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Associations between institutional characteristics and credits-to-degree and time-to-degree in Ohio community colleges

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ASSOCIATIONS BETWEEN INSTITUTIONAL CHARACTERISTICS
AND CREDITS-TO-DEGREE AND TIME-TO-DEGREE
IN OHIO COMMUNITY COLLEGES

Dissertation

Submitted to

The School of Education and Allied Professions

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The Degree

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By

Martha R. Crawmer, MA, BA

THE UNIVERSITY OF DAYTON

Dayton, Ohio

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ASSOCIATIONS BETWEEN INSTITUTIONAL CHARACTERISTICS
AND CREDITS-TO-DEGREE AND TIME-TO-DEGREE
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ABSTRACT

ASSOCIATIONS BETWEEN INSTITUTIONAL CHARACTERISTICS AND CREDITS-TO-DEGREE AND TIME-TO-DEGREE IN OHIO COMMUNITY COLLEGES

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Committee Chair: Dr. Theodore J. Kowalski

This study examined associations between selected characteristics of Ohio's public comprehensive community colleges and degree completion efficiency.

Institutional characteristics were classified as demographic (enrollment, size of population served, calendar system, governance designation), financial (annualized full-time tuition and fees, percent of students receiving financial aid in the form of federal grants), course delivery (percent of classes taught by part-time faculty, percent of student credit hours taken online), and policy (developmental education placement, academic dismissal/readmission, admission protocols of limited enrollment programs). Efficiency indicators for completing an associate degree were institutional mean credits and median time in calendar years.

The study population consisted of 14 of the 15 public comprehensive community colleges in Ohio. Pearson's product-moment coefficients were computed to determine strength of associations. Profiles of the study colleges were created, including data for

each of the measured institutional characteristics, a historical background, and current attributes.

Despite a common open access mission and control by the Ohio Board of Regents, each college was found to have a somewhat unique profile. Shorter time-to-degree was associated at a large level with higher tuition and with colleges designated as state community colleges. Larger enrollments and larger populations served were associated with both longer time-to-degree and more credits-to-degree. The percentage of credit hours delivered online was associated in opposite directions with credits-to-degree and with time-to-degree, at a small level. The percent of students receiving financial aid was also associated in opposite directions with the two efficiency indicators, at the small and medium levels. The referenced policies exhibited little variation among the colleges and displayed associations at the small level and low end of the medium level with both efficiency indicators. The percentage of classes taught by part-time faculty was associated with fewer credits-to-degree and shorter time-to-degree at a small level. Implications of these findings for policy and further research were discussed.

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CHAPTER I

INTRODUCTION

Introduction

Timely and credit-efficient degree completion have become important policy issues for most public higher education institutions in the United States for at least two reasons. First, when students use more time, earn excess credits, or both, in the process of attaining degrees, institutional efficiency decreases. Second, decreased institutional efficiency spawns accountability concerns that have both economic and political implications, especially for public institutions that subsidize student tuition with substantial state funding. In the case of Ohio's public community colleges, time and cost related to completing associate degrees arguably also affect an institution's ability to achieve current state initiatives.

Statement of the Problem

American higher education has undergone increasing scrutiny in recent years. In 2006, the U.S. Department of Education produced *A Test of Leadership Charting the Future of U.S. Higher Education*, commonly referred to as the Spellings Report. This document brought widespread attention to the productivity and the fiscal accountability of higher education in the United States, calling on the nation's institutions of higher education to improve efficiency. In addition, the report noted that while the rate of

college attendance in the United States has “risen substantially in recent decades, the college completion rate has failed to improve at anywhere near the same pace” (U.S. Department of Education, 2006, p. 1). The nation’s community colleges are not exempted from the criticism implicit in this statement; the Spellings Report also indicates that more than 40% of the nearly 14 million undergraduates in the United States attend 2-year community colleges (U.S. Department of Education, 2006, p. xi).

The emphasis on accountability and efficiency which is present on a national scale also exists on a statewide level. In its 2008 report, *The Condition of Higher Education in Ohio*, the Ohio Board of Regents (OBR) called for increased accountability and higher levels of productivity. Specifically, the state’s institutions were to produce 230,000 more associate, baccalaureate, or higher degrees among the citizens of the state by the year 2017 (Ohio Board of Regents, 2008a). This directive is rooted in two facts: Ohio ranks below the national average in percent of the adult population with associate, baccalaureate, or higher degrees; and Ohio is well below the national average for residents aged 25 to 49 enrolled in higher education.

A third factor contributes to demands for improved performance. Many Ohio college students have not been completing degrees within the normative time periods and within the normative number of credits. “The median associate degree awarded in 1998-1999 was earned in 3.8 years and accomplished in 82 semester credit hours. The median baccalaureate was earned in 4.5 years and accomplished in 141 semester credit hours” (Ohio Board of Regents, 2001, p. 1). By 2004-2005, the median time for earning a baccalaureate degree had been reduced to 4.3 years, but the average credit hours remained essentially unchanged at 140. For the associate degree, however, the median

time had remained constant at 3.8 years, and the mean semester credits had increased to 84 (Ohio Board of Regents, 2007b). While the time and credit hours required for completion of the baccalaureate degree were now only moderately over the normative standards (4 years and 120 semester credit hours), statistics for completing the associate degree were less positive. The median time to complete this degree was almost twice the normative standard of 2 years, and the mean number of credit hours was more than one-third over the minimum 60 semester hours, and even exceeded 73, the OBR maximum number of credits that could be required in any specialization for this degree.

The implications of the excess time and credits utilized to complete degrees are vitally important on both state and national levels. The Spellings Report identifies the rising cost of college as a deterrent to college attendance and completion. Excess time and credits spent earning the first 2 years of postsecondary education are costly both to individual students and to institutions and systems of higher education. These costs exacerbate the problems of college affordability and of institutional efficiency.

Protracted degree completion has fiscal implications not only for students and their families, but also for colleges and for the state of Ohio. The institutions bear costs affiliated with housing and food services, provision of student and instructional support services, and the disbursing of institutional financial aid dollars beyond the standard budgeted per student allotment. The general public bears costs of expending federal financial aid dollars beyond the expected per student amount, and of reduced access to desirable and competitive majors or programs when spaces are filled by students for more terms than would normally be required for completion. In the case of state-funded colleges, the public also bears the burden of providing the state's portion of the

educational expenses for extended time. In turn, students incur added tuition expenses and often a more substantial debt as the result of student loans. Kramer (1993) adds that

The opportunity costs of going to college are increased alarmingly by a lengthening of time-to-degree. Typically, a student is probably losing a third to half of his [sic] earning capacity in every year his [sic] entry into the adult labor market is postponed Further, delayed degree completion can reduce the number of an individual's years of peak earnings later on (p. 1).

This loss of potential earnings affects not only the student, but the institution, the state, and the general public.

Importance of the Problem

Addressing concerns facing higher education, Ohio's governor, Ted Strickland, issued an Executive Directive in August 2007, creating the University System of Ohio (USO), a structure encompassing all public institutions of higher education in the state. Subsequently, in March 2008, a 10-year strategic plan for higher education was submitted by the state's Chancellor of Higher Education, Eric Fingerhut. The *Strategic Plan for Higher Education, 2008-2017* contains sweeping statewide initiatives for increased enrollments in higher education institutions, increased graduation rates, increased percentage of bachelor's degree recipients with at least one year of credit from a community college, and decreased average out-of-pocket costs for state students (Ohio Board of Regents, 2007d, 2008b).

Ohio ranks 38th among states in the percent of the population ages 25 to 64 having attained at least an associate's degree (Ohio Board of Regents, 2008b). The *Strategic Plan* targets the associate degree for significant growth, calling for an increase of 54%

(from 18,156 to 28,000) in associate degrees awarded annually by the year 2017. The state's community colleges are clearly identified as the gateway for students entering the USO, with the expectation that many students will continue their education after completing an associate degree. The strategic plan also stipulates that the state funding formula will be re-evaluated, to "only reward those educational outcomes that align with Ohio's priorities" (Ohio Board of Regents, 2008b, p. 63).

Purposes of the Study

The purpose of this study was to generate data that could enhance the ability of community college leaders to elevate institutional efficiency and to meet expectations included in the state's strategic plan. Specifically, this research examined relationships between selected characteristics of Ohio's public comprehensive community colleges and timely degree completion, as indicated by institutional mean credits earned in the process of degree completion and institutional median time-to-degree in calendar years.

Importance of the Study

This study adds to the knowledge base on community college administration generally, and on student degree completion specifically. The findings and conclusions provide information that facilitate planning and decision making at individual community colleges. Moreover, this study should prove informative for the Ohio Board of Regents, as it addresses questions raised in OBR documents and plans. Representatives of other types of higher educational institutions are a secondary audience, with the qualification that this study was conducted using descriptive statistics; no attempt was made to make inferences toward a larger population outside that group studied.

Research Questions

This study addressed the overarching issue of whether institutional characteristics influence institutional mean credits-to-degree and institutional median time-to-degree. It was guided by four primary research questions.

1. What are the institutional characteristics of Ohio's public comprehensive community colleges, based on the following variables?
 - Demographic characteristics: enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).
 - Financial characteristics: cost to the student (annualized full-time tuition and fees) and percent of students receiving financial aid in the form of federal grants.
 - Course delivery characteristics: percent of classes taught by part-time faculty and percent of student credit hours taken online.
 - Policy characteristics: developmental education placement policy (*strong, moderately strong, moderately weak, weak*), academic dismissal/readmission policy (*strong, medium, weak*), and admission protocols of limited enrollment programs (waiting list or selective/competitive).
2. Among Ohio's public comprehensive community colleges, what level of association exists between institutional characteristics from each of the following categories?

- Demographic characteristics: enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).
 - Financial characteristics: cost to the student (annualized full-time tuition and fees) and percent of students receiving financial aid in the form of federal grants.
 - Course delivery characteristics: percent of classes taught by part-time faculty and percent of student credit hours taken online.
 - Policy characteristics: developmental education placement policy (*strong, moderately strong, moderately weak, weak*), academic dismissal/readmission policy (*strong, medium, weak*), and admission protocols of limited enrollment programs (waiting list or selective/competitive).
3. Among Ohio's public comprehensive community colleges, what level of association exists between institutional mean credits-to-degree and institutional characteristics from each of the following categories?
- Demographic characteristics: enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).
 - Financial characteristics: cost to the student (annualized full-time tuition and fees) and percent of students receiving financial aid in the form of federal grants.

- Course delivery characteristics: percent of classes taught by part-time faculty and percent of student credit hours taken online.
 - Policy characteristics: developmental education placement policy (*strong, moderately strong, moderately weak, weak*), academic dismissal/readmission policy (*strong, medium, weak*), and admission protocols of limited enrollment programs (waiting list or selective/competitive).
4. Among Ohio's public comprehensive community colleges, what level of association exists between institutional median time-to-degree and institutional characteristics from each of the following categories?
- Demographic characteristics: enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).
 - Financial characteristics: cost to the student (annualized full-time tuition and fees) and percent of students receiving financial aid in the form of federal grants.
 - Course delivery characteristics: percent of classes taught by part-time faculty and percent of student credit hours taken online.
 - Policy characteristics: developmental education placement policy (*strong, moderately strong, moderately weak, weak*), academic dismissal/readmission policy (*strong, medium, weak*), and admission protocols of limited enrollment programs (waiting list or selective/competitive).

Overview of the Research Design/Methodology

Definition of the Study Population

The defined population in this study included 14 of the 15 public comprehensive community colleges in Ohio, according to 2007 designations. Omitted were the 2-year institutions classified as technical colleges or university regional campuses. Rio Grande Community College, although classified as a public comprehensive community college, was not included in the study population because the institution shares facilities, classes, faculty, administration, and academic policies with a private liberal arts university, Rio Grande University. Consequently, disaggregating essential data for this institution was not possible.

Design and Methodologies

The study was non-experimental and retrospective, using data from existing public data banks. The existence and strength of relationships were tested using Pearson product-moment correlations. Some categories in the first and fourth sub-questions are non-parametric. In the first sub-question, the predictor variables of calendar system and governance system have two levels; dummy variables were assigned based on the presence of a semester calendar system or a *state* designation in governance designation, respectively. Other non-parametric predictor variables required three or more levels and were rank-ordered as described in Chapter III, Methodology. The Pearson product-moment correlation coefficient, r was computed to test for the existence of and to measure the strength and direction of any relationships.

The variables were drawn from state of Ohio official documents, from two educational public datasets, from the United States Census Bureau, and from the

Carnegie Classifications Data File. Ohio documents include primarily annual performance reports (Ohio Board of Regents, 2007a, 2007b). Educational datasets utilized included the Integrated Postsecondary Education Data System (IPEDS) and the Higher Education Information (HEI) system. IPEDS is the postsecondary education data collection program for the National Center for Education Statistics (NCES) and contains data on enrollments, program completions, graduation rates, faculty, staff, finances, institutional prices, and student financial aid. HEI is a comprehensive relational database and contains data on students, courses, faculty, facilities, and finances; these data are supplied by colleges and universities in Ohio. The Carnegie Classifications were developed in 1970 by the Carnegie Commission on Higher Education (Carnegie Foundation, 2010a). In addition to a basic classification for each included institution, this classification system contains data relating to instructional programs, enrollment profiles, and size and setting classifications. The Carnegie Classification Data Files are “the leading framework for describing institutional diversity in U.S. higher education” (Carnegie Foundation, 2010c). As needed, individual institutions were contacted for data relating to institutional policies and clarification of institutional interpretation of definitions of terms where such definitions cannot be presumed to be consistent across institutions.

Definitions of Terms

The following definitions were used in this study.

Associate Degree. The associate degree, as defined by the OBR, must require a minimum of 60 semester credit hours but may not require more than 73 semester credit hours, excluding credits taken in developmental level courses. A minimum of

approximately one third of the credits must be in general studies or “courses basic to the technical field” (OBR, 1998b, Appendix A, p. 6) for any degree type. The OBR recognizes six types of associate degrees. These include:

- Associate of Applied Business (AAB). The AAB degree is intended for preparation toward entry into an occupation in fields such as Business, Office Management, Computers, and related technologies.
- Associate of Applied Science (AAS). The AAS degree is intended for preparation toward entry into an occupation in fields such as Health Care, Agriculture, Engineering Technology, and related fields.
- Associate of Arts (AA). The AA degree is intended to serve as the first 2 years of a baccalaureate degree. The AA must contain prescribed amounts of credits earned in identified areas of general education with emphasis toward humanities, literature and arts, as well as elective credits.
- Associate of Science (AS). The AS degree is intended to serve as the first 2 years of a baccalaureate degree. The AS must contain prescribed amounts of credits earned in identified areas of general education with emphasis toward mathematics and science, as well as elective credits.
- Associate of Technical Studies (ATS) and Associate of Individualized Studies (AIS). The ATS and AIS degrees are individualized programs related to the areas included in AAB and AAS degrees. They are used when the specific interests of the student do not meet specific degree requirements for a major, but the credits earned fit the general categorical distributions of the AAB or AAS degree (Ohio Board of Regents, 1998a).

Community College. A community college is an institution of higher education which is regionally accredited to confer associate degrees. In general, in the United States, community colleges are “comprehensive two-year institutions offering both technical and transfer programs” (OBR, 2007b, p. 1).

Comprehensive Community College. A comprehensive community college offers both associate degrees intended for preparation to continue toward a baccalaureate degree as well as associate degrees intended for entry into an occupational field whereby transfer to a baccalaureate granting institution is a secondary goal.

Community College, OBR Classifications. The OBR recognizes five categories within this classification. Some, but not all, of the five categories are included in this study.

- Community College (OBR governance designation). By OBR definition, the comprehensive community colleges bearing this designation are allowed to receive fiscal support through local tax levies in addition to state subsidy and tuition and fees. Historically, these colleges have had official service districts consisting of one county. Three of the nine members of their Boards of Trustees are gubernatorially appointed and six are locally appointed (OBR, 2007b).
- State Community College (OBR governance designation). By OBR definition, the comprehensive community colleges bearing this designation derive their fiscal support primarily from state subsidy and tuition and fees, requiring special OBR permission prior to proposing any local tax levies, which must be approved by election in the entire service district. State community colleges are most often

assigned service districts covering multiple counties. All members of their nine-member Boards of Trustees are gubernatorially appointed.

- Technical College. By OBR definition, these institutions offer technical associate degrees (AAB, AAS, above) intended for direct entry into an occupational field (OBR, 1998b). Technical colleges were not included in this study.
- University Regional Campus. While not usually considered a community college, a university regional campus also grants associate degrees. It is affiliated with a public university, governed by the university board of trustees, but is housed in a separate facility. The strength of its affiliation with the parent university varies by institution. Neither university regional campuses nor 2-year programs housed within university campuses were included in this study.

Credits-to-degree. Institutional credits-to-degree is the mean number of credits earned per student in the process of degree completion, in semester hours, measured by institution.

College Level Credits. College level credits are those credits earned in classes that are either transferable to a baccalaureate granting institution or specialized within a technical area.

Developmental Level Credits. Developmental level credits are earned in classes that are college preparatory in nature. These classes often consist of basic skills such as reading, writing, and mathematics (including at least one course in algebra). These credits typically do not count toward graduation or contribute toward the student grade point average. However, they are considered in determining full-time student status for financial aid or insurance purposes.

Enrollment. Institutional enrollment can be calculated using different measures.

- Headcount Enrollment counts the total number of students enrolled in credit classes.
- Full-time Equivalency (FTE) Enrollment determines the equivalent number of full-time students necessary to generate the total number of credits in which all students are enrolled. By OBR guidelines, FTE is computed by dividing the generated student credit hours per term by 15.

Extended Degree Completion. The phenomenon whereby a student requires time or credits beyond the normative standards to complete a degree. In this study, extended degree completion and prolonged degree completion are used synonymously.

First Generation College Student. A college student is considered first generation if neither parent has earned a college degree, baccalaureate or higher.

Full-time Faculty. The specific teaching load and other requirements for full-time faculty status vary from institution to institution. One area of consistency is the requirement that full-time faculty members contribute to the life of the college in ways beyond classroom teaching. The normative standards include holding regular office hours and participating in committee work. In this study, institutional classifications of full-time faculty status were accepted as self-reported data.

Full-time Student. A full-time student is one who is enrolled for a minimum of 12 credit hours for all terms of the standard academic year. These credits may include developmental level credits. Any student enrolled for fewer than 12 credits during a term of the standard academic year is considered a part-time student. It is worth noting that while this definition is used by federal financial aid regulations as well as

most insurance carriers, a student enrolled for 12 credits per term will not complete a degree within the normative standards for degree completion.

Governance Designation. For purposes of this study, *governance designation* was used to identify study institutions as *state* community colleges or community colleges, as defined above.

Limited Enrollment Program. Many colleges have degree or certificate programs for which the demand outpaces the available space. This occurs frequently in Nursing and other Allied Health programs due to the staffing restrictions of clinical components; other technical programs may limit enrollment because of availability of specialized equipment or specialized lab space.

Non-traditional Student. A student is considered non-traditional if s/he is age 24 or older, or if any other two of the attributes of traditional student are not met.

Part-time Faculty. Part-time faculty members teach classes at community colleges, but typically a part-time faculty member teaches fewer credit hours per academic term or per academic year than are required for a full-time faculty member. Part-time faculty members are not required or expected to hold office hours or to advise students. They are considered at-will employees, hired on a term-by-term basis. Some institutions use the term “adjunct faculty” to refer to part-time faculty; this term is not used consistently across institutions. Thus, this study uses the term “part-time faculty.”

Part-time Student. A part-time student is one who is enrolled for fewer than 12 credit hours during a regular academic term.

Prolonged Degree Completion. The phenomenon whereby a student requires time or credits beyond the normative standards to complete a degree. In this study, prolonged degree completion and extended degree completion are used synonymously.

Service District. In the state of Ohio, each community college is assigned a specific geographic area within which it is expected to provide educational services.

Service Population. In this study, service population is used to measure the population size of the immediate geographic area surrounding the primary address for each college. It is not necessarily equal to the population of the entire service district. Service population and population served are used synonymously.

Stop Out. A college attendance pattern in which the student has term(s), other than summer, of non-enrollment but returns for subsequent term(s).

Student Credit Hour. Total credit hours generated, computed by multiplying the number of students in a course by the credit hour value of the course. Student credit hours may be computed as an institutional measure, by discipline, by course, or by individual class section.

Study Population. The study population in this research consisted of the Ohio public comprehensive community colleges whose campus operations were not intermingled with another institution of higher education.

Time-to-degree. Institutional time-to-degree is the median length of time per student used for degree completion, in calendar years, measured by institution.

Traditional Student. The traditional student attends college full-time, is between the ages of 18 and 24, and if employed, is employed less than 20 hours per week.

Traditional students are usually single, and are not responsible for the daily care of others.

Variables. This study is non-experimental in design and thus the variables are not manipulated; the variables are identified as predictor variables and criterion variables, rather than independent and dependent variables, which would imply a level of control over the independent variables (Green & Salkind, 2008; Kachigan, 1991).

Whenever possible, institutional characteristics were measured using IPEDS categories and designations. Those characteristics already identified by the state of Ohio as important, as indicated by their inclusion in HEI data and state reports, were identified and included. Where applicable, demographic characteristics were measured using Carnegie classifications and United States Census Bureau files. Credits-to-degree and time-to-degree were measured according to OBR determinations; OBR documentation includes both median calendar years and mean number of semester credits-to-degree.

Limitations

There are limitations specific to this study. The population studied is the previously identified set of 14 of the 15 public, comprehensive community colleges in Ohio; it excludes the 8 technical colleges and the 24 university regional campuses. The study is not intended for generalization to any larger population, of which the studied population may or may not be representative. IPEDS and HEI data are used widely in this study; these data are mainly self-reported and may be subject to reduced accuracy. Because of the limited timeframe of the data, this study also is not generalizable to future settings. There is no intent to imply that any observed associations are predicted to continue at the same levels into the future. Additionally, colleges were used as the unit of

analysis in this study and techniques to allow ecological inference were not applied. The results of this study are not meant to infer correlations involving individual students or student cohorts (Chen & Popovich, 2002; King, 1997).

