was not considered in the

analysis. Over the same period, one thousand, two hundred and eighteen more Caucasian students than non-white students transferred to Temple University, representing 61.2% of the study population. Of the ethnicities identified in the non-white category, the next most strongly represented group was African-American, with 981 student transfers making up 18.1% of the total student transfer population.

Table 6. Distribution of study population by gender and ethnicity (N = 5,419)

Variable	Category	<i>n</i>	%
Gender	Male	2297	42.4
	Female	3121	57.6
	Missing	1	.0
Ethnicity	African American	981	18.1
	Asian American	392	7.2
	Caucasian/White	3318	61.2
	Hispanic/Latino	156	2.9
	Native American	14	.3
	Non-Resident Alien	83	1.5
	Other	454	8.4
	Missing	21	.4
Totals		5419	100.0

Table 7 displays the distribution of the study population by economic status. Financial aid eligibility was used as a proxy for economic status. For each student, eligibility for financial aid was determined by Temple University during the application process. For this population, greater than two-thirds (77.3%) of the students were eligible for financial aid. Only 1,228 of the 5,419 students, representing 22.7% of the study population, were not eligible.

Table 7. Distribution of study population by economic status (N = 5,419)

Variable	Response	<i>n</i>	%
Financial Aid Eligibility	Yes	4191	77.3
	No	1228	22.7
Totals		5419	100.0

Table 8 displays the distribution of the study population by transfer GPA. In almost one-third of the cases (31%), the transfer GPA was not recorded in the student's academic record. For those that were recorded (3740), more than half (65.2%) had transfer GPA's between 2.51 and 3.50. The lowest transfer GPA was 1.25; the highest 4.00. Not surprisingly, the 1.25 GPA was recorded on only one student record. After that, the next lowest GPA was 2.00, which appeared on 16 student records. The highest transfer GPA, 4.00, appeared on 66 student records. The mean GPA for the overall transfer student population (excluding missing records) was 2.97.

Table 8. Distribution of study population by transfer GPA (N = 5,419)

Variable	Category	<i>n</i>	%
Transfer GPA	1.01 – 2.00	17	0.3
	2.01 – 2.50	694	12.8
	2.51 – 3.00	1420	26.2
	3.01 – 3.50	1020	18.8
	3.51 – 4.00	589	10.9
	Missing	1679	31.0
Totals		5419	100.0

Table 9 displays the distribution of the study population by transfer credits. For this population, greater than half (58.7%) of the students transferred between 46 and 75 credits. This is not a surprising result given that most students transfer after their second year. The mean number of credits transferred (including those that transferred none) was 52. The mean number of credits transferred (excluding those that transferred none) was also 52.

Table 9. Distribution of study population by transfer credits (N = 5,419)

Variable	Category	<i>n</i>	%
Transfer Credits	0	10	0.2
	3 - 15	212	3.9
	16 – 30	657	12.1
	31 – 45	923	17.0
	46 – 60	1740	32.1
	61 – 75	1444	26.6
	76 – 90	323	6.1
	> 90	110	2.0
Totals		5419	100.0

Table 10 displays the distribution of the study population by educational intent. Educational intent was identified during the application process when the student entered an intended major on the application form. However, given the number of items this created in the data set, each major was manually associated with the School or College that administers the major. Based upon that adjustment, the data revealed that the Fox School of Business and Management generated the most interest (21.0%) among incoming transfer students. However, three schools out of the twelve included in the study served more than 50% of the total transfer student population. In order, those schools are The Fox School of Business and Management (21.0%), the College of Liberal Arts (16.6%), and the College of Education (15.3%).

Table 10. Distribution of study population by educational intent (N = 5,419)

Variable	Category	<i>n</i>	%
Educational Intent	Ambler College	52	1.0
	Tyler School of Art	228	4.2
	Fox School of Business And Management	1136	21.0
	School of Communications And Theater	597	11.0
	College of Education	831	15.3
	College of Engineering	147	2.7
	College of Health Professions	371	6.8
	College of Liberal Arts	900	16.6
	Boyer College of Music & Dance	39	0.7
	College of Science & Technology	547	10.1
	School of Social Administration	211	3.9
	School of Tourism & Hospitality Management	92	1.7
Undeclared	268	4.9	
Totals		5419	100.0

Table 11 displays the distribution of the study population by class standing. Since class standing is based upon the number of credits a student earns, it would be expected that this would align very closely with the results reported in Table 10. Therefore, it is no surprise that the vast majority of incoming transfer students received Sophomore or Junior standing at Temple University. Interestingly, a slightly higher percentage received Sophomore standing rather than Junior standing. Given that the mean number of transfer credits was 52, and that Junior standing is awarded upon earning 60 credits, it can be reasonably assumed that many students who received Sophomore standing were just a few credits short of receiving Junior status.

Table 11. Distribution of study population by class standing (N = 5,419)

Variable	Category	<i>n</i>	%
Class Standing	Freshman	738	13.6
	Sophomore	2508	46.3
	Junior	2008	37.1
	Senior	165	3.0
Totals		5419	100.0

Table 12 provides a breakdown of the number of students who transferred from each of the eleven community colleges participating in Temple University's Core-to-Core transfer program. The Community College of Philadelphia, Montgomery County Community College, and Bucks County Community College collectively accounted for 79.4% of the student transfers to Temple University.

Table 12. Distribution of study population by community college (N=5,419)

Name	<i>n</i>	%	\bar{x} per year
Bucks County Community College	1210	22.3	403.3
Burlington County Community College	70	1.3	23.3
Camden County College	182	3.4	60.7
Community College of Philadelphia	1969	36.3	656.3
Delaware County Community College	477	8.8	159.0
Gloucester County College	30	.6	10.0
Harrisburg Area Community College	123	2.3	41.0
Lehigh Carbon Community College	46	.8	15.3
Mercer County Community College	66	1.2	22.0
Montgomery County Community College	1125	20.8	375.0
Northampton Community College	121	2.2	40.3
Totals	5419	100.0	164.2

Table 13 displays the distribution of the study population by transfer program. For this population, greater than two-thirds (80.8%) transferred to Temple University using the more traditional process of transcript evaluation. Only 1,043 of the 5,419 students, representing 19.2% of the study population, took advantage of Temple's Core-to-Core transfer program.

Table 13. Distribution of study population by transfer program (N = 5,419)

Variable	Category	<i>n</i>	%
Transfer Type	Core-to-Core	1043	19.2
	All other transfers	4376	80.8
Totals		5419	100.0

The frequency data have provided a picture of the student who applied for transfer to Temple University over a four-year period starting with the Fall 1998 semester through the Spring 2002 semester. The typical student who transferred to Temple University previously attended the Community College of Philadelphia. She was a 25-year old Caucasian female. She was eligible for financial aid support (77.3%), and her program of interest was administered by the Fox School of Business and Management (21.0%). Her transfer GPA was 2.97, and she transferred 52 credits, giving her Sophomore standing at Temple University. And though the Core-to-Core transfer program was available to her, she chose to apply to Temple via the more traditional transfer process of transcript evaluation (80.8%).

At the time of her application to Temple University, it is of interest to note that according to Table 14, 3673 (67.8%) of the study population would eventually earn a bachelor's degree. The remaining 1746 transfer students (32.2% of the total sample) discontinued their enrollment at Temple University before receiving bachelor's degrees. Therefore, while not a perfect predictor, it appears that the typical transfer student to Temple – regardless of prior academic experience and/or mode of transfer - had almost a 70% chance of earning her baccalaureate degree.

Table 14. Distribution of study population by degree attainment (N = 5,419)

Variable	Category	<i>n</i>	%
Degree Attainment	Yes	3673	67.8
	No	1746	32.2
Totals		5419	100.0

Results of the Study

Because of the large sample size of this research (N = 5419), all of the statistical analyses have substantial power. However, the large sample size also means that the measures could be statistically significant without being meaningful. To compensate for this, analyses of statistical significance and of effect size are both presented.

The results are presented from a univariate perspective first with an investigation of each of the predictor variables individually. Following that analysis, a multivariate approach is used where the predictors are considered as a set through a logistic multiple regression.

Research Question 1. Do proportions of persisters and non-persisters differ significantly according to demographic variables of age, ethnicity, gender, and financial aid eligibility?

Table 15 displays the graduation status of transfer students by age range. Among persisters, the highest graduation rate, 71.7%, occurred in the 41 – 45 age range; the lowest graduation rate, 51.4%, occurred in the 46 – 50 age range. However, the majority of the study population (70.4%) falls between the ages of 17-20 (15.7%) and 21-25 (54.7%); both of which graduate at higher rates, 69.1% and 70.4% respectively, than the

67.8% average achieved by the total population. The mean age for transfer students who graduated was 25.0. The mean age for transfer students who did not graduate was 26.4.

Table 15. Comparison of graduation rates by age (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
17 – 20	264	30.9	589	69.1	853	15.7
21 - 25	878	29.6	2087	70.4	2965	54.7
26 – 30	259	36.1	459	63.9	718	13.2
31 – 35	113	36.7	195	63.3	308	5.7
36 – 40	90	41.7	126	58.3	216	4.0
41 – 45	49	28.3	124	71.7	173	3.2
46 – 50	54	48.6	57	51.4	111	2.0
> 51	38	39.6	31	60.4	69	1.3
Missing	1	16.7	5	83.3	6	0.1
Totals	1746	32.2	3673	67.8	5419	100.0

Table 16 displays the graduation status of transfer students by ethnicity. Among persisters, the highest graduation rate, 75.9%, occurred in the non-resident alien group, the lowest graduation rate, 21.4%, occurred in the Native American group. In addition to the non-resident aliens, the ethnic groups that surpassed the anticipated graduation rate of 67.8% were Caucasians (69.8%) and Other (68.1%). It is also evident from the data that, with the exception of the Native American students (which is a very small sample),

the graduation rates of the various ethnic groups differ by only a small degree with most of the groups graduating at around 70%.

