

Abstract

HILL, LAURA DAVENPORT, The Impact of Accountability: An Evaluation of Performance-Based Budgeting in the North Carolina Community College System. (Under the direction of Conrad Glass.)

In 1998, the North Carolina legislature enacted general statute 115D-31.3 which states:

The State Board of Community Colleges shall create new accountability measures and performance standards to be used for performance budgeting for the Community College System...The State Board of Community Colleges shall review annually the accountability measures and performance standards to ensure that they are appropriate for use in performance budgeting.

This mandate, set forth in statutory language, established a new system of accountability for the North Carolina Community College System and its member institutions in an effort to justify state expenditures. Further, the Legislature enacted GS115D-31.3 into law in anticipation that this bill might also enhance the educational process for at least one of the stakeholders—the students.

The purpose of this study was two-fold: first, to review and determine the rate of progress, if any, among North Carolina community colleges in meeting the five core performance measures; and, second, to determine if a variety of independent variables have the potential to impact a community college's performance with respect to these mandated standards.

This research was designed to review the performance of North Carolina's fifty-eight community colleges since the inception of the performance-based budgeting program and to review the data in an effort to establish whether or not the performance of North Carolina community colleges is improving, declining or maintaining from year-to-year. Additionally, the research was designed to ascertain if there is a relationship between various independent values and these five core performance measures.

Descriptive statistics were used first to analyze the rate of progress among North Carolina community colleges on each of the five core performance measures: 1) progress of basic skills students, 2) passing rate for first-time test-takers on licensure and certification examinations, 3) goal completion for program completers, 4) employment status of graduates, and 5) performance of college transfer students. Data were compiled in both categorical and continuous form in order to provide a comprehensive review of the performance of the fifty-eight community colleges during the 1998-99, 1999-00, and 2000-01 reporting years. A review of the results from these years, for the most part, demonstrated little variance in performance.

Additional analysis was conducted using both bivariate and multivariate regression. Pearson Correlation Coefficient was used to determine if a relationship exists between each of the core performance measures and a variety of independent variables identified as student and institutional characteristics. At an alpha level of .05 significance, several independent measures demonstrated notable significant relationship with two of the performance measures:

- Performance measure 2: Ten of the 14 independent variables demonstrated primarily moderate, but significant correlations with

the dependent variable or the passing rate for first-time test-takers on licensure and certification examinations; and

- Performance measure 5: Two of the 14 independent values demonstrated moderate, but significant correlations.

The last test administered was a multiple regression analysis, which examined the interaction between each performance measure and the independent variables for indications of sample variance. The model was able to explain sample variance for two of the five core performance measures. For the second performance measure, the stepwise regression model suggests that almost half of the sample variation (49%) can be explained by four of the independent variables. Approximately a third (31%) of the sample variance for the fifth performance measure was explained by three of the independent variables.

**THE IMPACT OF ACCOUNTABILITY:
AN EVALUATION OF PERFORMANCE-BASED BUDGETING IN THE
NORTH CAROLINA COMMUNITY COLLEGE SYSTEM**

by

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Dedication

I'm very thankful for my family—they have been the best teachers throughout my life...best teachers and best cheerleaders. When I began traveling down this road in 1996, I was extremely fortunate that all four of my grandparents were living and incredibly enthusiastic of this endeavor. I am the first family member on either side of my family to reach this level of education, and their pride in this accomplishment has sustained me on the days when I simply could not see the light at the end of the tunnel. It is to them that I would like to express my sincere appreciation and dedicate this dissertation—Wade Jackson Lawrence (deceased), Ruby Ballard Lawrence (deceased), Reynold Slade Davenport, Sr. (deceased) and Mary Frances Davenport. All my love to each of you.

Biography

North Carolina native Laura Davenport Hill has been based in the Sandhills of her home state most of her life with forays into the Triangle Area as well as South Carolina for educational and professional stints.

A graduate of University of North Carolina at Chapel Hill with a degree in journalism and mass communication (1991), she earned a Masters of Education in Higher Education Administration with a minor in Counselor Education from North Carolina State University in 1994. Two years later she embarked on a doctoral program in Higher Education Administration at that same university.

Her professional career began in 1991 when she became the administrative assistant to the vice president for student development and technical advisor to student publications at Meredith College. After two years in this position, Laura Hill spent another year at Meredith as a communications specialist responsible for public relations, photography, and design.

In 1994, she moved to Spartanburg, SC to work at Converse College as assistant to the president. Later that same year, Laura returned home to the Sandhills as the coordinator of community enrichment programs and director of the evening college at Sandhills Community College in Pinehurst. Five years later, she became the director of marketing for SCC. This is a job that Laura has thoroughly enjoyed as it provides her with the opportunity to work with many of her SCC colleagues and students, as well as

offers new challenges almost every day. In 1999, she began a three-year stint working part-time as the host of a local television show, Sandhills Journal.

Today, she continues to direct the college-wide marketing effort, fills in occasionally for public relations support, handles campus photography, and participates in a wide array of community service activities.

Laura is married to Charles Urquhart “Jeff” Hill, III, and they welcomed twins—Charles Jackson and Rebecca Grace—into their family on February 23, 2004.

*“Do not follow where the path may lead. Go instead where there is no path
and leave a trail.”* —Muriel Strode

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First and foremost, I thank God for enabling me to complete this endeavor. This was a true test of endurance that required spiritual, emotional, physical and intellectual support.

Education was in many parts the inspiration for this study as well as the motivation for pursuing this degree. My family and their respect for education has always been a part of my life. An advocate, and one of the best community college professors that I’ve ever had the privilege to know is my father—Reynold Davenport Jr.—fostered this outlook in me from an early age. Did it happen overnight? Most certainly not, and I’m sure he would be happy to tell you that for himself. However, after a lifetime as a student and working in higher education for fourteen years, my respect and love for this field has grown immensely. The best lessons are often those learned through experience and life. My mother, Becky Lawrence Davenport, taught me that learning is a part of life, and that higher education is something of value. While my brother and I were in middle school, my mother enrolled in Sandhills Community College to earn her second degree. I watched her balance the many roles that so many of these students typically embrace—family, work and school. With each role, she excelled, and from my parents I learned a great deal about the value of higher education.

I have been so blessed in my life; especially, through the people who have become a part of it. To my husband, Jeff, I love you for repeatedly telling me that I had come too far not to finish. During this last year, there were a lot of those moments when I wanted to have a “normal” life and you were my inspiration to continue on this path. You and the anticipation of beginning a family enabled me to reach this point.

As anyone who has ever gone through the process of earning an advanced degree and writing a dissertation knows all too well, without a knowledgeable and supportive advisor and graduate committee life can become unbearable. Fortunately for me, I have had both. I am very thankful to have had Dr. Conrad Glass as an advisor. He has been a true mentor—always telling me the truth whether it be good or bad and always encouraging me to do better. With his guidance, I have grown both professionally and personally. I also would like to express appreciation to the members of my committee—Dr. Duane Akroyd, Dr. John Pettitt, Dr. Dan Rodas and Dr. David Martin. With the preliminary defense, we all realized that this study was unique and might lead to better ones down the road. Everyone was supportive of these possibilities and challenged me to focus on elements that might provide some compelling results. Although the results were not as dynamic as I would have liked, I hope that these members of my committee realize the importance of their suggestions and support.

The support from colleagues and administrators at my workplace, Sandhills Community College, has been invaluable. To that end, I would like to thank the college and the SCC Foundation for allowing me to adjust my work schedule on occasion, and for the unique opportunities offered to SCC employees through educational leave and tuition reimbursement. Special acknowledgement goes to SCC President John Dempsey,

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An extremely crucial element to any dissertation is the research component. This is a critical element and, perhaps, the most challenging one. Special thanks to Dr. Lynne Gregorio for her guidance, assistance and feedback throughout the multitude of statistical tests that had to be conducted, as well and during the composition of the fourth chapter.

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Chapter 1

Introduction

All things come with a price tag—including higher education, and with higher costs come increased demands for assurance that fiscal allocations are well spent. In fiscal year (FY) 2000, appropriations for higher education throughout the United States reached \$56.7 billion, an increase of seven percent over the previous fiscal year. Legislatures responded to the rising cost of higher education through a variety of means including pricing alternatives, tuition inflation, student financial aid, performance-based budgeting and funding, technology, and distance education. A majority of these endeavors were introduced to offset the costs through alternative funding, as well as to justify the expenditure of tax dollars to various stakeholders (McKeown-Moak, 2000). Rising costs have also contributed to a growing unease by state governments and taxpayers regarding the distribution of funds to higher education without stronger mechanisms for accountability. Throughout the '90s and into the 21st Century, accountability has been the driving force behind higher education legislation (Albright, 1998; Burke, 1998,1999; Christal, 1998; Layzell, 1998; Harbour, 2001). This shifting emphasis to accountability for dollars spent toward higher education has had a vast impact on the country's community colleges.

It is the demand for accountability and the response to performance-based initiatives that were the focus of this study. However, one wonders if performance-

based budgeting, such as it exists in North Carolina, is the most reasonable and potentially the most successful response to the nationwide push for educational accountability. Exploration of this question was undertaken in several steps: first, by introducing some of the historical events behind the development of community colleges and the accountability movement as well as defining the research questions, the limitations and significance of this study, and key terminology. The body of this study established the conceptual framework and explored relevant literature on the subject of performance-based initiatives. Finally, this study reviewed the research methodology and interpreted the findings for North Carolina's fifty-eight community colleges with respect to the core performances measures mandated by the state's General Assembly.

Historically, higher education has taken many shapes, represented many ideologies and demonstrated various dynamics in America—public and private, single-sex and coeducational, segregated and desegregated, two-year and four-year and undergraduate and graduate. Early in the development of higher education, there were undertones of what would eventually become the modern-day community college. The focus of Colonial America's educational methods was inherent to the need for survival and the acquisition of jobs skills relevant to this period. As the knowledge base for America increased and economics made possible an interest in broader-based education, a formal system of higher education began to emerge. Initially, access was limited and costs favored those who were affluent. The Morrill Acts of 1862 and 1890 provided a platform for publicly supported higher education at a lower cost; thus, higher education became more accessible (Cohen, 1982; Knowles, 1977).

The 1800s ushered in the first form of public higher education with land-grant universities and junior colleges, and this period was followed by the development of community colleges in the mid-1900s. Support for post-secondary education on the national level came in 1947 with President Truman's Commission on Higher Education. The Commission's report supported community colleges as a way to address the decline in the economy, and it recommended that the scope of public education change to include grades 13 and 14. The rationale for expansion included: increased accessibility, provision of a variety of services not offered at four-year colleges and universities, student assistance in the transition from adolescence to adulthood, and assurance that the needs of a more diverse public would be met (Cohen, 1982; Findt, 1989; Segner, 1966; Wiggs, 1989).

One of the most recent trends in higher education is the use of performance measures to ensure educational and fiscal accountability. With the cost of higher education reaching new heights, state and federal governments have encouraged the use of new initiatives such as performance funding to justify these increased costs to stakeholders. The use of performance measures suggests that changes in college operations, rather than requests for additional funding, appear to be the path of choice for cost-conscious legislators.

Almost two-thirds of the states have implemented one of two performance models—performance-based funding or performance-based budgeting (Christal, 1998; McKeown-Moak, 2000). Both models allocate funds to colleges who successfully complete the established performance standards for that state. The difference between performance-based funding and performance-based budgeting lies in the relationship

between the performance measures and the budget. For performance-based funding, there is a direct link between the funds allocated and the operational budget. So, if a community college does not meet the performance standard, in a given year, it will receive less operational funding than it did the previous year (Albright, 1998; Paulson, 2001; Layzell, 1998; Burke, 1999). With performance-based budgeting, funds are not directly linked to the operational budget. Performance funds are not the sole means for monies awarded by the state; rather, these funds serve as an incentive to meet the performance standards. In North Carolina, the performance-based funds are awarded in addition to the operational budget, which is driven by enrollment or full-time equivalents (FTE) (Brudsher, 2000). According to Burke (1999), both performance models are “easier to adopt than implement, and simpler to start than sustain” (p. 6).