Overview of the Chapters

This study is arranged in five chapters. Chapter II provides a brief history of the comprehensive community college, both in the United States and in the state of Ohio. It also contains a summary of the research literature regarding credits-to-degree and time-to-degree, as well as related attainment measurements, especially as related to student success and institutional characteristics in the community college. Chapter III contains a more detailed explanation of the sources and databases employed in this study, along with a thorough discussion of the statistical procedures and analysis techniques that were utilized. Chapter IV contains descriptive and frequency statistics for the institutions studied and presents the results of the correlation tests. The final chapter, chapter V, provides a summary of findings, conclusions based on those findings, and recommendations for both policy analysis and future research.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

This chapter presents a summary and analysis of the literature relevant to the research questions presented in chapter I. Literature addressing the historical background and context of the community college was taken from a variety of sources, with the American Association of Community Colleges (AACC) providing current data and philosophies. Sources related to student success and retention, and to time-to-degree were taken from published research concerning a wide range of postsecondary institutions, including the work of Tinto (1993) and Astin (1993), and were not restricted to research involving 2-year colleges.

Historical Background

Mission of Community Colleges

The history and development of community colleges and the context in which they operate enhance the analysis of credits-to-degree and time-to-degree in public community colleges. Nationwide, these institutions share certain attributes and goals. Sometimes referred to as junior colleges or technical institutes, they have a core mission distinct from their baccalaureate-granting partners. Virtually all American community

colleges share this core mission, even though individual colleges may have different areas of emphasis. Vaughan (2000) described this charge as follows:

The community college's mission is the fountain from which all of its activities flow. In a few words, this mission is to provide access to postsecondary educational programs and services that lead to stronger, more vital communities.

... The mission of most community colleges is shaped by these commitments:

- Serving all segments of society through an open-access admissions policy that offers equal and fair treatment to all students.
- Providing a comprehensive educational program.
- Serving the community as a community-based institution of higher education.
- Teaching and learning.
- Fostering lifelong learning. (p. 3)

The American community college has been built on the values of access and service, with open admission and low tuition. While some 2-year institutions focus more on pre-baccalaureate transfer and others more on occupational preparation, most have both foci. In support of their open admission policies and goal of serving all segments of their communities, community colleges regularly offer non-credit classes, and courses in developmental or remedial education: basic reading, writing, and mathematics (AACC, 2009a).

National Policy

The growth and development of community colleges in the United States fall logically within the framework of several notable historical events. The 1862 Morrill Act granted 30,000 acres of land to each state to be used to generate funds 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 such branches of learning as are related to agriculture and the mechanic arts. (Morrill Act § 4)

The Morrill Act established a pattern whereby institutions of higher education would be dispersed throughout the nation, and would include subject matter distinct from, but not excluding, the traditionally recognized liberal arts.

By encouraging the study of agricultural and mechanical arts, the Morrill Act of 1862 opened the curriculum of America's postsecondary institutions beyond the liberal arts and sciences to applied professional and occupational areas (Krug, 1966). These professional and occupational areas of study continue to form the framework that sustains the programs and degrees at many American community colleges today. The Second Morrill Act of 1890, explicitly expanding educational opportunities to Black students, helped to set the stage for the open admission policies of today's community colleges, which have a consistent history of admitting students regardless of race or gender.

The Servicemen's Readjustment Act of 1944, commonly known as the GI Bill of Rights of 1944, was another pivotal point for American higher education. By providing financial assistance for veterans toward "education or training at an approved educational or training institution" (GI Bill, para. 2), the legislation furnished the means for many to

pursue education or training beyond high school and altered the country's attitude toward higher education. In the aftermath, America's colleges, universities, and other training institutes became much more accessible to a new group of students whose members were typically older, married, and had families. Moreover, they had post-high school experiences not commonly possessed by traditional college students. Characteristics of this group remain common among today's community college population (AACC, 2007b).

The Economic Opportunity Act of 1964 was the first of two pieces of federal legislature that affected higher education during the 1960s. Its preamble, quoted by Krug (1966), identifies the Act's intent as "opening ... the opportunity for education and training, the opportunity to work" (p. 149). The Economic Opportunity Act emphasized vocational education and literacy training for both youth and adults; vocational education and literacy training are still vital components of the community college mission, nationwide (AACC, 2009a).

The Higher Education Act of 1965 followed shortly after the Economic Opportunity Act. Rising from a setting where education and job training were considered the primary weapons of the "War on Poverty," it was a decidedly influential force in the history of the American community college. The initial Higher Education Act of 1965 and its subsequent reauthorizations, particularly those in 1972 and 1998, opened the door to new possibilities of financial assistance for economically disadvantaged students. The 1965 legislation emphasized two forms of federal aid: Educational Opportunity Grants (need based) and work-study funding (Hearn, 2001, p. 278). The 1972 reauthorization, considered by many to contain the most important revisions, expanded the potential

beneficiaries of the original Higher Education Act, and brought new ideologies and definitions to American higher education. Provisions for equal opportunity and for the placement of student needs ahead of institutional needs changed the face of federal involvement in higher education. "Higher education" became "postsecondary education" and federal grants to students became portable; the grants were delivered directly to the student instead of through the enrolling institution (Hearn, 2001, pp. 280-281). This flexibility encouraged attendance at multiple institutions, supporting the transfer mission of the community college.

National Development of the Community College

The birth of the American community college is traditionally marked by the 1901 establishment of Joliet Junior College in Joliet, Illinois. Housed originally within Joliet Township High School, its mission was to provide a local program equivalent to the first 2 years of a baccalaureate education (Joliet Junior College, 2007). Over subsequent decades, the number of community colleges increased steadily in the United States. By 1921, their numbers were strong enough to warrant the formation of the American Association of Junior Colleges, which later became the American Association of Community Colleges (AACC, 2009b). America boasted more than 500 community colleges in 1950, over half of which were independent or private institutions (United States Department of Education, 2007).

Federal policy, in the form of the Morrill Acts and the GI Bill of Rights, had laid the groundwork for the development of community colleges in this country. The Economic Opportunity Act and Higher Education Act and their subsequent reauthorizations during the 1960s and 1970s played key roles in the expansion and

refinement of these institutions. From 1960 to 1980 the number of public 2-year colleges in the United States grew over 150%, from 328 to 846, while the number of public 4-year colleges increased from 367 to 464, only about 25%, (U.S. Department of Education, National Center for Education Statistics [NCES], 1998). During the same period, the number of private colleges (2-year and 4-year combined) increased from 1,309 to 1,665, or approximately 27%. The increase rate of 27% in the number of all private colleges was close to the 25% increase rate of public 4-year colleges (U.S. Department of Education, National Center for Education Statistics, 1998).

Data presented by NCES for years prior to 1974 were compiled without counting branch campuses as separate entities; however, this practice changed in 1974. Between 1974 and 1986, the total number of campuses was recorded using two methods: not including branch campuses in the total and including them in the total. After 1986, all branches were counted as separate institutions. This change in the method of counting campuses makes comparisons of data from before 1974 with data from after 1986 less reliable; intermediate data from the time period using both methods have been included so that trends can be observed via that bridge.

In 1980, the number of public 2-year campuses nationally was 926 (including branch campuses). From 1980 to 2000, the number of public 2-year and 4-year campuses, including branches, increased at similar rates; 2-year campuses increased 15%, from 926 to 1,068, while public 4-year campuses increased 14%, from 549 to 614 (U.S. Department of Education, National Center for Education Statistics, 2007). Clearly, the greatest growth rates for community colleges occurred during and immediately following the 1960s.

Ohio Community Colleges

The growth and development of Ohio community colleges followed a pattern parallel to the national development of the community college. Sinclair Community College in Dayton, Ohio, traces its beginnings to the late 19th and early 20th centuries, springing from an adult education program at the local YMCA. Until 1965, Sinclair Community College operated as an independent non-profit institution, subject to the laws of Ohio, but not directly funded by the state. Its official affiliation with state public higher education in Ohio was established through the Ohio Board of Regents' (OBR) approval of the college charter in 1966 (Sinclair Community College, 2009). The timing and character were similar to Joliet Junior College; Joliet also began offering classes in the early 20th century as a locally governed postsecondary institution. It was an outgrowth of a specialized educational program within an established community organization. As with Sinclair, its official status as a public, state-affiliated institution was acquired decades later (Joliet Junior College, 2007).

Consistent with other 2-year institutions across the nation, the growth of community colleges in Ohio was slow prior to the Higher Education Act of 1965. According to Medsker (1960), Ohio had no "*public* [italics added] junior colleges" prior to 1960; the niche for state-sponsored postsecondary, baccalaureate-preparatory education was being filled exclusively by "22 branches maintained by the 5 public universities" (p. 260). Ohio's first 2-year public campuses were officially chartered or granted recognition and sponsorship in the 1960s; growth accelerated during the years between the initial Higher Education Act and its 1972 reauthorization. Of Ohio's 23

currently active community and technical colleges, 15 were chartered between 1966 and 1971.

Public institutions of higher education in Ohio were under the jurisdiction of the OBR. This “coordinating board” has historically overseen the operation and accountability of all colleges and universities. Established by the state legislature in 1963, the OBR’s original charge was, “[to] advocate for and manage state funds for public colleges; and coordinate and implement state higher education policies,” (OBR, 2007a). The formation of this board helped to set the stage for the growth and development of public higher education in Ohio. The most immediate notable result was the emergence of community colleges in the state. In May 2007, the passage of House Bill 2 of the 127th General Assembly effectively transferred the responsibilities of the OBR to the Chancellor of the Board (the Chancellor had become a direct appointee of the governor) and altered the role of the OBR to one of “an advisory board to the Chancellor” (HB2, summary).

The OBR was preceded by the Ohio College Association. Its 1958 *Ohio Commission on Education beyond High School* identified a need for at least three types of 2-year colleges: the university branch campuses, 2-year colleges, and 2-year technical institutes (Medsker, 1960, pp. 262, 263). These basic differentiations of college types are still recognized by the OBR, as indicated in the most recent *Operating Manual for Two-Year Campus Programs*. The manual identifies 2-year campuses as:

- Community colleges or state community colleges. These institutions are discernable from each other by their funding bases and governance designations, and fit into the 1958 Commission’s “two year college” classification,

- Technical colleges, which were previously identified as technical institutes,
- University regional campuses, previously classified and still commonly recognized as “university branch campuses,” and
- Additional 2-year programs which are curricularly and physically housed within universities (OBR, 1998b).

Community colleges and state community colleges are “comprehensive two-year institutions offering both technical and transfer programs” (OBR, 2007c, p. 1). They are divided by the OBR into these categories: “*state* [italics added] community colleges ... [are] supported primarily by state subsidy and tuition and fees” while “community colleges ... [are] supported in part by a local tax levy as well as by state subsidy and tuition and fees” (OBR, 2007c, p. 1). The service district assigned to a *state* community college usually consists of multiple contiguous counties or parts thereof, while a community college historically has served only one county. Additional differences exist in the respective governance structures. A *state* community college is governed by a nine-member local board of trustees; all members are appointed by the governor. A community college is also governed by a nine-member board of trustees, all of whom are residents of the service district. However, unlike the *state* community college board, only three of the nine members on the community college boards are appointed by the governor, while the other six are appointed by local officials (OBR, 1998b). The influences of the Morrill Acts and the Economic Opportunity Act are clearly seen; 13 of the 23 currently existing 2-year campuses in Ohio either began as, or are currently, technical colleges or technical institutes, and all 23 offer technical programs.

All Ohio public 2-year programs that are not university affiliated are expected to deliver “career/technical programs, adult continuing education ... [and] workforce skills enhancement” (OBR, 1998b, p. 201.02). Additionally, both technical colleges and community colleges are expected to offer coursework appropriate for transfer to a baccalaureate granting institution (OBR, 1998b). Technical colleges have not traditionally offered full degree programs consisting of transferable coursework. However, since 2007 there has been an increasing effort for Ohio technical colleges to offer full degree programs intended to transfer to baccalaureate granting institutions; several have been recently approved by their accrediting body, the Higher Learning Commission of the North Central Association of Colleges and Schools to offer Associate of Arts and Associate of Science degrees (Higher Learning Commission, 2009). These degrees are designed to approximate the first 2 years of a baccalaureate degree and are not intended for immediate occupational preparation.

The previously referenced growth pattern of American community colleges during the years surrounding the Higher Education Act is also obvious in Ohio’s community colleges. Nationally, 60% of the public community colleges were established between 1960 and 1980 (U.S. Department of Education, National Center for Education Statistics, 1998); some Ohio community colleges had begun as locally governed entities; however, all 23 of Ohio’s currently existing comprehensive community colleges were either founded or state-chartered between 1960 and 1975.

At the beginnings of the American community college in 1901, Joliet Junior College sought to provide higher education within its community. American community colleges today continue to provide higher education access and support locally; and

Ohio's community colleges are no exception. The geographic dispersion of these Ohio institutions is neither random nor self-determined; the OBR specifically defines their service districts and approves their locations (see Appendix A).

The development of American community colleges can be traced on a path parallel to significant historical events. Community colleges nationwide have developed and adjusted to fit the times, beginning with the Morrill Act's introduction of occupational and professional subject areas into undergraduate education, moving forward to the wide access implicit in the GI Bill of Rights and the Economic Opportunity Act, and continuing on to the institutional mobility allowed by the 1972 reauthorization of the Higher Education Act. The community colleges and other 2-year campuses of Ohio followed the same path, consistent with the national trends.

The Community College Today

Out of this rich history has grown a truly American institution. The famous American symbol, the Statue of Liberty announces,

Give me your tired, your poor,

Your huddled masses yearning to breathe free,

The wretched refuse of your teeming shore.

Send these, the homeless, tempest-tost to me (Lazarus, E. 1883).

As an American institution, the community college is an open-access institution, typically accepting students regardless of academic background and preparation, and serving a diverse and sizable portion of the undergraduate population. The 1,177 community colleges in the United States enroll 11.7 million students in both credit and non-credit programs (AACC, 2007b).

Many of these students fall into widely recognized high-risk groups (Pike & Kuh, 2005; Thayer, 2000; Tinto, 1993). The average age of the community college student is 29; 60% are enrolled part-time and of that portion, half are employed full-time with another one-third working part-time. Among full-time students, half are employed part-time with another one-fourth working full-time. Campus housing is available at only 26% of public community colleges, decreasing the opportunities for engagement.

Women make up the clear majority (58%) of community college students. Single parents form a smaller, but still noticeable subpopulation, at 17%. Community colleges are the clear choice of first-generation students; 39% of all community college students are first generation. A disproportionate percent (36%) of community college students are minority; in fact, 8% of community college students are non-US citizens (AACC, 2007b). Among both Black and Hispanic/Latino undergraduate students in the United States, the majority choose community colleges for postsecondary enrollment (AACC, 2010d).

The geographic distribution of community colleges in America favors urban locations, with 49% of all enrollments coming from those institutions which are located in or at the fringe of a large city. Another 33% of community college students nationwide attend colleges in or at the fringe of midsize cities. Thus, a distinct majority (82%) of community college students attend urban or suburban colleges. This majority is supported by institutional size; the colleges in the urban and suburban categories report average enrollments ranging from 4,263 for colleges in the fringe of a midsize city, and increasing up to 8,204 for those colleges within large cities. However, this geographic distribution does not imply parallel proportions arranged by size of institution; only 32% of all community college students are enrolled at institutions of over 5,000 students and 25% of

all community college students are enrolled at institutions of under 1,000 students (AACC, 2010c) according to NCES 2003 statistics.

Community colleges in America derive their revenue from a variety of sources. Consolidating all community colleges across the country, state funds are the single largest source of income, providing 37% of community college revenue. Local funding provides 21% of the revenue received by community colleges nationwide (AACC, 2010a). In Ohio, however, those comprehensive community colleges with the word "state" in their official names are not allowed to levy local taxes (e.g., property or income taxes) without special permission from the state government; such levies must be approved by election within the entire multicounty service district. Thus, these institutions usually operate without local funding. Conversely, those public 2-year institutions whose names do not contain "state" receive a portion of their revenue from local taxes. Community colleges nationally derive 17% of their revenue from tuition and fees and 11% from federal funds. The degree to which community colleges are dependent on federal funding is greater than it might seem; 30% of Pell grant funding is dispersed through public associate degree granting institutions (AACC, 2010b).

Community college students do not fit the common college student stereotype of the young recent high school graduate, single, living in campus housing with other similar students, attending full-time at a picturesque, non-urban institution. Over the past 40 years, community colleges have taken on a progressively larger role in American higher education. With a mission and student population distinct from other types of institutions of higher education, the measures and variables used in research on student success at the baccalaureate level and beyond are not necessarily appropriate to the study

of student success in the community college (Astin, 1993). The implications of these differences are necessary to an understanding of the research related to student success and degree completion.

Credits-to-Degree and Time-to-Degree

The problems of extended time-to-degree and excess credits-to-degree are closely related to institutional efficiency as well as to degree completion. In response to the challenges of educating a larger portion of a growing population, Gilmore and Hoffman (1997) proposed a Graduation Efficiency Index, based on credits-to-degree, as an effective means of measuring institutional efficiency and accountability.

Institutional Efficiency and Accountability

Institutions of higher education are facing renewed demands for institutional efficiency and accountability. The Spellings Report (U.S. Department of Education, 2006) brought national awareness to the issues surrounding the fiscal efficiency and accountability of higher education in the United States. In Ohio, the OBR has put forth expectations of increased accountability and improved productivity, especially as related to degree production (Ohio Board of Regents, 2008a).

In 1996, the League for Innovation in the Community College published a report of community college innovations which had resulted in increased efficiency. Of the 63 projects included, only one listed improved graduation rates among the benefits to the college; while improved student performance was sporadically mentioned, the focus was clearly on reducing institutional expenditures (League for Innovation in the Community College, 1996). Gilmore and Hoffman (1997) argued that the number of credits in which a student enrolls over the course of his or her educational career is an accurate measure of

institutional efficiency. The pertinent factors connecting credits-to-degree with efficiency include: enrollments in extraneous classes (students take courses that do not contribute to degree completion), dropped classes (leaving empty classroom seats), and repeating failed courses (whereby students, in essence, fill the same seat twice). Further, Gilmore and Hoffman state “the most expensive aspect of higher education is the cost of instruction” (1997, p. 693). Their validation of the graduation efficiency index implies improving the graduation efficiency index at any particular institution would improve that institution’s overall efficiency.

Across the country, the governing bodies responsible for higher education policy at the state level have also acknowledged the relationship between time-to-degree, credits-to-degree, and institutional efficiency. The Board of Regents of the University of Wisconsin established a goal of decreasing attempted credits-to-degree from 145 to 140 (for a baccalaureate degree) between the academic years of 1995-1996 and 2000-2001. The stated objective of this initiative was to “improve institutional efficiency” (University of Wisconsin, 2002, p. 1). In response to state legislation, the Colorado Commission on Higher Education reported on institutional efforts in support of timely degree completion. Its report, titled “Enhancement of Efficiencies toward the Completion of Degree Programs by State-supported Institutions of Higher Education,” recognized the national scope of inefficiencies, and made recommendations in three major areas: “student-caused delays, institution-caused delays, and actions institutions can take” (Colorado Commission on Higher Education, 1993, p. 2).

The use of degree completion rates and time-to-degree as an accountability measure was a focus of Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006). It was

also seen in the University of Wisconsin study, and again in a study by the California Postsecondary Education Commission (2006). Rouche, Rouche, and Ely (2001) use the demand for increased accountability as the contextual setting for their study of developmental education in the Community College of Denver. Institutional efficiency and accountability are closely connected to prolonged degree completion.

Prolonged Degree Completion

The issue of prolonged degree completion has been recognized in a variety of contexts (Bach et al., 2000; Calcagno, Crosta, Bailey, & Jenkins, 2007; Floyd, 2002; Goldrick-Rab, 2007; Hong, 2002; Neutzling, 2003; University of Wisconsin, 2002; Walker, 2006). Within certain limits, prolonged degree completion has become an accepted condition in higher education; the standard length of time used in measuring degree completion rates has become arbitrarily set at 150% of the time normative to the degree, tracking baccalaureate degree completion in 6 years and associate degree completion in 3 years (Bailey et al., 2006). The 150% standard may be considered appropriate in the context of baccalaureate-granting institutions, with higher proportions of full-time and residential students; however, its applicability to the community college, with open access admissions, very few residential campuses, and higher proportions of part-time students, has been challenged (Neutzling, 2003).

A recent study of the student transfer process from the community college to baccalaureate-granting institutions in Oregon examined successful transfer of classes. Overall, 49% of the students in the sample had taken courses at one institution that were not transferable to the institution of degree completion (Bach et al., 2000). Not surprisingly, community college students who had completed a program of study

specifically designed to facilitate transfer completed baccalaureate degrees at a higher rate than those who had not completed such a program. However, the overall time required for baccalaureate degree completion among the students in the study conducted by Bach and associates was 9.65 years, with subgroups ranging from 6.99 to 12.24 years. Even though the university system had attempted to improve transfer efficiency, many students still took classes which were not applicable toward their degree programs and required extended time for degree completion.

Prompted by its Board of Regents, the University System of Wisconsin examined credits-to-degree, time-to-degree, and graduation rates, all of which improved during the study period. The Wisconsin study focused on the interrelationship between these three commonly used measures of institutional efficiency and student success. The factors recognized as influencing credits-to-degree, time-to-degree, and graduation rates included factors within the institution's control: admission and program requirements, course availability, course sequencing, and alignment between program and occupational requirements; as well as factors outside the institution's control: student high school preparation, student academic goals, student use of tools such as advising and degree-audits; and external factors such as financial resources and full-time versus part-time student status (University of Wisconsin, 2002). There were substantial differences found between students requiring more than 6 years for completion of the baccalaureate degree and those requiring less time for degree completion. Three of the findings were of particular relevance to community colleges. Students requiring extended time for degree completion were more likely than their peers to be (a) part-time students, (b) to have semesters of non-enrollment during their matriculation (on average, they required a time

period encompassing 20 semesters for degree completion, but actively matriculated during only 13 of those semesters), and (c) to have “enrolled more in summer sessions” (University of Wisconsin, 2002, p. 6) than the other students. Students requiring more time for degree completion were prone to certain enrollment patterns; they were more likely to be enrolled part-time, they had more gaps in their educational calendar, and they made more use of non-traditional enrollment terms.