Table 16. Comparison of graduation rates by ethnicity (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Native American	11	78.6	3	21.4	14	0.3
African American	382	38.9	599	61.1	981	18.1
Asian American	127	32.4	265	67.6	392	7.2
Hispanic	56	35.9	100	64.1	156	2.9
Caucasian	1000	30.2	2318	69.8	3318	61.2
Non-Resident Alien	20	24.1	63	75.9	83	1.5
Other	145	31.9	309	68.1	454	8.4
Missing	5	23.8	16	76.2	21	0.4
Totals	1746	32.2	3673	67.8	5419	100.0

Table 17 displays the graduation status of transfer students by gender. The highest graduation rate, 69.6%, occurred among female students; the lower graduation rate, 65.3%, occurred among male students.

Table 17. Comparison of graduation rates by gender (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Male	798	34.7	1500	65.3	2298	42.4
Female	948	30.4	2173	69.6	3121	57.6
Totals	1746	32.2	3673	67.8	5419	100.0

Table 18 displays the graduation status of transfer students by financial aid eligibility. As expected, the highest graduation rate, 71.7%, occurred in the population of transfer students who were eligible for financial aid; the lowest graduation rate, 56.2%, occurred in the population of transfer students who were not eligible for financial aid.

Table 18. Comparison of graduation rates by financial aid eligibility (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Eligible	1208	28.8	2982	71.2	4190	77.3
Not Eligible	538	43.8	691	56.2	1229	22.7
Totals	1746	32.2	3673	67.8	5419	100.0

In summary, the data indicate that the demographic characteristics of a transfer student with the greatest likelihood to graduate would be a Caucasian female, 25-years of age, who is eligible for financial aid.

Research Question 2. Do proportions of persisters and non-persisters differ significantly according to pre-enrollment variables of transfer GPA, transferrable credits, educational intent, class standing, community college attended, and Core-to-Core participation?

Table 19 displays the graduation status of transfer students by transfer GPA. Not surprisingly, the highest graduation rate, 76.4%, occurred in the GPA range of 3.51 – 4.00; the lowest graduation rate, 47.1%, occurred in the GPA range of 1.01 – 2.00. The mean transfer GPA for transfer students who graduated was 3.01. The mean transfer GPA for transfer students who did not graduate was 2.88.

Table 19. Comparison of graduation rates by transfer GPA (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
1.01 – 2.00	9	52.9	8	47.1	17	0.3
2.01 – 2.50	300	43.2	394	56.8	694	12.8
2.51 – 3.00	476	32.7	944	67.3	1420	26.2
3.01 – 3.50	274	27.7	746	72.3	1020	18.8
3.51 – 4.00	136	23.6	453	76.4	589	10.9
Missing	551	32.8	1128	67.2	1679	31.0
Totals	1746	32.2	3673	67.8	5419	100.0

Table 20 displays the graduation status of transfer students by number of transfer credits. The highest graduation rate, 76.8%, occurred when students transferred between 61 and 75 credits; the lowest graduation rate, 49.1%, occurred when students transferred fewer than 15 credits. The average number of transfer credits for those who graduated

was 52.1. The average number of transfer credits for those who did not graduate was 47.1.

Table 20. Comparison of graduation rates by transfer credits (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
0	7	70.0	3	30.0	10	0.2
3 - 15	113	50.0	99	49.1	212	3.9
16 – 30	323	41.5	334	58.5	657	12.1
31 – 45	357	31.6	566	68.4	923	17.0
46 – 60	499	24.0	1241	76.0	1740	32.1
61 – 75	345	23.2	1099	76.8	1444	26.6
76 – 90	75	24.5	248	75.5	323	6.1
> 90	27	43.8	83	56.2	110	2.0
Totals	1746	32.2	3673	67.8	5419	100.0

Table 21 displays the graduation status of transfer students by educational intent. For the purposes of this study, educational intent was identified as the College or School that administered the major selected by the transfer student during the admissions process. Based upon stated intent, the most popular programs were administered by Fox School of Business & Management (21.0%), the College of Liberal Arts (16.6%), and the College of Education (15.3%). However, the programs with the highest graduation rates were administered by the College of Education (74.2%), the School of Tourism & Hospitality (71.7%), the College of Liberal Arts (70.9%), and the Tyler School of Art

(70.6%). Based upon those two data points, it would appear that the College of Liberal Arts and the College of Education had the best record of accepting and graduating transfer students. The schools that graduated transfer students at lower rates than the 67.8% average achieved by all schools represented in this study were Ambler College (50.0%), Boyer College of Music & Dance (56.4%), the College of Science & Technology (59.8%), the College of Health Professions (62.0%), and the College of Engineering (67.3%). Given the specialized nature of these programs, it was not a surprising result that their graduation rates would be lower than those experienced by the other schools.

Table 21. Comparison of graduation rates by educational intent (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Ambler College	26	50.0	26	50.0	52	1.0
Tyler School of Art	67	29.4	161	70.6	228	4.2
Fox School of Business and Management	365	32.2	771	67.8	1136	21.0
School of Communications and Theater	180	30.2	417	69.8	597	11.0
College of Education	214	25.8	617	74.2	831	15.3
College of Engineering	48	32.7	99	67.3	147	2.7
College of Health Professions	141	38.0	230	62.0	371	6.8
College of Liberal Arts	262	29.1	638	70.9	900	16.6
Boyer College of Music & Dance	17	43.6	22	56.4	39	0.7
College of Science & Technology	220	40.2	327	59.8	547	10.1
School of Social Administration	64	30.3	147	69.7	211	3.9
School of Tourism & Hospitality Management	26	28.3	66	71.7	92	1.7
Undeclared	116	43.3	152	56.7	268	4.9
Totals	1746	32.2	3673	67.8	5419	100.0

Table 22 displays the graduation rates of transfer students by class standing. As expected, the highest graduation rate, 76.4%, occurred in the group of transfer students who received senior status; the lowest graduation rate, 50.5%, occurred in the group of transfer students who received freshman status. Also not surprisingly, graduation rates increased along with increases in class standing. Therefore, sophomores graduated at higher rates than did freshmen, and juniors graduated at higher rates than sophomores.

Table 22. Comparison of graduation rates by class standing (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Freshman	365	49.5	373	50.5	738	13.6
Sophomore	856	34.2	1652	65.8	2508	46.3
Junior	486	24.2	1522	75.8	2008	37.1
Senior	39	23.6	126	76.4	165	3.0
Totals	1746	32.2	3673	67.8	5419	100.0

Table 23 displays the graduation status of transfer students by community college attended. The highest graduation rate, 73.0%, occurred in the student population that previously attended Bucks County Community College; the lowest graduation rate, 55.7%, occurred in the student population that previously attended Burlington County Community College. However, the majority of the study population (36.3%) had previously attended Community College of Philadelphia. The transfer student population that previously attended the Community College of Philadelphia achieved a graduation rate of 64.7% as compared to the 67.8% achieved by the overall student transfer

population. In addition to Bucks County Community College, the community colleges attended by the transfer students who graduated at slightly higher rates than the average expected were Harrisburg Area Community College (70.7%) and Montgomery County Community College (70.3%). In addition to Burlington County Community College, the community colleges attended by the transfer students who graduated at slightly lower rates than expected were Camden County Community College (61.0%), Mercer County Community College (63.6%), and Northampton Community College (63.6%).

Table 23. Comparison of graduation rates by community college (N=5419)

	Did Not Graduate		Graduated		Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Bucks County CC	327	27.0	883	73.0	1210	22.3
Burlington County CC	31	44.3	39	55.7	70	1.3
Camden County College	71	39.0	111	61.0	182	3.4
CC of Philadelphia	696	35.3	1273	64.7	1969	36.3
Delaware County CC	158	33.1	319	66.9	477	8.8
Gloucester County College	10	33.3	20	66.7	30	0.6
Harrisburg Area CC	36	29.3	87	70.7	123	2.3
Lehigh Carbon CC	16	34.8	30	65.2	46	0.8
Mercer County CC	24	36.4	42	63.6	66	1.2
Montgomery County CC	333	29.7	792	70.3	1125	20.8
Northampton Community College	44	36.4	77	63.6	121	2.2
Totals	1746	32.2	3673	67.8	5419	100.0

Table 24 displays the graduation rates of transfer students who were admitted to Temple University through the Core-to-Core transfer program as compared to transfer students who were admitted to Temple University through a standard transfer process of transcript evaluation. The highest graduation rate, 80.8.7%, occurred in the population of transfer students who took advantage of Temple University’s Core-to-Core transfer program. Transfer students who did not participate in the Core-to-Core transfer program graduated at a much lower rate of 64.7%.

Table 24. Comparison of graduation rates by transfer program (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Core-to-Core Transfer	200	19.2	843	80.8	1043	19.2
All other transfers	1546	35.3	2830	64.7	4376	80.8
Totals	1746	32.2	3673	67.8	5419	100.0

In summary, the data indicate that the pre-enrollment characteristics of a transfer student with the greatest likelihood to graduate would be one who had a transfer GPA of 3.01, transferred at least 52 credits, previously attended Bucks County Community College, applied to Temple through the Core-to-Core transfer program, and selected a major administered by Temple’s College of Education.

Research Question 3. Do proportions of persisters and non-persisters differ significantly according to enrollment variables of enrollment status, GPA trend, credits per semester, number of semesters, and final GPA?

Table 25 displays the graduation rates of transfer students by enrollment status. The highest graduation rate, 74.9%, occurred in the population of transfer students who registered for twelve or more credits per semester (full-time enrollment); the lower graduation rate, 50.0%, occurred in the group of transfer students who registered for fewer than twelve credits per semester (part-time enrollment).

Table 25. Comparison of graduation rates by enrollment status (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Full-Time (12+ credits)	973	25.1	2902	74.9	3875	71.5
Part-Time (3–11 credits)	772	50.0	771	50.0	1543	28.4
Did not enroll	1	100.0	0	.0	1	0.1
Totals	1746	32.2	3673	67.8	5419	100.0

Table 26 displays the graduation status of transfer students by GPA trend as measured by comparing transfer GPA with final GPA. If the final GPA was higher than the transfer GPA, then it was considered an increase in GPA. If the final GPA was lower than the transfer GPA, then it was considered a decrease in GPA. Not surprisingly, the highest graduation rate, 80.7%, occurred in the transfer student population that experienced an increase in GPA; the lower graduation rate, 55.9%, occurred in the transfer student population that experienced a decrease in GPA.