Since the North Carolina Community College System’s (NCCCS) inception in 1963, financial policies have determined the colleges’ operational budgets and served as the initial forms of accountability for the System. Between the years of 1963-65, each community college negotiated its budget with the Department of Instruction (Porter, 2002). Then, in 1965, the first funding formula was developed, and colleges were presented with a line-item budget by the state. Funds included in each line item were restricted—meaning that the funds were locked into these areas designated by the state (Morgan, 2002). Formula funding or unit-rate formula funding allows the “state to allocate funds to community colleges on the basis of a formula that specifies a certain number of dollars per unit of measure” (Cohen, p. 141), or, in North Carolina, full-time equivalents (FTEs). To make certain that these funds are spent within the parameters

established by the General Assembly and NCCCS, these higher education institutions must undergo annual fiscal and program audits.

Each of these and similar processes—fiscal audits, program audits, negotiated budgeting, formula funding, institutional effectiveness plans, and program reviews—have arisen from attempts to ensure accountability to the System office, to the government and to the public for college expenditures with state money (State Board of Community Colleges, 1999). In addition, each of these systems arose from attempts to increase flexibility for community college budgets and to serve as a record for resource allocation (Morgan, 2002). Basic but fundamental, these regulations were designed to assure financial stability for the system, as well as a method of accountability to the stakeholders. However, North Carolina’s General Assembly has demanded an even more comprehensive system of assessment and accountability (Brown, 2002).

The rationale behind this decision is provided in several NCCCS documents including *Total Education: Duty of the State* (1977) and *Gaining the Competitive Edge: The Challenge to North Carolina’s Community Colleges* (1989). *Total Education: Duty of the State* (1977) was published by the Commission on Goals for the NCCCS and identified six broad goals including one which directed community colleges to focus on “the effective use of all human and material resources.” This 1977 goal stimulated formal attention to the need for assessment and to what would eventually become institutional effectiveness for North Carolina community colleges.

Institutional effectiveness has only come to the forefront of educational policy since the mid-80s—emerging along with the demand for accountability. In the vanguard of the institutional effectiveness movement, the Southern Association of

Colleges and Schools (SACS), wanted to strengthen its system for accreditation of two- and four-year educational institutions via a two-fold process which strives to improve quality of educational services and programs and to generate public awareness that a set of standards has been met. Previously, accreditation reviews had focused primarily on elements that provided input into the education process (*e.g.*, faculty resumes/*vitas*, facility specifications, course syllabi, libraries, etc.). Standards associated with these elements assisted with the educational process, but failed to measure student outcomes derived from this process (Baker, 2002). For example, a faculty member's *vita* may demonstrate that a developmental English professor is qualified to teach. However, it does not demonstrate whether or not the student enrolled in that developmental instructor's English class is able to progress through non-remedial English classes. In order to make the review process more comprehensive, in 1985 SACS introduced a new component to the review process—institutional effectiveness. Institutional effectiveness, therefore, became a part of the self-evaluation and self-study required by the North Carolina System office as well as the Southern Association of Colleges and Schools as the review process expanded its assessment to include outcomes or measurable goals. Individual states began to address this new requirement in various ways (Baker, 2002; Eaton, 2001; Palinchek, 1993).

In 1989, the NCCCS report *Gaining the Competitive Edge* presented thirty-three recommendations, including, a recommendation that directed the State Board of Community Colleges to “support the development and implementation of acceptable mechanisms for rewarding colleges for excellent performance” (p. 13). This report also suggested that a state-wide task force be appointed to examine options for rewarding

exemplary performance in recruiting, retraining and placing students, increasing the number of students transferring from community colleges to four-year institutions, and placing community college graduates in the workforce. This recommendation by the *Commission on the Future of the North Carolina Community College System* once again brought the issue of accountability to the forefront. The Commission suggested that the State Board, as well as each of the fifty-eight community colleges, develop planning processes that explain the use of System resources. This recommendation required each community college to submit a summary report on these recommendations, or critical success factors, annually. The expectation was that this process would promote college-wide planning after this initial evaluation of programs and services. In the next several years, North Carolina's community colleges initiated and expanded planning and evaluation processes. During these same years, the System, in response to the Legislature's mandate, eased toward a more clearly defined accountability initiative.

NCCCS' third annual report, *1992 Critical Success Factors for the North Carolina Community College System*, emphasized the performance of the system *in lieu* of individual colleges and reported process-oriented goals. Since the early '90s, this annual report has evolved into a more inclusive document with both process-oriented and outcome-oriented goals.

Concerned with issues of performance and accountability, the North Carolina General Assembly passed two key bills in 1998. Behind this legislation lay two concerns. First, the Legislature did not believe that the standards set by the North Carolina Community College System were of sufficient stringency to guide community colleges and provide a quality education for students. Second, this governmental body

wanted new accountability measures instituted. At the same time, the General Assembly was also reviewing a performance-funding process. The consensus was to merge the two bills into one system (Brown, 2002). In 1999, the General Assembly enacted GS115D-31.3, which mandated the use of performance measures for community colleges in North Carolina. Later that year, the North Carolina State Board of Community Colleges adopted the following twelve performance measures for accountability: 1) progress of basic skills students; 2) passing rates for licensure and certification examinations; 3) goal completion of program completers; 4) employment status of graduates; 5) performance of college transfer students; 6) passing rates of students in development courses; 7) success rate of developmental students in subsequent college-level courses; 8) student satisfaction of program completers; 9) curriculum students retention and graduation; 10) employer satisfaction; 11) business/industry satisfaction with services provided; and 12) program enrollment.

In order to comply with the accountability component, each community college must meet all twelve of the performance standards (GS115-D, 1999; NCCCS, 2002, Brown, 2002). For each standard not met, a community college is required to submit an action plan describing why the standard was not met and what corrective action will be taken (Brown, 2002; Adams, 2002). In order to comply with the performance budgeting requirement, each community college is required to fulfill six of the aforementioned standards. Successful completion of the first five measures, also referred as the core measures, is required of all North Carolina community colleges; each is then required to select one of the remaining seven measures as its sixth performance standard (State Board of Community Colleges, 2000; GS115-D, 1999).

This new system of accountability based on performance initiatives went into affect with a review of the 1999-2000 academic year.

Statement of the Problem

Performance-based budgeting, as demonstrated in North Carolina, is a new and evolving program established by the General Assembly to hold state community colleges accountable. As this program is in the midst of its fourth year of operation, this appears to be a good time for reflection to determine whether or not performance-based budgeting is an effective system of accountability, assessment instrument, and conduit for quality. Therefore, the concept that drove this study was the idea that this is an optimum time to make an early evaluation of performance-based budgeting (PBB) in North Carolina and to determine whether or not a variety of institutional and student characteristics have the potential to impact PBB-driven accountability measures.

Further, a review of the literature indicated that there were no earlier analyses of the implementation of performance-based budgeting in the North Carolina Community College System. Thus, this groundbreaking study was needed to address the effectiveness of performance-based budgeting for North Carolina community colleges, as well as to determine the relationship among various independent variables (*e.g.*, FTE, faculty credentials, average age of community college students, average class size, average faculty salary, *etc.*) and community colleges' performance of the five core performance standards.

Research Questions

Accountability has become a vital part of higher education's culture, and many states are choosing to address issues of accountability and higher education with the development and implementation of performance-based initiatives. Since this approach represents a relatively new trend for community colleges, this study attempted to determine if the five core performance measures set forth in GS-115D are helping North Carolina community colleges to either maintain or improve educational programs and services. To focus this analysis, the following questions were addressed:

- 1) *What is the rate of progress among North Carolina's community colleges in meeting the five core performance measures (progress for basic skills students, passing rate for first-time test-takers of licensure and certification examinations, goal completion for program completers, employment status of graduates, and performance of college transfer students) over a three-year period?*

- 2) *Further, what is the impact, if any, of certain independent variables on dependent values or performance measures? For more details regarding the variables incorporated into this part of the study, refer to the schematic outlining this process on p. 46.*

These questions primarily required the use of quantitative research methods with qualitative techniques being applied when appropriate.

Significance

This study was an attempt to verify or deny the success of performance-based budgeting within the North Carolina Community College System, to explore reasons for success or failure, and to examine the variables impacting individual community colleges in the accountability process.

Two critical issues emerge from the debate over performance measures. The first is the use of performance measures as a mechanism for accountability. The present need for accountability is heightened by the current economic climate—a time of dwindling resources and increased concern over the use of those resources. According to Massy (1994, p. 49), “New accountability demands and increased competition are challenging the tradition[al]” concepts of higher education. The idea of doing more with less is becoming more prevalent with regard to funding higher education. *In lieu* of awarding colleges more funds to ensure better programs and serve more students, states are opting to link funds to performance standards. Thus, states are developing accountability systems that guide both educational and fiscal policies. Community colleges in particular, by virtue of their mission to serve local constituencies, are caught between the demands made by increased services and the limitations created by reduced resources (McCabe, 1996; Paulson, 2001; Pickens, 1993).

The second critical issue relates to variables which may impact a community college’s performance. Once the performance of the fifty-eight community colleges is evaluated, the next question becomes, “Why are some colleges performing better than others?” It may very well be because of factors that have a direct or indirect impact on

the education environment. Analysis of the independent variables identified in chapter three (p. 61) may provide insight to assist with future studies regarding the effectiveness of performance-based initiatives. For example, is a community college with a greater percent of credentialed faculty evidence of greater student success? If a college has a lower average class size, do students benefit from the personal attention? These and other such variables could impact student success, which in turn might contribute to a higher rate of progression for basic skills students or a greater likelihood of college transfer students achieving a 2.0+ GPA at four-year colleges.

This study attempted to address issues of accountability and examine factors related to individual community college performance. In so doing, it will add to the existing body of literature on accountability and performance funding at the community college level and address the shortage of research on what makes some community colleges more effective than others.

Limitations of the Study

The focus of this research was the North Carolina Community College System's annual performance measure report and the fifty-eight community colleges that comprise the North Carolina system. Because this study was limited to one statewide reporting system and the fifty-eight community colleges therein, its conclusions may not be indicative of community colleges nationwide. While the conclusions drawn from this study were derived from common issues facing community colleges in general, the restrictive use of one state system does inhibit generalizing about all such systems.

In order to respond to the aforementioned research questions, a comparative and a correlational relationship study was conducted. A comparative model was used to review data for the first two years that the performance-based budgeting program applied to North Carolina community colleges and the year prior. This model yielded descriptive information about the subject being studied and may have been limited by the fact that results from descriptive tests can not be applied to reject or failure to reject a null hypothesis. At best, use of this information can provide a guide to whether or not community colleges in North Carolina are progressing on the five core performance measures based on a review a categorical and continuous data.

Use of a correlational research method analyzed the predictability of certain variables on a community college's performance. The tendency with results obtained from correlational tests is to derive a cause-and-effect relationship. Although the correlational research method may demonstrate characteristics of a cause and effect relationship, this impression is typically is due to an unknown, untested variable. Further, this research design did not allow a conclusion to be drawn.