Retention and Student Success

A thorough examination of time-to-degree or credits-to-degree requires consideration of the existing research and literature base related to retention and student success. In 2005, 40% of America’s undergraduates were enrolled at community colleges (U.S. Department of Education, 2006). As previously noted, the portion of the nation’s undergraduates served by these institutions makes timely and efficient degree completion arguably as important for community colleges as it is for other types of colleges and universities. Though much of the extant literature focuses specifically on baccalaureate and higher degrees, it is considered relevant to this study; restricting the review of literature to those works exclusively about community colleges would severely limit the pool of available studies.

Retention

In “Retaining First Generation and Low Income Students,” Thayer (2000) suggested that during the 1990s student retention became a defining theme, with success unseating access as a higher education priority. The American College Testing (ACT) Program for Educational Planning presented data in 2005 on retention and degree completion rates at higher education institutions nationwide. First to second year

retention was reported at 68.3% for all higher education institutions and only 51.3% for public, 2-year institutions, based on information collected between 1983 and 2004 (American College Testing, 2005). The report clearly shows that the problem of student attrition is not a new development of the 21st century.

Seminal works by Tinto (1993) and Astin (1993) further corroborate the history of research on student attrition. Both of these books were based on earlier works; Tinto's *Leaving College: Rethinking the Causes and Cures of Student Attrition* was first published in 1987 and Astin's original *What Matters in College* was released in 1977, according to the authors' notes in later volumes (Astin, 1993; Tinto, 1993). In fact, the 1977 edition of *What Matters in College* included results from community colleges as well as baccalaureate-granting institutions. Astin omitted the community colleges from the 1993 work, recognizing the inherent differences between community colleges and other institutions of higher education (1993).

Student Success

Being first generation (a student with neither parent having attained a baccalaureate degree) and being low income are recognized as characteristics which align with a low probability of enrolling in and completing postsecondary education (Pike & Kuh, 2005; Thayer, 2000). Community colleges have often been the destination of choice for such students (Thayer, 2000). Thayer reported a trend in declining graduation rates; American College Testing (ACT) reported that the 3-year graduation rate at all 2-year colleges dropped from 44.1% in 1983 to 39.9% in 1997, and continued to drop, reaching 35.9% in 2001 (ACT, 1998, 2009). The rate has continued to decline, with public 2-year

colleges suffering the greatest drop; ACT reports a 3-year graduation rate of 29.0% at 2-year public colleges for 2004 (ACT, 2005).

Many students enter college underprepared for the rigors of the coursework. To address this deficiency, they often are provided preparatory coursework, also known as developmental or remedial classes. In 2005, ACT test results showed that only 51% of high school graduates taking the ACT test met the ACT's benchmark for college readiness in reading (ACT, 2006). A survey in 1995 by the National Center for Education Statistics indicated that 100% of community colleges offered some form of remedial education (Schmidt, 2008).

Academic Attainment and Degree Completion Rates

Degree completion research typically measures degrees completed in 150% of the stated time frame; 6-year completion rates for baccalaureate degrees and 3-year completion rates for associate degrees are accepted standards (Bailey et al., 2006). In studying attrition and degree completion of first generation baccalaureate seeking college students, Ishitani (2006) observed a variety of student attributes that affected degree completion. Among these were delayed matriculation (not entering college immediately upon completion of high school), gender (females being more likely to drop out of college), and Hispanic ethnicity. Non-selectivity of the institution was seen to have an association with student departure at the fourth year, and the ratio (at the student level) of remedial courses to all courses had a strong negative effect on the 6-year graduation rate, but not on fourth or fifth year retention.

Ishitani (2006) focused his research on student departure and degree completion among first generation college students, noting various types of student departure. Not all

departures were permanent in nature; some students either returned at a later date to the institution at which they had initially enrolled, others transferred to new institutions.

While permanent student departure is not a factor in examining time-to-degree or credits-to-degree, the behavior of stopping out, or temporarily interrupting enrollment has implications for timely degree completion (Ishitani, 2006; Pascarella & Terenzini, 2005).

In a study at a large, suburban Texas community college, continuous enrollment was demonstrated to be significantly and positively related to more efficient degree completion (Hong, 2002). Students who stop out have extended their calendars for degree completion, and may also need to take additional courses in cases where degree requirements have changed during the absence from school. Additionally, some degree plans may impose time limits on the applicability of certain courses; such requirements can necessitate repeating courses for students who stop out.

Several attributes associated with student departure are also typical of the community college. The average community college student is 29 years of age, having delayed college matriculation, a recognized factor in timely degree completion (Ishitani, 2006; Pascarella & Terenzini, 2005). Demographics show that 59% of community college students are female, and approximately 60% are White (AACC 2007b). In contrast, 4-year institutions report that slightly less than 50% of enrollments are female and approximately 67% of enrollments are White (National Center for Education Statistics, 2008a, 2008b). By their very mission, community colleges are non-selective (AACC, 2007a). Also, there is evidence suggesting that two-thirds of all community college students enter college lacking college-level skills in at least one major subject area, thereby qualifying them for remedial or developmental courses (Bailey, 2009).

In *Leaving College: Rethinking the Causes and Cures of Student Attrition*, Tinto (1993) remarked that low ability, combined with low socio-economic status lead to a greater likelihood of leaving college before completion, especially for non-White students. He also noted certain factors implicated with early departure are more common for community college students. These include employment, part-time student status, non-residential status, social isolation, and "external pressures" (p. 58). Community college students are at higher risk for non-completion of degree than their colleagues at baccalaureate granting institutions. The same factors which indicate likelihood of departure also imply that those who complete degrees will likely require additional time or credits to do so.

Community colleges are open access, non-selective institutions. The non-selectivity of admission policies and the attributes of the resultant students are associated with higher rates of student departure and with non-completion of degrees (Astin, 1993; Pascarella & Terenzini, 2005). Student departure may not necessarily indicate the end of a particular student's academic career; students may transfer to a different institution or merely stop out temporarily. When departure is not permanent, it is a factor in extending time-to-degree and credits-to degree. The open-access admission policies of community colleges result in a student profile which differs from that of selective admissions institutions. Both the admissions policy and student population profile may well be factors in timely degree completion, but are largely out of the control of community colleges and their governing boards. It is therefore beneficial to examine other factors which may contribute to extended time and credits-to-degree.

Institutional Characteristics and Student Success

Some institutional characteristics are beyond the control of the institution; others, however, can be, if not completely controlled, at least modified, by the institution. The literature reporting on the relationships of these characteristics with student success, graduation rates, and time-to-degree is limited and shows mixed results; most studies tracking graduation rate consider the number of graduates within a fixed time, and do not account for those students who extend their time-to-degree or credits-to-degree beyond normative standards. Additionally, much of the extant research focuses on baccalaureate-granting institutions, and does not necessarily generalize to the community college.

Yet, the role of institutional characteristics on student success has not gone unnoticed. In Astin's (1993) input-environment-outcome model, environment includes both institutional and student characteristics; institutional characteristics include highest degree offered, source of control (public, or various designations of private), and size or enrollment. Student characteristics included outside employment and receiving need-based financial aid. In *How College Affects Students, Volume 2: A Third Decade of Research*, Pascarella and Terenzini specifically explored whether "different types of institutions have differential influence" on student development (2005, p. 9).

Systems of Classification and Demographic Characteristics

Since the 1970s, the Carnegie Foundation has categorized institutions of higher education, based traditionally on specific empirical criteria as well as institutional history, traditions, and identity. However, until the most recent revisions, this classification system provided little differentiation among 2-year institutions, even though, according to the classifications established in 2000, these institutions numbered more than the

aggregated total of doctorate-granting, comprehensive, and baccalaureate-granting groups (McCormick & Cox, 2003). *New Directions for Community Colleges* dedicated its entire Summer 2003 volume to research relating to classification systems for community colleges, with a variety of schemes presented. However, within this volume it was noted that any one scheme of classification was unlikely to satisfy the desires of all or even most community college leaders, and that the multiple missions of the community college further complicate the process of developing a scheme (Cohen, 2003).

Yet a sound and consistent system of classification for community colleges could help to advance the understanding of community colleges as well as simplifying research processes for community college scholars (McCormick & Cox, 2003). The usefulness of such a classification system is in direct relation to the extent to which it provides a meaningful representation of reality. To be considered valid, a classification scheme should use objective data, be based on meaningful criteria, and be compiled of groups which are relatively stable over time (Katsinas, 2003).

Certain institutional attributes would seem to be natural distinguishers for devising a scheme of classification for community colleges. Among these are institutional control (public, private-not-for-profit, or private-for-profit), size (enrollment), geography (urban, suburban, or rural), and governance (single campus or multiple campuses). However, with only one exception, the definitions for these criteria vary; they are defined differently by different researchers (Cohen, 2003; Cox & McCormick, 2003; Hardy & Katsinas, 2006; Katsinas, 2003; McCormick & Cox, 2003; Merisotis & Shedd, 2003; Schuyler, 2003). Within the above referenced issue of *New Directions for Community Colleges*, the only consistently defined criterion was institutional control.

Despite the variations in defining variables, relationships among these and other variables have been presented in the extant research. Community colleges and other 2-year institutions, by their missions and traditions, are dissimilar from other institutions of higher education. One primary area of difference lies in the realm of degree-production. While the number of degrees granted, and the proportion of those degrees granted in the liberal arts have been considered valid means of distinguishing among baccalaureate-granting institutions, that particular attribute is not as useful in the community college universe (McCormick & Cox, 2003). This is also the case among the smaller universe comprised of Ohio's public 2-year institutions; all Ohio comprehensive community colleges offer degrees or certificates in technical and occupational areas as well as degrees in the liberal arts; complete programs within the liberal arts have very recently been approved at Ohio's 2-year technical colleges (Higher Learning Commission, 2009). The proportion of liberal arts degrees granted by institutions has been in a state of change in Ohio's 2-year colleges.

However, Schuyler (2003) suggests that a division of community colleges based on the proportion of liberal arts or transfer degrees compared to occupational degrees granted is an "intuitive" (p. 31) means of differentiating among institutions. Significant negative relationships were indicated between the percent of an institution's classes that were liberal arts and the institutional per student expenditures as well as between the percent of an institution's classes that were liberal arts and the institutional percent of total expenditures directed toward instruction. This latter relationship was explained as growing from the higher costs affiliated with the necessary equipment and supplies for technical occupational programs (Schuyler, 2003).

Categorizing community colleges by geographic location was an attribute of the scheme developed by Katsinas (2003; Hardy & Katsinas, 2006). Determination of urban, suburban, or rural status was based on locating the street address of the college within one of the U.S. hundred largest metropolitan areas, according to U.S. census data. In the case of multicampus institutions, the street address of the central office was used to determine one geographic locale for the institution. The original model for determining geographic locale was proposed using 1990 U.S. Census data; a 2006 revision of the model used 2000 U.S. Census data. The 2000 Census utilized “primary” rather than “consolidated” metropolitan areas and allowed for better differentiation between urban and suburban classifications (Hardy & Katsinas, 2006).

The size of an institution is an attribute that is frequently used in classifying colleges, both by outside raters and by prospective students. In fact, in the context of 4-year institutions, Astin (1993) found that size was the institutional characteristic with the strongest effects on student affective attributes. However, the separation of community colleges by size does not have consistent division points or methodologies. Merisotis and Shedd (2003) propose three categories based on size. Their categories are split by quartile. Those community colleges with enrollments under 2,000 students constitute 25% of all community colleges; those with enrollments of 10,000 and above are also 25% of all community colleges, leaving 50% of the community colleges in the midsize category. In this scheme, the colleges in the middle category for size, 50% of the sample, also fell into the middle category for percent of part-time students; percent of first-time, full-time degree seeking students; percent of degrees conferred in occupational areas; and percent of part-time faculty. Colleges in the group of largest enrollments had the highest

percents of part-time students and part-time faculty, but the lowest percents of occupational degrees granted and of first-time, full-time degree seeking students.

Cohen (2003) used a similar approach by dividing the colleges in his sample into equal thirds based on size. As did Merisotis and Shedd (2003), Cohen found relationships between institutional enrollment and both percentage of part-time students and part-time faculty, and between institutional enrollment and percentage of students enrolled in liberal arts classes. Schuyler (2003) observed a significant negative relationship between the percent of an institution's classes that were liberal arts and the institutional percent of total expenditures directed toward instruction. The potential conclusion from these two pieces of research, that size is negatively related to the institutional expenditures on direct instructional costs when taken as a percentage of institutional total general and educational expenditures, was supported by Cohen (2003).

Merisotis and Shedd (2003) and Cohen (2003) both divided colleges by size based on predetermined portions of the samples with which they worked. Taking a different approach to differentiation by size, Katsinas (2003) suggested a scheme whereby rural community colleges are divided by enrollment size, whereas urban and suburban institutions are categorized as single campus or multicampus. Rural colleges were either small or large, using 2,500 students as the dividing point (Katsinas, 2003; Hardy & Katsinas, 2006). This scheme seems to ignore the implications of numbers of enrolled students for non-rural campuses, and also provides fewer categories than Merisotis and Shedd. However, Katsinas's research has strongly influenced the Carnegie Foundation's recent update to its classification system (Carnegie, 2010a).

Financial Characteristics

Tuition costs and the various forms of student aid are often intertwined in the student college choice decision. Much of the available literature focuses on the relationship between tuition and/or aid and enrollment, rather than on the relationship between tuition and/or aid and academic attainment. There is empirical evidence suggesting that receipt of financial aid increases student persistence and progress (Goldrick-Rab, 2007; Singell, 2003; St. John, 2000; Zhu, 2004); additionally, aid disbursed early in the student's career can have a greater benefit (Zhu, 2004). St. John (2000) stated that for college students of the 21st century, government sponsored grants are not sufficient for promoting either access or persistence. He further observed that the pattern of replacing grants with loans later in a student's career is actually detrimental to persistence. However, Zhu's (2004) model indicated that both grant and loan recipients are more likely to complete degrees within the prescribed time than are non-recipients.

Amounts of need-based financial aid vary from student to student. Singell and Stater (2007) found that the probability of degree completion was inversely related to the amount of need-based aid received. The strength of the relationship between amount of aid and probability of graduation was, however, greatly reduced when Singell and Stater controlled for student attributes including age, SAT scores, first-year college GPA, and major. Their conclusion was that these other factors played a much larger role in degree completion than did the amount of aid received.

Online Course Delivery

"On-line learning is here to stay" (Hurt, 2008). The role of technology in course delivery has been a subject of interest for higher education for many years. In the 1990s,

Florida was faced with many of the same problems that face Ohio's community colleges today; these factors included declining revenues from state sources, demands for increased enrollments, and state pressure to "improve the progress of students" (Dallet & Oppen, 1997). This context prompted an examination of the use of technology to deliver instruction. However, Dallet and Oppen's research preceded much of the recent rapid growth of online delivery. Their research provided little insight into online course delivery; the technology elements examined instead included the use of calculators in mathematics classrooms and overhead projectors in general classrooms.

Currently, virtually all college students own computers, according to the Educause Center for Applied Research (Caruso, Smith, & Salaway, 2009), with 98.8% of survey respondents reporting computer ownership. This percentage was up from 93.4% in 2004. There has been noteworthy growth in the use of course management systems such as Blackboard, WebCT and ANGEL Learning. The Educause surveys indicated that while 79.7% of respondents had used such a system in 2006, by 2009 the percentage had increased to 91.0% (Smith, Salaway, & Caruso, 2009). However, the widespread computer ownership and use of course management systems do not imply that students in this study preferred online course delivery. When asked to indicate the extent of technology preferred in a course, only 3.5% selected "exclusive IT" from five choices ranging from "no IT" to "exclusive IT" (Smith, Salaway, & Caruso, 2009). When queried regarding the benefits of including technology in course delivery, a strong majority (70.4%) of students surveyed indicated that the use of technology made completing course activities more convenient (Caruso, Smith, & Salaway, 2009; Smith, Salaway, & Caruso, 2009). However, these surveys were heavily populated by students from

Carnegie-classified doctoral institutions (55.6%) with only 8.2% of survey respondents from Carnegie-classified associate institutions. Additionally, only 12 two-year institutions were included among the 115 institutions in the survey (Caruso, Smith, & Salaway, 2009; Smith, Salaway, & Caruso, 2009). Hence, the applicability of these results to the community college is unsure. However, while the large percentages of computer ownership and usage reported might not extend to the community college, the indicated growth trends in these areas are likely present in all segments of the surveyed population.

Much of the research on the effectiveness of online learning is inconclusive (Bambara, Harbour, Davies, & Athey, 2009; Hurt, 2008). Most notably, there are problems with the quality of research into online learning as well as gaps in the research. Much of the literature addressing online education takes the form of opinion pieces or “how-to” articles, rather than empirical studies (Merisotis & Phipps, 1999). Of those works that are research based, many have used small, non-random and non-representative samples, and others have failed to address the factors other than the online environment that could have been expected to influence the differences found (Hurt, 2008; Merisotis & Phipps, 1999).

In a meta-analysis, Russell (2001) examined 350 studies and found that no significant difference in student learning existed between technology-mediated and traditional classes, when other variables were held constant. His examination of research began chronologically with a report from 1928, comparing correspondence courses and classroom based instruction. The technologies compared over the decades included but were not limited to audio transmission of content, film, closed circuit and open circuit

television, programmed instruction, computer-assisted and computer-based instruction, interactive video, asynchronous conferencing, and online instruction. Attributes of instructional technique such as use of eye contact, experience level of the instructor, and quality of the technology (“premium broadband video,” p. 64) were included. The academic level of instruction being taught via technology encompassed elementary school through doctoral studies, and subject areas included topics as disparate as English, mathematics, foreign language, and physical education. Russell’s final conclusion was that there is no (statistically) significant difference in learning, based on the instructional medium utilized, that “there is nothing inherent in the technologies that elicits improvements in learning” (p. xiii).

Despite the lack of consistent evidence in support of the benefits of online course delivery, many community colleges have difficulty meeting increasing student demand for this medium (Selingo, 2009). Increased demand is no doubt related to the perceived benefits of online course delivery to students. Many community college students work and rely on childcare providers; these commitments can conflict with traditionally scheduled classes. The flexibility to complete coursework in between other demands is an obvious attraction for students (Hurt, 2008). In addition to practical benefits such as convenience and flexibility, Hurt observed that online course delivery has “learning benefits.” Successful participation in online learning fosters the development of skill sets that are helpful or necessary to a student’s college success, such as improved reading skills, writing skills, and problem-solving skills. Participation in online courses also improves the student’s ability to work with technology and to manage time efficiently.

Possession of these same skills prior to attempting online courses also increases the student's likelihood of success (Hurt, 2008). Yet, a strong majority of entering community college students requires remediation in at least one subject area, with 11% placing into the lowest level of reading (Bailey, 2009). These deficiencies could influence the success of community college students in the online environment. In fact, the Instructional Technology Council found that while completion rates among community college students in online classes had improved over time, online course completion, at 72%, still lags behind the completion rate for traditionally delivered courses, measured at 76% (Instructional Technology Council, 2010). It is reasonable, therefore, to include percent of courses delivered online as an independent variable in this study of credits-to-degree and time-to-degree.

Part-time Faculty

The increasing reliance on part-time faculty at institutions of higher education has come under scrutiny from many corners. Part-time faculty are perceived as having poorer qualifications for teaching than their full-time counterparts and are also linked with lower levels of academic integration for students (Benjamin, 2002; Tinto, 1993). Beyond the obvious institutional economic benefits of utilizing part-time faculty, part-time faculty also play a beneficial role in institutional responsiveness and flexibility, and their use is consistent with Levin's business model of the community college as "new world college" (Levin, 2007, p. 15). In this context, Levin cautions against considering all part-time faculty as filling one institutional role; part-time faculty may often be a lower-cost substitute for full-time faculty in the liberal arts areas, but in the occupational disciplines, part-time faculty are often practicing experts within their chosen fields.

Larger percentages of part-time faculty have been seen to be negatively correlated with institutional graduation rates (Calcagno, Bailey, Jenkins, Kienzl, & Leinbach, 2008; Jacoby, 2006; Jaeger & Eagan, 2009). Umbach (2007) found that part-time faculty had lower levels of commitment to the college, and demonstrated fewer good practices in their classrooms. Specifically, part-time faculty members were less likely to use interactive and collaborative classroom techniques. Additionally, part-time faculty interacted with students less frequently outside the classroom; faculty-student interaction is a recognized factor in student persistence and degree attainment (Pascarella & Terenzini, 2005; Tinto, 1993). Part-time faculty “are underperforming in their delivery of undergraduate instruction” (Umbach, 2007, p. 110).

Jacoby cautions that while the correlation between high use of part-time faculty and low graduation rates exists, it does not imply cause and effect, nor did his study “identify the specific mechanisms” (2006, p. 1098) affiliated with part-time faculty which might be most closely related to the decrease in graduation rates. Furthermore, Jaeger and Eagan (2009) note that the significant body of recent research has dealt with 4-year colleges and universities, rather than specifically with community colleges.

High use of part-time faculty is often seen in developmental courses (Burgess & Samuels, 1999), another relevant factor when analyzing student success. The need for extensive developmental or remedial coursework adds to the potential for extending the credits-to-degree and time-to-degree as well as for non-completion of the intended degree.

Developmental Education

Community colleges serve a wide audience with a variety of needs; developmental education courses are a regular part of their course offerings. Students who require preparatory classes prior to beginning their college programs have increased their potential for enrolling in excess credits before degree completion as well as extending the calendar time required to complete their degrees. Enrolling in developmental courses and the number of such courses required have been shown to be statistically significant predictors of extended time-to-degree (Floyd, 2002; Hong, 2002). Often, these students also have low social and cultural capital (Goldrick-Rab, 2007; Jaeger & Eagan, 2009), compounding their potential for extended degree completion and non-completion of degree.