Table 26. Comparison of graduation rates by GPA trend (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Decrease in GPA	844	44.1	1071	55.9	1915	35.3
Increase in GPA	352	19.3	1474	80.7	1826	33.7
Missing	550	32.8	1128	67.2	1678	31.0
Totals	1746	32.2	3673	67.8	5419	100.0

Table 27 displays the graduation status of transfer students by average number of credits registered for each semester. The highest graduation rate, 77.3%, occurred in the transfer student population that registered for 12 – 15 credits; the lowest graduation rate, 32.9%, occurred in the transfer student population that registered for 1 – 5 credits. These data are not surprising given the results on part-time and full-time enrollment status reported in Table 26. For transfer students who graduated, the average number of credits registered for each semester was 12.9. For transfer students who did not graduate, the average number of credits registered for each semester was 10.7.

Table 27. Comparison of graduation rates by average credits per semester (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
1 – 5 credits	367	67.1	180	32.9	547	10.1
6 – 11 credits	390	41.0	561	59.0	951	17.5
12 – 15 credits	920	25.4	2700	74.6	3620	66.8
16 - 19 credits	68	22.7	232	77.3	300	5.5
Missing	1	100.0	0	.0	1	.0
Totals	1746	32.2	3673	67.8	5419	100.0

Table 28 displays the graduation status of transfer students by final GPA. The highest graduation rate, 84.3%, occurred in the GPA range of 3.01 – 3.50; the lowest graduation rate, 4.2%, occurred in the GPA range of 1.01 – 2.00. Again, these were not surprising results. Greater than three-quarters of the transfer student population who graduated (76.2%) had achieved a grade point average of 2.51 or above. The average final GPA for transfer students who graduated was 3.11. The average final GPA for transfer students who did not graduate was 2.34.

Table 28. Comparison of graduation rates by final GPA (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
1.01 – 2.00	531	95.8	23	4.2	554	10.2
2.01 – 2.50	391	52.9	348	47.1	739	13.6
2.51 – 3.00	378	25.0	1136	75.0	1514	28.0
3.01 – 3.50	255	15.7	1371	84.3	1626	30.0
3.51 – 4.00	191	19.4	795	80.6	986	18.2
Totals	1746	32.2	3673	67.8	5419	100.0

Table 29 displays the graduation status of transfer students by a simple count of semester registrations. The highest graduation rate, 85.8%, occurred in the group of transfer students who registered for 5 or 6 semesters; the lowest graduation rate, 4.0%, occurred in the group of transfer students who registered for less than two semesters. The average number of semester registrations within the group of transfer students who graduated was six (6). The average number of semester registrations within the group of transfer students who did not graduate was four (4). Interestingly, the data also indicate that the more semesters it takes to graduate (beyond 8), the less likely it will be that the student graduates.

Table 29. Comparison of graduation rates by number of semester registrations (N=5419)

	Did Not Graduate		Graduated		Total Population	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
0 - 2	767	96.0	32	4.0	799	14.7
3 - 4	450	31.6	973	68.4	1423	26.3
5 - 6	271	14.2	1640	85.8	1911	35.3
7 - 8	149	16.7	745	83.3	894	16.5
9 - 10	65	24.0	206	76.0	271	5.0
11 - 12	25	28.1	64	71.9	89	1.6
13 - 14	12	57.1	9	42.9	21	0.4
15 - 16	4	50.0	4	50.0	8	0.1
17 - 18	3	100.0	0	0.0	3	0.1
Totals	1746	32.2	3673	67.8	5419	100.0

In summary, the data indicate that the enrollment characteristics of a transfer student with the greatest likelihood of graduating (persister) were those who registered for at least 13 credits each semester, resulting in full-time enrollment status. Persisters experienced academic success as indicated by incremental increases in GPA leading to a final GPA of 3.11 or better. Also, persisters enrolled for no more than six semesters, completing their degrees within 3 years of initial transfer to Temple University.

Chi-square Analyses

A chi square was computed on each of the demographic, pre-enrollment, and enrollment variables addressed in this study. As anticipated, the results indicated that, using the criterion of an alpha level of .05 or less, all the variables had statistical significance. To further understand whether the results were meaningful for decision-making, an effect size was calculated for each variable. Most researchers consider an effect that accounts for at least 10% (.10 or larger) of the variance to be meaningful since this corresponds to a medium to large effect according to Cohen's definitions (Cohen, 1988). Using Cohen's guide, an effect size of 0.00 to 0.04 was considered a small effect, 0.05 to 0.13 was considered a medium effect, and greater than 0.13 a large effect. The results of these calculation (chi square and effect size) are presented in Tables 31 to 33.

Research Question 4. Do demographic variables of age, ethnicity, gender, and financial aid eligibility have significant effects on persistence at Temple University?

As summarized in Table 30, the chi square computed on age was highly significant ($\Psi^2 = 57.79$, $p = .000$, effect size = .02), indicating a tendency for older students to graduate at a somewhat lower rate. However, the effect was small, accounting for only 2% of the variance. The chi square computed on ethnicity was also significant ($\Psi^2 = 44.82$, $p = .000$, effect size = .01) but accounted for only 1% of the variance. For this variable, the data revealed that all the ethnic groups, with the exception of American Indians, had graduated at comparable rates. The chi square for gender was significant as well, indicating that females were more likely to graduate than males, but the effect was the weakest in this category ($\Psi^2 = 11.47$, $p = .001$, effect size = .002). The chi square for financial aid eligibility was highly significant and approached an effect size considered meaningful ($\Psi^2 = 57.79$, $p = .000$, effect size = .06).

The demographic variable that had the strongest value in predicting likelihood to graduate was eligibility for financial aid. For this data subset, the chi square was computed as significant but only marginal in terms of meaningfulness.

Table 30. Chi-Square results for demographic variables (Persisters and Non-Persisters)

Demographic Variables	Chi-Square Results	Effect Size
Age	$\Psi^2 = 57.79, p = .000$	$r^2 = .010$
Ethnicity	$\Psi^2 = 44.82, p = .000$	$r^2 = .010$
Gender	$\Psi^2 = 11.47, p = .001$	$r^2 = .002$
Financial Aid Eligibility	$\Psi^2 = 57.79, p = .000$	$r^2 = .060$

$p = <.05$ $r^2 = >.10$ *Note.* Persisters: $n = 3673$; non-persisters: $n = 1746$

Research Question 5. Do pre-enrollment variables of transfer GPA, transfer credits, educational intent, class standing, community college attended, and Core-to-Core participation have significant effects on persistence at Temple University?

As summarized in Table 31, the chi square computed on transfer GPA was considered significant, revealing that the higher the transfer GPA, the greater the likelihood of graduating, but the effect was only marginal in terms of its meaningfulness ($\Psi^2 = 17.31, p = .002, \text{effect size} = .005$). For the pre-enrollment variable of transferred credits, the chi square was again significant, indicating that the greater the number of transfer credits, the greater the likelihood of graduation. This variable accounted for a much larger percentage of the variance ($\Psi^2 = 233.7, p = .00, \text{effect size} = .043$) than did

transfer GPA. For educational intent, the chi square was significant; revealing that students in the College of Education graduated at the highest rates; but with only a small effect in terms of meaningfulness ($\Psi^2 = 72.38$ $p = .000$, effect size = .013). As with the other variables, the chi square for class standing was significant; indicating a positive correlation between class standing and graduation, while also accounting for a larger percent, nearly 4%, of the variance ($\Psi^2 = 205.7$, $p = .000$, effect size = .038). The calculation for chi square for community college attended continued to indicate that, though significant, the effect was small, accounting for only 1% of the variance ($\Psi^2 = 51.69$, $p = .000$, effect size = .010). Finally, for Core-to-Core participation, the chi square was again significant, but still accounted for only 3% of the variance ($\Psi^2 = 153.52$, $p = .000$, effect size = .028); well under the 10% required to be considered meaningful.

For this data subset, the pre-enrolment variables that had the strongest value in predicting likelihood to graduate were transfer credits (4.3%), class standing (3.8%) and Core-to-Core participation (2.8%). However, all the variables within this data set had an effect size that was only marginal to small in terms of meaningfulness.

Table 31. Chi-Square results for pre-enrollment variables (Persisters and Non-Persisters)

Pre-enrollment Variables	Chi-Square Results	Effect Size
Transfer GPA	$\Psi^2 = 17.31, p = .002$	$r^2 = .005$
Transfer Credits	$\Psi^2 = 233.70, p = .000$	$r^2 = .043$
Educational Intent	$\Psi^2 = 72.38, p = .000$	$r^2 = .013$
Class Standing	$\Psi^2 = 205.70, p = .000$	$r^2 = .038$
Community College Attended	$\Psi^2 = 51.69, p = .000$	$r^2 = .010$
Core-to-Core Participation	$\Psi^2 = 153.52, p = .000$	$r^2 = .028$
$p = <.05$	$r^2 = >.10$	<i>Note.</i> Persisters: $n = 3673$; non-persisters: $n = 1746$

Research Question 6. Do enrollment variables of enrollment status, GPA trend, credits per semester, number of semesters, and final GPA have a significant effects on persistence at Temple University?

As summarized in Table 32, the chi square for enrollment status was significant; indicating that students pursuing full-time study graduate at higher rates than those who pursue part-time study. And for the first time, the effect approached a size considered meaningful, contributing to 8.2% of the variance ($\Psi^2 = 444.62, p = .000$, effect size = .082). Following the same trend, the chi square for GPA trend was also significant; resulting in a positive correlation with graduation, and accounting for 7% of the variance ($\Psi^2 = 259.10, p = .000$, effect size = .070). Likewise, the chi square for credits per semester equaled 382.01 and accounted for a little over 7% of the variance. ($\Psi^2 = 382.01, p = .000$, effect size = .071). As might be anticipated, the chi square calculated for

number of semesters was significant and accounted for the second largest amount of the variance among all of the variables investigated ($\Psi^2 = 1107.30$, $p = .000$, effect size = .212). Also, as might be expected, the final GPA was significant and accounted for 35% of the variance, well above the 10% considered meaningful ($\Psi^2 = 1895.3$, $p = .000$, effect size = .350).