The research utilized for this study involved data on the North Carolina Community College System for the reporting years 1998-99, 1999-2000 and 2000-2001. Although performance measures were first reported in the *2000 Critical Success Factors* document, accountability reporting was implemented as a mandate by the N.C. legislature for the 1999-2000 academic year. The relative youth of this program may have yielded insufficient data for a longitudinal study. This study may also be considered premature as many aspects of college performance are longitudinal in nature since they are affected by factors occurring over a period of time. Yet, variables such as

credentials for instructional staff, course requirements/descriptions, facilities, *et al.* remain fairly stable and may not have greatly inhibited the study.

Moreover, several difficulties lie with the mechanisms and the requirements for reporting the performance standards. First, this relatively new system is evolving and undergoing frequent change in order to better accommodate data collection and to ensure accuracy of the data. For example, the initial standard for college transfer students was set that eighty-four percent of these students would have to maintain a GPA of 2.0+ after two semesters enrolled at a four-year college. This standard was altered to 82.9 percent because it had been incorrectly set based on an outdated percent of sophomores and juniors native to the four-year state universities with a GPA of 2.0+. Presently, NCCCS is lobbying for this standard to be adjusted to eighty percent in accordance with national norms (Brown, 2002; NCCCS, 2002). Another example of inconsistency among the performance measures involves the reporting of certain licensure and certification results, which were temporarily withheld because of concerns involving privacy. For the 2000-2001 report, real estate exam scores were not reported since issues regarding privacy of test takers could not be resolved. Instead, the data were scheduled to be incorporated into the 2001-2002 report with the anticipated result of an increase in failure among community colleges to meet this measure (Brown, 2002).

These examples illustrate how the data may vary slightly from year to year. If gaps exist because of data collection methods, how did these inconsistencies impact this study? By inconsistencies, one might consider the impact of 1) standards being altered from year-to-year, 2) consistency in the reporting methods, and 3) data included in a

given report typically included the results from the previous academic year. In a *Critical Success Factor* report, only ten of the twelve performance measures were derived from data gathered from the previous academic year. Two measures relied on the external collection and compilation of data which resulted in a delay of one to three years. For example, NCCCS must rely on the each college or university to provide the information necessary to evaluate the college transfer performance standard. This information may take up to two to three years for institutional compilation and delivery to NCCCS. Also, information regarding the progress of basic skills students is derived from the *LEIS* report (Literacy Education Information Systems), which is typically filed one year later than the performance report. So, the *2000-2001 Critical Success Factors* report includes basic skills information from the *1999-2000 LEIS* report.

There is also the consideration of unknown variables that may not only impact community college performance, but the results of the study. For example, North Carolina community colleges have recently experienced up to thirty-two percent growth in enrollments. Two student populations that have significantly contributed to this increase at community colleges in the past couple of years include high school students and displaced workers. Many high school students are opting to take the introductory college-level classes available in their schools through local community colleges as part of the Huskins Bill and dual enrollment programs. Also, the economy has taken its toll through the closing of local plants and industries. The answer for many of these recently unemployed workers is to retrain for another career at a nearby community college. How has the dramatic fluctuation in enrollments affected students in North Carolina's performance-based system? Has this fluctuation in student demographics

impacted average class sizes for college credit and basic skills classes? Might these students affect the average age of a community college's student population and, in turn, potentially impact the results of this study? Issues like these were addressed in this study as variables such as average class size, average student age, and FTE are analyzed.

The scope of the study was another limitation. While one test might have included a survey of North Carolina legislators to discover if this process reflected appropriate use of public funds, a more substantive evaluation focuses on whether or not individual community college—or the North Carolina Community College System—find that this process leads to improvements. In order to complete this current study in a timely fashion, such a comprehensive study was impossible.

Key Terms

Accountability: The use of assessment measures to review education programs and services in response to stakeholders' concerns over the use of public resources. In turn, colleges must demonstrate that these resources are being efficiently and effectively used to serve students and the public. Originally, state governments brought issues of accountability to the forefront during the glory days of community colleges—mid-'60s through the mid-'70s. Accountability initially focused on documenting inputs or existing programs and services offered by community colleges. In the past decade, the term has expanded to also include student-learner outcomes.

[Institutional] Accreditation: A level of educational achievement awarded by the Southern Association of Colleges and Schools (SACS), or another regional accrediting body, that allows community colleges to confer academic degrees.

Base [or Operational] Budget: The budget allocated by the state to each community college to cover operational costs. As in many states, the base budget awarded to each community college in North Carolina is driven by enrollments or full-time equivalents (FTEs).

Benchmarks: Established goals that support a community college's mission statement. These are goals that are measurable and designed to identify strengths and weaknesses. Typically, benchmarks are designed for internal review and focus on the institution's quest for improvement—usually through a comparison of previous performances or performances of competing colleges or organizations.

Continuing Education programs: Non-credit classes consisting of basic skills education, workforce training and development, and personal and community enrichment.

Critical Success Factors: An annual report by the North Carolina Community College System from 1989 to present. The title originated from the idea that these “factors” were ones critical for community colleges to operate effectively. A report prepared by the Commission on the Future of the NCCCS entitled *Gaining the Competitive Edge*:

The Challenge to North Carolina's Community Colleges (1989) is the first public record to identify critical success factors.

Curriculum programs: Programs comprised of college credit courses leading to a certificate, diploma or an associate degree.

Fiscal Year (FY): For North Carolina community colleges, the fiscal year operates from July 1 of one year to June 30 of the following year.

Incentive funding: Funds allocated based upon community colleges' success in meeting the standards for performance measures. This model utilizes funds that would otherwise revert back to the state. Colleges that meet the performance standards can earn up to two percent of the college's base budget.

Institutional Effectiveness: Introduced as an institutional accreditation standard in 1985, the purpose of institutional effectiveness is to identify and report student-learner outcomes. Previously, regional accreditation bodies had focused entirely on input and process issues (e.g. faculty qualifications, facilities specifications, program components). Institutional effectiveness required community colleges to develop and implement measurable goals that are outcome-oriented. Components of institutional effectiveness include—mission or purpose, goals, benchmarks, evaluation, planning, research, with college-wide involvement in all activities.

Mission: A statement of purpose that guides an educational system and/or an institution in its service to the student population as well as to the community at large.

[The] North Carolina Community College System (NCCCS): A system of fifty-eight comprehensive community colleges that offer degrees in college transfer, and vocational and technical education, as well as non-credit programs for workplace training and development, basic skills education and personal enrichment. (A fifty-ninth institution in the System is not a community college and so not relevant to this study.)

Performance-based budgeting (PBB): Funds allocated for performance that are not directly linked to an educational institution's base budget. This is a flexible incentive funding approach.

Performance-based funding (PBF): An initiative to improve quality by linking budget allocations with an institution's performance on an established set of initiatives or measures.

Performance reporting: The concept that performance in colleges and universities will improve based on the requirement of publishing its academic achievements.

Prescription/Performance Initiatives/Standards: A set of measures adopted by institutions of higher education that examine the educational services and programs offered. These measures quantify institutional effectiveness.

Stakeholders: Individuals who have an interest in the effectiveness of educational activities. In North Carolina, stakeholders include the North Carolina Legislature, the governor, the North Carolina Community College System, students, parents, employers and the general taxpaying public.

Summary

In order to effectively address the needs of their service areas, community colleges generally have a broader mission than four-year colleges and universities (Mayes, 1995). Therefore, assessments also need to be more broadly based and flexible. Performance-based budgeting appears to be a good fit for community colleges as: 1) the loose link between funding and results in performance budgeting allows for individual consideration of each college's performance—an evaluation of a college's strengths and weaknesses; 2) the flexibility of performance budgeting permits community college systems to use more measures in order to encompass more objectives; and, 3) the use of more measures also buffers the impact of validity and reliability problems that might be associated with an individual indicator or an insufficient sample size (Burke, 1999). Performance-based budgeting also attempts to address the concerns of accountability expressed by external constituencies (*e.g.*

legislature and taxpayers), of quality educational programs and services by community colleges, and of measurable performance standards by NCCCS.

The purpose of this study, therefore, was to analyze North Carolina's statewide community college system in an effort to determine if performance-based budgeting is indeed an effective tool for achieving accountability among the state's community colleges.

Chapter 2

Review of Related Literature

The concept behind this study is the premise that this is an appropriate time to evaluate the impact of performance-based budgeting (PBB) among community colleges both in an effort to determine if this approach to accountability is viable for North Carolina and if, by extension, it is viable for other states. Performance-based concepts have emerged from many accountability efforts critical to the understanding and development of PBB. The review of literature designed to support this study encompassed theories regarding accreditation, institutional effectiveness, accountability, resource allocation, and performance initiatives. Further consideration of these elements may suggest whether or not accountability tools lead to improved

performance by community colleges via quality educational programs, more effective resource allocation, graduates qualified for employment or college transfer, etc.

Accreditation

The literature illustrates that performance initiatives, institutional effectiveness, and other accountability measures are all influenced by the guidelines that shape higher education's accreditation process. Baker (2001) asserts that accreditation was founded and continues to operate on the basic premise of "protecting academic virtue" and "sustaining institutional integrity." However, early accrediting bodies began primarily as a function of student recruitment since four-year colleges were seeking qualified high school students. Using the Carnegie standard unit—which required that a subject be studied at least 120 hours per year—as a reference, these colleges would review public high schools and rate them based on educational programs and services. Then, during the 1800s the number of public high schools in the United States drastically increased with the inclusion of vocational high schools. The rise of vocational training was especially evident in the South, where there was a great need for these colleges to provide training for skilled occupations in order to support economic development (Palincheck, 1993; Wiggs, 1989). Colleges overseeing the accreditation process became more selective and began to exclude the vocational schools. The basic principles of supply and demand became a catalyst for the development of regional accreditation. With the rise of vocational education concentrated in the South and Midwest, accreditation bodies began to develop and to distinguish themselves by regions (Palincheck, 1993).

Today, there are six regional accrediting bodies whose purpose is to review both two-year and four-year colleges and universities seeking the authority to award degrees. In addition, a variety of specialized accrediting agencies also exist to review academic programs such as nursing, radiography, basic law enforcement, etc. Regional reviews occur every ten years and have traditionally included the submission of a self-study prepared by the college under review followed by a site visit of collegiate peers who make a recommendation on accreditation or reaffirmation of accreditation (in the case of previously accredited institutions). Accreditation is the primary form of accountability in higher education. The accreditation process holds colleges accountable for providing educational classes, services and programs that meet a specific standard as outlined in the *Criteria of Accreditation* (Palinchek, 1993; Todd, 1998). For example, the sections that cover educational programs and personnel verify that a college offers the appropriate classes staffed by qualified faculty members.

Of relevance to this study is The Southern Association of Colleges and Schools, commonly known as SACS. This accrediting body endorses institutions through one of four commissions with two-year colleges accredited by either the Southern Association of Colleges or Schools on Colleges or the Southern Association of College and Schools on Occupational Education (developed in 1971) (SACS, 2002; Todd, 1998). The Southern Association of Colleges and Schools includes the following states: Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia.