All community colleges offer coursework at the pre-college level (Schmidt, 2008). In some states, community colleges are expected to fill the need for developmental education for all public colleges. Maryland's community colleges manage over 90% of the state's remedial needs (Kolajo, 2004). In California, developmental education courses all must be taken at community colleges (Shulock & Moore, 2005). The Ohio Core legislation (AM. Sub. S. B. 311, 2007) revises high school core curriculum and restructures admissions requirements for state universities, phasing out state funding for developmental classes to most baccalaureate-granting institutions beginning with Fiscal Year 2015. In Ohio, only those baccalaureate-granting institutions with active and historical open access admissions policies are exempted from this policy.

Nationally, approximately 60% of community college students enroll in remedial or developmental classes (Bailey, 2009; Kolajo, 2004). These enrollment figures do not

include underprepared students at the colleges that do not require students to complete designated developmental courses prior to beginning their college-level coursework. Bailey (2009) reports that California community colleges allow full registration in college-level classes for students who have test scores indicating a need for remediation; developmental education becomes, in essence, voluntary. Additionally, when policies requiring mandatory enrollment in indicated developmental courses exist, these policies are not necessarily routinely enforced (Bailey, 2009).

Using national longitudinal data sets, Bailey found that students requiring developmental education were less likely to graduate and for those who graduate, less likely to graduate on time (2009). However, there are also examples of colleges with aggressive student success programs where these students graduate at a rate comparable to peers who do not require developmental education (Rouche, Rouche, & Ely, 2001). At the Community College of Denver, this programming involved additional instruction in the areas of social skills, communication skills, career planning, and goal setting as well as “extensive integration of technology” (Rouche, Rouche, & Ely, 2001, p. 526). Overall, research on the success of students requiring developmental education presents mixed results.

The inconsistency of these results is no doubt influenced by the range of college preparation needed by students. Some students may require less remediation, as little as one course in one area, delivered over one academic quarter (approximately 11 weeks), while other students might require as much as three semesters in each of the three standard developmental areas of mathematics, reading, and writing. The amount and type of college preparatory coursework required thus produces a range of impact on credits-to-

degree for the affected students. Despite the mixed results of much of the research in the area of the effect of developmental education on student success, Pascarella and Terenzini concluded that developmental education is “at least moderately effective” in helping students to overcome deficiencies, to persist, and to eventually attain degrees (2005, p. 398).

Completion rates vary by subject area, with the highest completion rates seen in developmental reading and the lowest in mathematics. Bailey’s (2009) study showed that two-thirds of students who enroll in developmental reading complete the necessary reading classes, but only 44% of those who enroll in developmental mathematics complete the required sequence. However, as many as one-third of all first-time students test into the lowest level of developmental mathematics while only 11% place into the lowest level of reading, implying greater deficiencies to be accommodated in mathematics prior to readiness for college level courses.

In comparing degree completion of remedial students to their peers who did not enroll in developmental education, Bailey (2009) found that less than one-third of remedial students at community colleges completed a degree or certificate within 8 years, compared to almost 40% of those who did not enroll in developmental education. However, for both groups, 14% transferred to a baccalaureate-granting institution without first completing a degree or certificate. Community colleges provide a considerable portion of developmental education across the nation; it is likely that many of Bailey’s remedial students never intended to complete any degree or certificate at the community college and were simply using their time there to prepare for matriculation at a baccalaureate granting institution.

Attewell, Lavin, Domina, and Levey (2006) also found mixed results. Some of these inconsistencies can be explained by controlling for the variables of high school academic performance and preparation, as well as sociodemographic status. Using a model that controlled for these factors, Attewell, Lavin, Domina, and Levey found that students who took remedial coursework made more academic progress than their equivalently prepared peers, while eliminating these controls from the model reversed the results. When examining institutions separately according to their status as either 2-year or 4-year colleges, there were differences in degree completion rates. At the community college, controlling for academic and sociodemographic background, there was no significant difference in degree completion rates between remedial and non-remedial students. However, at the 4-year colleges, degree completion rates for remedial students were statistically significantly lower than for non-remedial students, whether or not academic and sociodemographic background were controlled.

Summary

Community colleges nationwide and in the state of Ohio are specialized institutions and have marked differences from baccalaureate and graduate degree-granting colleges and universities. As examples, the student profiles and core missions of the former are dissimilar from those of the latter. Yet, attrition, efficient time-to-degree, and efficient credit-to-degree are highly relevant statistics across higher education. With increasing numbers of students beginning their postsecondary education at community colleges, timeliness of completing associate degrees has become increasingly important.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to generate data that could enhance the ability of community college leaders to increase institutional efficiency and accountability and to meet expectations included in the state's strategic plan. Specifically, this research examined relationships between selected characteristics of Ohio's public comprehensive community colleges and timely degree completion, as indicated by institutional mean credits earned in the process of degree completion and institutional median time-to-degree in calendar years.

The predictor variables were institutional characteristics of size, size of population served, calendar system, governance designation, annualized student costs, percent of student body receiving aid in the form of federal grants, percent of classes taught by adjunct faculty, percent of student credit hours taken online, developmental education placement policy, academic dismissal/readmission policy, and limited enrollment programs admission protocols. Variables were drawn from state of Ohio official documents; from two datasets, the Integrated Postsecondary Education Data System (IPEDS) and the Higher Education Information (HEI) system; from the Carnegie

Classifications Data File; as well as from individual institutional publications, as necessary.

The predictor variables of institutional characteristics were grouped into four categories for analysis. The first included those classified as demographic; they were dichotomous, ordinal, or continuous. The second included those classified as financial; they were continuous ratio scale variables. The third included those describing characteristics of course delivery methods; they were also continuous ratio scale variables. The fourth included those describing institutional academic policies; they were dichotomous or ordinal. The existence of relationships and the strength and direction of such relationships were tested for and measured through correlation coefficients.

Research Questions

This study was guided by four primary research questions.

1. What are the institutional characteristics of Ohio's public comprehensive community colleges, based on the following variables?
 - Demographic characteristics: enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).
 - Financial characteristics: cost to the student (annualized full-time tuition and fees) and percent of students receiving financial aid in the form of federal grants.
 - Course delivery characteristics: percent of classes taught by part-time faculty and percent of student credit hours taken online.

- Policy characteristics: developmental education placement policy (*strong, moderately strong, moderately weak, weak*), academic dismissal/readmission policy (*strong, medium, weak*), and admission protocols of limited enrollment programs (waiting list or selective/competitive).
2. Among Ohio's public comprehensive community colleges, what level of association exists between institutional characteristics from each of the following categories?
- Demographic characteristics: enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).
 - Financial characteristics: cost to the student (annualized full-time tuition and fees) and percent of students receiving financial aid in the form of federal grants.
 - Course delivery characteristics: percent of classes taught by part-time faculty and percent of student credit hours taken online.
 - Policy characteristics: developmental education placement policy (*strong, moderately strong, moderately weak, weak*), academic dismissal/readmission policy (*strong, medium, weak*), and admission protocols of limited enrollment programs (waiting list or selective/competitive).
3. Among Ohio's public comprehensive community colleges, what level of association exists between institutional mean credits-to-degree and institutional characteristics from each of the following categories?

- Demographic characteristics: enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).
 - Financial characteristics: cost to the student (annualized full-time tuition and fees) and percent of students receiving financial aid in the form of federal grants.
 - Course delivery characteristics: percent of classes taught by part-time faculty and percent of student credit hours taken online.
 - Policy characteristics: developmental education placement policy (*strong, moderately strong, moderately weak, weak*), academic dismissal/readmission policy (*strong, medium, weak*), and admission protocols of limited enrollment programs (waiting list or selective/competitive).
4. Among Ohio's public comprehensive community colleges, what level of association exists between institutional median time-to-degree and institutional characteristics from each of the following categories?
- Demographic characteristics: enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).
 - Financial characteristics: cost to the student (annualized full-time tuition and fees) and percent of students receiving financial aid in the form of federal grants.

- Course delivery characteristics: percent of classes taught by part-time faculty and percent of student credit hours taken online.
- Policy characteristics: developmental education placement policy (*strong, moderately strong, moderately weak, weak*), academic dismissal/readmission policy (*strong, medium, weak*), and admission protocols of limited enrollment programs (waiting list or selective/competitive).

Data and Population

Data

The Ohio Board of Regents (OBR) regularly publishes reports of various demographic and performance measures for all publicly funded postsecondary institutions in the state. *The Performance Report for Ohio's Colleges and Universities, 2006* (OBR, 2007b) includes statewide summaries for academic year 2005-2006 as well as reports including Fiscal Year (FY) data from FY 2001 through FY 2005; FY 2005 equates roughly to the academic year 2004-2005. *The Performance Report for Ohio's Colleges and Universities, 2006, Institutional Outcomes Measures* (OBR, 2007c) contains the same measures, but reported at institutional levels, rather than at an aggregated state level. The data in these reports are drawn primarily from the Higher Education Information (HEI) system. The data from OBR reports were supplemented, as needed, with reports commissioned by the OBR (Ohio Learning Network, 2007) and with data taken directly from HEI and the Integrated Postsecondary Education Data System (IPEDS) as well as data taken from the Carnegie Classifications Data File. The Carnegie Classifications were initially developed in 1970 by the Carnegie Commission on Higher Education. In addition to a basic classification for each included institution, the Carnegie

Classification Data Files contain data relating to instructional programs, enrollment profiles, and size and setting classifications (Carnegie Foundation, 2010b).

HEI is a comprehensive relational database, containing data on students, courses, faculty, facilities, and finances, supplied by colleges and universities in Ohio. IPEDS is the postsecondary education data collection program for the National Center for Education Statistics (NCES); it contains data on enrollments, program completions, graduation rates, faculty, staff, finances, institutional prices, and student financial aid. Where OBR and HEI data were incomplete or ambiguous, appropriate personnel at the individual colleges were consulted. Non-parametric data reporting policies on developmental education placement, academic dismissal/readmission, and limited enrollment programs admission were drawn from institutional documents, institutional research departments, admissions departments, and other institutional sources.

Population

This study was conducted at the institutional level; the unit of analysis was the college. The defined population consisted of 14 of the 15 public, comprehensive community colleges in the state of Ohio. With the aim of reducing confounding variables, the state's 8 technical colleges and the 24 university regional campuses were not included, primarily because they have missions that are clearly distinct from the mission of the state's public comprehensive community colleges. Additionally, Rio Grande Community College was not included in the study population because the institution shares facilities, classes, faculty, administration, and academic policies with a private liberal arts university, Rio Grande University. Although Rio Grande Community College is classified as a public comprehensive community college, disaggregating essential data

for this institution was not possible. The study schools are “comprehensive two-year institutions offering both technical and transfer programs” (OBR, 2007c, p. 1). They are divided by the OBR into two categories: “*state* [italics added] community colleges ... [are] supported primarily by state subsidy and tuition and fees” while “community colleges ... [are] supported in part by a local tax levy as well as by state subsidy and tuition and fees” (OBR, 2007c, p. 1). Additional differences exist in the respective service districts and governance structures. A *state* community college usually serves a district consisting of multiple, contiguous counties and is governed by a nine-member local Board of Trustees; all members are appointed by the governor of the state. A community college is also governed by a nine-member Board of Trustees, all of whom are residents of the service district, which has historically been a single county. However, unlike the *state* community college board, only three of the nine members on the community college boards are appointed by the governor, while the other six are locally appointed (OBR, 1998b).

Of the 14 public comprehensive community colleges in this study, 3 were configured as multiple campuses in distinct locations at the time of data collection. However, data on credits-to-degree and time-to-degree were not available in disaggregated form; therefore, multiple campus institutions were each treated as a single institution even though there may be inconsistencies among some predictor variables. The presence or absence of such inconsistencies, and their implications, are discussed in chapter IV, Report of Findings and chapter V, Conclusions and Recommendations.

Variables

Tables 1 and 2 summarize the predictor variables and coding methods, and the criterion variables, respectively.

Table 1

Measurement and Coding of Predictor Variables

Variable name	Coding/range
Enrollment	Raw number of headcount enrollment
Size of population served	Small = 1, moderately small = 2, moderately large = 3, large = 4
Calendar system	Quarter = 0, semester = 1
Governance designation	Community college = 0, state community college = 1
Cost to the student	Annualized full-time tuition and fees, in dollars.
Financial aid	Percent of students (headcount) receiving federal grant-based financial aid.
Percent of classes taught by part-time faculty	Percent of classes (by credit hours) not taught by full-time, tenure track (or equivalent) faculty.
Percent of student credit hours taken online	Annualized online credit hours as a percent of total annualized credit hours generated.

(table continues)

Table 1

Variable name	Coding/range
Developmental education placement policy	Strong (mandatory testing and placement) = 4, moderately strong (mandatory testing, optional placement) = 3, moderately weak (self-placement, counseling) = 2, weak (no testing, or no policy) = 1
Academic dismissal/readmission policy	Strong = 3, medium = 2, weak or no policy = 1
Limited enrollment programs	Selective/competitive admission = 1, waiting list = 0

Table 2

Measurement of Criterion Variables

Variable name	Measurement method
Time-to-degree	Median length of time used for degree completion, in calendar years, as measured by institution
Credits-to-degree	Mean number of credits earned in process of degree completion, in semester hours, as measured by institution

Statistical Methods

This non-experimental, retrospective study used data from its entire population. As the predictor variables were not controlled, causation is not hypothesized (Kratwohl,

1998). As a population study, all statistical reports are descriptive rather than inferential. Using the strategies for effect size suggested by Cohen and Cohen (1983), *small* associations were identified by correlation coefficients with absolute values from .01 to .29, *medium* associations were identified by correlation coefficients with absolute values from .30 to .49, and *large* associations were identified by correlation coefficients with absolute values of .50 or greater. These values are widely accepted for use in the behavioral sciences (Chen & Popovich, 2002; Green & Salkind, 2008).

Sub-questions related to the demographic characteristics explored the institutional characteristics of enrollment (headcount enrollment), size of population served (*small*, *moderately small*, *moderately large*, *large*), calendar system (semester or quarter), and governance designation, and asked to what extent these characteristics were associated with each other and with the institutional mean credits-to-degree and with the institutional median time-to-degree in calendar years. The size of population served variable was coded by rank ordering from lower to higher population densities. Calendar system and governance designation were coded as dummy variables, with a value of 1 indicating the presence of a semester calendar or of a "state" designation, respectively.

Financial characteristic and course delivery characteristic variables were all continuous, ratio scale variables. Cost variables were rounded to the nearest whole dollar, and percent measures to the nearest percent. Policy variables of developmental education placement and academic dismissal/readmission were assigned rank order values based on stringency of the policy, increasing values indicating increasing stringency. As the assigning of stringency levels involved a degree of subjectivity, qualitative descriptions of the implications of variations in data were also included. Admission policies for

limited enrollment programs were assigned dummy variables, with 1 indicating the presence of a selective/competitive admission process.

In the cases of dichotomous and ordinal variables (size of population served, calendar system, governance designation, developmental education placement policy, academic dismissal/readmission policy, and limited enrollment programs) relationships between predictor variables and between each predictor variable and each criterion variable were identified through correlation testing; Pearson's r was computed to measure the direction and strength of the relationship. As Pearson's r was used as a descriptive statistic, rather than inferential, it did not require the assumption of a bivariate normal distribution (Chen & Popovich, 2002).

For all continuous ratio scale variables, and for the dichotomous and ordinal variables, Pearson correlation coefficients were computed. The Pearson correlation coefficient is appropriate for both variable types; for those dichotomous variables with no implied order or rank (calendar system, governance designation, limited enrollment programs), the point-biserial correlation is a simplification of the standard Pearson's r . Pearson's r is appropriate for the rank-ordered variables; Chen and Popovich (2002) utilize mathematically identical formulae in computing both Pearson's product-moment r and the point-biserial r_{pb} thus reinforcing their statement that the correlation between an ordinal or dichotomous variable and a continuous variable is properly computed using the Pearson's r formula.

Analysis of data to clarify relationships between and among variables, but not directly addressing the association with the criterion variables, was conducted prior to analyzing the data within the research questions. These preliminary analyses explored

relationships between and among predictor variables, and between and among criterion variables which appeared potentially to be dependent. Specifically, Pearson product-moment correlation coefficients were computed to test the strength of the associations between credits-to-degree and time-to-degree, between headcount enrollment and FTE enrollment, and between student costs and governance designation. Potential dependence between student costs and governance designation was motivated by the state funding model which allows a local tax levy for some community colleges; anecdotally, the community colleges, with local levy funding, are known for lower tuition rates.

Limitations

This study is descriptive, examining the associations of selected institutional factors with institutional median credits-to-degree and institutional mean time-to-degree at Ohio public comprehensive community colleges. Thus, there are no inferences intended for the affect of institutional characteristics in predicting credits-to-degree and time-to-degree at any other types of institutions or locations. This study also makes no claim to having examined all possible institutional factors. The data for both predictor and criterion variables are self-reported and subject to associated inaccuracies. The inclusion of multiple campus institutions may reduce the predictive power of the analyses, as multiple campus institutions may exhibit variation across campuses among predictor variables, but have only one value reported for the criterion variables.

The unit of analysis of this study was the college. The results are not intended for application to other units, such as individual students or student cohorts. To extend the results to those contexts would be an example of the ecological fallacy, of inferring

relationships at individual levels, based on “correlation[s] derived from aggregate data” (Chen & Popovich, 2002, p. 67).

Summary

This study examined associations between selected characteristics of Ohio's public comprehensive community colleges and timely degree completion, as indicated by institutional average credits earned in the process of degree completion and institutional median time-to-degree in calendar years. Conducted using SPSS version 17, the analyses were correlational in nature, relying on the accepted computation of Pearson's product-moment r , and using the established standards of .01 to .29, .30 to .49, and .50 and above for *small*, *medium*, and *large* associations, respectively. Results were subject to the above named limitations.

CHAPTER IV

STUDY FINDINGS

Introduction

Findings in this chapter were drawn from data collected from Ohio Board of Regents' (OBR) documents, from the Integrated Postsecondary Education Data System (IPEDS), from the Higher Education Information (HEI) system, from the National Center for Education Statistics (NCES), from the Carnegie Classifications Data File, from the United States Census Bureau, and from institutional catalogs, Web sites, and policy and procedures. In some cases, employees at study colleges were contacted for clarification and specifics relating to the policy variables (See Appendix B). Descriptive statistics and narrative details are provided for the population set and for the criterion and predictor variables. Correlations within the criterion and predictor categories are included within the descriptive sections. Analyses of the variables and presentation of the correlations follow the statistics and descriptions.

Study Population Profile

Data were collected and entered for 14 of the 15 public comprehensive community colleges in the state of Ohio, utilizing 2007 designations and names. Rio Grande Community College was excluded, as explained in chapter I. Within the University System of Ohio (USO) there are several designations for associate degree-

granting institutions. In addition to the comprehensive community colleges, within the USO 2007 designations there are technical colleges, which offer technical associate degrees (AAB, AAS, and ATS, defined in chapter I) intended for direct entry into an occupational field and not intended for transfer into a baccalaureate program (OBR, 1998b). The USO associate degree-granting institutions also include university regional branch campuses. These campuses are affiliated with public universities; each branch campus is governed by the respective university's board of trustees, but is geographically separated from the main university's campus. Additionally, some baccalaureate degree-granting institutions offer associate degree programs on their main campuses.

General Information

Ohio's public comprehensive community colleges offer associate degrees intended as preparation for a baccalaureate degree as well as associate degrees intended for direct entry into an occupational field with transfer to a baccalaureate granting institution being a secondary goal. These institutions have one of two governance designations.

1. Comprehensive community colleges whose OBR approved names contain the word "state" typically have state-assigned service districts including two or more counties. Fiscally, they rely primarily on a mix of state subsidies, student tuition, and student fees. If they wish to seek local funding in the form of tax revenues, they are required to obtain OBR permission and the proposed tax rate must then be applied to all counties in their state designated service district. All nine members of their boards of trustees are gubernatorially appointed.

2. Those comprehensive community colleges whose official names do not contain the word "state" typically have a state-assigned service district of just one county (in more recent years, some of these institutions have expanded their outreach into neighboring unassigned counties). Fiscally, institutions in this group rely on a mix of state subsidies, student tuition, student fees, and local tax revenues. Unlike institutions in the first category, these institutions do not require state approval to pursue local tax revenues; they are, however, subject to all other pertinent tax laws for local governmental agencies. Among the nine members of their boards of trustees, three are gubernatorially appointed and six are locally appointed, often by county commissioners.

All comprehensive USO community colleges are accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools.

Ohio's comprehensive community colleges have traits in common, as indicated above. They also have other features that distinguish them one from another. Some initially offered classes in local secondary schools or technical high schools, others in rented facilities, and some constructed or purchased their own buildings. Some, but not all, were originally chartered as comprehensive community colleges; many had initial charters as technical institutes. Of those originally chartered as technical institutes, all were re-chartered as comprehensive community colleges between the mid-1980s and mid-1990s. Most have expanded from their original geographic locations to include multiple campuses or satellite locations. They are located throughout the state, with a clear pattern of providing access to higher education for the population of the state in both rural and urban areas.

Individual Institutional Descriptions and Profiles

The following paragraphs provide brief summaries of the histories and current statuses of each of the 14 comprehensive community colleges. Also included are profiles based on the predictor variables. Where continuous data were feasible, they were used; otherwise categories were established, as indicated in chapter III. The rubrics utilized for establishing these categories are included in the section *Analysis of Variables* in this chapter. Tables 3 through 5 list the predictor variables and coding methods. Table 3 lists the continuous variables, Table 4 the ordinal variables, and Table 5 the dichotomous variables.

Table 3

Continuous Predictor Variables

Variable name	Coding method
Enrollment	Raw number, headcount enrollment
Cost to the student	Annualized full-time tuition and fees, in dollars.
Financial aid	Percent of students (headcount) receiving federal grant-based financial aid.
Percent of classes taught by part-time faculty	Percent of classes by credit hour, not taught by full-time, tenure track (or equivalent) faculty.
Percent of student credit hours taken online	Annualized online credit hours as a percent of total annualized credit hours generated.