For this data subset, the enrollment variables that had the strongest value in predicting likelihood to graduate were final GPA (35%) and class standing (21%); both of which were significant and meaningful. Additionally, GPA trend (7%) and credits per semester (7%), in addition to being significant, had effect sizes that came closer to being meaningful than any of the remaining variables in the overall data set.

Table 32. Chi-Square results for enrollment variables (Persisters and Non-Persisters)

Enrollment Variables	Chi-Square Results	Effect Size
Enrollment Status	$\Psi^2 = 444.62, p = .000$	$r^2 = .082$
GPA Trend	$\Psi^2 = 259.10, p = .000$	$r^2 = .070$
Credits/Semester	$\Psi^2 = 382.01, p = .000$	$r^2 = .071$
Number of Semesters	$\Psi^2 = 1895.30, p = .000$	$r^2 = .212$
Final GPA	$\Psi^2 = 1107.30, p = .000$	$r^2 = .350$
$p = <.05$	$r^2 = >.10$	<i>Note.</i> Persisters: $n = 3673$; non-persisters: $n = 1746$

In summary, Table 33 presents the complete list of all the demographic, pre-enrollment, and enrollment variables ranked in order of each variable's effect size, based upon the following scale according to Cohen's *d*:

- $> .14$ = large effect
- $.05 - .13$ = moderate effect
- $.00 - .04$ = small effect

Table 33. Ranked list of predictor variables based upon effect size

Variable	Effect Size	Effect Measure	Research Question	Comment
Number of Semester Registrations	.350	Large	3, 6	Students who register for 5-8 semesters have a higher probability of graduating. Registration for a smaller number or a larger number of semesters decreases graduation.
Final GPA	.212	Large	3, 6	The higher the GPA, the greater the likelihood of graduating. Students with a 2.00 GPA or less had nearly no chance of graduating.
Enrollment Status	.082	Moderate	3, 6	Students who pursued full-time study graduated at much higher rates than did those who pursued part-time study.
Credits per Semester	.071	Moderate	3, 6	The more credits registered for each semester, the greater the probability of graduating.
GPA Trend	.070	Moderate	3, 6	Students who experienced an increase in GPA over time graduated at much higher rates than did students who experienced a decrease in GPA.
Financial Aid Eligibility	.060	Moderate	1, 4	Students who are eligible for financial aid graduate at much higher rates than those who are not.
Number of Transfer Credits	.043	Small	2, 5	The greater the number of transfer credits, the greater the likelihood of graduation.
Class Standing	.038	Small	2, 5	The higher the class standing, the greater the likelihood of graduation.

Table 33. (continued)

Variable	Effect Size	Effect Measure	Research Question	Comment
C2C Participation	.028	Small	2, 5	Students who participated in Temple's Core-to-Core transfer program graduated at much higher rates than did those who did not.
Age	.020	Small	1, 4	Students younger than 26 have a higher probability of graduating. The likelihood of graduation seems to decrease with age, except for students in the 41-45 age range.
Educational Intent	.013	Small	2, 5	Students enrolled in the College of Education have the highest probability of graduating. Students enrolled in a specialized program (i.e., science, engineering, dance) have the lowest probability of graduating
Ethnicity	.010	Small	1, 4	Non-resident aliens have the highest probability of graduating, though they only make up 1.7% of the study population. Caucasians account for the majority of the study population and graduate at nearly the same rate. Native Americans are by far the least likely to graduate.
Community College Attended	.010	Small	2, 5	Students who previously attended Bucks County, Harrisburg Area, and Montgomery County Community Colleges have the highest probability of graduating. Students who previously attended Burlington County Community College have the lowest probability of graduating.

Table 33. (continued)

Variable	Effect Size	Effect Measure	Research Question	Comment
Transfer GPA	.005	Small	2, 5	There is a direct, positive correlation between transfer GPA and graduation. The higher the transfer GPA, the greater the probability of graduation.
Gender	.002	Small	1, 4	Females graduate at slightly higher rates than males.

Logistic Regression Analysis

As discussed in the beginning of the chapter, the final analysis to be conducted was a logistic regression where all the variables were treated as a group rather than evaluated one at a time. Before running the analysis, however, there were two decisions made to make the results more meaningful. First, some of the variables listed above, such as final GPA, can be reasonably assumed to have a strong correlation with graduation. Therefore including them in the analysis would produce a relatively meaningless result since it is obvious that students who have higher final GPA's are more likely to graduate. Additionally, a variable such as final GPA has very little predictive ability since, by its definition, it is a data point that occurs at the end of a student's academic career. Another example of a variable considered to have a strong correlation with graduation was transfer credits. It can be reasonably assumed that a student who transfers with almost all of the credits he or she needs to graduate is much more likely to graduate. Therefore, any variable that was considered strongly correlated with graduation was eliminated from the regression analysis. Using this reasoning, the

variables that were eliminated from analysis were transfer credits, final GPA, and number of semesters enrolled.

Second, some of the variables, by their nature, were complex and did not lend themselves to a logistic regression analysis. For example, the community college previously attended was considered a complex variable because it was nominal and had eleven possible responses. Another example was educational intent. Educational intent was also a nominal variable with thirteen possible responses. Therefore, any nominal variables that had more than ten possible options were eliminated from the regression analysis. The variables that were eliminated from analysis were community college attended and educational intent.

As a consequence of these decisions, the following variables were entered into the logistic regression as predictors:

- Gender
- Age
- Ethnicity (grouped into African American, Caucasian, Hispanic, Asian and Other)
- Financial Eligibility
- Transfer GPA
- Class Standing
- Enrollment Status (full time/part time attendance)
- GPA Trend (increase or decrease)
- Average credits per semester
- Core-to-Core Participation

The logistic regression was computed using the above variables as predictors, and graduation versus non-graduation as the criterion. The results were highly significant ($p = .000$) with 22.6% of the variance accounted for. The significant predictors in the

equation, in rank order, are listed below. Students who have a higher probability of graduating:

- (1) demonstrate a pattern of increasing GPA from initial transfer to graduation,
- (2) have a higher transfer GPA,
- (3) attend Temple on a full-time basis,
- (4) have taken advantage of Temple's Core-to-Core transfer program,
- (5) are eligible for financial aid, and
- (6) are female.

Summary

The data analyses presented a very detailed picture of the persisters and non-persisters who transferred to Temple University in pursuit of a baccalaureate degree. The frequency results were presented in ranges to allow a complete view of the two groups in order to see what the average student in each group looked like and also to see what the extremes looked like within each group. For example, the data revealed that for persisters the average length of time elapsed from first enrollment at Temple University to last enrollment (graduation) at the university was three years, but a look at the extremes showed that four persisters and seven non-persisters took from seven to almost eight years from first to last enrollment. Another example is provided by the number of transfer credits, where the credits transferred by most persisters and non-persisters ranged between 46 and 75. However, the extremes revealed that 99 persisters and 113 non-persisters transferred fewer than 16 credits, and 83 persisters and 27 persisters transferred more than 90 credits.

The chi-square analyses conducted to examine the data for significant differences revealed that all of the demographic, pre-enrollment, and enrollment variables played a role in predicting degree attainment. However, because of the large sample size, an analysis of effect size was also conducted in order to determine how meaningful the results were. That analysis revealed that, as a group, enrollment variables were the strongest predictors of baccalaureate degree attainment. However, the independent variables that were the most significant and the most meaningful were the number of semesters for which a student registered, final GPA, enrollment status (full-time/part-time), average number of credits per semester, GPA trend, and financial aid eligibility.

The logistic regression analyses examined the predictive factors for baccalaureate degree attainment after eliminating several variables due to multicollinearity concerns and due to the complexity introduced with variables containing multiple nominal responses. The results were highly significant with 22.6% of the variance accounted for, indicating that the students who have a higher probability of graduating demonstrate a pattern of increasing GPA from initial transfer to graduation, have a higher transfer GPA, attend Temple University on a full-time basis, have taken advantage of Temple's Core-to-Core transfer program, are eligible for financial aid, and are female.

CHAPTER 5

SUMMARY AND CONCLUSIONS

This chapter summarizes the findings described in Chapter 4. In addition, this summary will discuss the relationship of these findings to those reviewed in the literature. Recommendations for further research and policy considerations are included as well.

Summary of Findings

This study examined the records of 5419 students who transferred from one of eleven community colleges that had entered into an articulation agreement with Temple University between Fall 1998 and Spring 2002. These students included 3673 persisters, defined as students who had completed or were still enrolled in a baccalaureate program, and 1746 non-persisters, defined as students who had discontinued their enrollment at Temple University before completing a bachelor's degree. The purpose of the study was to examine the persistence and graduation rates of students who transferred using Temple University's Core-to-Core transfer program as compared to those who transferred through the more traditional transfer process of transcript evaluation. Additionally, this study investigated the extent to which demographic, pre-enrollment, and enrollment variables differed for persisters and non-persisters.

Data for this study were extracted from Temple University's student information system by the Department of Institutional Research and provided to the researcher for analysis. Data analyses (e.g., descriptive statistics, chi-square analyses, effect size, and

logistic regression analyses) provided a profile of persisters and non-persisters at both the univariate and multivariate levels.

Differences between transfer students who took advantage of Temple's Core-to-Core transfer program and those who did not

The primary intent of this study was to examine the impact of Temple's Core-to-Core transfer program on transfer success as measured by baccalaureate degree attainment. Students that took advantage of the Core-to-Core transfer program comprised 19.2% of the total transfer population used in this study. By definition, participation in Temple's Core-to-Core transfer program requires that the student has completed a pre-approved Associate's degree at the community college. However, this is a lower rate than that reported in other studies which have found that about one-third of students transfer with some type of community college degree (Cejda & Kaylor, 1997; McCormick & Carroll, 1997). With that said, this study did not address those students who may have transferred to Temple University with an Associate's degree in hand, but did not participate in the Core-to-Core transfer program. In those cases, a transcript evaluation would have been completed on a course-by-course basis, but there would not have been a notification on the student's record that an Associate's degree had been previously completed. This could be an issue for policy considerations. If this notification could be made on the student record, then a much clearer picture of the typical transfer student could be established and therefore, a better understanding of the pre-enrollment characteristics that lead to academic success.