Accreditation is a four-tiered process: Level I encompasses community, junior and technical colleges; Level II evaluates the performance of baccalaureate degree

granting colleges and universities; Level III reviews comprehensive institutions; and, Level IV focuses on doctoral-granting universities. (Todd, 1998)

Accreditation reviews have traditionally included elements that were a part of the educational process—faculty résumés/*vitas*, facility specifications, course syllabi, resource materials, libraries, etc. (Eaton, 2001). Many of these same elements are also considered input variables for higher education. For instance, none of them measured outcomes derived from the educational experience. In 1985, the Southern Association of Colleges and Schools added an outcome-oriented approach with the introduction of institutional effectiveness. The *Criteria for Accreditation* articulates this new philosophy as it considers, “outcome assessment or institutional effectiveness ...of equal value with institutional process” (p. 17). Institutional effectiveness, therefore, became a vital part of the evaluation and study required by SACS, and the review process began to include outcomes or measurable goals (NCCCS, 1992, 2002; Nichols, 1998; Palincheck, 1993; Eaton, 2001; Baker, 2001; Todd, 1998). The timing was right for higher education reform. Eaton (2001) expands on the idea of institutional effectiveness. In the mid-80s and early 90s, higher education had reached a level of maturity; in an effort to improve higher education and the evaluation process, examination of institutional effectiveness was introduced. Although a substantial focus was on quality improvement or performance, other areas were also impacted by this reform—distance learning/technology, a renewed focus on teaching and learning, and an increased efficiency in the accreditation process. These changes initiated a need for documenting educational effectiveness at the state level (Nichols, 1998). The addition of institutional effectiveness on college campuses, however, created several concerns

regarding manpower, technology, and funding required to adequately oversee the effectiveness of an institution.

Dill and Massy (1996) and Palinchek (1993) consider the key elements of accreditation as follows:

- Meeting established standards;
- Including objectives and goals as well as their implementation;
- Comparing actual performance with established standards;
- Involving performance indicators, self-study and/or peer review;
- Preparing every 10 years for regional reaffirmation of accreditation;
- Publishing the final study; and,
- Being reviewed by an external agency.

Palinchek (1993) expands on the benefits of accreditation with respect to three areas: providing a realistic evaluation of two-year colleges; bridging the gap between vocational and academic oriented schools; and, developing a more fluid process for the transfer of college credits from a two-year to four-year schools. The implication is that regional accreditation has evolved to become more inclusive of the educational process; and, therefore, provide a more realistic and complete evaluation. Palinchek (1993) attributes the inclusive nature of community colleges and the accrediting agencies with the increased compatibility between vocational and college transfer programs, as well as with the transfer process. By requiring institutions to develop some means of demonstrating their effectiveness in order to maintain accreditation, regional accrediting agencies have encouraged innovation and self-scrutiny.

Furthermore, Dill and Massy (1996) point out that there are primarily two types of accreditation reviews—institutional and program. Each of these reviews tends to take a slightly different approach to data collection with institutional reviews emphasizing qualitative methods and program reviews focusing on quantitative ones. Although the collection and reporting for these reviews may differ, institutional and program reviews would later come together to address other issues such as institutional effectiveness, accountability to the public, and college performance.

Institutional Effectiveness

With the economic recession in the early '90s, a heightened sense of public concern regarding the expenditure of tax dollars emerged. Todd and Baker (1998) quote Derek Bok, president emeritus of Harvard University: “The public has come to suspect quite strongly that our institutions (of higher education) were not making the education of students a top priority” (Todd, 1998, p. 57). Further, Massy (1994) believes that higher education could not adequately respond to the public outcry since there was a lack of documentation specifically addressing institutional effectiveness and, therefore, justifying resource allocation. Todd and Baker (1998) support this idea since “the continuing inability to document effectiveness and improvement hurts higher education’s cause, especially in hard times; legislators are increasingly reluctant to support higher education spending without such evidence (p. 57).”

Hudgins (1991) suggests that institutional effectiveness has only come to the forefront of educational policy since the mid-80s—emerging along with the demand for accountability. However, according to Young (1993), institutional effectiveness has

been a part of higher education for many years through mission statements, institutional goals and objectives, annual reports, etc. In Welker and Morgan's (1991) review of the literature prior to 1990, the authors explain that the two previous decades established a foundation for institutional effectiveness with the 70s emphasizing institutional goals and the 80s marking the movement toward student outcomes assessment. These authors also note several weaknesses in the literature relating to a lack of clarity with definitions of terms such as *effectiveness*, *assessment*, and *efficiency*. Another criticism voiced during the 80s and 90s is that the "field of institutional effectiveness is plagued with a lack of leadership and organization" (p. 28). Welker and Morgan (1991) also expressed a prevailing concern that the body of literature on institutional effectiveness contains more opinion than the results of research—especially in literature pertaining to community colleges.

The literature reviewed up to this point indicates that lack of clarity with institutional effectiveness extends beyond the terminology and into the concepts. Welker and Morgan (1991) identify performance as an action or deed, and effectiveness is the result of the action. Therefore, within the higher education environment, institutional effectiveness must be defined in relation to the educational programs and services available to students and in turn the students' contribution back to the community/society. In the article "One Step Beyond What the Literature Says on Institutional Effectiveness of Community, Junior and Technical Colleges," there is an apparent concern that education has allowed the definitions and models of effectiveness that originated with business and management to shape educational policy and action. The authors recognize the importance of these theories, but believe that community

colleges cannot be managed, organized, and evaluated in exactly the same manner as businesses—these colleges encompass different activities, environment, and personnel. In their concluding remarks, Welker and Massy (1991, p. 31) state that education programs/activities “are not an end, but the means to an end.”

While Welker and Massy define institutional effectiveness in terms of educational activities, Todd and Baker (1998) consider it to be a “process in which a community, junior or technical college engages in better identifying, assessing and improving education outcomes” (p. 59). They also recommend that institutional effectiveness needs to include: purpose, goals, planning, research and evaluation.

A review of the literature indicates that the ‘90s marked significant changes in several areas: a rise in the statewide use of performance measures in order to demonstrate how effectively resources were being expended for educational services and programs; a greater emphasis by regional accrediting agencies’ requirement to prove effectiveness in order to maintain accreditation; and, an increase in the use of institutional effectiveness as a vital part of the accreditation review process. SACS redefined accreditation standards to incorporate institutional effectiveness and accountability with the following two goals: “1) to maintain and improve the quality of education services and programs at colleges and universities, and 2) to create public awareness that a set of standards had been met by these institutions of higher education” (Palinchek, 1993, p. 12). In Ewell’s (1985) opinion, higher education can achieve excellence or institutional effectiveness by demonstrating change that is consistent with institutional objectives, student educational goals, and the needs of the general public. He considers incorporating the needs of the community as extremely

important for community colleges because of the unique relationship these colleges have with their service areas. This relationship leads to the importance of a college being accountable to its community.

Accountability

The body of literature on accountability and higher education identifies several reasons for the momentum behind the movement. Wellman (2001) is of the opinion that higher education is being influenced by the success of the K-12 standards, as well as demands to increase efficiency and be accountable to the public. Systems of accountability are being pushed for three reasons: “to motivate for internal improvement, to encourage institutions to address state goals, and to deregulate higher education by strengthening consumer information about institutional performance (p. 47).” Researchers (Wellman, 2001; Ewell, 1995; Fuhrman, 1999) also indicate that state governments are beginning to require measures of accountability in an effort to demonstrate that financial resources are being used effectively. Some states offer incentives for colleges who met these standards, and other states are opting to link performance to the allocation of resources through state budgets (Wellman, 2001; Christal, 1999; Burke, 1999).

The idea of performance indicators or accountability measures is not new. Wellman (2001) believes that earlier forms of performance reporting or accountability existed in earlier management systems such as program-planning budgeting systems (PPBS), zero-based budgeting and MBO (management-by-objectives). Alert to the dangers of moving too fast and/or elevating accountability mandates above institutional

common sense, Wellman (2001) also indicates that there are several problems inherent to these earlier models when applied to education: Arguing that “form must follow function” in academic accountability processes, she warns that politically-motivated requirements imposed on institutions (i.e., a state purchasing vendor list) can lead away from accountability and into a maze of expensive and limiting options.

Although there has been some debate about the anticipated longevity of performance-based initiatives, Wellman (2001) and Hudgins (1995) suggest that accountability and institutional effectiveness should be considered trends and not fads. Their capacity for long academic lives is apparent because both of these processes are quickly becoming a part of the foundation for higher education. When James Hudgins addressed the Texas Association of Community College Trustees and Administrators (1995), he provided the following explanation for how community colleges reached this accountability crisis so prevalent in the late 80s and early 90s:

- 1) Community colleges are not in this position because they volunteered.
- 2) These institutions are now facing issues of accountability, since they did not address them earlier. While businesses were embracing similar initiatives in models like Total Quality Management (TQM), colleges were debating if outcomes could be measured, and if so, then how.
- 3) Then, there was the need to adopt mechanisms for accountability, since it had been so successful with business and industry.
- 4) The public was losing confidence in higher education because of examples of mismanagement and criticism of the competency of college graduates.

- 5) Finally, stakeholders wanted a “return on their investment” (p. 4). With the rising costs of higher education, people wanted to know exactly where their money was being spent and what were the results of this expenditure.

In 1995, the American Association of State Colleges and Universities, the American Association of Community Colleges, and the National Association of Universities and Land Grant Colleges developed a joint commission to address accountability. A letter jointly drafted by these organizations states, “Accountability reporting is the right thing to do. The credibility of the higher education community is suffering because of the lack of consistent, comparable information available to government policy makers and the public.” (Hudgins, p. 6)

In examining the literature on accountability, several consistencies can be found in the way experts define its basic function in relation to higher education. Many of the authors interchangeably use terms such as *accountability measures*, *benchmarks*, *report cards* and *performance indicators* (Ewell, 1994; Burke, 2000; Wellman, 2001; Young, 1995; Frye, 2002). Young (1995) identifies accountability as a requirement imposed by an external funding agency (i.e., the North Carolina Legislature) in relation to the use of public resources (i.e., tax dollars). Meanwhile, Frye (2002) analyzes accountability in terms of its relationship with assessment. “Assessment for accountability” defines a regulatory process that can be used to maintain a stated standard by colleges and universities. For example, community colleges assess their performance; community colleges are accountable to others (i.e., legislators, governors, state boards, students,

parents, taxpayers) for their performance. Accountability, therefore, attempts to assert a level of control by the public over higher education.

Wellman (2001) suggests that state accountability uses both qualitative and quantitative measures; thus, combining the elements identified earlier in this chapter with regard to data collection for institutional and program review for accreditation. Both complementary relationships—institutional reviews typically require qualitative research methods and program reviews tend to focus on quantitative techniques—are necessary for institutional effectiveness as well as for accountability systems.

Researchers, in an attempt to thoroughly review accountability systems, have identified several barriers for the establishment of accountability programs. Outcalt and Rabin (1998) mention three concerns. First, implementation of accountability can be difficult when faculty members are not fully supportive of the standards or the process. Second, data are a vital part of this process and can inhibit its effectiveness if poor data collection techniques or misunderstood data are used. Third, the purpose of accountability is lost when there is “an unclear or non-existent relationship between assessment and budget appropriations” (p. 4). Concurring with Outcalt and Rabin’s last point, Frye (2002) is concerned that measures may be ambiguous and that “the measures themselves direct institutional goals to some extent, rather than the other way around” (p. 7). Instead, he recommends that college mission statements ought to be the source for assessment and, in turn, an indicator for what should be measured. Therefore, to be effective, accountability measures should—1) be unambiguous and 2) be linked to indicators of quality.

With a process that is becoming more and more outcome-driven, Wellman (2001) questions what outcomes are being included in the standards set for many states. The author's concern lies with the interpretation and use of educational outcomes. The basis for Wellman's (2001) argument rests on delineating the difference between student outcomes and student learner outcomes. Students are the focus, so why do we not focus our measures accordingly? Student outcomes—i.e., graduation rates, transfer rates, job placement rates, and retention—are used by many states. These are actually institutional outcomes, since they do not impact change on the students while they are enrolled at a college or university. Such indicators are typically involved in accountability reporting.