Table 4

Ordinal Predictor Variables

Variable name	Coding method
Size of population served	Small = 1, moderately small = 2, moderately large = 3, large = 4
Developmental education placement policy	Strong = 4, moderately strong = 3, moderately weak = 2, weak = 1
Academic dismissal/readmission policy	Strong = 3, medium = 2, weak or no policy = 1

Table 5

Dichotomous Predictor Variables

Variable name	Coding method
Calendar system	Quarter = 0, semester = 1
Governance designation	Community college = 0, state community college = 1
Limited enrollment programs	Selective/competitive admission = 1, waiting list = 0

Cincinnati State Technical and Community College. Cincinnati State Technical and Community College's main campus is located in the Clifton neighborhood, within the city limits of Cincinnati but outside the downtown area. The Cincinnati Technical Institute was chartered by the state in 1969 and initially shared facilities with Courter

Technical High School. In 1972, state legislation recognized the postsecondary nature of the technical institute and it became Cincinnati State Technical College. The technical college converted to a comprehensive community college in 1994 and became Cincinnati State Technical and Community College. In addition to the main campus, Cincinnati State currently operates a West Campus near the Indiana state line. The West Campus houses Aviation Maintenance Technology courses. Cincinnati State offers over 100 degree and certificate programs and is recognized for its extensive cooperative work experience program (Cincinnati State Community College, 2006, 2010). The characteristics for Cincinnati State Technical and Community College are summarized in Table 6.

Clark State Community College. Clark State Community College serves the counties of Champaign, Clark, Greene, and Logan in west central Ohio. It began in 1962 as the Springfield and Clark County Technical Education Program, and was initially housed in the facilities of the Springfield/Clark vocational technical high school. In 1966, the college was chartered by the OBR as Clark County Technical Institute, self-identified as Ohio's first technical college. Renamed Clark Technical College in 1972, the institution enhanced and expanded its offerings in the general education areas of humanities and social sciences, and by 1985, it had one of the broadest general education programs of the Ohio technical colleges. In 1988, the OBR authorized the change to Clark State Community College. At this writing, the College offers over 60 associate degree and certificate programs and is expanding its physical presence from the original Clark County locations into other parts of its service district (Clark State Community

College, 2006, 2010a, 2010b). The characteristics for Clark State Community College are summarized in Table 7.

Table 6

Profile of Cincinnati State Community College

Variable	Value
Enrollment	8,608
Size of population served	Large
Calendar system	Quarter
Governance designation	State community college
Cost to the student	\$3,702
Percent of students receiving financial aid	45%
Percent of student credit hours taught by part-time faculty	56%
Percent of student credit hours taken online	5%
Developmental education policy	Strong
Dismissal/readmission policy	Strong
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Columbus State Community College. With a main downtown campus and more than nine off-campus centers, Columbus State Community College is among Ohio's largest 2-year institutions. Columbus State Community College traces its roots to the 1963 Columbus Board of Education's creation of the Columbus Area Technician School within Central High School. This was followed shortly by the OBR approval of the Columbus Technical Institute District and the 1976 chartering of the Columbus Technical

Institute. The Institute was re-chartered in 1987 as Columbus State Community College, an event recognized by the institution as a “significant change” (Columbus State Community College, 2010, p. 7). Today, Columbus State Community College offers over 140 associate degree and certificate programs (Columbus State Community College, 2006, 2010). The characteristics for Columbus State Community College are summarized in Table 8.

Table 7

Profile of Clark State Community College

Variable	Value
Enrollment	3,472
Size of population served	Moderately large
Calendar system	Quarter
Governance designation	State community college
Cost to the student	\$3,502
Percent of students receiving financial aid	48%
Percent of student credit hours taught by part-time faculty	53%
Percent of student credit hours taken online	25%
Developmental education policy	Strong
Dismissal/readmission policy	Weak
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Table 8

Profile of Columbus State Community College

Variable	Value
Enrollment	22,014
Size of population served	Large
Calendar system	Quarter
Governance designation	State community college
Cost to the student	\$3,555
Percent of students receiving financial aid	36%
Percent of student credit hours taught by part-time faculty	61%
Percent of student credit hours taken online	17%
Developmental education policy	Strong
Dismissal/readmission policy	Weak
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Cuyahoga Community College. Cuyahoga Community College is informally known as "Tri-C." Tri-C, self-identified as Ohio's first community college, began its history in 1963, holding classes in the 19th century Brownell School building, leased from the Cleveland Board of Education. Tri-C has expanded to include three distinct campuses with headcount enrollments ranging from 6,914 to 13,090: the main Metro Campus near downtown Cleveland; the Eastern Campus, opened in 1971 in Highland Hills; and the Western Campus, which opened in 1966 in a repurposed hospital building in Parma and moved to a new building in 1975. Additionally, the College operates two freestanding

Corporate Colleges® for non-credit workforce and industry training. Tri-C offers over 140 associate degree and certificate programs, with classes available in 15 locations across Cuyahoga County (Cuyahoga Community College, 2007, 2010). The characteristics for Cuyahoga County Community College are summarized in Table 9.

Table 9

Profile of Cuyahoga Community College

Variable	Value
Enrollment	30,135
Size of population served	Large
Calendar system	Semester
Governance designation	Community college
Cost to the student	\$2,416
Percent of students receiving financial aid	55%
Percent of student credit hours taught by part-time faculty	50%
Percent of student credit hours taken online	9%
Developmental education policy	Strong
Dismissal/readmission policy	Medium
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Edison State Community College. Edison State Community College serves the populations of Darke, Miami, and Shelby counties in the west central region of Ohio. Edison was chartered in 1973 as Edison State General and Technical College and offered its first classes in rented facilities. In 1977, as a result of modifications in state codes, the

name was changed to Edison State Community College. At this writing, Edison operates a main campus in Piqua and a Darke County Campus, located in Greenville, approximately 20 miles west of Piqua. With close proximity to the Indiana state line, the Ohio-Indiana Reciprocity Agreement allows Indiana residents of Jay, Randolph, and Wayne counties to attend Edison at in-state tuition rates. Additionally, partnerships with a variety of Ohio public and private universities provide opportunities for students to complete baccalaureate and master's degrees from Edison's Piqua campus (Edison State Community College, 2006, 2010; Ohio Association of Two-Year Colleges, 2010). The characteristics for Edison State Community College are summarized in Table 10.

Jefferson Community College. Recent initiatives of the USO prompted the expansion of Jefferson Community College to serve a larger region; it currently has been reorganized and expanded into Eastern Gateway Community College. The data used in this study were generated during the time in which it was still Jefferson Community College. Jefferson Community College was a product of the nationwide community college expansion in the 1960s with the formation of Jefferson County Technical Institute District in 1965, followed by the OBR chartering of Jefferson County Technical Institute in 1966. The construction of campus facilities in Steubenville was begun in 1967, and the first students enrolled in 1968. The OBR approved a name change in 1977 to Jefferson Technical College; expansion of the college facilities continued through the 1990s. In 1993, the Technical College became Jefferson Community College. Jefferson Community College offers over 60 associate degree and certificate programs with two distinct facilities; in addition to the main instructional building, in 2004 Jefferson Community College purchased an adjacent building to house the College's Department

of Workforce and Community Outreach (Eastern Gateway Community College, 2010; Jefferson Community College, 2006; Ohio Association of Two-Year Colleges, 2010). The characteristics for Jefferson Community College are summarized in Table 11.

Table 10

Profile of Edison State Community College

Variable	Value
Enrollment	3,130
Size of population served	Moderately small
Calendar system	Semester
Governance designation	State community college
Cost to the student	\$3,450
Percent of students receiving financial aid	38%
Percent of student credit hours taught by part-time faculty	60%
Percent of student credit hours taken online	7%
Developmental education policy	Strong
Dismissal/readmission policy	Strong
Limited enrollment policy	Selective/competitive

Note. Data from academic year 2005-2006 and FY 2005.

Lakeland Community College. Lakeland Community College is located on “400 acres of rolling, wooded countryside in Kirtland, Ohio, only 30 minutes from Cleveland” (Lakeland Community College, 2010b, p. 7). Lakeland traces its history to a community effort culminating in the 1965 vote of the general populace of Lake County to establish a community college in Lake County. The OBR sanctioned this effort and the first classes

were held in 1967 at a variety of locations throughout the county. The main campus has been located at the current site since its purchase in 1971. Currently, the College includes the main campus with 10 buildings and additional facilities in Madison, Painesville, and Willowick Counties. With close proximity to Cleveland, it also draws students from eastern Cuyahoga County. Lakeland Community College offers over 40 associate degree and certificate programs as well as non-credit and continuing education (Lakeland Community College, 2010a, 2010b; Ohio Association of Two-Year Colleges, 2010). The characteristics for Lakeland Community College are summarized in Table 12.

Table 11

Profile of Jefferson Community College

Variable	Value
Enrollment	1,697
Size of population served	Moderately small
Calendar system	Semester
Governance designation	Community college
Cost to the student	\$2,700
Percent of students receiving financial aid	57%
Percent of student credit hours taught by part-time faculty	60%
Percent of student credit hours taken online	10%
Developmental education policy	Strong
Dismissal/readmission policy	Strong
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Table 12

Profile of Lakeland Community College

Variable	Value
Enrollment	8,627
Size of population served	Large
Calendar system	Semester
Governance designation	Community college
Cost to the student	\$2,697
Percent of students receiving financial aid	32%
Percent of student credit hours taught by part-time faculty	58%
Percent of student credit hours taken online	11%
Developmental education policy	Moderately strong
Dismissal/readmission policy	Weak
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Lorain County Community College. Serving Lorain County near the shore of Lake Erie between Toledo and Cleveland, Lorain County Community College was chartered in 1963 and began offering classes in rented facilities in 1964, absorbing the Lorain School of Technology. In 1966 the College moved into its present location; expansion of these facilities has continued into the 21st century. Lorain County Community College offers over 80 associate degree and certificate programs. Lorain's University Partnership provides options for students wishing to complete a baccalaureate or master's degree while remaining on the Lorain campus. The Entrepreneurship Innovation Institute at

Lorain County Community College offers services to local business and industry ranging from start-up assistance to employee training and individual professional development (Lorain County Community College, 2010a, 2010b). The characteristics for Lorain County Community College are summarized in Table 13.

Table 13

Profile of Lorain County Community College

Variable	Value
Enrollment	10,189
Size of population served	Moderately large
Calendar system	Semester
Governance designation	Community college
Cost to the student	\$2,400
Percent of students receiving financial aid	31%
Percent of student credit hours taught by part-time faculty	59%
Percent of student credit hours taken online	16%
Developmental education policy	Strong
Dismissal/readmission policy	Strong
Limited enrollment policy	Selective/competitive

Note. Data from academic year 2005-2006 and FY 2005.

Northwest State Community College. In 1968 the OBR approved the formation of Four County Technical Institute to serve the extreme northwest corner of Ohio. The Technical Institute offered its first classes in 1969, occupying a wing of the Four County Joint Vocational School. In 1972, the Institute moved to its current location in Archbold

and was renamed Northwest Technical College. The Technical College became Northwest State Community College in 1994 and has expanded to provide classes toward over 70 associate degree and certificate programs at several satellite locations throughout the service district of Defiance, Fulton, Henry, and Paulding counties. Many classes at the satellite locations are conducted via synchronous distance learning in classrooms at multiple locations with audio and video links to allow live interaction across the various sites (Northwest State Community College, 2006, 2009, 2010). The characteristics for Northwest State Community College are summarized in Table 14.

Table 14

Profile of Northwest State Community College

Variable	Value
Enrollment	3,563
Size of population served	Small
Calendar system	Semester
Governance designation	State community college
Cost to the student	\$3,870
Percent of students receiving financial aid	41%
Percent of student credit hours taught by part-time faculty	46%
Percent of student credit hours taken online	12%
Developmental education policy	Strong
Dismissal/readmission policy	Weak
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Owens State Community College. Named after Michael Owens, a Toledo inventor credited with mechanizing bottle blowing, Owens Technical Institute first offered classes in 1965 under the authority of the Ohio Department of Education (ODE). The ODE oversees the operations of the state elementary and secondary schools and affiliated programs. In 1967, Owens Technical College was chartered by the OBR; in 1983, the Technical College opened a campus in Findlay, approximately 45 miles south of the main campus, which is located in an urban/industrial area near downtown Toledo. The Technical College was re-chartered as a comprehensive community college in 1994. Although officially chartered as a *state* community college, Owens Community College often omits the word “state” from its name. The college offers over 130 associate degrees and certificates to its service district, which includes the counties of Lucas, Wood, Hancock, and parts of Ottawa and Sandusky counties, covering the route between Toledo and Findlay (Owens State Community College, 2006, 2010a, 2010b). According to 2005 enrollment data, the Findlay campus enrolled 2,606 of the College’s 21,407 students. The characteristics for Owens Community College are summarized in Table 15.

Sinclair Community College. With a history that includes vocational classes in the downtown Dayton YMCA in the late 1800s, Sinclair Community College traces its historical roots earlier than any other Ohio community college. In 1948, the YMCA College became Sinclair College, named after David Sinclair, the founder of the Dayton YMCA educational program. Incorporated as a non-profit institution of higher learning in 1959, the ODE authorized the college to offer a junior college program. The Montgomery County Community College District was created in 1965 by the Montgomery County Commissioners, and in 1966 the OBR issued a charter to Sinclair Community College,

granting the college public status. At this writing, the College occupies over 62 acres in downtown Dayton; the College purchased the first 20 acres in 1972 as part of an urban renewal effort. Sinclair Community College offers over 100 programs to the greater Dayton area at the main downtown campus and over 40 other locations. Residents of Montgomery County enjoy reduced tuition rates, a result of the county property tax levy (Sinclair Community College, 2009, 2010a, 2010b). The characteristics for Sinclair Community College are summarized in Table 16.

Table 15

Profile of Owens State Community College

Variable	Value
Enrollment	21,407
Size of population served	Moderately large
Calendar system	Semester
Governance designation	State community college
Cost to the student	\$2,972
Percent of students receiving financial aid	41%
Percent of student credit hours taught by part-time faculty	61%
Percent of student credit hours taken online	8%
Developmental education policy	Strong
Dismissal/readmission policy	Weak
Limited enrollment policy	Selective/competitive

Note. Data from academic year 2005-2006 and FY 2005.

Table 16

Profile of Sinclair Community College

Variable	Value
Enrollment	22,762
Size of population served	Moderately large
Calendar system	Quarter
Governance designation	Community college
Cost to the student ^a	\$2,025
Percent of students receiving financial aid	36%
Percent of student credit hours taught by part-time faculty	37%
Percent of student credit hours taken online	8%
Developmental education policy	Strong
Dismissal/readmission policy	Strong
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005. ^aCost to the student reflects reduced tuition rates as applied in Montgomery County.

Southern State Community College. Southern State General and Technical College was chartered in 1975 with a service district that included Adams, Brown, Clinton, Fayette, and Highland counties bordering Kentucky on the south, and Madison County, just west of Columbus, on the north. In 1977, the College was officially renamed Southern State Community College. Southern State has four distinct campuses; individual campus enrollments range from 384 to 1,264. The largest, Central Campus, is located in Hillsboro, Highland County. The North Campus is in Wilmington, Clinton

County; the South Campus, serving Adams and Brown counties, is home to the Appalachian Gateway Center, the only resource center for Appalachian history, culture, and heritage nationwide. The Fayette Campus is located in Washington Courthouse in the northernmost county of the service district. In addition to technical and transfer associate degrees, Southern State offers a variety of adult basic literacy and workforce development (non-credit) programs (Southern State Community College, 2009, 2010). The characteristics for Southern State Community College are summarized in Table 17.

Table 17

Profile of Southern State Community College

Variable	Value
Enrollment	2,890
Size of population served	Small
Calendar system	Quarter
Governance designation	State community college
Cost to the student	\$3,390
Percent of students receiving financial aid	57%
Percent of student credit hours taught by part-time faculty	51%
Percent of student credit hours taken online	5%
Developmental education policy	Moderately strong
Dismissal/readmission policy	Medium
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Terra State Community College. Terra State Community College began its history as Vanguard Technical Institute, offering night classes in the Vanguard Vocational Center in Fremont, Ohio, in 1968. In 1969, the OBR declared Vanguard Technical Institute a state institution of higher learning. With the construction of its own facilities in 1971, Vanguard Technical Institute expanded its class offerings to include day classes. In 1973, the College Board of Trustees selected the name Terra Technical College, and in 1994 the College was re-chartered as Terra State Community College. The College has remained in Fremont, near the shore of Lake Erie, approximately 40 miles southeast of Toledo and at this writing offers over 100 associate degree and certificate programs (Terra State Community College, 2006, 2010a, 2010b). The characteristics for Terra State Community College are summarized in Table 18.

Washington State Community College. In 1971, Washington Technical Institute offered classes in the basement of a local elementary school in Marietta, Ohio. The OBR chartered Washington Technical College in 1972, and new facilities were constructed. In 1974, Washington Technical College received accreditation from the North Central Association of Colleges and Schools and added continuing education (non-credit) and evening classes. The College became Washington State Community College in 1991 and moved to a new campus, at which it has remained located. The current campus is outside the city limits of Marietta, along the West Virginia state line in the extreme southeast Ohio. This Appalachian location has qualified the College for scholarship and economic development grants designated specifically for the Appalachian region (Washington State Community College, 2010a, 2010b). The characteristics for Washington State Community College are summarized in Table 19.

Table 18

Profile of Terra State Community College

Variable	Value
Enrollment	2,488
Size of population served	Moderately small
Calendar system	Semester
Governance designation	State community college
Cost to the student	\$3,590
Percent of students receiving financial aid	41%
Percent of student credit hours taught by part-time faculty	58%
Percent of student credit hours taken online	7%
Developmental education policy	Weak
Dismissal/readmission policy	Weak
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Table 19

Profile of Washington State Community College

Variable	Value
Enrollment	2,329
Size of population served	Moderately small
Calendar system	Quarter
Governance designation	State community college
Cost to the student	\$3,555
Percent of students receiving financial aid	52%
Percent of student credit hours taught by part-time faculty	45%
Percent of student credit hours taken online	5%
Developmental education policy	Moderately weak
Dismissal/readmission policy	Medium
Limited enrollment policy	Waiting list

Note. Data from academic year 2005-2006 and FY 2005.

Analysis of Variables

Criterion Variables

Data values for institutional mean credits-to-degree and institutional median time-to-degree were taken from *The Performance Report for Ohio's Colleges and Universities, 2006: Institutional Outcomes Measures* (OBR, 2007c). Institutional mean credits-to-degree ranged from 67 semester credits to 88 semester credits, with a mean of 79.71 credits, a median of 80.50 credits, and a standard deviation (population method) of 6.04 credits. The median and mean for credits-to-degree were very close, differing by only

0.13 standard deviations. Both measures of central tendency were closer to the maximum value (the maximum value was 1.37 standard deviations above the mean and 1.24 standard deviations above the median) than they were to the minimum (the minimum value was 2.10 standard deviations below the mean and 2.24 standard deviations below the median).

The institutional median time-to-degree ranged from 3.3 years to 5.3 years, with a mean of 3.94 years, a median of 3.70 years, and a standard deviation (population method) of 0.59 years. The mean and median were less close than in credits-to-degree, with a difference of 0.41 standard deviations. The distribution of the values for time-to-degree also differed from that for credits-to-degree in the direction in which the distribution was skewed; the measures of central tendency for time-to-degree were closer to the minimum value; the mean differed from the minimum by only 1.08 standard deviations but was 2.31 standard deviations from the maximum value and the median was only 0.68 standard deviations from the minimum but was 2.71 standard deviations from the maximum value. Data concerning credits-to-degree and time-to-degree are in Tables 20 through 23. The presentation of data in these tables differs in that Table 20 is ordered alphabetically by institutional name, Table 21 is ordered by credits-to-degree, Table 22 is ordered by time-to-degree, and Table 23 provides a summary of the measures of central tendency and dispersion.

Table 20

Credits-to-degree and Time-to-Degree by Institution

Institution	Credits-to-degree	Time-to-degree
Cincinnati State Community College	85	3.5
Clark State Community College	76	4.0
Columbus State Community College	82	4.3
Cuyahoga Community College	86	5.3
Edison State Community College	72	3.7
Jefferson Community College	80	3.7
Lakeland Community College	80	4.0
Lorain County Community College	85	4.7
Northwest State Community College	74	3.3
Owens State Community College	81	3.3
Sinclair Community College	86	4.8
Southern State Community College	74	3.5
Terra State Community College	67	3.5
Washington State Community College	88	3.6

Note. Credits-to-Degree is the institutional mean, measured in semester credit hours.

Time-to-Degree is the institutional median, measured in calendar years. Data from FY 2005.

Table 21

Credits-to-Degree in Ascending Order, by Institution

Institution	Mean credits-to-degree
Terra State Community College	67
Edison State Community College	72
Northwest State Community College	74
Southern State Community College	74
Clark State Community College	76
Jefferson Community College	80
Lakeland Community College	80
Owens State Community College	81
Columbus State Community College	82
Cincinnati State Community College	85
Lorain County Community College	85
Sinclair Community College	86
Cuyahoga Community College	86
Washington State Community College	88

Note. Credits-to-Degree values are the institutional means, measured in semester credits.

Data from FY 2005.

Table 22

Time-to-Degree in Ascending Order, by Institution

Institution	Median time-to-degree
Northwest State Community College	3.3
Owens State Community College	3.3
Cincinnati State Community College	3.5
Southern State Community College	3.5
Terra State Community College	3.5
Washington State Community College	3.6
Edison State Community College	3.7
Jefferson Community College	3.7
Clark State Community College	4.0
Lakeland Community College	4.0
Columbus State Community College	4.3
Lorain County Community College	4.7
Sinclair Community College	4.8
Cuyahoga Community College	5.3

Note. Time-to-Degree values are the institutional median values, in calendar years. Data from FY 2005.