For the entire cohort examined in this study, the drop-out, persistence, and graduation rates are consistent with literature findings (Cohen & Brawer, 2003b;

McCormick & Carroll, 1997). Of the total population, there was a 32% drop-out rate and approximately a 68% persistence rate. However, when examined by cohort, the students who participated in the C2C program experienced a much lower drop-out rate (19%), and a much higher graduation rate (81%). There was a statistically significant difference between transfer students who participated in Temple's Core-to-Core transfer program and those who did not on drop-out and graduation rates. These findings strengthen the notion that earning an associate's degree prior to transfer may contribute to persistence and baccalaureate completion. This is consistent with the findings of McCormick & Carroll's (1997) study of transfer students which found that the baccalaureate graduation rates of students with associate degrees were higher than those who did not complete transfer degrees.

Differences between demographic, pre-enrollment, and enrollment characteristics of persisters and non-persisters

When the demographic, pre-enrollment, and enrollment predictor variables were examined through the use of logistic regression, only six were strong enough to be selected through the regression analysis.

Among the four demographic variables tested, only gender and financial aid eligibility were strong enough to emerge as predictors. The persistence rate for females (69.6%) was slightly higher than for males (65.3%), though it was the least significant of the predictor variables. The persistence rate for students who were eligible for financial aid (71.2%) was much higher than for students who were not eligible for financial aid (56.2%). Again, though financial aid eligibility was selected as a predictor, it fell next to last in overall ranking among the six variables that emerged as predictors.

Among the three pre-enrollment variables tested, two of them - transfer GPA and participation in Temple's Core-to-Core transfer program - were strong enough to emerge as predictors. Research has shown that students with higher GPA's upon transfer to a university graduate at higher rates than those with lower GPA's (Egamba, 1997; Glass Jr & Harrington, 2002). In addition, students who transfer with community college degree have been found to have higher GPA's (Carlan & Byxbe, 2000). The results of this study confirmed both of these issues. Persistence was directly and positively related to transfer GPA. The higher the transfer GPA, the greater the likelihood of graduating. The lower the transfer GPA the lesser the likelihood of graduating. The point at which the difference between persisters and non-persisters became significant was in the 2.51 – 3.00 grade point range, and that difference continued to increase with each .5 point increase in the GPA. Transfer GPA was identified as the second strongest predictor variable. The persistence rate for students who participated in Temple's Core-to-Core transfer program (80.8%) was much higher than for students who did not (64.7%). According to the regression analysis, participation in Temple's Core-to-Core transfer program was the fourth strongest predictor of persistence.

Among the three enrollment variables tested, only enrollment status (full-time/part-time) and GPA trend were strong enough to emerge as predictors. Transfer students who pursued full-time study (74.9%) were much more likely to graduate than those who pursued part-time study (50.0%). On average, persisters needed six semesters, or 3 years, to earn their baccalaureate degree. Some studies have shown that community college transfer students can take up to eight years to finish the baccalaureate degree (Glass Jr & Bunn, 1998; Piland, 1995; Porter & Gebel, 1993). These delays may be attributed to a variety of goal setting strategies, fears, procrastination, or financial and administrative issues; but ultimately, every semester of delay puts a transfer student's likelihood to graduate at increased risk (Piland, 1995; Porter & Gebel, 1993). Enrollment

status was identified as the third strongest predictor variable. As for GPA trend, those students who experienced an increasing GPA over their academic career graduated at much higher rates (80.7%) than did students who experienced a decreasing GPA (55.9%). The logistic regression selected GPA trend as the strongest predictor of persistence and eventual attainment of a Bachelor's degree.

Overall, the data established that the transfer student who persisted at Temple University was a 25-year old Caucasian female. She transferred from Bucks County Community College with an Associate's degree, a 3.01 GPA and 52 transferrable credits. She took advantage of the Core-to-Core transfer program as a pathway to earning a degree from Temple's College of Education. Once at Temple, she pursued full-time study, demonstrated a pattern of increasing GPA, and earned her bachelor's degree within six semesters. This is consistent with research that indicates that transfer students who enter four-year institutions after earning an associate's degree are better able to sustain a higher GPA and therefore, more likely to persist (Diaz, 1992; Glass Jr & Harrington, 2002). The findings of this study imply that community college transfer students who earn a degree before moving to the university strengthen their likelihood of baccalaureate completion.

Overall Summary

Of course, there were students within the population who did not match the traits of the average persisters; they were much older (or younger), took more (or less) time to complete the degree, and maintained a higher (or lower) GPA. However, the persistence behaviors and patterns that emerged in relation to the group of transfer students who persisted and eventually earned a Bachelor's degree contain important information and implications for practitioners, policy makers, faculty members, researchers and students involved in the higher education transfer process.

Limitations

Throughout this study the demographic data that were collected was restricted to information that was readily available during the admissions process and recorded in Temple's student information system. Any information that might have been available by examining the original application or transcript, or by conducting student interviews, was not pursued. In some cases, the data gathered during the admissions process were not entered into the SIS, and therefore were not available to the researcher. When presenting this type of data in the results, the data were coded as missing. In other cases, the data that were captured or the way in which it was coded, changed over the period of time addressed in this study (e.g., birth date, ethnicity). For data that were affected by those changes, the Director of Institutional Research normalized the data so they were uniformly presented and could be evaluated consistently across the data set.

This study was limited to a student population that transferred to a single institution within a specific time frame. The results of the study should not be generalized to all institutions. Another limitation of the study was that the community colleges involved were not included in the process due to the decision to only use data collected by Temple University. Contacting each of the community colleges to gather enrollment data on the students could have provided a richer data set that might have provided a clearer picture of the transfer student's academic pathway from start to finish. A similar limitation was that the actual people involved were also not included in the process. The administration of surveys with practitioners and students would certainly shed light on the issues and concerns of the people involved in the transfer process. Further research using different methodologies would allow for the perceptions and

experiences of the academic process, as well as the effects of the outside environment on the persistence rates of transfer students to be included in an overall assessment of transfer retention. This study was not able to ascertain what happened to the non-persisters, other than knowing that at the end of the time frame of the study, the students had not re-enrolled or completed a bachelor's degree at Temple University.

Because this study was limited to available data provided by the student records maintained by Temple University, some information was missing that would have allowed for a clearer understanding of trends or theses presented. Although the use of existing records was extremely valuable due to the fact that the data was already collected thereby indicating its importance to the institution; the data collection procedure relied primarily upon manual data entry sometimes leading to flawed or inappropriate data (Hedrick, Brickman, & Rog, 1993). This study involved data collected at the receiving institution by different staff over an extended period of time, creating a complex data set that was not complete in every case. However, this study provided benchmarks in many areas that further research should build upon and clarify to inform future policy decisions.

The final limitation of the study was the research methodology. Causal-comparative research was used to study events that had already occurred and sought possible cause and effect relationships. The relationships identified are not necessarily causal, but the results can be used to facilitate decision-making for practitioners and policy planners.

Future Research and Policy Recommendations

1. Additional research using Temple's existing institutional data would be valuable with a focus on an in-depth analysis of a transfer student's academic progress once he or she has been admitted to Temple University. For example, it would be of interest to examine whether students changed majors between initial admission when educational intent was declared and last enrollment (drop-out or graduation). Knowing whether students changed majors, and how often, could be an important predictor that this study was not able to ascertain.

2. Of course, there is also an issue of concern regarding the generalizability of this study's results. Further study of the use of articulation agreements should be done across several institutions. In particular, it would be important to learn how well institution-specific articulation agreements can be established, maintained, and communicated. In other words, are institutions able to keep these agreements up-to-date and accurate so that students and their advisors can confidently rely on the information to make academic decisions?

3. It is difficult to ascertain why students do not earn degrees at the community college before they transfer. Studies have shown that students do better academically at the university when they have previously earned an associate's degree at the time of transfer (Gao, Hughes, O'Rear, & Fendley, 2002) and graduate at higher rates than those without degrees (McCormick & Carroll, 1997). The question remains whether it is the earning of the degree which contributes to these accomplishments or inherent characteristics of the students themselves. Further studies could look at the personal characteristics of these two groups and see if there are any trends.

4. It would also be of interest to look more closely at each of the community colleges and better understand why some have more students who participate in Temple's Core-to-Core transfer program than others. In particular, it would be useful to identify which programs are articulated between the community college and Temple, and then determine whether student transfer success (or lack thereof) is more strongly related to the transfer pathway or the academic program that the student selects.

5. Another question worth examining is whether the number of excess credits has any impact on a student's likelihood to graduate. Within the existing data set, the number of credits earned, number of credits transferred, total number of awarded credits (earned and transferred), and the number of credits required for graduation are identified. With this information, additional analysis could be completed in order to better understand whether earning too many credits is a barrier to persistence, and therefore, graduation. If available, it would also be interesting to understand how many credits were earned at the community college versus how many were accepted by Temple. In other words, how many community college credits were not accepted by Temple? Currently, the total number of earned community college credits is not recorded on the student's academic record, so this analysis would require individual transcript evaluations. As a best practice, it may be of interest to Temple to record all previously earned credits on a transfer student's academic record, regardless of whether those credits are accepted by Temple University toward a degree.

6. Temple's Core-to-Core transfer program is working. Students who take advantage of the C2C program have significantly higher graduation rates than those who do not, and significantly higher graduation rates than what would be expected of a

general transfer student population. Temple should consider ways in which to better communicate and promote this option to all students who are considering transfer to Temple University. Additionally, Temple should consider expanding the number of programs that each community college can articulate to a program at Temple; particularly for those programs considered “*transfer-friendly*.”