States are establishing accountability to align student assessment to the expectations set forth in accountability or performance measures. Although Fuhrman (1999) describes accountability and performance as they pertain to primary and secondary schools, many of her ideas could apply to higher education. Fuhrman (1999) indicates that the focus has shifted to an outcome-oriented approach of review instead of reviewing the system of the college as a whole. For example, North Carolina's system of accountability considers the satisfaction of the employers of community college graduates. Previously, this system would have been satisfied simply with the job placement rate of students within six months of graduation. In an effort to implement accountability tools, Fuhrman (1999) described how many states have adopted continuous improvement strategies and reinforced these efforts through public reporting, attaching consequences to performance levels, or providing incentives for high achievers.

Based on the experiences of primary and secondary schools systems, Fuhrman (1999) cautions higher education to consider the following questions facing policymakers and educators:

- How should states measure performance?
- What is satisfactory progress? And, who defines *satisfactory*?
- How do you hold schools accountable for value-added measures?
- Were the complexity of measures and trade-offs developed with fairness in mind?
- What is the state's capacity for remedy?
- Does the performance model provide stability and credibility?
- Does the public understand the performance model?
- Does the performance model include incentive for students?

The literature thus far indicates that forming partnerships for assessment; stronger ties with government; increased faculty involvement; and, development of an assessment program with a “shared vision of outcomes” are vital to a successful accountability program (Fuhrman, 1999). Such partnerships, many believe, can be more successfully formed if they streamline resource allocation and make known to each target partner the advantages of the allocation process.

Resource Allocation

How are resources allocated? According to Massy (1996), resources are typically allocated based on process or input variables. Effective resource allocation

begins with the identification and understanding of the mechanisms that guide spending—instrumental values (those of the marketplace or stakeholders) and intrinsic values (i.e., mission, goals, benchmarks). Finding a balance among these sets of values is essential to several areas of higher education, especially fiscal responsibility. In this instance, it would require finding the balance between the values of the marketplace or stakeholders (i.e., legislature, taxpayers, students and parents) and the goals of the community colleges. If the values of the stakeholders are ignored, these stakeholders are less likely to support community colleges through increases in funding and resources. This action, or lack of, by the stakeholders could result in an overall decline in the quality of the product—education. A system of accountability, such as measuring performance, attempts to balance these values (Massy, 1996 and 1994).

Recognizing and managing diverse intrinsic values is the second key to successful resource allocation. Areas of diversity might include educator backgrounds, differences in educational purposes/goals, educational programs and services, or hidden agendas (a result, in part, of self-interest) (Massy, 1996; McKeown-Moak, 2000). This approach presents a unique challenge to community colleges who serve a considerable cross-section of the population. For example, while one population might give priority to resource materials in the library and in open Internet labs, another may place the highest value on trips, excursions, and a rich program of student activities. Similarly, one group of faculty members may prize most tuition reimbursement for advanced study while another group will demand support for sabbaticals. In a time when no public campus can satisfy all the demands for resources, it is critical that management be able to allocate resources in a way that keeps all constituencies satisfied.

The third key lies in managing the often complex conflict between centralization and decentralization of budget matters. Centralization is the traditional approach taken by many in higher education with the budgeting controls from the center out or the top down. On the other hand, decentralization takes the power away from the center and applies it in a way that typically benefits middle management (Massy 1994, 1996). According to Paulson and Smart (2001), resource allocation reform typically involves decentralizing budgeting responsibility. In the case of performance-based funding decentralization is especially evident as the funds are directly linked with an operational budget. The authors further explain that “performance funding developed originally as a cost reimbursement model for resource allocations. Performance funding was unused for many years....and has recently been reenergized as a state-level budgeting practice that relates resources to activities and outcomes” (Paulson and Smart, 2001, p. 516) and ensures accountability by postsecondary institutions.

Performance Initiatives

With rising costs and a decrease in state resources, the public demands that the community college make every effort to ensure a quality product through the education it provides its students. Accountability to the public, and to the state legislature, is part of the rationale behind the implementation of the performance-based initiatives.

The idea of performance-based funding originated in 1979 with the Tennessee Higher Education Commission’s recommendation to develop a performance-funding program for both four and two-year institutions. Two years later, the state implemented the performance-funding program, which required community colleges to emphasize

outcomes, derived from student performance rather than inputs from services, programs and personnel. Tennessee did not want to replace formula funding but chose instead to use additional funds as an incentive for institutions to make performance outcomes more of a priority (Mayes, 1995; Albright, 1998; Christal, 1998). There were three overlying goals for this program: to improve instruction and student learning, to provide incentive funding for excellence in higher education, and to develop an assessment instrument that addressed these goals (Mayes, 1995).

This new approach to financing and accountability began with a five-year pilot program in which the goal was “designated to stimulate instructional improvement and student learning and recognize institutional mission” (Albright, p. 4). Initially, a community college in Tennessee could earn up to two percent of its base budget for successful performance. This groundbreaking program included five performance standards—1) objective measure of general education outcomes (i.e. testing with ACT Comp. or College Base), 2) competency tests for certain majors, 3) alumni and student surveys, 4) accreditation (percent of creditable programs), and 5) “improvement actions.” The later standard is no longer available. By 1995, community colleges in Tennessee could earn up to 5.45 percent of their operational budget. Further, the number of performance standards had doubled to ten with these standards reflecting a shift from assessment of the process or input variables to the evaluation of outcomes (Mayes, 1995; Albright, 1998).

From this movement toward greater public accountability, three performance-based programs have emerged—performance reporting, performance-based funding, and performance-based budgeting. Performance reporting operates on the assumption

that an improvement in performance is rewarded solely by publishing the results. There does not appear to be any link to funding with performance reporting, which might explain why it is primarily used as a tool to encourage colleges toward performance initiatives, but does not guarantee the adoption of performance-based funding or performance-based budgeting (Burke, 1999).

The use of performance as a factor in funding public colleges and universities takes two forms: performance-based funding and performance-based budgeting. Performance-based funding (PBF) “links specific dollar allocations to measured institutional results on each of the designated indicators. The tie is automatic and formulaic” (Burke, p. 18). The confining elements of performance-based funding has resulted in several states like Washington, Colorado, and Mississippi either switching to performance budgeting or dropping the performance model all together (Albright, 1998; Burke, 1999; AACC, 2000).

Performance-based budgeting (PBB) allows governors and legislatures, or coordinating or system boards to consider a college’s performance as one factor in determining total allocation, since these funds are awarded in addition to the base budget. The link between performance and the allocation of funds in performance budgeting is flexible and random. With regard to PBB, incentive funding is awarded—funds are allocated based upon each college’s success in meeting the performance measures. In North Carolina, this model utilizes funds that would otherwise revert back to the state. At the close of the fiscal year, some community colleges return remaining funds back to the state financial office. Awards for performance are administered from

this pool of money. Community colleges in North Carolina can earn up to two percent of the college's base budget (Harbour, 2001, GS-115D, 1999; Morgan, 2002).

Both of these models consist of performance measures which demonstrate public accountability—improving institutional performance and meeting state-established performance indicators, which identify areas of achievement and specify how they are to be measured (Burke, 1999). Other aspects of performance funding include funding weights, funding levels and funding sources. Funding weights assign the same or different values to the performance indicators and may be predetermined by the state or by the college. Funding levels establish the percentage of state support for performance to be administered as part of the college's operating budget. For example, South Carolina's funding level is 100 percent while Tennessee only uses 5 percent. Burke (1999) and Albright (1998) recommend a funding level of three to eight percent. Funding sources for PBB or PBF typically include additional or reallocated resources. (Burke, 1999; Paulson, 2001, Albright, 1998)

In 1997, the State Higher Education Executive Officers (SHEEO) conducted a survey to learn more about the use of performance measures throughout the United States. Reviews of this survey were articulated by Joseph Burke, Brenda Albright, Shahpar Modaressi, Melodie Christal, and Mary McKeown-Moat. At the time this survey was administered, more than half of the states, thirty-two, had adopted or planned to adopt a performance-based funding or performance-based budgeting model (Albright, 1998; Burke, 1999, 1998; Christal, 1998). Table 2.1 illustrates how these thirty-two states planned to either implement or continue use of performance measures by the year 2000. Of those states using performance measures in 1996, eight used

performance measures directly linked to budgets, and fifteen used the performance measures to determine allocations not related to the budget.

Table 2.1 Uses of performance measures in relation to college budgets

Use	Number of States
Directly linked to the allocation of funds	8
Considered in allocating resources, but no direct linkage	15
Not used, but plans to do so within two years	9
Not used and no plans	16

Differences in performance funding and performance budgeting can be attributed to two factors: first, the relationship between the base or operating budget and allocation of funds in relation to performance measures and second, flexibility of the implementation and allocation processes. In performance funding, the relationship between performance results and resources is clearly outlined and inflexible. Performance funding provides a “direct and tangible incentive” for community colleges to improve performance. However, this funding approach could also punish campuses where performance fails. For this reason, South Carolina is reassessing its position with respect to performance funding for its higher education institutions. In 1996, this state adopted a performance funding policy that related performance measures to 100 percent of each college or university’s operating budget. This approach to PBF tends to result in less funds, thereby punishing the colleges as well as their students. Because of the restrictive nature of performance funding, Burke (1999) and Christal (1998) recommend using a few, carefully selected measures.

In order to effectively address the needs of their service areas, community colleges typically have a broader mission that attempts to address the diversity present among students and prospective students (Mayes, 1995). One might deduce then that assessments also need to be more broadly based and flexible. Burke (1999) is of the opinion that the loose link between funding and results in performance budgeting allows for individual consideration of each college. This flexibility allows performance budgeting to use more measures in order to encompass many more objectives. The use of more measures also decreases the likelihood of validity and reliability problems that might be associated with a single performance indicator or an insufficient sample size. However, the flexible-nature of performance budgeting and the loose link between performance and budgeting can reintroduce the political process into the equation. With political turnover and ever-changing agendas, performance budgeting is more susceptible to modifications by state legislatures (Burke, 1999).

Another consideration of the SHEEO study was the implementation of performance initiatives. Some states—Delaware, Mississippi and North Carolina—were mandated by their state legislature, while others such as Florida and Tennessee have voluntarily adopted performance-based principles. Appendix D (p. 205) references the involvement of the governor's office, state legislature, system or governing boards and colleges/universities in the development of performance measures. The survey denoted the levels of involvement as heavy, moderate, minimum or none. According to this survey, North Carolina's legislature and the System board were heavily involved in the initial stages while colleges were moderately so and the governor's office not at all (Christal, 1998). Burke (1999) cautions against the use

performance initiatives instigated only as a result of legislative mandates—perhaps not good indicators of longevity for either performance funding or performance budgeting.

States implement performance measures for a variety of reasons including elimination or reduction in the size of programs; focus on outcomes rather than inputs; emphasis of state or legislative goals; provision of common or similar accountability information; linkage of budgeting with planning and programming; rewarding improvement, accessing resources, assessing and reinforcing existing quality; and, encouraging change throughout the campus (Burke, 1999; Layzell, 1998; Albright, 1998). Based on the SHEEO survey, some of the more popular performance measures can be found in Table 2.2. (Performance measures used by each state are identified as Appendix E, pp. 206 and 207. These tables include information for two- and four-year colleges and universities.)

Table 2.2 Most Commonly Reported Performance Measures

Performance Measures	Number of States
Graduation rates	32
Transfer rates	25
Faculty workload/productivity	24
Follow-up satisfaction studies	23
External/sponsored research funds	23
Remediation activities/effectiveness	21
Pass rates on licensure exams	21
Degrees awarded	20
Placement data on graduates	19
Admission standards and measures	18
Total student credit hours	18
Number and percentage of accredited programs	13

Burke (1999) and Albright (1998) consider performance budgeting to be more stable than performance funding. Yet, there are several factors that affect both performance models: involving stakeholders throughout the entire process, getting off to a good start, and receiving continued support. By involving stakeholders in the early decisions, implementation, and evaluation, colleges are providing them with an invaluable opportunity to develop ownership in the performance model, the college and the allotment of state tax dollars. Reviews of the SHEEO survey also indicate that input from the state or coordinating boards is also important throughout this process. Albright (1998) believes these organizations can provide a more global or statewide perspective on a variety of performance-related issues.