Table 23

Distributions of Credits-to-Degree and Time-to-Degree

	Minimum	Maximum	<i>Mdn</i>	<i>M</i>	<i>SD</i>
Institutional mean credits-to-degree	67.00	88.00	80.50	79.71	6.04
Median institutional time-to-degree	3.30	5.30	3.70	3.94	0.59

Note: Time-to-degree was measured in calendar years; credits-to-degree in semester credit hours, converted when necessary. Data from FY 2005.

The association between the criterion variables was *large*, with a Pearson's *r* value of 0.521. This *r* was slightly above the lower bound of .5 for *large* correlation. Despite the strength of their correlation, they have different patterns of distribution, as described above. These differences in distribution support the methods of this study, whereby correlations between extended degree completion and institutional characteristics were computed separately for each measure of extended degree completion.

Predictor Variables

Demographic variables. Demographic variables examined in this study included enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).

Headcount enrollment ranged from a minimum value of 1,697 (Jefferson Community College) to a maximum value of 30,135 (Cuyahoga Community College). The median headcount enrollment was 6,068; the mean was 10,237 with a standard deviation (population method) of 9,304. Enrollment measured by FTE was similarly

distributed, with a minimum value of 1,209 (Jefferson Community College) and a maximum value of 17,574 (Cuyahoga Community College). The median FTE enrollment was 3,848; the mean was 6,398 with a standard deviation (population method) of 5,555. Headcount and FTE were almost perfectly correlated, with a Pearson's r -value of .987 indicating a relatively constant ratio of full-time to part-time students. This near perfect correlation justifies the use of headcount enrollment as the sole measure of institutional size. Figure 1 demonstrates the relationship between headcount and FTE enrollment; Table 24 contains institutional headcount data, ordered by headcount.

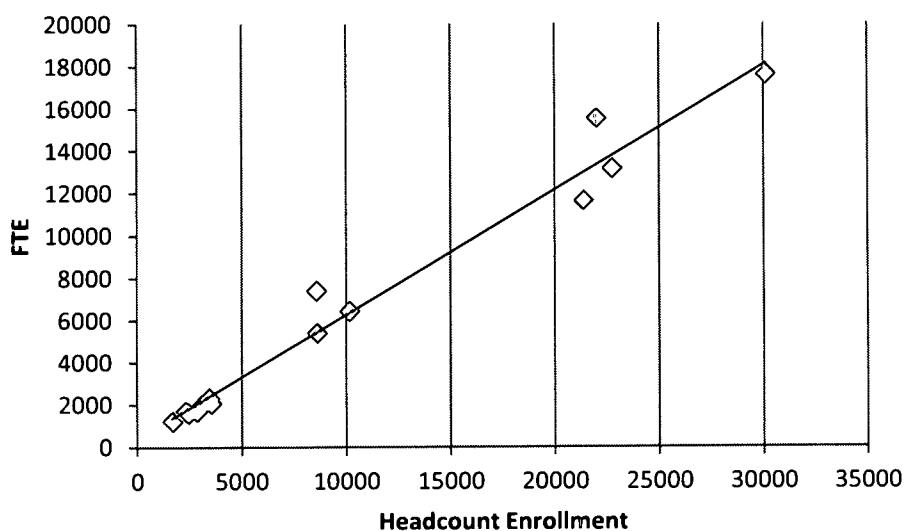


Figure 1. Correlation between headcount enrollment and FTE enrollment, Fall 2005.

Table 24

Institutional Enrollment (Headcount) in Ascending Order

Institution	Headcount Enrollment
Jefferson Community College	1,697
Washington State Community College	2,329
Terra State Community College	2,488
Southern State Community College	2,890
Edison State Community College	3,130
Clark State Community College	3,472
Northwest State Community College	3,563
Cincinnati State Community College	8,608
Lakeland Community College	8,627
Lorain County Community College	10,189
Owens State Community and Technical College	21,407
Columbus State Community College	22,014
Sinclair Community College	22,762
Cuyahoga Community College	30,135

Note. Data from Fall 2005.

Ohio's institutions of higher education were deliberately dispersed throughout the state; research conducted in the middle of the 20th century showed that long distances from students' homes to institutions of higher education proved a deterrent for Ohio's high school graduates in continuing their education (Medsker, 1960). This geographic dispersion can be seen among the comprehensive community colleges, as well as Ohio

higher education institutions in general (See map, Appendix A). In addition to the dispersion of campuses throughout the state, the 14 community colleges in this study provide educational services to populations of varying size. For this study, the location of each college and size of population served was determined by the address of the primary central offices of the college, as suggested by Katsinas (2003) and Hardy and Katsinas (2006). The populations served were categorized as *large* (metropolitan area including suburbs, population of the consolidated urban area greater than 1,000,000), *moderately large* (metropolitan area including suburbs, population of the metropolitan cluster between 50,000 and 1,000,000), *moderately small* (population of metropolitan area between 20,000 and 50,000; with some center municipalities having populations between 10,000 and 20,000), and *small* (population of the central defined area less than 10,000). Metropolitan populations were taken from U.S Census Bureau data for urban areas and urban clusters (U.S. Census Bureau, 2002a). The selection of values used to stratify by size was determined primarily by the natural gaps in the data. Additionally, these values were consistent with the definitions of rural used by the U.S. Census Bureau (2002b), with those used by Sperling's *Best Places* (2010), and with those used by *Places Rated Almanac* (Savageau, 2007). Within the study population, two served *small* populations, four served *moderately small* populations, four served *moderately large* populations, and four served *large* populations. Size of population served and institutional size exhibited a *large* association; $r = .654$.

Among the 14 institutions, 9 were classified as *state* community colleges and 5 were classified as community colleges. The variables of governance designation and calendar were moderately correlated, with a Pearson's r value of $-.344$. The negative

direction of this correlation coefficient was indicative of the fact that the majority of *state* community colleges utilized a quarter calendar whereas the majority of community colleges operated on a semester calendar. Governance designation was also moderately correlated with institutional size; the Pearson's *r* value of $-.356$. The negative direction of this correlation coefficient reflected the fact that all but one of the colleges with size below the median were *state* community colleges. Additionally, governance designation was moderately correlated with size of population served; the Pearson's *r*-value of $-.351$. The negative direction of this correlation coefficient was consistent with the pattern that all but one of the colleges serving *small* or *moderately small* populations were *state* community colleges. Data concerning non-continuous demographic characteristics are summarized in Table 25, arranged by governance designation. Table 26 lists academic calendar information; each institutional name indicates its governance designation.

Table 25

Frequency of Non-Continuous Demographic Variables by Governance Designation

	State community college	Community college	Total
Quarter calendar	5	1	6
Semester calendar	4	4	8
Large	2	2	4
Moderately large	2	2	4
Moderately small	3	1	4
Small	2	0	2

Note. Data from academic year 2005-2006 and FY 2005.

Table 26

Calendar System, by Institution

Institution	Calendar
Cincinnati State Community College	Quarter
Clark State Community College	Quarter
Columbus State Community College	Quarter
Cuyahoga Community College	Semester
Edison State Community College	Semester
Jefferson Community College	Semester
Lakeland Community College	Semester
Lorain County Community College	Semester
Northwest State Community College	Semester
Owens State Community College	Semester
Sinclair Community College	Quarter
Southern State Community College	Quarter
Terra State Community College	Semester
Washington State Community College	Quarter

Note: Data from academic year 2005-2006.

Financial variables. Included in this category were cost to the student (annualized full-time tuition and fees) and percent of students receiving financial aid in the form of federal grants. Annualized full-time tuition and fees ranged from a minimum cost of \$2,025 (Sinclair Community College, reduced in-county tuition rate) to a maximum cost of \$3,870 (Northwest State Community College). The median for annualized costs was

\$3,420. The mean value was \$3,130.29 with a standard deviation (population method) of \$561.70. The *state* community colleges had annualized tuition and fees ranging from \$2,972 to \$3,870, higher than those without that designation, which had a range from \$2,025 to \$2,700. Within the governance categories, costs at *state* community colleges had a range of 1.60 standard deviations while community colleges had a range of 1.20 standard deviations. The difference between the two categories of institutions was only \$272, approximately half a standard deviation, indicating that the extent of variation occurring within either category was greater than the gap between categories. The distribution of tuition and fees is illustrated in Figure 2.

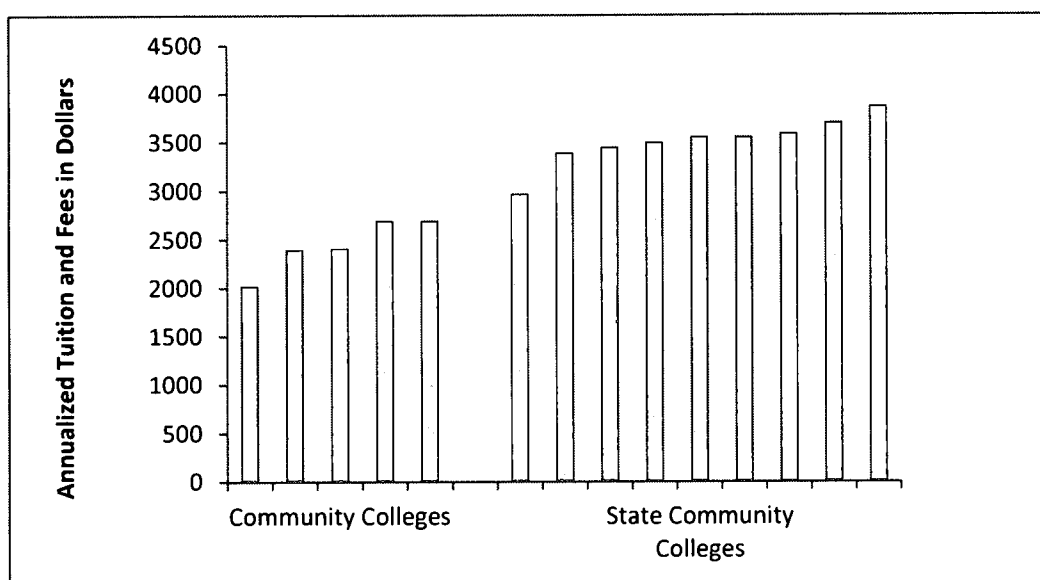


Figure 2. Annualized tuition and fees for community colleges and state community colleges, FY 2005.

The percent of students receiving financial aid in the form of federal grants ranged from 31% to 57%. The median value was 41%; the mean was 43.57% with a standard deviation (population method) of 8.62%. The percent of students receiving financial aid in the form of federal grants had a very *small* correlation with the annualized

tuition and fees; the Pearson's r was .154. The percent of students receiving federal financial aid grants was not dependent on the tuition rate. Data concerning financial characteristics are in Table 27 and Table 28. Table 27 contains a summary of the measures of central tendency and dispersion for both tuition and percent of students receiving financial aid; data concerning the percent of students receiving financial aid in the form of federal grants are in Table 28, ordered alphabetically by institutional name.

Table 27

Distributions of Financial Variables

	Minimum	Maximum	<i>Mdn</i>	<i>M</i>	<i>SD</i>
Annualized tuition and fees	\$2,025	\$3,870	\$3,420	\$3,130.29	\$561.70
Federal financial aid grants	31%	57%	41%	43.57%	8.62%

Note. Data from FY 2005.

Table 28

Financial Variables by Institution

Institution	Cost	Federal grants
Cincinnati State Community College	\$3,702	45%
Clark State Community College	\$3,502	48%
Columbus State Community College	\$3,555	36%
Cuyahoga Community College	\$2,416	55%
Edison State Community College	\$3,450	38%
Jefferson Community College	\$2,700	57%
Lakeland Community College	\$2,697	32%
Lorain County Community College	\$2,400	31%
Northwest State Community College	\$3,870	41%
Owens State Community College	\$2,972	41%
Sinclair Community College	\$2,025 ^a	36%
Southern State Community College	\$3,390	57%
Terra State Community College	\$3,590	41%
Washington State Community College	\$3,555	52%

^aTuition at Sinclair Community College reflects the reduced tuition rate as applied in Montgomery County. Data from FY 2005.

Course delivery variables. Course delivery variables included percent of classes taught by part-time faculty and percent of annualized student credit hours taken online. The percent of classes taught by part-time faculty was measured by credit hours, rather than by number of class sections. Measuring by credit hours places this variable in terms of the relative amount of a student's total class time that would be spent with part-time faculty. As reported to the OBR, the percent of classes taught by part-time faculty ranged from 37% to 61%. The median value was 57% and the mean was 53.93% with a standard deviation (population method) of 7.06%. Both mean and median were much closer to the maximum value (1.00 standard deviation and .57 standard deviations, respectively) than they were to the minimum value (2.40 standard deviations and 2.83 standard deviations, respectively); only 5 of the 14 colleges had scores below the mean. This distribution was skewed by one low score; the lowest and second lowest scores differed by 1.33 standard deviations. Data concerning the percent of classes taught by part-time faculty are shown in Table 29, arranged in ascending order.

The percent of student credit hours taken online ranged from 5% of student credit hours to 25% of student credit hours taken online. The median percent of student credit hours taken online was 8.5%; the mean was 10.36% with a standard deviation (population method) of 5.45%. The median and mean were closer to the minimum which was 0.642 standard deviations from the median and 0.983 standard deviations from the mean, than to the maximum value which was 3.02 standard deviations from the median and 2.69 standard deviations from the mean. Only 5 of the 14 colleges had values above the mean for online delivery. This distribution was skewed by one high score; the highest and second highest scores were separated by 1.48 standard deviations. The percents of

part-time faculty and online credit hours had a *small* association, with a Pearson's *r*-value of .180. Data concerning the percent of credit hours taken online are in Table 30, arranged in ascending order. Data concerning course delivery data are in Table 31. Table 32 displays a summary of the measures of central tendency and dispersion for part-time faculty and classes taken online.

Table 29

Percent of Classes Taught by Part-Time Faculty, in Ascending Order

Institution	Part-time faculty
Sinclair Community College	37%
Washington State Community College	45%
Northwest State Community College	46%
Cuyahoga Community College	50%
Southern State Community College	51%
Clark State Community College	53%
Cincinnati State Community College	56%
Lakeland Community College	58%
Terra State Community College	58%
Lorain County Community College	59%
Edison State Community College	60%
Jefferson Community College	60%
Columbus State Community College	61%
Owens State Community College	61%

Note. Percent of classes measured by student credit hour, Fall 2004.

Table 30

Percent of Credit Hours Online, in Ascending Order

Institution	Credit hours online
Cincinnati State Community College	5%
Southern State Community College	5%
Washington State Community College	5%
Edison State Community College	7%
Terra State Community College	7%
Owens State Community College	8%
Sinclair Community College	8%
Cuyahoga Community College	9%
Jefferson Community College	10%
Lakeland Community College	11%
Northwest State Community College	12%
Lorain County Community College	16%
Columbus State Community College	17%
Clark State Community College	25%

Note. Online credit hours are the percent of annualized credit hours taken online, Fall 2004.

Table 31

Delivery Variables by Institution

Institution	Part-time faculty	Online delivery
Cincinnati State Community College	56%	5%
Clark State Community College	53%	25%
Columbus State Community College	61%	17%
Cuyahoga Community College	50%	9%
Edison State Community College	60%	7%
Jefferson Community College	60%	10%
Lakeland Community College	58%	11%
Lorain County Community College	59%	16%
Northwest State Community College	46%	12%
Owens State Community College	61%	8%
Sinclair Community College	37%	8%
Southern State Community College	51%	5%
Terra State Community College	58%	7%
Washington State Community College	45%	5%

Note. Part-time faculty measured by student credit hour, Fall 2004; Online delivery is percent of annualized student credit hours, Fall 2005.

Table 32

Distributions of Course Delivery Variables

Course delivery variables	Minimum	Maximum	<i>Mdn</i>	<i>M</i>	<i>SD</i>
Percent of classes taught by					
part-time faculty	37	61	57	53.93	7.06
Percent of student credit					
hours taken online	5	25	8.5	10.36	5.45

Note. Part-time faculty data from Fall 2004, online credit hours data from Fall 2005.

Policy variables. Policy variables included developmental education placement policy, academic dismissal/readmission policy, and admission protocols of limited enrollment programs. Developmental education placement policies were rated *weak* (no testing and/or policy), *moderately weak* (self-placement with optional testing or counseling), *moderately strong* (mandatory testing with recommendatory placement), and *strong* (mandatory testing and placement). All but four of the colleges placed into the *strong* category for developmental education placement; two placed into *moderately strong* and only one each placed as *moderately weak* or *weak*.

Academic dismissal and readmission policies were also rated from *weak* to *strong*. Ratings were based on the number of categories of academic sanction, the length of time for dismissal, and grade point averages used to determine academic standing. Each factor was assigned from zero to 3 points for increasing levels of stringency; a total score was computed, with totals of one to 2 points indicating a *weak* dismissal/readmission policy, 3 to 4 points a *medium* policy, and 5 or greater a *strong* policy. Six colleges had *weak* policies, three *medium* and five had *strong* policies. The

length of time for which a student could be dismissed for poor academic performance varied from one quarter (roughly 11 weeks) to 2 calendar years, and in one case, possible permanent expulsion.

Evaluation of admissions policies for limited enrollment programs was based on the protocols of health career programs. All colleges had health career programs, and at least one health career program at each college had applicants exceeding the enrollment capacity of the program. Admission policies for limited enrollment programs were assigned dummy variables, with one indicating the presence of a selective/competitive admission process. Those which did not have a selective/competitive admission process used a waiting list protocol; the variable was assigned a value of zero, indicating the absence of a selective/competitive process. Only 3 of the 14 colleges used a selective/competitive admission process, the remaining schools utilized waiting list protocols. Waiting lists required completion of certain prerequisites, but students were not ranked by grade point averages (overall or in prerequisite courses) or other performance measures. Correlations among the policy variables were *small to medium*, ranging from $r = .239$ between admissions policies for limited enrollment programs and academic dismissal/readmission policies to $r = .312$ between developmental education placement policies and academic dismissal/readmission policies. Data concerning policy variables are in Table 33, listed alphabetically by institutional name.

Table 33

Academic Policy Variables by Institution

Institution	Developmental education	Academic dismissal	Limited enrollment programs
Cincinnati State Community College	Strong	Strong	Waiting list
Clark State Community College	Strong	Weak	Waiting list
Columbus State Community College	Strong	Weak	Waiting list
Cuyahoga Community College	Strong	Medium	Waiting list
Edison State Community College	Strong	Strong	Competitive ^a
Jefferson Community College	Strong	Strong	Waiting list
Lakeland Community College	Moderately strong	Weak	Waiting list
Lorain County Community College	Strong	Strong	Competitive ^a
Northwest State Community College	Strong	Weak	Waiting list
Owens State Community College	Strong	Weak	Competitive ^a
Sinclair Community College	Strong	Strong	Waiting list
Southern State Community College	Moderately strong	Medium	Waiting list
Terra State Community College	Weak	Weak	Waiting list
Washington State Community College	Moderately weak	Medium	Waiting list

^aCompetitive is used to designate selective/competitive admissions protocols. Data from academic year 2005-2006.

Policy information for the appropriate academic year was not available through catalogs or Web sites at some study colleges. In those cases, contact was made with a suitable office. Email contact was used at Lakeland Community College, Northwest State Community College, Sinclair Community College, Southern State Community College, Terra State Community College, and Washington State Community College. Cincinnati State Community College, Columbus State Community College, and Jefferson Community College were contacted via telephone. Details of contact information are listed in Appendix B.

Correlations of Institutional Characteristics with Credits-to-Degree and Time-to-Degree

Analysis revealed varying levels of correlation between the predictor variables and criterion variables. Despite the moderately *large* correlation between the two criterion variables ($r = .521$), there were noticeable differences in how the predictor variables correlated to the different criterion variables. This study was conducted on a defined population; all associations are descriptive of that population and no inferences are intended.

Demographic Variables

Several demographic variables demonstrated a *large* association with one or both criterion variables. The greatest correlation between a demographic variable and criterion variable was between governance structure and time-to-degree, with $r = -.699$. The negative direction of the Pearson's r -value was representative of the trait that the median time-to-degree was shorter at *state* community colleges than at community colleges. Credits-to-degree was also more efficient at *state* community colleges than at community colleges, but the relationship was not as strong, with an r -value of $-.455$.

Institutional size exhibited a *large* association with both credits-to-degree and time-to-degree. The correlation coefficient between credits-to-degree and institutional size was .542, and the correlation between time-to-degree and institutional size was .678; these values indicate increased credits-to-degree and time-to-degree at larger institutions. Size of population served also demonstrated a *large* association with both credits-to-degree and time-to-degree. Both credits-to-degree and times-to-degree increased as the size of the municipality increased, with Pearson's *r*-values of .561 between credits-to-degree and size of population served and .557 between time-to-degree and size of population served.

Academic calendar had a *small* association with credits-to-degree and time-to-degree, indicating reduced credits-to-degree and reduced time-to-degree on a semester calendar. However, the respective Pearson's *r*-values of -.010 and -.304 indicate *small* associations. Among the demographic variables, only academic calendar produced a greater association with credits-to-degree than with time-to-degree. Correlation coefficients for the associations between the demographic variables and the criterion variables are in Table 34.

Table 34

Correlations between Demographic Variables and Criterion Variables

Predictor	Correlation between each predictor and time-to- degree	Correlation between each predictor and credits-to- degree
Institutional size (enrollment)	.678	.542
Academic calendar	-.010	-.304
Governance designation	-.699	-.455
Size of population served	.577	.561

Note. Negative values in Academic calendar indicate very slightly reduced credits-to-degree and time-to-degree associated with a semester calendar; negative values in Governance structure indicate reduced credits-to-degree and time-to-degree at *state* community colleges. Data from FY 2005.