It is difficult to evaluate the effectiveness of institutions as diverse as community colleges or to change student behavior. There will always be future drop-outs entering the higher education system. Students have always dropped out or stopped out, and therefore, the pipeline continues to lose students. In addition, for many years and despite many efforts to increase it, the transfer rate has remained steady at about 22% (Cohen & Brawer, 2003a; McCormick & Carroll, 1997). These phenomena continue to exist despite the many institutional and state efforts to mitigate barriers to successful transfer. Students experience challenges that are often beyond their own control and certainly beyond the control of the institutions they attend. What is known about students is that they are unique, diverse, and multi-tasked and will accomplish what they see fit to accomplish.

Nevertheless, it is valuable to continue to provide accessibility and simplify processes to aid students in completing their goals; indeed there are those who would not make it without assistance. Institutions must evaluate and improve their processes and policies, provide opportunities and ways to achieve them, but ultimately, students need to walk through the door.

BIBLIOGRAPHY

- AACC, & AASCU. (2004). *Improving Access to the Baccalaureate: Full Report*. Washington, D.C.
- AcademyOne Inc. (2004). Advisory Council,. Retrieved July 7, 2007, from <http://www.academyone.com/AboutUs/OurAdvisoryCouncil/>
- Adelman, C. (1998). *National replication of selected variables in the University of Memphis transfer study*. Paper presented at the Reframing Student Transfer in Higher Education: Implications for Policy and Research (ASHE Annual Conference).
- Adelman, C. (1999). *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and the Bachelor's Degree Attainment*. Washington, DC: U.S. Department of Education.
- Adelman, C. (2003). *The story-lines of multi-institutional attendance*. Paper presented at the Association for Institutional Research.
- Alfred, R., Ewell, P., Hudgins, J., & McClenney, K. (1999). *Core indicators of effectiveness for community colleges* (2nd ed.). Washington DC: Community College Press.
- American Association of Community Colleges. (2006). About Community Colleges: Community College Fast Facts [Electronic Version]. Retrieved November 16, 2006 from http://www.aacc.nche.edu/Content/NavigationMenu/AboutCommunityColleges/Fast_Facts1/Fast_Facts.htm.
- American Association of Community Colleges. (2007a). About Community Colleges - Historical Information [Electronic Version]. Retrieved January 5, 2007 from http://www.aacc.nche.edu/Content/NavigationMenu/AboutCommunityColleges/HistoricalInformation/Historical_Information.htm.

- American Association of Community Colleges. (2007b). Significant Historical Events in the Development of the Public Community College [Electronic Version]. Retrieved October 23, 2007 from <http://www.aacc.nche.edu/Content/NavigationMenu/AboutCommunityColleges/HistoricalInformation/SignificantEvents/SignificantEvents.htm>.
- Applegate, J., Brown, T., Chaloux, B., Grites, T. J., Jacobs, B. C., Kerr, T. J., et al. (2006). AcademyOne Advisory Council. In April 23rd Meeting Notes (Ed.). West Chester, PA: AcademyOne, Inc.
- Arizona State University. (2007). ACETS Course Evaluation Information. Retrieved November 2, 2007, from <http://www.asu.edu/provost/articulation/faculty/acets.html>
- Ashby, C. M. (2005). *Transfer Students: Postsecondary Institutions Could Promote More Consistent Consideration of Coursework by Not Basing Determinations on Accreditation. Report to Congressional Requesters. GAO-06-22*. Washington DC: General Accounting Office.
- Astin, A. (1993). *What matters in college? Four critical years revisited*. San Francisco: Jossey-Bass.
- Baker, G. A. (1994). *A handbook on the community college in America: Its history, mission, and management*. Westport, CT: Greenwood Publishing Group.
- Banks, D. L. (1990). Why a consistent definition of transfer? *Community College Review*, 18(2), 47-53.
- Banks, D. L. (1992). *External and Institutional Factors Affecting Community College Student-Transfer Activity*. California.
- Barkley, S. M. (1993). A synthesis of recent literature on articulation and transfer. *Community College Review*, 20(4), 38.
- Barry, P. J., & Barry, P. A. (1992). Establishing equality in the articulation process. In B. W. Dziech & N. R. Vilter (Eds.), *New directions for community colleges Vol. 78. Prisoners of elitism: The community college's struggle for stature* (pp. 35-44). San Francisco: Jossey-Bass.

- Bean, J., & Metzner, B. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Education Research*, 55(4), 485-540.
- Bender, K. K., & Ross, C. S. (1997). A Comprehensive Approach to Facilitate Student Transfer Within the Oklahoma State System of Higher Education. *College and University*, 73(1), 8-12.
- Bender, L. W. (1990). *Spotlight on the Transfer Function: A National Study of State Policies and Practices*. Washington DC: American Association of Community and Junior Colleges.
- Berdahl, R. O. (1987). State involvement in higher education. In M. Peterson & L. A. Mets (Eds.), *Key resources on higher education governance, management, and leadership: A guide to the literature* (pp. 40-64). San Francisco: Jossey-Bass.
- Berdahl, R. O., & McConnell, T. R. (1994). Autonomy and accountability: some fundamental issues. In P. G. Altbach, R. O. Berdahl & P. J. Gumport (Eds.), *Higher Education in American Society* (3rd ed., pp. 55-72). Amherst, NY: Prometheus Books.
- Berkner, L., He, S., & Citaldi, E. F. (2002). *Descriptive summary of 1995-96 beginning postsecondary students: Six years later*. Washington, D.C.: U.S. Department of Education.
- Berman, P., Curry, J., Nelson, B., & Weiler, D. (1990). Enhancing transfer effectiveness: A model for the 1990's. Washington, DC: American Association of Community and Junior Colleges.
- Bogart, Q. J., Price, M. J., & Arizona State Board of Directors for Community Colleges, P. (1993). *Arizona Student Success: A Comparative Study of Community College Transfer, Four-Year College Transfer, and Native University Students. A Final Report to the State, Its Leadership, and Its Citizens*.
- Borden, V. M. H. (2004). Accommodating Student Swirl: When Traditional Students Are No Longer the Tradition. *Change*, 36(2), 10-18.
- Bradburn, E., & Hurst, D. (2001). *Community college transfer rates to 4-year institutions using alternative definitions of transfer (Research and Development Report No.*

NCES 2001 - 197). Washington DC: US Department of Education. National Center for Educational Statistics.

Brick, J. M. (1964). *Forum and focus for the junior college movement: the American Association of Junior Colleges*. New York City: Teachers College, Columbia University.

Brint, S., & Karabel, J. (1989a). American education, meritocratic ideology, and the legitimization of inequality: The community college and the problem of American exceptionalism. *Higher Education*, 18(6), 725-735.

Brint, S., & Karabel, J. (1989b). *The diverted dream: Community colleges and the promise of educational opportunity in America, 1900-1985*. New York: Oxford University Press.

Brubacher, J., & Rudy, W. (1997). *Higher education in transition* (4th ed.). New Brunswick: Transaction Publishers.

Cabrera, A. F. (1994). Logistic regression analysis in higher education: An applied perspective. In J. C. Smart (Ed.), *Higher Education: Handbook of Theory and Research* (Vol. 10, pp. 225-256). New York: Agathon Press.

Caldwell, C. (2005). Education Administration 601: The Two Year College - Class 4 Curriculum Notes. Unpublished Syllabus. Temple University.

Callan, P. M. (1997). Standards of opportunity: America's public community colleges [Electronic Version].

Carlan, P. E., & Byxbe, F. R. (2000). Community Colleges under the Microscope: An analysis of Performance Predictors for Native and Transfer Students. *Community College Review*, 28(2), 27.

Carnevale, A. P., Johnson, N. C., & Edwards, A. R. (1998). Performance-based appropriations: Fad or wave of the future? *The Chronicle of Higher Education*, B6.

Carpenter, K. (1991). Serving the transfer needs of international student: Cooperation between two-year and four-year schools. *College and University*, 6(3), 63-66.

- Cataldi, P., K., & Cataldi, F. (2005). *The Road Less Traveled. Students Who Enroll in Multiple Institutions*. (No. NCES 2005-157). Washington, DC: NCES.
- Cejda, B. D. (1999). The role of the community college in Baccalaureate attainment at a private liberal arts college. *Community College Review*, 27(1), 1.
- Cejda, B. D., & Kaylor, A. J. (1997). Academic Performance of Community College Transfer Students at Private Liberal Arts Colleges. *Community College Journal of Research and Practice*, 21(7), 651-659.
- Cejda, B. D., & Rewey, K. L. (1998). The Effect of Academic Factors on Transfer Student Persistence and Graduation: A Community. *Community College Journal of Research & Practice*, 22(7), 675.
- Center for Community College Policy. (2000). *Community College Policy Handbook*. Denver, CO: Education Commission of the States.
- Chenoweth, K. (1998). Transfer and dropout statistics don't tell the whole story. *Community College Week*, 10(16), 6.
- Childers, M. R. (2004). *Community college to university transfer and articulation in Illinois*. Unpublished PhD, Southern Illinois University at Carbondale.
- Christie, R. L., & Hutcheson, P. (2003). Net Effects of Institutional Type on Baccalaureate Degree Attainment of "Traditional" Students. *Community College Review*, 31(2), 1-20.
- Cicarelli, J. (1993). Making it easier to transfer from 2-year to 4-year colleges. *Chronicle of Higher Education*, 39(32), B1.
- Cohen, A. M. (1989). *Commitment to Transfer* (No. EDO-JC-89-02). Los Angeles: ERIC Clearinghouse for Junior Colleges, Office of Educational Research and Improvement.
- Cohen, A. M. (1999). Analyzing community college student transfer rates. *New Directions for Community Colleges*, 86, 71-79.