Albright (1998), Burke (1999), Christal (1998), and McKeown-Moak (2000) recommend several important factors that can help states develop a functional and effective performance model:

- ✓ Determine the method of the performance measures (i.e. mandated/prescribed, unmandated/prescribed, or unmandated). For example, mandated/prescribed implies that the legislation mandates the program and prescribes the performance indicators.
- ✓ Select a performance model (PBB or PBF) that accentuates the budgetary needs of the state and the higher education institutions.
- ✓ Limit funding between three to six percent in addition to the base budget.
- ✓ Develop a policy that emphasizes quality over efficiency.
- ✓ Create standards that focus on institutional effectiveness and/or support strategic planning.
- ✓ Attempt to use additional rather than reallocated resources.
- ✓ Allow adequate time to prepare.
- ✓ Develop measures that can utilize existing data when possible.
- ✓ Consider the “state’s educational priorities, needs and organizational and political structure” (Albright, 1998, p. 17).

After deciding on a performance model, stakeholders and Legislators will find that the first couple of years are a time of trial and error spent developing, adjusting and improving performance measures, data collection and reporting (Albright, 1998; Burke, 1999; Nichols, 1995; Paulsen, 2001; Christal, 1998).

Summary

Why is performance an issue for public colleges and universities? The bottom line is that higher education is the product. Community colleges are only one among many purveyors of higher education, who serve a substantial part of the U.S. population. Growth is evident in many of our statewide systems. On average, community colleges in North Carolina appear to have grown by ten to thirteen percent for the 2001-2002 academic year (NCCCS, 2002). Further, the cost for this education is growing with the number that it serves. The stakeholders, who are paying for a majority of this education through tuition and tax dollars, want to know that their investment is providing for a quality education. Performance funding and performance budgeting are designed to address public accountability by reporting on a mandated set of standards. Performance initiatives allow the review process to come full circle—accreditation, accountability, institutional effectiveness, resource allocation, and performance measures—and close the loop with remediation actions as needed. Figure 2.1 summarizes the impact of these theories on performance models in higher education.

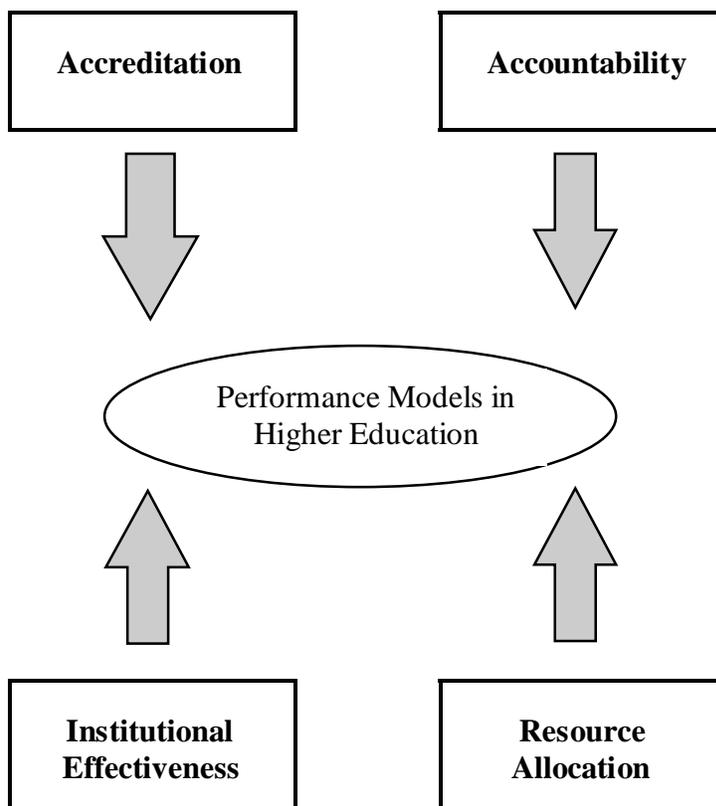


Figure 2.1 Impact of other related theories on Performance Models in Higher Education

Then, the question that needs to be addressed is whether or not performance models are effective in practice? By effective, the implication for this study lies in the progression from year-to-year of each community college in North Carolina's performance system. Further, are there factors not under consideration by these statewide systems that might indirectly influence the performance results? The conceptual schematic behind the second research question is represented in figure 2.2.

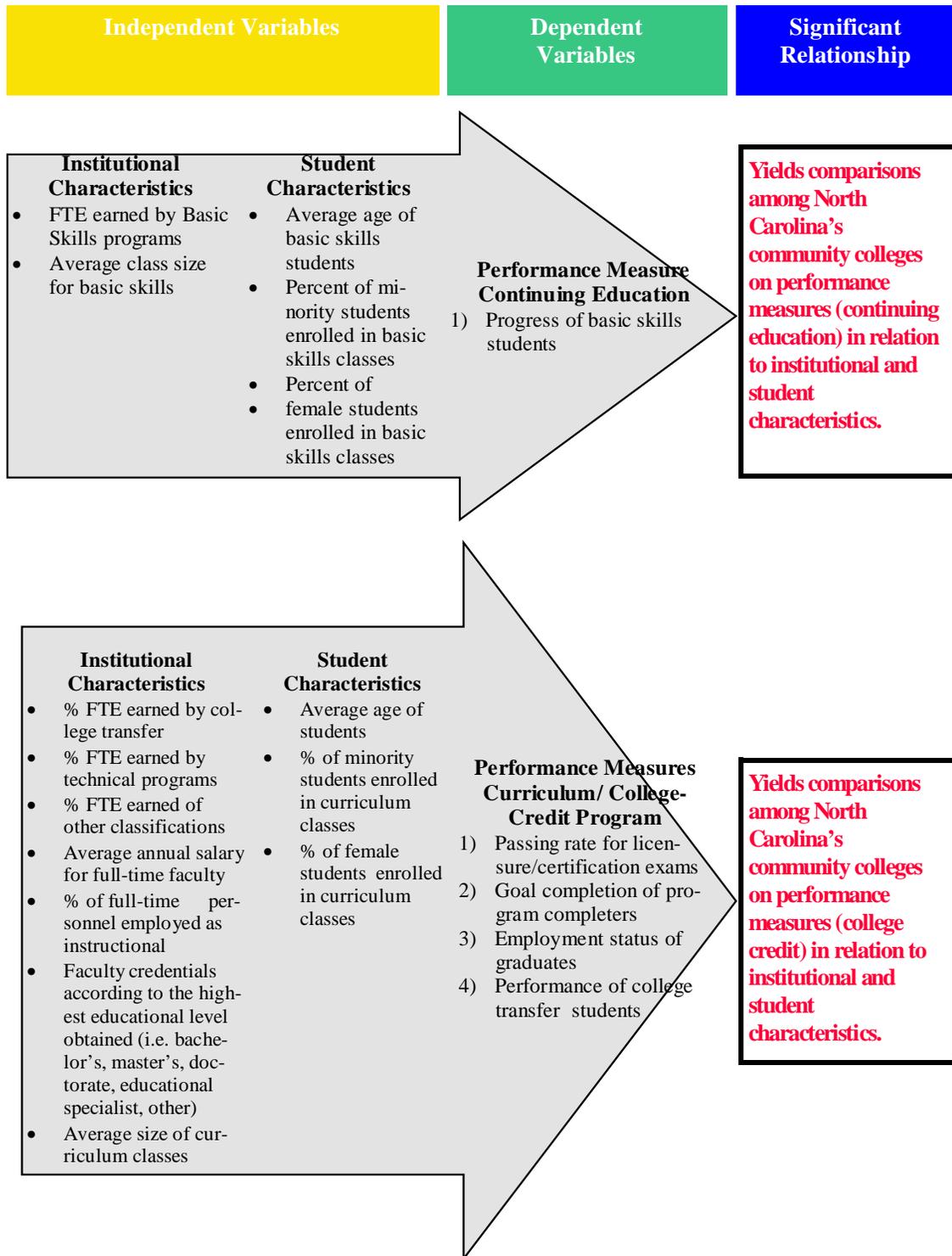


Figure 2.2 Conceptual Schema for dissertation study with respect to correlation and regression analyses.

While many states, such as North Carolina, are implementing performance-based programs in an effort to substantiate state funds spent toward higher education, these efforts need to be reviewed to determine whether or not community colleges are satisfactorily meeting the performance standards. This study attempted to analyze performance funding in North Carolina through the following questions:

- 1) *What is the rate of progress among North Carolina's community colleges in meeting the five core performance measures (progress for basic skills students, passing rate for licensure and certification examinations, goal completion for program completers, employment status of graduates, and performance of college transfer students) over a three-year period?*

- 2) *Further, what is the impact, if any, of certain independent variables on dependent values or performance measures? For more details regarding the variables incorporated into this part of the study, refer to the schematic outlining this process on the previous page.*

The first question addressed the effectiveness of performance-based budgeting in holding North Carolina's community colleges accountable by meeting a core set of standards. Effectiveness was reviewed based on the progression of all fifty-eight of North Carolina's community colleges during the first two years of this initiative and the

previous year. The 1998-99 reporting year was included since a majority of the same data was incorporated in the *Critical Success Factors Report* for that year.

Research Questions to Address #1

Research Question 1A: Did North Carolina's community colleges demonstrate a successful rate of progress on the first core performance measure—progress of basic skills students—over a three-year period?

Research Question 1B: Did North Carolina's community colleges demonstrate a successful rate of progress on the second performance measure—the passing rate for first-time test-takers for certification and licensure examinations—over a three-year period?

Research Question 1C: Did North Carolina's community college demonstrate a successful rate of progress on the third performance measure—goal completion of program completers—over a three-year period?

Research Question 1D: Did North Carolina's community college demonstrate a successful rate of progress on the fourth performance measure—the employment status of graduates—over a three-year period?

Research Question 1E: Did North Carolina's community college demonstrate a rate of progress on the fifth performance measure—the performance of college transfer students—over a three-year period?

The second question to be addressed by this study was to determine if any statistically significant relationships exist between a community college's performance

on the required core measures and several independent variables classified as institutional and student characteristics.

Research Hypotheses for Question #2

Ho 1: There is no relationship between the progress of basic skills students and pertinent institutional and student characteristics.

Ho 2: There is no relationship between the passing rate for first-time test-takers for certification and licensure examinations and pertinent institutional and student characteristics.

Ho 3: There is no relationship between goal completion of program completers and pertinent institutional and student characteristics.

Ho 4: There is no relationship between employment status of community college graduates and pertinent institutional and student characteristics.

Ho 5: There is no relationship between the performance of college transfer students and pertinent institutional and student characteristics

Chapter 3

Methodology

Because the purpose of this study was both evaluative and analytic, the methodology of this work was a combination of archival research, current data survey, and data analysis. In other words, the two controlling research questions were answered by collecting data primarily through quantitative research methods with qualitative methods being used to supplement the information in an effort to provide a comprehensive study. This study first reviewed the core performance measures for North Carolina's community colleges: 1) progress of basic skills students; 2) passing rates for licensure and certification examinations; 3) goal completion of program completers; 4) employment status of graduates; and, 5) performance of college transfer students. The second part of the study analyzed the possible impact, if any, that several independent variables may have on a community college's performance of the five core standards. The independent values fall into two classifications—institutional (*e.g.* percent of full-time instructional personnel, percent of FTE earned by students enrolled in college transfer programs, technical/vocational programs, miscellaneous curriculum programs, and basic skills, average salary earned for full-time faculty, and average class sizes for curriculum and basic skills programs) and student characteristics (*e.g.* average age of curriculum and basic skills students, the percent of curriculum and basic skills

students who are non-Caucasian, and the percent of female students enrolled in each of these programs).