Financial Variables

Correlation coefficients were computed to test the strength and direction of relationships between the financial variables and the criterion variables. The direction of the association between tuition (annualized full-time tuition and fees) and excess credits and time toward degree completion was negative; as tuition increased, the credits and time used to complete the associate degree decreased. Of these correlations, the greatest was between tuition (annualized full-time tuition and fees) and time-to-degree with an *r*-value of *-.725*. The negative direction and magnitude of this correlation coefficient indicated a *large* tendency for time-to-degree to decrease as tuition increased. Tuition

was also negatively related to credits-to-degree, but more moderately, with a Pearson's r of $-.498$; the negative direction and magnitude of this correlation coefficient indicated a *medium* tendency for credits-to-degree to decrease as tuition increased. The percent of students receiving financial aid in the form of federal grants had only a *small* association with either credits-to-degree or time-to-degree. In the case of time-to-degree, the relationship was negative, with Pearson's $r = -.147$. The negative direction of this correlation coefficient indicated a *small* tendency for time-to-degree to decrease as the percent of students receiving federal financial aid grants increased. The relationship of percent of students receiving financial aid in the form of federal grants to credits-to-degree was positive, but inconsequential with $r = .017$. In this case, the negative direction of the correlation coefficient indicated a very *small* tendency for credits-to-degree to increase as the percent of students receiving financial aid in the form of federal grants increased. Correlation coefficients for the associations between the financial variables and the criterion variables are in Table 35.

Table 35

Correlations between Financial Variables and Criterion Variables

Predictor	Correlation between each predictor and time-to-degree	Correlation between each predictor and credits-to-degree
Tuition	$-.725$	$-.498$
Financial aid	$-.147$	$.017$

Note. Data from FY 2005.

Course Delivery Variables

Associations between the course delivery variables (percent of class sections taught by part-time faculty and percent of annualized credit hours delivered online) and the criterion variables were *small*, with the percent of classes taught by part-time faculty having a more consistent relationship. The Pearson's r -value for the associations between percent of classes taught by part-time faculty and time-to-degree was $-.241$ and between percent of classes taught by part-time faculty and credits-to-degree was $-.290$. The negative direction of these associations indicated that as percent of classes taught by part-time faculty increased, credits-to-degree and time-to-degree decreased, at a *small* level.

Online delivery also held a *small* association with the criterion variables. The r -value for the association between the percent of annualized credit hours delivered online and time-to-degree was $.289$, indicating that an increase in percent of annualized credit hours delivered online is associated at a *small* level with an increase in time-to-degree. The r -value for the association between percent of annualized credit hours delivered online and credits-to-degree was $-.040$ indicating a very *small* association of decreased credits-to-degree with increased annualized credit hours delivered online. Correlation coefficients for the associations between the course delivery variables and the criterion variables are in Table 36.

Table 36

Correlations between Delivery Variables and Criterion Variables

Predictor	Correlation between each predictor and time-to-degree	Correlation between each predictor and credits-to-degree
Part-time faculty	-.241	-.290
Online course delivery	.289	-.040

Note. Data from Fall 2004 (part-time faculty), Fall 2005 (online delivery), and FY 2005 (credits-to-degree and time-to-degree).

Policy Variables

Correlation coefficients were computed to test the strength and direction of relationships between the policy variables of developmental education placement policy, academic dismissal/readmission policy, and admission protocols of limited enrollment programs with the criterion variables. Developmental education placement policy and academic dismissal/readmission policy were ranked by stringency with higher scores corresponding to stronger policies. Correlation coefficients for the policy variables were at the high end of *small* and the low end of *medium*. The association of the developmental education placement policy with time-to-degree produced a Pearson's *r*-value of .319; with credits-to-degree it produced an *r*-value of .352. The association of the dismissal/readmission policy with time-to-degree produced a Pearson's *r*-value of .265; with credits-to-degree it produced an *r*-value of .371. These values indicate a *small/medium* tendency for credits-to-degree and time-to-degree to increase as stringency of the policy increases. It is worth noting that these correlations involved only time-to-degree or credits-to-degree for students who complete associate degrees without

transferring, and they neither confirm nor deny any possible relationship between these policies and institutional completion rates (percent of an incoming cohort who graduate within a predetermined length of time).

Admission protocols of limited enrollment programs were coded as selective/competitive admissions or waiting list protocol. Correlation coefficients with both criterion variables were very *small*. The Pearson's *r*-value for limited enrollment programs and time-to-degree was $-.038$ and for limited enrollment programs with credits-to-degree was $-.033$. The negative direction of the coefficients indicates a very *small* association for decreased credits-to-degree and time-to-degree at schools with selective/competitive admission policies. As noted earlier, in the section Analysis of Variables, there was little variation in the data for developmental education policy and admission protocols for limited enrollment programs. This homogeneity reduces the usefulness of the corresponding correlations (Chen & Popovich, 2002; Heiman, 2006). Correlation coefficients for the associations between the policy variables and the criterion variables are in Table 37.

Table 37

Correlations between Policy Variables and Criterion Variables

Predictor	Correlation between each predictor and time-to- degree	Correlation between each predictor and credits-to- degree
Developmental education	.319	.352
Dismissal/readmission	.265	.371
Limited enrollment programs	-.038	-.033

Note. Data from academic year 2005-2006 and FY 2005.

Summary

Ohio's public comprehensive community colleges are charged by the Ohio Board of Regents to offer associate degrees intended as preparation toward a baccalaureate degree as well as associate degrees intended for direct entry into an occupational field whereby transfer to a baccalaureate granting institution is a secondary goal. Additionally, these institutions offer continuing or non-credit education, and skills training for workforce development (OBR, 1998b). Despite a common primary mission, they have distinct qualities and characteristics.

Considering some of the institutional distinctions, defined by the categories of demographic, financial, course delivery methods, and placement policies, brings to light various associations of the characteristics with timely and credit-efficient degree completion. There were also secondary associations within some of the categories which can serve to expand the understanding of the primary correlations.

These results are intended as descriptive correlations and there is no intent to generalize beyond the study population. As colleges were used as the unit of analysis in this study and techniques to allow ecological inference were not applied, the results of this study are not meant to infer correlations involving individual students or student cohorts (Chen & Popovich, 2002; King, 1997). Additionally, timely degree completion was measured institutionally within the cohort of degree completers and no inferences are intended toward institutional completion rates.

CHAPTER V

SUMMARY AND DISCUSSION

This chapter includes a summary of information related to institutional characteristics of Ohio public comprehensive community colleges and the associations of these characteristics with the institutional measures of credits-to-degree and time-to-degree. Content is divided into three sections: a summary of findings, conclusions, and recommendations.

Summary of Findings

The purpose of this study was to generate data that could enhance the ability of community college leaders to increase institutional efficiency and accountability and to meet expectations included in the state's strategic plan. Specifically, this research examined relationships between selected characteristics of Ohio's public comprehensive community colleges and timely degree completion, as indicated by institutional mean credits earned in the process of degree completion and institutional median time-to-degree in calendar years.

Addressing the overarching issue of whether institutional characteristics influence institutional mean credits-to-degree and institutional median time-to-degree, this study was guided by four primary research questions. A summary of the findings is provided for each of these questions.

Institutional Characteristics

What are the institutional characteristics of Ohio's public comprehensive community colleges? Findings pertinent to this question were designated as demographic, financial, course delivery, and policy. The former included enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).

Headcount enrollment ranged from a minimum value of 1,697 at Jefferson Community College to a maximum value of 30,135 at Cuyahoga Community College; the mean was 10,237 with a standard deviation (population method) of 9,304. The values for FTE enrollment ranged from a minimum value of 1,209 at Jefferson Community College to a maximum value of 17,574 at Cuyahoga Community College; the mean was 6,398 with a standard deviation (population method) of 5,555. Measures of central tendency and dispersion for headcount and FTE enrollment are found in Table 38.

Table 38

Summary of Enrollment Data

	Minimum	Maximum	<i>Mdn</i>	<i>M</i>	<i>SD</i>
Headcount Enrollment	1,697	30,135	6,068	10,237	9,304
FTE Enrollment	1,209	17,574	3,848	6,398	5,555

Note. Data from Fall 2005 and FY 2005.

The minimum for both headcount and FTE enrollment appear at the same college and the maximum values for both headcount and FTE enrollment appear at the same college; there was an additional level of similarity between headcount and FTE. The value for FTE enrollment is computed by dividing the total generated student credit hours

per term by a fixed constant, 15, to generate the FTE for that term. Headcount and FTE were almost perfectly correlated, with a Pearson's r -value of .987. This indicates that despite the range of institutional size, the mean value for credit hours per student is very consistent across campuses.

Ohio's institutions of higher education were deliberately located throughout the state; this geographic dispersion can be seen among the comprehensive community colleges, as well as Ohio higher education institutions in general (See map, Appendix A). Of the 14 study colleges, 2 served *small* populations, 4 served *moderately small* populations, 4 served *moderately large* populations, and 4 served *large* populations.

The distribution of academic calendar system followed by each institution showed a relatively balanced split between quarters and semesters, with six of the study colleges utilizing a quarter calendar and eight utilizing a semester calendar. The semester calendar was more prevalent in the northern part of the state.

A somewhat stronger majority (9 of 14) of the study colleges have a governance designation of *state* community college. Most *state* community colleges were originally chartered as technical institutions; the only exceptions are Edison State and Southern State, which were originally chartered as general and technical colleges. On the other hand the community colleges, with the exception of Jefferson Community College, were originally chartered as comprehensive institutions and thus do not share the technical institute history. Data concerning governance designation and academic calendar are found in Table 39.

Table 39

Summary of Academic Calendar and Governance Designation

	State community college	Community college	Total
Quarter calendar	5	1	6
Semester calendar	4	4	8
Total	9	5	14

Note. Data from academic year 2005-2006.

With respect to financial characteristics, annualized tuition and fees ranged from \$2,025 at Sinclair Community College (reduced in-county rate) to \$3,870 at Northwest State Community College, with a mean value of \$3,130.29 and a standard deviation (population method) of \$561.70. The *state* community colleges, considered as a subgroup, all had higher tuition than the community colleges, which are freely allowed to levy local taxes for their financial support. Within the subgroup of community colleges, annualized tuition and fees ranged from \$2,025 to \$2,700, with a mean of \$2,447.60 and a standard deviation (population method) of \$248.10. Annualized tuition and fees at *state* community colleges ranged from \$2,972 to \$3,870, with a mean of \$3,509.56 and a standard deviation (population method) of \$232.00. The gap in annualized tuition and fees between the *state* community colleges and those without that designation was \$272, less than half of the range for either subgroup. While the *state* community colleges, as a group, have higher tuition and fees, the gap in annualized tuition between *state* community colleges and community colleges is smaller than at least one gap between consecutive values in each subgroup. Table 40 contains a summary of the measures of

central tendency and dispersion for tuition and fees, both for the entire group of study colleges and for the subgroups segregated by governance designation.

Table 40

Summary of Annualized Tuition and Fees

	Minimum	Maximum	<i>Mdn</i>	<i>M</i>	<i>SD</i>
All study colleges	\$2,025.00	\$3,870.00	\$3,420.00	\$3,130.29	\$561.70
Community colleges	\$2,025.00	\$2,700.00	\$2,416.00	\$2,447.60	\$248.10
State community colleges	\$2,972.00	\$3,870.00	\$3,555.00	\$3509.56	\$232.00

Note. Data from FY 2005.

The percentage of students receiving federal financial aid in the form of grants ranged from 31% to 57%, with a mean of 43.57% and a standard deviation (population method) of 8.62%. Financial aid appeared to be somewhat aligned with geographic location and size of population served; the colleges with the two lowest percents receiving aid are located in exurbs of the Cleveland area, serving *large* populations, while the colleges with the two highest percents receiving financial aid are located in rural areas/small towns, serving *small* or *moderately small* populations. Other than the colleges at these extremes, patterns connecting financial aid with other predictor variables were not observed.

With respect to course delivery, the variables of delivery methods each included one extreme value relatively far removed from the remaining data points. In the case of student credit hours taught by part-time faculty, the scores ranged from 37% to 61%. The

mean was 53.93% with a standard deviation (population method) of 7.06%; the median was 57%. However, the college with the lowest reported percent was 1.33 standard deviations from the next closest score. Consistent with the skewed distribution, only 5 of the 14 colleges had scores below the mean.

The percent of student credit hours taken online ranged from 5% to 25% of annualized student credit hours. The mean was 10.36% with a standard deviation (population method) of 5.45%; the median was 8.5%. In the case of percent of credit hours online, the highest score was 1.48 standard deviations from the closest score. Again consistent with the skewed distribution, only 5 of the 14 colleges had values above the mean for online delivery.

Removing the extreme score reduced the range of each variable to two-thirds or less of the original range; however it made a difference of less than one-fourth of a standard deviation in the value for the mean in both cases. Additionally, for both course delivery characteristics, the mean and median differed by less than one-half standard deviation. The measures of central tendency and dispersion for course delivery variables are shown in Table 41.

Table 41

Course Delivery Characteristics

Course delivery variables	Minimum	Maximum	<i>Mdn</i>	<i>M</i>	<i>SD</i>
Percent of classes taught by					
part-time faculty	37	61	57	53.93	7.06
Percent of student credit					
hours taken online	5	25	8.5	10.36	5.45

Note. Part-time faculty data from Fall 2004, online delivery data from Fall 2005.

With respect to policies relating to student placement into college-level coursework and into limited enrollment programs, the results proved very consistent across the study population. A strong majority (10 of the 14) of the population colleges were rated as *strong* in their developmental education placement policies, with another two being rated as *moderately strong* and only one each in *moderately weak* and *weak*. Similarly, 11 of the 14 study colleges used a waiting list protocol (as opposed to a selective/competitive process) for limited enrollment programs. Academic dismissal and readmission showed more variation; five colleges were rated *strong*, six were rated *weak*, and three were rated as *medium*.

Some alignments between developmental education and academic dismissal policies were visible; all of the colleges with *weak*, *moderately weak*, or *moderately strong* developmental education placement policies also had *weak* or *medium* dismissal/readmission policies. All of the colleges with *strong* dismissal/readmission policies also had *strong* developmental education placement policies.

Associations within Categories of Institutional Characteristics

What level of association exists between institutional characteristics? Findings pertinent to this question were designated as demographic, financial, course delivery, and policy. The former included enrollment, size of population served (*small, moderately small, moderately large, large*), calendar system (semester or quarter), and governance designation (community college or *state* community college).

This study used headcount enrollment to measure institutional size. The use of this metric was supported by the association between headcount and FTE enrollment; the Pearson's r -value for this association was .987. Institutional size demonstrated a *large* association with size of population served; $r = .654$. The strength of this correlation was diluted by Lakeland Community College and Cincinnati State Community College; both of these colleges served *large* general populations but their student enrollments were less than the mean enrollment value for the study population. Institutional size was correlated with governance designation at a *medium* level, $r = -.356$. The negative direction of this correlation coefficient indicates the tendency of smaller colleges to be *state* community colleges. Size of population served was also correlated with governance designation at a medium level, $r = -.351$. Consistent with the tendency for smaller colleges to be *state* community colleges, *state* community colleges tend to be located in areas of smaller general populations, as indicated by the negative direction of the correlations.

The academic calendar followed by the institution was associated at the *medium* level with governance designation, $r = -.344$; the majority of *state* community colleges utilized a quarter calendar whereas the majority of community colleges operated on a semester calendar. The variable of academic calendar held only *small* associations with

the remaining demographic variables; the correlation coefficients were $r = -0.01$ for the association of academic calendar with institution size and of $r = -0.10$ for the association of academic calendar with size of population served. The extremely *small* size of these associations indicates that there is essentially no association between calendar system and either size of institution or size of population served.

With respect to financial characteristics, the variables measured were annualized tuition and fees and percent of students receiving financial aid in the form of federal grants. These two variables had a very *small* association, $r = .154$; indicating a *small* tendency for the percent of students receiving federal financial aid grants to increase as annualized tuition and fees increased.

With respect to course delivery, variables measured were percent of classes taught by part-time faculty and percent of annualized student credit hours taken online. The association between these two variables was *small*, with a Pearson's r -value of .180. There was a *small* tendency for annualized student credit hours taken online to increase as the percent of classes taught by part-time faculty increases.

With respect to policy, variables measured included developmental education placement policy, academic dismissal/readmission policy, and admission protocols of limited enrollment programs. As noted in the *Analysis of Variables* in chapter IV and the *Intutional Characteristics* in the Summary of Findings in chapter V, both developmental education placement and admissions policies to limited enrollment programs had skewed distributions; 12 of the 14 study colleges had either *strong* or *moderately strong* developmental education placement policies; 11 of the 14 study colleges used a waiting list protocol for admissions policies to limited enrollment programs. The largest

association between policy variables was found between academic dismissal/readmission policies and developmental education placement policies; $r = .312$, indicating that as the stringency of one policy increased, the stringency of the other tended also to increase. Admissions policies for limited enrollment programs had a smaller association with the other policy variables. The correlation coefficient was $r = .288$ with developmental education placement policies; all competitive/selective admissions protocols were at institutions with *strong* developmental education placement policies. The correlation coefficient was $r = .239$ between admissions policies for limited enrollment programs and academic dismissal/readmission policies; all but one of the institutions using a selective/competitive admissions process for limited enrollment programs also had a *strong* academic dismissal/readmission policy.

Associations of Institutional Characteristics with Credits-to-Degree and Time-to-Degree

The institutional characteristics exhibited associations of varying strength with the criterion variables of credits-to-degree and time-to-degree. The strengths of these associations are shown in Table 42.

The single strongest correlation between a predictor and criterion variable was that between annualized tuition and fees and time-to-degree, with Pearson's $r = -.725$; higher tuition had a *large* association with shorter time-to-degree. Among the other predictors showing a *large* association with time-to-degree were governance designation ($r = -.699$) which showed a tendency for *state* community colleges to be associated with shorter time-to-degree, institutional size ($r = .678$) where larger institutions associated with longer time-to-degree, and size of population served ($r = .577$) where those institutions serving a larger population were associated with longer time-to-degree. With

the exception of annualized tuition and fees, all predictor variables demonstrating *large* associations with time-to-degree were demographic.

Table 42

Associations between Predictor and Criterion Variables

Predictor variables	Pearson's <i>r</i> for predictor and credits-to-degree	Pearson's <i>r</i> for predictor and time-to-degree
Demographic variables		
Institutional size	.542	.678
Academic calendar	-.304	-.010
Governance designation	-.455	-.699
Size of population served	.561	.577
Financial variables		
Tuition	-.498	-.725
Financial aid	.017	-.147
Delivery variables		
Part-time faculty	-.290	-.241
Online course delivery	-.040	.289
Policy variables		
Developmental education	.352	.319
Dismissal/readmission	.371	.265
Limited enrollment programs	-.033	-.038

Note. Data from academic years 2004-2005 and 2005-2006 and from FY 2005.

Associations of the predictor variables with credits-to-degree were not as great as those with time-to-degree. The *largest* association was between size of population served and credits-to-degree ($r = .561$); those institutions serving a larger population were associated with a higher number of credits-to-degree. Institutional size also demonstrated a large association with credits-to-degree ($r = .542$); larger institutions were associated with a greater number of credits-to-degree.

The remaining predictor variables demonstrating *large* associations with time-to-degree showed associations with credits-to-degree in the same direction as their associations with time-to-degree and in the high range of *medium* strength associations. The Pearson's r value for the association between annualized tuition and fees and credits-to-degree was $r = -.498$; higher tuition was associated with fewer credits-to-degree. The correlation coefficient for the association between governance designation and credits-to-degree was $r = -.455$, indicating reduced credits-to-degree at *state* community colleges.

In several cases, the association between the predictor variable and criterion variable was so low as to be nearly nonexistent. The predictor variable of admission policy for limited enrollment programs had Pearson's r -values of $-.033$ and $-.038$ with credits-to-degree and time-to-degree, respectively. This very *small* association is in the direction of reduced credits-to-degree and reduced time-to-degree at colleges that employ a selective/competitive admissions protocol for limited enrollment programs. Other instances of Pearson's r -values with absolute value near $.10$ for the association with one criterion variable had *larger*, but still *small*, correlation coefficients with the other criterion variable. The academic calendar variable had an association of $-.010$ with time-to-degree, but $-.304$ with credits-to-degree; in both cases the association was in the

direction of more efficient degree production for those schools using a semester academic calendar. Percent of students receiving federal financial aid in the form of grants showed a very *small* association ($r = .017$) with credits-to-degree; a greater percent of students receiving aid having a very *small* tendency to be accompanied by increased credits-to-degree. Conversely, percent of students receiving federal financial aid in the form of grants showed slightly less *small* ($r = -.147$) correlation with time-to-degree; in this case, a higher percent of students receiving aid showed a *small* tendency for a greater percent of students receiving aid to be accompanied by reduced time-to-degree.

One other predictor variable showed mixed directions for its associations with the two criterion variables. The variable for percentage of student credit hours delivered online produced Pearson's r -values slightly larger than for the percentage receiving federal financial aid; in the case of online delivery, $r = -.040$ with credits-to-degree and $r = .289$ with time-to-degree. These values indicate a very *small* association of increased credit hours delivered online with decreased credits-to-degree and a noticeably *larger* association of increased credit hours delivered online with increased time-to-degree. The Pearson's r of .289 for increased credit hours online with increased time-to-degree is at the very high end of the *small* range (absolute values from .01 to .29). Other correlations between the predictor variables and criterion variables were of medium strength and in the same direction for both criterion variables.

Conclusions

Institutional Characteristics

The study population exhibited similarities and differences relative to the demographic variables. These similarities and differences among the colleges can be

readily recognized as aligning with the purposes of the state of Ohio in chartering these institutions and with their common, state affirmed, mission. With campuses deliberately distributed across the state, there was very little consistency in the size of population served. The community colleges were intended to bring higher education to the people of the state; located throughout the state, in urban, small town, and rural areas, they clearly demonstrate this purpose. Variation in enrollment logically follows variation in size of population served, with institutions serving larger populations typically having larger enrollments and those serving smaller populations having smaller enrollments. Two exceptions to this pattern are seen in Lakeland Community College and Cincinnati State Community College. Both serve *large* general populations, but have enrollments less than the mean enrollment value for the study population. As previously noted, the ratio of headcount enrollment to FTE enrollment is nearly constant across the population, reflecting their common mission and goal of providing access to students with varying backgrounds and academic intentions, including full access to both full-time and part-time students.