- Cohen, A. M., & Brawer, F. B. (1996). *The American Community College* (3rd ed.). San Francisco: Jossey-Bass.
- Cohen, A. M., & Brawer, F. B. (2003a). *The American Community College* (4th ed.). San Francisco: Jossey-Bass.
- Cohen, A. M., & Brawer, F. B. (2003b). The Collegiate Function of Community Colleges: Fostering Higher Learning through Curriculum and Student Transfer.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New Jersey: Lawrence Erlbaum.
- College Credit Mobility: Can Transfer of Credit Policies be Improved?*, U.S. House of Representatives, Testimony of Jerome H. Sullivan Sess. (2005).
- Davies, T. G., & Casey, K. (1999). Transfer student experiences: Comparing their academic and social life at the community college and university. *Community College Journal of Research & Practice*, 22(5), 542-557.
- de los Santos, A., & Wright, I. (1990). Maricopa's Swirling Students: Earning One-Third of Arizona State's Bachelor's Degrees. *Community, Technical, and Junior College Journal*, 60(6), 32-34.
- Deegan, W. L., & Tillery, D. (1985). *Renewing the community college: priorities and strategies for effective leadership*. San Francisco: Jossey-Bass.
- Delaney, M. A. (1995). Reverse registrants in community colleges. Unpublished Doctoral Dissertation. University of Connecticut.
- Diaz, P. E. (1992). Effects of transfer on academic performance of community college students at the four-year institution. *Community Junior College Quarterly of Research and Practice*.
- Donovan, R. A., Schaier-Peleg, B., & Forer, B. (1987). *Transfer: making it work; a community college report*. Washington, DC: American Association of Community and Junior Colleges, National Center for Higher Education.

- Doucette, D., & Hughes, B. (1990). *Assessing Institutional Effectiveness in Community Colleges*. Laguna Hills, CA: League for Innovation in the Community College.
- Dougherty, K. J. (1992). Community Colleges and Baccalaureate Attainment. *Journal of Higher Education*, 63(2), 188-214.
- Dougherty, K. J. (1994). *The contradictory college: The conflicting origins, impacts and futures of the community college*. Albany, NY: State University of New York Press.
- Dougherty, K. J. (2001). *The contradictory college: the conflicting origins, impacts, and futures of the community college*. Albany: State University of New York Press.
- Education Commission of the States. (2001). *Transfer and Articulation Policies. ECS StateNotes: Transfer and Articulation*. Denver, CO: ECS.
- Eelis, W. C. (1943). Success of transferring graduates of junior college terminal curricula. *Journal of American Association of Collegiate Registrars*.
- Eells, W. C. (1931). *The junior college*. New York: Houghton Mifflin.
- Egemba, C. I. (1997). *An investigation and analysis of the baccalaureate degree completion rates of community college transfer students*. Unpublished EdD, UNIVERSITY OF NEVADA LAS VEGAS.
- Fincher, C. (1987). Policy analysis and institutional research. In M. Peterson & L. A. Mets (Eds.), *Key resources on higher education governance, management, and leadership: A guide to the literature* (pp. 282-302). San Francisco: Jossey-Bass.
- Finifter, D. H., Baldwin, R. G., & Thelin, J. R. (1991). *The uneasy public policy triangle in higher education: Quality, diversity, and budgetary efficiency*. New York: Macmillan.
- Fountain, B. E., & Tollefson, T. E. (1989). *Community colleges in the United States: Forty-nine state systems*. Washington, DC: Association of Community and Junior Colleges.

- Fredrickson, J. (1998). Today's transfer students: Who are they? *Community College Review*, 26(1), 43.
- Friedel, F. (1976). *America in the 20th Century*. New York: Knopf.
- Gao, H., Hughes, W., O'Rear, M., & Fendley, W. (2002, June). *Developing structural equation models to determine factors contributing to student graduation and retention: Are there differences for native students and transfers*. Paper presented at the Annual Research Forum of the Association for Institutional Research, Toronto, Ontario, Canada.
- Gay, L. R. (1992). *Educational research: Competencies for analysis and application* (4th ed.). New York: Macmillan.
- Geiger, R. L. (Ed.). (1999). *History of Higher Education* (Vol. 19): The Pennsylvania State University.
- Gernhart, J. C. (Ed.). (1981). *1981 community, junior, and technical college directory*. Washington, DC: American Association of Community and Junior Colleges.
- Ginzberg, E. (1979). *Good jobs, bad jobs, no jobs*. Cambridge, MA: Harvard University Press.
- Glass Jr, J. C., & Bunn, C. E. (1998). Length of time required to graduate for community college students transferring to senior institutions. *Community College Journal of Research & Practice*, 22(3), 239-253.
- Glass Jr, J. C., & Harrington, A. R. (2002). Academic Performance of Community College Transfer Students and "Native" Students at a Large State University. *Community College Journal of Research & Practice*, 26(5), 415-430.
- Goldin, C., & Katz, L. B. (1999). The Shaping of Higher Education: The Formative Years in the United States, 1890 to 1940. *Journal of Economic Perspectives*, 13(Winter), 37 - 62.
- Gose, B. (1997). Community college in Virginia attracts Ph.D.'s - as students [Electronic Version]. *The Chronicle of Higher Education*, July 11. Retrieved October 24, 2007 from <http://www.chronicle.com>.

- Greene, H., & Greene, M. (2002). Understanding and targeting retention. *University Business, October*, 21-22.
- Grubb, W. N. (1991). The decline of community college transfer rates. *Journal of Higher Education, 62*(2), 194-222.
- Hayek, J. (2002). Most college students satisfied but transfer students less engaged. [Electronic Version]. *The National Survey of Student Engagement* from http://nsse.iub.edu/2002_annual_report/.
- Hedrick, T. E., Brickman, L., & Rog, D. L. (1993). *Applied research design: A practical guide*. Newbury Park, CA: Sage Publications.
- Heinze, M. C., & Daniels, J. L. (1970). *The transfer of students into Community Colleges*. Hattiesburg: University of Southern Mississippi.
- Hines, E. R. (1988). Higher education and state governments: Renewed partnership, cooperation, or competition? *ASHE-ERIC Higher Education Report No. 5*.
- Hogan, R. R. (1986). An update on reverse transfer to two-year colleges. *Community/Junior College Quarterly, 10*, 295-306.
- Hudak, E. M. (1983). The reverse transfer student: An emerging influence on the community/junior college campuses. Unpublished Doctoral Dissertation. George Washington University.
- Hughes, J. A., & Graham, S. W. (1992). Academic performance and background characteristics among community college transfer students. *Community/Junior College Quarterly of Research and Practice, 16*, 35-46.
- Ignash, J. M. (1993). *Community college non-liberal arts: Implications for transferability*. Los Angeles: Center for the Study of Community Colleges.
- Ignash, J. M., & Townsend, B. K. (2000). Evaluating State-Level Articulation Agreements According to Good Practice. *Community College Review, 28*(3), 1-21.

- Jacobs, B. C. (Ed.). (2004). *The College Transfer Student in America: The Forgotten Student*. Washington DC: American Association of Collegiate Registrars and Admissions Officers.
- Jones, D., Ewell, P., & McGuinness, A. (1998). *Challenges and opportunities facing higher education: An agenda for policy research*: National Center for Public Policy in Higher Education.
- Karabel, J. (1972). Community colleges and social stratification. *Harvard Educational Review*, 42(4), 521-562.
- Kearney, G. W., Townsend, B., & Kearney, T. (1995). Multiple transfer students in a public urban university: Background characteristics and interinstitutional movements. *Research in Higher Education*, 36, 323-344.
- Keith, B. (1996). The context of educational opportunity: States and the legislative organization of community college systems. *American Journal of Education*, 105, 67-101.
- Kinnick, M. K., & Kempner, K. (1988). Beyond "front door" access: Attaining the bachelor's degree. *Research in Higher Education*, 20(4), 299-318.
- Kintzer, F. C. (1989). *Articulation and Transfer: A Review of Current Literature on Statewide and Interinstitutional Program Models and Trends*. Trenton, NJ: New Jersey State Dept. of Higher Education, Office of Research.
- Kintzer, F. C. (1996). A Historical and Futuristic Perspective of Articulation and Transfer in the United States. *New Directions for Community Colleges*, 24(4), 10.
- Kintzer, F. C., & Wattenbarger, J. L. (1985). *The Articulation/Transfer Phenomenon: Patterns and Directions*. Washington, DC: American Association of Community and Junior Colleges.
- Kissler, G. R. (1982). The Decline of the Transfer Function: Threats or Challenges? *New Directions for Community Colleges*, 39, 19-29.
- Knoell, D. (1990). *Transfer, Articulation, and Collaboration: Twenty-Five Years Later* (No. 0871172119). U.S.

District of Columbia.

Knoell, D. M. (1982). The Transfer Function--One of Many. *New Directions for Community Colleges*, 39, 5-17.

Knoell, D. M. (1990). Guidelines for Transfer & Articulation. *Community, Technical, and Junior College Journal*, 61(2), 38-41.

Knoell, D. M., & Medsker, L. L. (1965). From Junior to Senior College: a national study of the transfer student. *American Council on Education*.

Kodama, C. M. (1999). Transfer students: An overlooked commuter population. *Commuter Perspectives*, 25(1), 2, 6-8.

Koos, L. V. (1924). The junior college. In *Education Series, no. 5*. Minneapolis: University of Minnesota.

Kozeracki, C. A. (2001). Studying Transfer Students: Designs and Methodological Challenges. *New Directions for Community Colleges*, 2001(114), 61.

Laanan, F. S. (2001). Transfer Student Adjustment. In *Transfer students: Trends and issues*. *New Directions for Community Colleges* (pp. 5-13). San Francisco: Jossey-Bass.

Lee, V. E., & Frank, K. A. (1990). Students' Characteristics That Facilitate The Transfer From Two-Year To Four-Year Colleges. *Sociology of Education*, 63(3), 178-193.

Leslie, D. W., & Routh, D. K. (1991). A critical analysis of the cultural and linguistic distinctions between policymakers and researchers: A case study of policy development in Florida. *Educational Policy*, 5(3), 279-295.

Levine, D. O. (1986). *The American college and the culture of aspiration, 1915 - 1940*. Ithica, NY: Cornell University Press.