In addition, this study presented the results of a comparative and a correlational analysis to determine if, in fact, performance-based budgeting is the optimum accountability tool for the state's community colleges and if there is a discernible correlation between performance measures and various independent variables. In order to expand on this methodology, this chapter consists of a) research design, b) procedures, c) population, d) instrumentation, and e) data analysis.

Research Design

This study was inclusive in nature as data were compiled from all fifty-eight community colleges in North Carolina. Although the inclusion of all these community colleges required a lot of data entry, it was decided that the more comprehensive the study, the better the results.

Personnel who oversee the collection of data for NCCCS—including System personnel and representatives from several community colleges—indicated that two elements appeared to be key to this study. First, the study reviewed the performance of North Carolina's community colleges on the five core standards, a review which required a comparative analysis of the first preparatory year as well as the first two years of performance-based budgeting in terms of the success or failure of colleges in meeting the mandated standards. Second, this study provided correlational and

regression analyses to determine if there is a relationship among selected independent variables and each community college's performance on these core standards.

Procedures

As previously noted, a majority of the data used in this study was derived from published reports from the North Carolina Community College System for the 1998-1999, 1999-2000, and 2000-2001 academic years. These reports account for the data involving the performance measures as well as for a few of the independent variables. The remainder of the data was obtained through the System's data warehouse program and from various published reports. Data warehouse is a computer database for NCCCS and its member institutions. Some of these data were also gathered from NCCCS' *Critical Success Reports* and *Fact Books*. Data obtained in this manner were accessed by either through the NCCCS website or hard copies of these annual reports.

Any missing data or supplemental information were extrapolated from interviews with members of the North Carolina Community College System and/or personnel of the individual colleges.

Population

The population for this study included the student body as well as faculty and staff members of the fifty-eight community colleges in the NCCCS. It is staggering to realize that in North Carolina, one out of every six adults attended a community college during the 2000-2001 academic year. Enrollments for the System included about

772,280 students whose ages ranged from 5 to 90+, and whose demographic breakouts included 401,250 females and 371,030 males and 177,037 African Americans, 512,248 Caucasians, 12,878 Asians, 51,224 Hispanics, 10,806 American Indians, and 8,268 classified as other (NCCCS, Factbook, 2002). These numbers reflect the enrollment of the entire North Carolina Community College System, which is comprised of fifty-eight community colleges and a textile institute. This study, however, solely focused on the fifty-eight community colleges.

The mission of the System, as defined in the 2002 NCCCS Fact Book is:

...the establishment, organization, and administration of a system of educational institutions throughout the state offering courses of instruction in one of more of the general areas of two-year college parallel, technical, vocational and adult education programs...(p. 5)

And, it is worth noting that for years the icon associated with this System was the open door, indicative of the historic and continuing inclusiveness of these campuses that provide both college credit and continuing education experiences for their populations. Curriculum, or college-credit, programs offer certificate, diploma and associate degrees; thus, requirements for completing one of these program ranges from one semester to two years. The North Carolina Community College System offers over 1,800 programs leading to an associate in science and training students for quick entry into the job market in technical, human resource, and business-related fields. In keeping with the comprehensive nature of the System, these colleges also provide students with the opportunity to transfer to a four-year institution through one of three associate degrees.

The final component of the curriculum programs is developmental education classes, which prepare students to take college-level classes.

Continuing education classes are non-credit learning opportunities that focus on occupational, academic and avocational subjects as well as specialized small business resources and classes. Additionally, continuing education programs account for a majority of the financial and educational/training assistance given annually to community industry. Basic skills programs—Adult High School, General Equivalency Diploma, English as a Second Language, compensatory education, and family/workplace literacy—are included in the continuing education offerings as well.

Instrumentation

The primary instrument in this study was a review of data compiled by the North Carolina Community College System. Information that can be ascertained through this means includes: the core performance measures for each community college from 1999 through 2001 and size as determined by FTE. The NCCCS database for its fifty-eight members, Data Warehouse, was used to collect data regarding full- and part-time personnel, average size for curriculum and basic skills classes, student population by gender, minority student population, faculty credentials, average salary for full-time curriculum faculty, and the average ages of curriculum and basic skills students.

Data Analysis

This section focused on the following elements: 1) the five core performance measures for each of the fifty-eight community colleges, and 2) a variety of institutional and student characteristics for the 2000-2001 academic year. Two key relationships were studied with the first concentrating on the relationship between community colleges' performance on the core standards from 1999 through 2001. To effectively study any possible relationships—either the rate or progress among the community colleges or the impact of independent measures on a college's performance—data were entered into Excel 2000 and evaluated using that software as well as SAS 8.1.

Table 3.1 Description of North Carolina's core performance measures for community colleges.

Dependent Variables/ Performance Measures	Definition/Standard	Source
Progress of Basic Skills Students	Basic skills programs include all adult literacy students. This measure has a fixed standard of 75% for students progressing through this program via (1) progressing within level, (2) completing the level entered or a predetermined goal, and (3) completing the level entered and advancing to a higher level.	The 2000, 2001 and 2002 <i>Critical Success Factors Reports</i> and the Literacy Education Information System (LEIS).
Passing rate for licensure and certification exams	The percentage of first-time test-takers from a community college passing an examination required for NC licensure or certification. Performance standard is set at an institutional aggregate passing rate of 80% for all first-time test-takers. In addition, there can be no passing rate falling below 70% for any single examination.	The 2000, 2001 and 2002 <i>Critical Success Factors Reports</i>
Goal completion of program completers	This standard initially allowed that 90% of program completers will report goal completion. For 1999-00, the standard was changed to 95%, and included the responses of non-completers as well. Non-completers were eliminated from the PBB portion of the analysis the following year. Completers are graduates who earned a certificate, diploma or degree from a college-credit program.	The 2000, 2001 and 2002 <i>Critical Success Factors Reports</i>
Employment status of graduates	At least 90% of community college graduates will be employed within one year of commencement date. There is an allowance for this standard to be adjusted pending the unemployment rate per county.	The 2000, 2001 and 2002 <i>Critical Success Factors Reports</i>
Performance of college transfer students	Two cohort analyses are used for this measure. One compares the performance of community college graduates entering public universities in the fall with the performance of "native" juniors at the end of two semesters. The other cohort analysis compares the performance of former community college students, who transferred to four-year, post-secondary institutions after completing 24 or more hours at a community college but did not earn a degree, with the performance of native sophomores. These two cohorts are combined for analysis of this standard that mandates 84% of transfers earn a GPA of 2.0 or higher after completing one year at a four-year institution. This standard changed to 82.9% for the 2000-01 reporting year.	The 2000, 2001 and 2002 <i>Critical Success Factors Reports</i>

*Information taken from the NCCCS report on Performance Measures and Standards on Performance Funding.

- 1) *What is the rate of progress among North Carolina's community colleges in meeting the five core performance measures (progress for basic skills students, passing rate for first-time test-takers of licensure and certification examinations, goal completion for program completers, employment status of graduates, and performance of college transfer students) over a three-year period?*

A comparative study of the performance-based budgeting model since the North Carolina Community College System first used this system in 1999, included entering data from the fifty-eight member institutions for each of the core performance measures. Then, a review of each community college's performance during the first three years of this program was determined based on a review of descriptive or univariate statistics. The comparative analysis addressed the first question regarding the rate of progress among North Carolina's community colleges in satisfactorily meeting the standards. Further, success of this performance-based budgeting program may be determined if the number of community colleges reaching the satisfactory level increases from year-to-year.

Since the standard for several of the performance measures has been adjusted over the past three years, it seemed that the best method for review would include the use of both categorical and continuous data. For the categorical portion of the review, data were recorded as "2" for achieving the designated percent/standard, "1" for

demonstrating significant improvement on a measure as designated by NCCCS, and “0” for an unsuccessful score. By using categorical data, the rate of progress among these colleges was quickly ascertained. For a list of these performance measures, the standards and location of the data refer to Table 3.1. Use of basic statistical applications such as mean, median, mode, variance, standard deviation and range enhanced the review of these colleges and allowed for comparisons among the three years through box plots and summary tables.

The projected goal for each community college is to meet all five of the core performance standards and one additional standard of their choosing. Since the core measures are required of all fifty-eight community colleges, this study reviewed each college’s ability to achieve five for five of these measures—at least by the third year. The results for a community college from year-to-year should be progressive. For example, Sandhills Community College may meet three of the performance standards the first year, and then progress with each proceeding year with the goal of obtaining all five by the third year of the program.

Results for this portion of the study benefited the North Carolina Community College System so far as it provided a review of the core performance measures for the first three years; determined which of these measures are attainable by North Carolina’s community colleges; and, provided an overview of the initial stages of the PBB-driven initiative. For individual community colleges, the study provided a review of each school’s performance on the mandated measures; and allowed them to compare their performance with that of other community colleges.

- 2) *Further, what is the impact, if any, of certain independent variables on dependent values or performance measures? For more details regarding the variables incorporated into this part of the study, refer to the schematic outlining this process on p. 46.*

The second relationship attempted to determine if the dependent variables (core performance measures) are affected by any of the independent variables (institutional and student characteristics). A correlational study allows for an analysis of the relationships among a substantial number of variables (Borg and Gall, 1996). This method supports a review of how “these variables, either singly or in combination, affect the pattern of behavior” (p. 414). A review of this nature tests the possible impact of an independent variable upon a dependent variable. For the purpose of this study, the variables were classified as:

Dependent variables: The five performance measures required by all NC community colleges in order to be eligible for performance-based budgeting—

- Progress of basic skills students,
- Passing rates for licensure/certification exams,
- Goal completion of program completers,
- Employment status of graduates, and
- Performance of college transfer students.

Independent variables: These variables are classified as either institutional characteristics (i.e. size of a college based on FTE earned,

average salary for full-time instructional personnel, full-time personnel, average class size, faculty credentials) or student characteristics (i.e. average of students, ethnicity of students, and gender of students).

Table 3.1 defines each of the dependent variables, and Table 3.2 explains each of the independent variables, defines them and cites the resource for the data.