Differences in academic calendar and governance designation appear to be highly geographically affiliated. The colleges on a quarter academic calendar are located near or south of Columbus, Ohio (the location of the Ohio State University, which has continued to operate on a quarter calendar), while those on a semester calendar are located in the northern half of the state. With one exception (Sinclair Community College), the community colleges are located in the northeast third of the state, while the *state* community colleges are located in the southwest portion of the state. The community colleges were chartered with single county service districts; three of the five community

colleges are located in the northeast border of the state, in contiguous counties along the shore of Lake Erie.

Financial variables exhibited variability; the percentage of students receiving federal financial aid in the form of grants ranged from just under one-third to just over one-half of each college's student population. While tuition and fees at any *state* community college were greater than the tuition and fees at any community college (primarily because of the local tax levies used to supplement income at community colleges), the gap between the two categories was less than half the range for tuition and fees within either category, implying less difference than might be presumed.

With respect to both of the characteristics for course delivery, one college was markedly different from the others. For the percent of classes taught by part-time faculty the lowest reported percentage was 1.33 standard deviations from the second lowest. Additionally, 4 of the 14 study colleges reported values at or within one percentage point of the highest value, indicating a skewed distribution. With respect to online course delivery, the highest reported percentage was 1.48 standard deviations from the second highest. Additionally, three colleges were at the lowest value. This distribution is also skewed, but in the opposite direction.

Developmental education placement policies exhibited consistency across the study population, with a strong majority of colleges either *strong* or *moderately strong*. While these policies pre-date the current state initiatives which assign increasing levels of responsibility for developmental education to the community colleges, they do not pre-date national initiatives such as Achieving the Dream, which emphasize student success, especially in developmental education (Achieving the Dream, 2010). While there was no

apparent pattern for the almost even split of colleges with respect to academic dismissal/readmission policies, all colleges with *strong* dismissal/readmission policies also had *strong* developmental education placement policies. Both developmental education placement and academic dismissal policies are typically developed as a collaborative effort between academic and student affairs; these alignments could reflect the active statewide associations of chief academic affairs officers and chief student affairs officers. That the strong majority of colleges (11 of 14) use a waiting list rather than selective/competitive processes for limited enrollment programs seems a logical outgrowth of the open door general admission policies of the colleges. As with the other predictor variables, a connection to institutional mission and to the state purposes in establishing the community colleges can be made.

Associations within Categories of Institutional Characteristics

The largest association among predictor variables in any one category was between institutional size and size of population served. This association was expected, as serving a larger population provides more potential students. Governance designation was associated at a *medium* level with all other demographic variables. *State* community colleges have a *medium* tendency to be smaller colleges, to serve smaller populations, and to operate on a quarter-based academic calendar.

There was *small* to *medium* association among the policy variables. The similarities likely derive from the commonalities of institutional mission, as prescribed by the state and the statewide organizations that bring together similar groups of student affairs personnel, academic affairs personnel, and discipline-specific faculty and

administrators. The differences reflect the fact that there are no state mandates in these areas.

Associations between variables in the course delivery and financial characteristic categories were *small*. This would indicate that student receipt of federal financial aid grants is not dependent on tuition rates, and that higher levels of online course offerings have at most a *small* association with increased percents of classes taught by part-time faculty.

Associations of Institutional Characteristics with Credits-to-Degree and Time-to-Degree

Correlation coefficients were computed for all predictor variables with each criterion variable. These computations produced associations of varying strengths between the predictor and criterion variables. The *largest* single association was between annualized tuition and fees and time-to-degree. Community colleges nationwide were founded on principles of access and affordability; Ohio's public community colleges continue to uphold those values (Ohio Board of Regents, 2008b). It was not unexpected that students who have chosen a low-cost option for higher education would reinforce that choice by pursuing more rapid degree completion in instances where tuition is higher. It was unexpected, however, that the strength of the association with time-to-degree was noticeably stronger than with credits-to-degree. This implies that the motivation to complete the degree provided by higher costs was stronger in terms of calendar years utilized than it was for credits taken, despite that fact that credits taken have a direct linear relationship with student costs, and calendar years do not directly determine costs.

The second strongest association was between governance designation and time-to-degree. Institutional size had a *large* association with both credits-to-degree and time-to-degree. A combined measure was examined by computing the means of the associations with both criterion variables for the strongest predictors. The mean of the *r*-values for tuition was .611; the corresponding mean for institutional size was .610, while the corresponding mean for governance designation was .577. Thus, if a combination of credits-to-degree and time-to-degree is used as a measure of institutional efficiency, the two predictors, tuition and institutional size, have virtually the same predictive value. Institutional size was expected to be a strong predictor; Astin (1993) identified size as the institutional characteristic with the strongest effect on student success.

As noted earlier, governance designation was associated with credits-to-degree and time-to degree at the high end of the *medium* level and at the *large* level, respectively. *State* community colleges exhibited fewer credits-to-degree and shorter time-to-degree. This association can be aligned with other predictors which demonstrated *large* associations with the criterion variables. Tuition and fees are higher at *state* community colleges; higher tuition and fees are associated with more efficient degree completion. All but one of the eight smallest colleges were *state* community colleges and the two largest were community colleges, not *state* community colleges; smaller size is also associated with more efficient degree completion.

The final of the strong predictors, size of population served, demonstrated a *large* association with both credits-to-degree and time-to-degree; an increase in size of the general service population is associated both with an increase in the number of excess credits-to-degree and with longer time-to-degree. Tinto (1993) identified several student

characteristics which contribute to degree non-completion. Among them are outside employment, part-time status, and non-residential status. Larger population centers are logically affiliated with these student risk factors, as in areas of greater population there are more opportunities for outside employment which can in turn encourage part-time student status as well opportunity for off-campus housing. For the non-residential student, larger population centers are also likely to offer a wider variety of college-going choices. Of these choices, the community college is often the low-cost option, which may skew the community college student population more toward the lower end of the socio-economic scale, another recognized contributor to lack of student success (Pike & Kuh, 2005; Thayer, 2000; Tinto, 1993).

Two predictors, percentage of students receiving federal financial aid and percentage of annualized credits delivered online, each demonstrated mixed direction of correlation with the two criterion variables. This was not unexpected; in both cases the literature did not indicate a solid, directional connection with student success. Financial aid has been seen to increase student persistence toward degree (Goldrick-Rab, 2007; Singell, 2003; St. John, 2000; Zhu, 2004); however, federal grants are often insufficient for full degree completion (St. John, 2000). Singell (2003) and Singell and Stater (2007) concluded that other student attributes (GPA, SAT scores, major) contributing to the receipt of financial aid played a larger role in student success than did the actual receipt of aid.

Russell's meta-analysis (2001) concluded that technology-mediated course delivery produced no significant difference in student learning. The available research on the effectiveness of online learning is largely inconclusive (Bambara et al., 2009; Hurt,

2008). That the associations with the two criterion variables of percent of annualized credit hours delivered online were *small* and in opposite directions is consistent with the existing literature.

The selectivity level of admission requirements of an institution plays an important role in student success (Ishitani, 2006; University of Wisconsin, 2002). Ohio's public community colleges are by their state charters non-selective, open admissions institutions. Two of the policies used as predictor variables, developmental education placement and admission protocols for limited enrollment programs, provide a semblance of selectivity for these open-door institutions. Consistent with the literature, there was a *small* correlation of decreased credits-to-degree and decreased time-to-degree with selective/competitive admissions protocols for limited enrollment programs. Developmental education placement and academic dismissal/readmission policies also contribute to the institution's culture of selectivity. However, inconsistent with the research on selectivity, stronger developmental education placement and dismissal/readmission policies (more selectivity) were associated at a *medium* level with both increased credits-to-degree and increased time-to-degree, in other words, less efficient degree completion. These correlations are of limited use because of the level of homogeneity within the variable (Chen & Popovich, 2002; Heiman, 2006).

Just as developmental education and academic dismissal/readmission policies may be viewed as selectivity measures; they may also be seen as advising tools for placement of students into the proper level of coursework. Colleges may have certain policies in place for developmental education placement and dismissal/readmission, but these policies are not necessarily routinely enforced (Bailey, 2009). If stronger

developmental education placement and dismissal/readmission policies result in more students actually enrolling in developmental education courses, extended time-to-degree is corroborated by other studies (Floyd, 2002; Goldrick-Rab, 2007; Hong, 2002; Jaeger & Eagan, 2009). Thus, if the policies in Ohio community colleges result in more students actually enrolling in developmental education courses rather than serving as a mechanism for selectivity, the results of this study are consistent with the extant research base.

Perhaps the most unexpected of the results was the association of percentage of credits delivered by part-time faculty with the criterion variables. Among the study colleges, a higher percentage of credits delivered by part-time faculty was associated at the high end of the *small* level with decreased credits-to-degree and decreased time-to-degree. In the extant research base, increased percentages of part-time faculty have been observed to be negatively related to graduation rates (Calcagno et al., 2008; Jacoby, 2006; Jaeger & Eagan, 2009). Part-time faculty have been identified as using fewer interactive/collaborative teaching techniques, having lower levels of commitment to the institution, and interacting less with students outside of class (Pascarella & Terenzini, 2005; Tinto, 1993; Umbach, 2007). However, the literature base draws connections primarily between part-time faculty and graduation rates; this study measured credits-to-degree and time-to-degree among completers and did not attempt to make any conclusions about institutional or cohort graduation rates. Additionally, Jacoby (2006) and Jaeger and Eagan (2009) note that the relationships observed between part-time faculty and student success do not indicate cause and effect; additionally the extant research in this area has focused primarily upon 4-year colleges and universities and thus may not be generalizable to the community college.

Recommendations

On a national level, the Spellings Report has brought attention to the accountability of higher education in the United States, calling on the nation's institutions of higher education to improve efficiency (U.S. Department of Education, 2006). The same directive also exists on a statewide level. In its 2008 report, *The Condition of Higher Education in Ohio*, the Ohio Board of Regents (OBR) called for increased accountability and higher levels of productivity, specifically including the area of degree production (Ohio Board of Regents, 2008a). The purpose of this study was to generate data that could enhance the ability of community college leaders to meet these expectations.

Policy Recommendations

Tuition. The predictor variable with the largest association with a criterion variable was annualized tuition and fees with time-to-degree; higher tuition and fees was associated with reduced time-to-degree. This result might be seen as a justification for raising tuition. However, the OBR, in its *Strategic Plan for Higher Education, 2008-2017* has mandated that Ohio's colleges and universities take the appropriate steps to make the cost of higher education on Ohio among the lowest in the nation. The strategic plan also acknowledges that some institutions may be recognized as low-cost options for postsecondary education and others may be recognized as providers of special programs and services (Ohio Board of Regents, 2007d). It is important that college leaders and lawmakers consider the interrelationship between reducing the costs of higher education and timely completion of degrees. Taking both aspects into consideration, this study recommends consideration of variable tuition rates, whereby students pay higher tuition

for credits above a predetermined limit. This could maintain affordability for students who efficiently follow their specified degree plans and also encourage timely degree completion.

Academic calendar. The academic calendar is also included in the state's strategic initiatives; the state's plan calls for all colleges and universities currently on a quarter calendar to convert to a semester calendar. For Ohio's public community colleges, this transition correlates with improved efficiency in timely degree production. While the association of academic calendar with time-to-degree was *small*, the association with credits-to-degree was *medium*, and in both cases the semester calendar was aligned with more efficient degree production. These associations are encouraging for those institutions in the process of changing calendars. Maintaining this policy encouraging a statewide transition to a semester academic calendar is consistent with encouraging fewer excess credits-to-degree and shorter time-to-degree.

Degree requirements. The association between governance designation and credits-to-degree and time-to-degree indicated a tendency for fewer credits-to-degree and shorter time-to-degree at *state* community colleges. These associations were present at the *large* and high end of the *medium* levels, respectively. It was also observed that seven of the nine *state* community colleges were originally chartered as technical institutes and the remaining two as general and technical colleges. The AAB and AAS degrees offered at technical institutes and technical colleges are more highly prescribed than are the AA and AS degrees; AA and AS degrees were not offered at these institutions prior to their change in status to comprehensive community colleges. The AA and AS degrees were offered throughout the history of those members of the study population which began as

comprehensive community colleges; all but one of the community colleges were initially chartered as comprehensive institutions. The AA and AS degrees are intended to fulfill the requirements of the first 2 years of a baccalaureate degree; they are predominantly loose collections of general education credits. Policy which provides more structure to the traditionally flexible AA and AS degrees is recommended as a tool to reduce credits-to-degree and time-to-degree.

Recommendations for Further Research

Institutional size and size of population served. Institutional size and size of population served were positively associated with both credits-to-degree and time-to-degree at the *large* level. Additionally, institutional size and size of population served demonstrated a *large* association with each other. The tendency for larger schools to be located in or around larger metropolitan areas is logical; larger population areas have a larger number of potential students. However, other and various factors no doubt influence the relationships with the criterion variables. Larger metropolitan areas offer more choices for students pursuing postsecondary education and more opportunities for employment and other activities outside of the college. These factors have been shown to align with less efficient degree production (Pike & Kuh, 2005; Thayer, 2000; Tinto, 1993). Conversely, larger institutions offer more sections of more classes more frequently at a wider range of days and times, thereby allowing students more opportunity to complete degrees in a timely fashion. Further research is warranted to discover and pursue the factors that characterize the institutions of varying size, and to explore which, if any, of these factors are associated with efficient degree completion.

Part-time faculty. There is a broad perception that the performance of part-time faculty is inferior to that of full-time faculty (Benjamin, 2002; Levin, 2007; Tinto, 1993; Umbach, 2007). Yet in this study, higher use of part-time faculty was correlated, at the high end of the *small* level, with both fewer credits-to-degree and reduced time-to-degree. To further investigate this association, correlation coefficients were computed between the percent of part-time faculty and the stronger predictor variables. The percent of classes taught by part-time faculty had only *small* associations with any of the predictors which had demonstrated *large* associations with either criterion variable. The associations of part-time faculty with the criterion variables were not influenced by other predictors.

Further research relating to part-time faculty at community colleges is warranted. Most of the current research literature relating to part-time faculty and student success is set in 4-year colleges and universities (Jaeger & Eagan, 2009) and addresses graduation rates (Calcagno et al., 2008; Jacoby, 2006; Jaeger & Eagan, 2009) rather than efficiency of degree completion. Further research on the association of the use of part-time faculty and prolonged degree completion, especially in the community college setting, would help close this gap. Areas to explore include longevity of part-time faculty (as those with long-term commitments to a college could more closely mirror full-time faculty); distribution of part-time faculty in occupational, in liberal arts, or in developmental education coursework (Burgess & Samuels, 1999; Carnegie, 2010b; Levin, 2007; McCormick & Cox, 2003); and professional development opportunities for part-time faculty (Benjamin, 2002; Tinto, 1993; Umbach, 2007).

Developmental education. Based on the correlation coefficients produced in this study, more stringent developmental education and academic dismissal policies do not appear to function as surrogate methods of creating a level of selectivity for general college admissions. Additionally, there was a high level of uniformity within the stringency levels of developmental education placement policies among the study colleges; thus the correlations are of limited use (Chen & Popovich, 2002; Heiman, 2006). The results of this study were consistent with existing research indicating extended degree completion time for students requiring developmental education (Bailey, 2009). There is current research regarding the appropriate placement of students into and subsequent completion of developmental education coursework (Achieving the Dream, 2010; Bailey, 2009; Kolajo, 2004; Pascarella & Terenzini, 2005; Rouche, Rouche, & Ely, 2001). That research has shown mixed results in the areas of student success, graduation, and timely graduation, with better success demonstrated when developmental education coursework is accompanied by specialized support services (Achieving the Dream, 2010; Rouche, Rouche, & Ely, 2001). Hence, based on the results of this study, further research is called for in the area of enforcement of the policies and in the area of the support services offered or mandated for students in developmental education. The results of such research would provide insight into and differentiation of success of developmental education students at Ohio's community colleges.

Dismissal/readmission. The correlation coefficients for dismissal/readmission policies were similar to those for developmental education placement policies, including direction. Thus, the implications regarding academic dismissal/readmission policies being seen as indicative of institutional selectivity are also parallel. As with the developmental

education placement policies, further research in the area of enforcement of the policies and in the area of support services offered or mandated for students in academic risk categories could provide insight into and differentiation of success of high risk students at the various schools.

Online course delivery. The findings of this study were consistent with the literature base which indicated gaps in the research (Merisotis & Phipps, 1999) as well as no definitive conclusions regarding online education and student success (Bambara et al., 2009; Hurt, 2008; Russell, 2001). Online instruction is a relatively new mode of course delivery (Dallet & Opper, 1997) and student ownership and use of computers is increasing (Caruso, Smith, & Salaway, 2009). Preliminary data (Ohio Learning Network, 2010) suggest that patterns of online course delivery are changing among Ohio's community colleges; in preliminary 2009 data, the distribution of the percent of classes delivered online has a narrower range, noticeably greater mean and median, and more closely approximates a normal distribution than do the data from the 2004-2005 academic year and FY 2005 time period used in this study. In this context of changing patterns, further research is warranted in online education. Specifically, further study at the student and student cohort levels to explore associations between student enrollment in online courses and various measures of student success, including degree completion, credits-to-degree, and time-to-degree.

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APPENDIX A

Map of Locations of Institutions of Higher Education in Ohio.

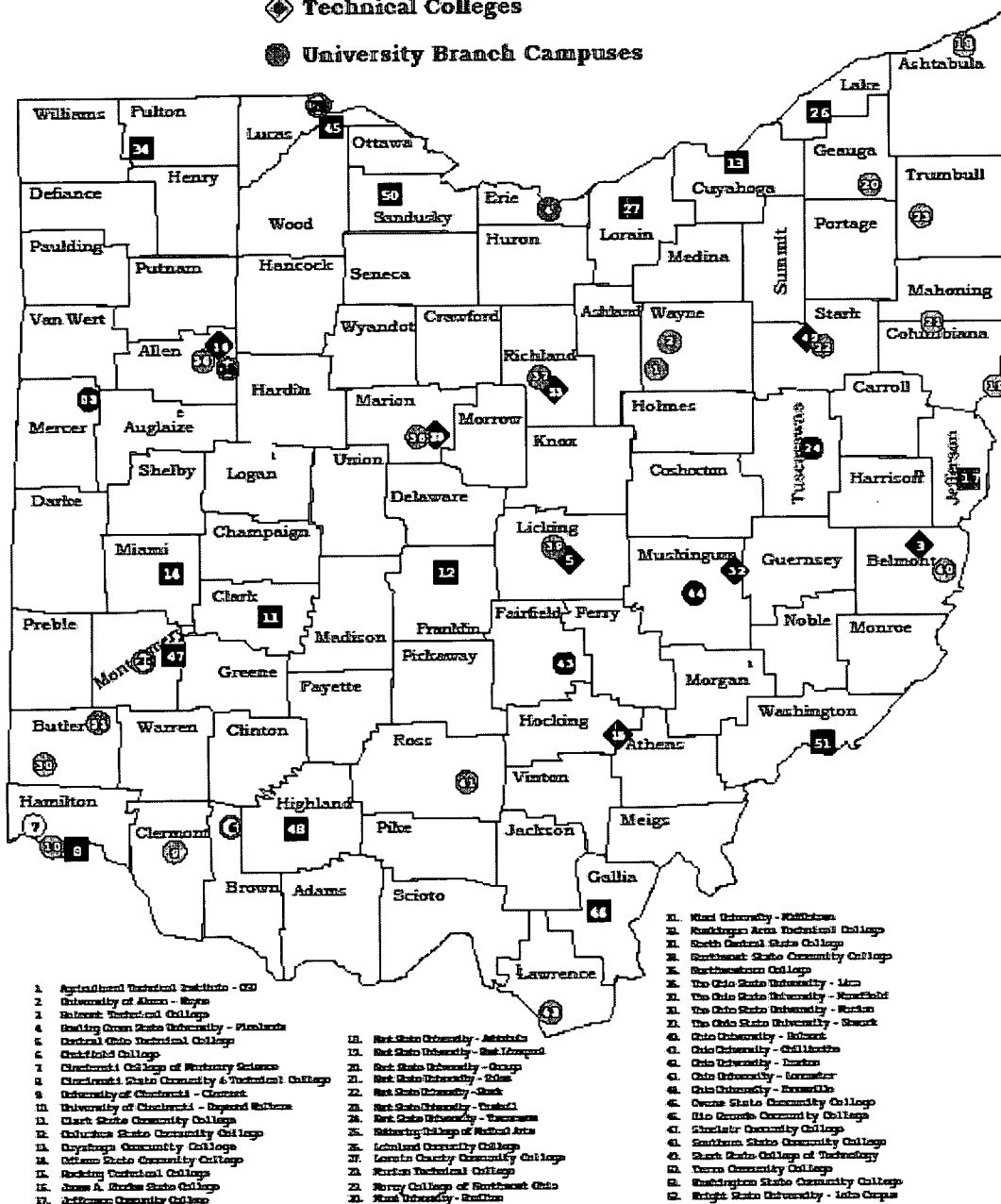
Independent: ○ Colleges

State Supported: ■ Community Colleges

◆ Technical Colleges

● University Branch Campuses

TWO-YEAR CAMPUSES



OBR, 1998a

APPENDIX B

Contact Information, Personal Contacts at Individual Colleges

R702035908

Persons contacted at specific colleges for policy information.

Cincinnati State Community College: Front Desk Receptionist, Division of Health and
Public Safety

Columbus State Community College: Former Administrator for Distance Learning and
Academic Counselor (employed during the years aligning with the years for data
utilized)

Jefferson Community College: Admissions Transfer Coordinator

Lakeland Community College: Program Director of Nursing

Northwest State Community College: Dean of Nursing

Sinclair Community College, Associate Provost

Southern State Community College: Director of Nursing

Terra State Community College: Dean, Allied Health, Nursing, and Science

Washington State Community College: Vice President of Academic Affairs