Maricopa Community Colleges. (2007, April 13). The Arizona State University/Maricopa Community Colleges Alliance Retrieved October 26, 2007, from <http://www.maricopa.edu/alliance/M>

- McCormick, A. C. (2003). Swirling and double-dipping: New patterns of student attendance and their implications for higher education. *New Directions for Higher Education, 121*, 13-24.
- McCormick, A. C., & Carroll, C. D. (1997). Transfer behavior among beginning postsecondary students, 1989-94. Washington DC: U.S. Dept. of Education, Office of Educational Research and Improvement.
- McGrath, D., & Spear, M. B. (1991). *The academic crisis of the community college*. Albany, NY: State University Press.
- Medsker, L. L. (1960). *The junior college: progress and prospect*. New York: McGraw-Hill.
- Mercer, J. (1992). States seek cheaper routes to higher education degrees. *Chronicle of Higher Education, A1*.
- Mercer, J. (1994). Fighting over autonomy. *The Chronicle of Higher Education, A26*.
- Mitchell, G. N., & Grafton, C. I. (1985). Comparative study of reverse transfer, lateral transfer, and first-time community college students. *Community/Junior College Quarterly of Research and Practice, 9*, 273-280.
- Monroe, C. (1972). *Profile of the community college*. San Francisco: Jossey-Bass.
- Munkittrick, M. L. (2005). Making the CASE: Curricular Alignment through Shared Equivalencies (FIPSE Proposal). West Chester, PA: AcademyOne, Inc.
- Munkittrick, M. L., & L'Orange, H. (2006). *AcademyOne Transfer Automation Webcast* (Presentation to SHEEO members). West Chester, PA: AcademyOne, Inc.
- National Center for Education Statistics. (1995). *Beginning postsecondary students longitudinal study (BPS89)*. Washington, DC: U.S. Department of Education.
- National Center for Education Statistics. (2005). Integrated postsecondary education data system (IPEDS) completions survey. Washington, DC: U.S. Department of Education.

- National Center for Public Policy in Higher Education. (2000). *Measuring Up 2000*. Washington, D.C.: National Center for Public Policy in Higher Education.
- National Survey of Student Engagement. (2002). *From promise to progress: How colleges and universities are using student engagement results to improve collegiate quality*. Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.
- Nevins, A. (1962). *The State Universities and Democracy*. Urbana, IL: University of Illinois Press.
- Newman, F. (1987). *Choosing quality: Reducing conflict between the state and university*. Denver, CO: Education Commission of the States.
- Nora, A. (2000). *Reexamining the community college mission*. Washington, DC: Community College Press.
- Nowak, M. (2004). *Understanding the community college transfer student experience from the student voice*. Unpublished PhD, BOSTON COLLEGE.
- Olivas, M. A. (1979). *The dilemma of access: Minorities in two-year colleges*. Washington, D.C.: Howard University Press.
- Palmer, J. C., Ludwig, M. J., & Stapleton, L. (1994). *At what point do community college students transfer to baccalaureate-granting institutions? Evidence from a 13-state study*. Washington, DC: American Council on Education.
- Parnell, D. (1986). *The neglected majority*. Washington, D.C.: Community College Press.
- Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty years of research*. San Francisco: Jossey-Bass.
- Phelan, D. J. (1999). Institutional and Public Policy Implications of the Phenomenon of Reverse Transfer Students. *New Directions for Community Colleges*(106), 77.
- Phillippe, L., & Patton, M. (2000). *National profile of community colleges: trends & statistics* (3rd ed.). Washington, DC: Community College Press.

- Piland, W. E. (1995). Community college transfer students who earn bachelor's degrees. *Community College Review*, 23(3), 17.
- Pincus, F. L., & Archer, E. (1989). *Bridges to opportunity? Are community colleges meeting the transfer needs of minority students*. New York: College Board.
- Popovich, T. L. (2005). *Impacts of community college certificate and associate degree completion on baccalaureate attainment*. Unpublished EdD, Arizona State University.
- Porter, J. D., & Gebel, M. A. (1993). Student tracking in a university setting. *New Directions for Institutional Research*, 87, 21-30.
- Prager, C. (1991). *Internal transfer and articulation*. Bar Harbor, ME: Council of Two-Year College of Four-Year Institutions.
- Prager, C. (1994). Internal Transfer and Articulation.
- Pressman, J. L., & Wildavsky, A. (1973). *Implementation: how great expectations in Washington are dashed in Oakland*. Berkeley, CA: University of California Press.
- Quanty, M. B., Dixon, R. W., & Ridley, D. R. (1999). The course-based model of transfer success: An action-oriented research paradigm. *Community College Journal of Research & Practice*, 23, 457-466.
- Quinley, J. W., & Quinley, M. P. (2000). *Four-year graduates attending community colleges as serious credit students*. New York: Community College Research Center, Columbia University.
- Reed, L. D. (1971). *Jesse Parker Bogue: Missionary for the two-year college*. New York: Carlton.
- Richardson, R. C., & Bender, L. W. (1987). *Fostering minority access and achievement in higher education*. San Francisco, CA: Jossey-Bass.

- Rifkin, T. (2000). *Improving Articulation Policy To Increase Transfer. Policy Paper* (No. CC-00-5). Colorado: Education Commission of the States, Denver, CO. Center for Community College Policy. Metropolitan Life Foundation.
- Robertson, P. F., & Frier, T. (1996). The Role of the State in Transfer and Articulation. *New Directions for Community Colleges*, 24(4), 15-24.
- Rodriguez, E. (1994). *State-level educational reform: Collaborative roles for higher education*. Denver, CO: State Higher Education Executive Officers.
- Ross, R. A. (1982). *The reverse transfer phenomenon at Piedmont Virginia Community College* (No. 3-82). Charlottesville: Piedmont Virginia Community College.
- Russell, A. B. (1999). *The status of statewide student transition data systems: A survey of SHEEO agencies*. Denver, CO: State Higher Education Executive Officers.
- Sabloff, P. L. W. (1997). Another reason why state legislatures will continue to restrict public university autonomy. *The Review of Higher Education*, 20(2), 141-162.
- Salkind, N. J. (2000). *Exploring Research*. Upper Saddle River, NJ: Prentice Hall.
- Schmidt, P. (1997). States Press Their Colleges To Make Transferring Easier. *Chronicle of Higher Education*, 43(45), A28-A29.
- Slark, J. Y. (1982). *Reverse transfer student study*. Santa Ana, CA: Santa Ana College.
- Stahl, V. V., & Pavel, D. M. (1992, June). *Assessing the Bean and Metzner model with community college student data*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.
- Stanley, D. (2006). *Course Equivalency Audit*. West Chester, PA: AcademyOne, Inc.
- Susskind, T. Y. (1997). 2YC3: Is articulation from two- to four-year colleges an allowed or forbidden transition? *Journal of Chemical Education*, 74(10), 1156.

- The National Survey of Student Engagement. (2005). *Exploring Different Dimensions of Student Engagement*. Bloomington, IN: Center for Postsecondary Research, Indiana University.
- Thornton, J. W. (1972). *The community junior college* (3rd ed.). New York: Wiley.
- Tinto, V. (1975). Dropouts from higher education: A theoretical synthesis of recent research. *Review of educational research*, 45, 89-125.
- Tinto, V. (1982). Limits of theory and practice in student attrition. *Journal of Higher Education*, 53, 687-700.
- Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: The University of Chicago Press.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.
- Townsend, B. (2002). Transfer rates: a problematic criterion for measuring the community college. *New Directions for Community Colleges*, 117, 13-23.
- Townsend, B., & Twombly, S. (2001). *Community colleges: Policy in the future context* (2nd ed.). Westport, CT: Ablex Publishing.
- Townsend, B. K. (2000). Rationales Of Community Colleges For Enrolling Reverse Transfer Students: A Second Chance For Whom? *Community College Journal of Research & Practice*, 24(4), 301-311.
- Townsend, B. K., & Dever, J. T. (1999). What Do We Know About Reverse Transfer Students? *New Directions for Community Colleges*(106), 5.
- Turner, C. S. V. (1992). It Takes Two to Transfer: Relational Networks and Educational Outcomes. *Community College Review*, 19(4), 27-33.
- Vaughan, G. B. (1992). The community college unbound. In B. W. Dziech & N. R. Vilter (Eds.), *New directions for community colleges Vol. 78. Prisoners of elitism: The community college's struggle for stature* (pp. 22-34). San Francisco: Jossey-Bass.

- Wagoner, J. L. J. (1985). The search for mission and integrity: A retrospective view. In D. E. Puyear & G. B. Vaughan (Eds.), *New directions for community colleges No 52: Maintaining institutional integrity* (pp. 3-16). San Francisco: Jossey-Bass.
- Walleri, R. D. (1990). Tracking and follow-up for community college students: Institutional and statewide initiatives. *Community/Junior College Quarterly of Research and Practice*, 14(1), 21-36.
- Watkins, B. T. (1990). Two-Year Institutions under Pressure to Ease Transfers. *The Chronicle of Higher Education*, A1.
- Wellman, J. V. (2002). *State Policy and Community College--Baccalaureate Transfer. National Center Report* (No. NC-R-02-6).
- Welsh, J. F., & Kjorlien, C. (2001). State Support For Interinstitutional Transfer And Articulation: The Impact Of Databases And Information Systems. *Community College Journal of Research & Practice*, 25(4), 313-332.
- WICHE. (1985). *Improving the Articulation/Transfer Process between Two- and Four-Year Institutions*. Colorado: Western Interstate Commission for Higher Education, Boulder, CO.
- Wichita State University. (2007). For Transfer Students: Transfer Guides. Retrieved October 26, 2007, from <http://www.wichita.edu/registrar/transguides/>
- Williams, E. G. (1992). *"Limited Access" Programs: Exceptions that Threaten the Florida Higher Education Articulation Agreement*. Gainesville, FL: Florida University Institute of Higher Education.
- Winter, P. A., Harris, M. R., & Ziegler, C. H. (2001). Community College Reverse Transfer Students: A Multivariate Analysis. *Community College Journal of Research & Practice*, 25(4), 271-282.
- Wright, M. I. (1996). Articulation and Transfer: Definitions, Problems, and Solutions.
- Zamani, E. M. (2001). Institutional Responses to Barriers to the Transfer Process. *New Directions for Community Colleges*(114), 15.

Zwerling, L. S. (1976). *Second best: The crisis of the community college*. New York: McGraw Hill.

Zwerling, L. S. (Ed.). (1986). *The community college and its critics*. San Francisco: Jossey-Bass.