Table 3.2 Source for data collected with respect to independent variables

Independent Variable	Definition	Source
Institutional Characteristics		
Faculty Credentials	A review of faculty credentials in terms of bachelor, master, and doctoral degrees, educational certificate and other per community college.	NCCCS data warehouse
FTE earned by students enrolled in college transfer programs	Full-time equivalent hours earned by students enrolled in college transfer programs.	The 2000, 2001 and 2002 <i>Critical Success Factors Report</i> and NCCCS data warehouse
FTE earned by students enrolled in technical or vocational programs	Full-time equivalent hours earned by students enrolled in technical and vocational programs.	The 2000, 2001 and 2002 <i>Critical Success Factors Report</i> and NCCCS data warehouse
FTE earned by students enrolled in miscellaneous categories	Full-time equivalent hours earned by students enrolled in miscellaneous categories (<i>e.g.</i> special students, dually enrolled students, etc.)	The 2000, 2001 and 2002 <i>Critical Success Factors Report</i> and NCCCS data warehouse
FTE earned by basic skills programs	Full-time equivalent hours for basic skills classes.	NCCCS data warehouse or LEIS report
Average faculty salary	The average annual salary for full-time faculty of college credit or curriculum classes.	NCCCS data warehouse
Full-time instructional staff	Percent of full-time personnel hired as instructional or “faculty” for curriculum programs.	NCCCS data warehouse
Average Class Size (curriculum)	Average class size for curriculum or college credit programs.	NCCCS data warehouse
Average Class Size (basic skills)	Average class size for basic skills (continuing education) programs.	NCCCS data warehouse
Student Characteristics		
Average age of curriculum student	The average age of degree seeking students for each community college.	NCCCS data warehouse
Average age of basic skills students	The average age if students enrolled in continuing education classes.	NCCCS data warehouse
Percent of minority students	Percent of minority (African-American, Asian, Native	NCCCS data warehouse

(curriculum)	American, Hispanic and Other) students enrolled in college credit or curriculum classes.	
Percent of minority students (basic skills)	Percent of minority (African-American, Asian, Native American, Hispanic and Other) students enrolled in basic skills classes.	NCCCS data warehouse
Percent of female students (curriculum)	Percent of female students enrolled in college credit or curriculum classes.	NCCCS data warehouse
Percent of female students (basic skills)	Percent of female students enrolled in basic skills classes.	NCCCS data warehouse

A majority of the coefficients used in this study were standardized in an effort to establish a more comparable level among the data. For example, FTE earned from students enrolled in college transfer programs was derived by dividing that number into the total FTE earned from curriculum programs at each community college. Several coefficients were not standardized since there was not a substantial discrepancy in the range of the data (*e.g.* average faculty salary, average ages of curriculum and basic skills students, and average class sizes for curriculum and basic skills programs). Data used for the bivariate and multivariate portions of this study were obtained as follows:

FTE earned from college transfer programs was the percent of total FTE earned by a college from students enrolled in college transfer programs.

FTE earned from technical/vocational programs was the percent of total FTE a college earns from students enrolled in technical programs.

FTE earned from other curriculum classifications was the percent of total FTE earned from miscellaneous classifications such as special students, dually enrolled, Huskins Bill, etc.

FTE earned from basic skills programs was the percent of total FTE earned by a community college for students participating in basic skills classes.

Full-time instructional staff for curriculum classes was estimated as the percent of full-time employees at each college who were classified as faculty or instructional.

Average faculty salary was determined based on an annual or twelve-month salary for curriculum instructional staff at each college.

Faculty credentials apply to the curriculum or college-credit programs only. Faculty credentials were estimated based on the percent of full-time employees at each college whose highest educational degree was 1) bachelor's, 2) master's, 3) doctorate, 4) education specialist certificate, and 6) other.

The average age of curriculum and basic skills students enrolled in the fifty-eight community colleges was pulled from NCCCS' data warehouse. This is the mean age of students enrolled in each of these programs per college.

Average class size (for both curriculum and basic skills) was obtained from NCCCS' data warehouse. For college credit classes, several codes were not included in this figure—independent study, instrumental instruction of music, and coops/internships/clinical—as they could skew the average. For basic skills classes, immured students were not included in this figure, since not all of these students are able to finish their studies prior to their release from prison.

Percent of minority students was figured based on data from the NCCCS data warehouse or *2000-2001 Fact Book*. This number was determined based on the percent of non-Caucasian students enrolled in either curriculum or basic skills classes.

Percent of female students data was also be pulled from the NCCCS data warehouse or *2000-2001 Fact Book*. Again, this variable was established based on the percent of females students enrolled in 1) curriculum and 2) basic skills classes.

The code sheet for this study is located in the Appendix F (p. 208).

A correlational research method examines the relationship between variables (*e.g.* criterion and predictor) and determines if the predictor, or independent, variable has an affect on the criterion, or dependent, variable (Borg and Gall, 1996; Hatcher 1999). According to Young (1991), “The bivariate correlations of the independent measures on the dependent measure of performance provides a means of assessing their predictive influence on a individual basis. Correlational analysis is typically applicable to the study of the relationships between variables, as well as to examine their predictive value independent of one another” (p. 102). This analysis provides a good foundation for assessing relationships between independent and independent variables; however, other statistical tests should accompany a correlational analysis to give further credence to these results (Borg and Gall, 196).

The analyses employed in this study, to address the hypotheses of whether there is a relationship between the dependent and independent measures, utilized a correlation study—a bivariate correlation and multiple regression analysis. Correlational and regression analyses were applied to test the performance of each of the fifty-eight colleges. Correlations were performed between each dependent measure and the appropriate independent measure(s) (see Table 3.3).

To lend support to the findings from the correlational analysis, a multivariate approach, a step-wise regression model, was then conducted. Multiple regressions

involve regressing all potentially important independent measures on the dependent performance measures (Gall, 1996). These analyses determine the most significant factors related to differences on the selected performance measures for community colleges in the North Carolina system. Regressing all potentially important predictor variables on the selected performance measures until no further improvement in variance explanation can be obtained helps in the determination of the more pertinent predictors in explaining college performance (Borg and Gall, 1996). This method was applied to each of the fifty-eight community colleges. The particular form of stepwise regression used in this study added and removed independent variables to the model based on their ability to explain the variance of each of the core performance measure. Variables were added and removed to the model until no further improvement of variance influence (R^2) can be determined by the SAS software.

According to Mendenhall and Sincich (1996), certain assumptions apply to a multiple regression analysis:

1. The population of Y is normal for each combination of independent values known as X_1, X_2, \dots, X_k .
2. Y consists of two components—"one fixed and one random"—which establishes Y as a random variable.

Since some of the independent variables relate to the curriculum or college-credit program and others to the continuing education program, these variables were matched with relevant performance measure(s). Table 3.3 matches each independent variable with the appropriate dependent variable(s) or performance measure(s).

Table 3.3 How the independent variables for this study will be matched with performance measures.

Independent Variables	Dependent Variables (Performance Measures)
Percent of FTE earned by students enrolled in college transfer programs	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams • Goal completion of completers • Employment status of graduates • Performance of college transfer students
Percent of FTE earned by students enrolled in technical/vocational programs	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams • Goal completion of completers • Employment status of graduates • Performance of college transfer students
Percent of FTE earned from students enrolled under other classifications	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams • Goal completion of completers • Employment status of graduates • Performance of college transfer students
Average annual salary for full-time faculty	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams • Goal completion of completers • Employment status of graduates • Performance of college transfer students
Percent of full-time personnel employed as instructional (curriculum)	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams • Goal completion of completers • Employment status of graduates • Performance of college transfer students
Faculty Credentials (curriculum programs)	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams • Goal completion of completers • Employment status of graduates • Performance of college transfer students
FTE earned by basic skills programs	<ul style="list-style-type: none"> • Progress of basic skills students
Average class size (curriculum)	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams • Goal completion of completers • Employment status of graduates • Performance of college transfer students
Average class size (basic skills)	<ul style="list-style-type: none"> • Progress of basic skills students
Average age of curriculum students	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams • Goal completion of completers • Employment status of graduates • Performance of college transfer students
Average age of basic skills students	<ul style="list-style-type: none"> • Progress of basic skills students
Percent of minority	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams

students (curriculum)	<ul style="list-style-type: none"> • Goal completion of completers • Employment status of graduates • Performance of college transfer students
Percent of minority students (basic skills)	<ul style="list-style-type: none"> • Progress of basic skills students
Percent of female students (curriculum)	<ul style="list-style-type: none"> • Passing rate for licensure and certification exams • Goal completion of completers • Employment status of graduates • Performance of college transfer students
Percent of female students (basic skills)	<ul style="list-style-type: none"> • Progress of basic skills students

Summary

In summary, the study proposed the use of comparative and correlational analysis to determine: first, if PBB, as a system of performance and accountability, is effective in the sense that North Carolina's community colleges are improving within this system; and second, if institutional and/or student characteristics may have an indirect impact on community college performance within PBB. Results from this study may also be beneficial in assisting NCCCS with identification of extraneous factors that may contribute to or inhibit a college's performance; highlight performance measures which may not be appropriate for community colleges at this time; and generate awareness of the overall performance of community colleges for the first three years of this program. Additionally, this report may ultimately indicate whether future and expanded study of these and other independent variables is warranted.

Chapter 4

Presentation of Findings

The purpose of this study was two-fold: first, to review and determine the rate of progress, if any, among North Carolina community colleges in meeting the five core performance measures and second, to determine if a variety of independent variables have the potential to impact a community college's performance with respect to these mandated standards. In 1998, the North Carolina legislature enacted general statute 115D-31.3 which states:

The State Board of Community Colleges shall create new accountability measures and performance standards to be used for performance budgeting for the Community College System...The State Board of Community Colleges shall review annually the accountability measures and performance standards to ensure that they are appropriate for use in performance budgeting.

This mandate, set forth in statutory language, established a new system of accountability for the North Carolina Community College System and its member institutions in an effort to justify state expenditures. Further, the Legislature enacted GS115D-31.3 into law in anticipation that this bill might also enhance the educational process for at least one of the stakeholders—the students.

This research was designed to review the performance of North Carolina's fifty-eight community colleges since the inception of the performance-based budgeting program: to review the data in an effort to establish whether or not the performance of North Carolina community colleges is improving, maintaining or declining from year-to-year. Additionally, the research was designed to ascertain if there is a relationship between various institutional and student characteristics and these five performance measures. Data and other supporting information are provided in accordance with the research methodology discussed in Chapter 3.

Information included in this chapter is first presented according to the two research questions:

- 1) *What is the rate of progress among North Carolina's community colleges in meeting the five core performance measures (progress for basic skills students, passing rate for first-time test-takers of licensure and certification examinations, goal completion for program completers, employment status of graduates, and performance of college transfer students) over a three-year period?*

- 2) *Further, what is the impact, if any, of certain independent variables on dependent values or performance measures? For more details regarding the variables incorporated into this part of the study, refer to the schematic outlining this process on p. 46.*

These research questions were developed in an effort to provide a comprehensive review of the first five of these performance measures set forth in GS115D-31.3. This

study's attempt to answer the aforementioned research questions using descriptive statistics were to address the rate of progress among North Carolina's community colleges (question #1), with correlation and regression analysis addressing the question of predictability among various independent variables upon each of these five performance measures or dependent variables (question #2).

Data Collection

All research data were collected from either archival documents published by the North Carolina Community College System Office or a computer-based data retrieval system—Data Warehouse. NCCCS installed and implemented the data warehouse program in 2000. This computer program stores a wide-range of data categorized as business objects under the following headings: Continuing Education Universe, Course/FTE Universe, Curriculum Student Universe, Staff Universe, and Literacy Universe. A data search with NCCCS' data warehouse program is called a query. Compilation of the data addressing the second research question included approximately thirty-two queries.

The author attended a two-day workshop on the data warehouse program at the NCCCS office located in Raleigh, NC, as well as enlisting the assistance of several NCCCS staff members with respect to data retrieval from this computer program. Data pertaining to the performance measures were gathered from the *Critical Success Factors* reports published during each of the years included in this study. With regard to the second portion of this study, data were collected from archival documents and the data warehouse program.

Research Question 1

Research Question 1: *What is the rate of progress among North Carolina's community colleges in meeting the five core performance measures (progress for basic skills students, passing rate for first-time test-takers of licensure and certification examinations, goal completion for program completers, employment status of graduates, and performance of college transfer students) over a three-year period?*

For the first research question, data were entered into *Excel 2000* in both categorical and continuous form, saved as comma-delimited files, and then converted in *SAS (Statistic Analysis System) 8.1*. Categorical variables were determined based on the following criteria: (1) failed to meet the performance measures; (2) met the performance measure based on receiving an award of significant improvement (SI) by NCCCS; or (3) met the performance measure based on merit. Data were reported in this manner to determine if each community college either regressed, maintained or progressed on each of the five core measures from year-to-year; further, if that progression was based on merit or a significant improvement designation. The data may be slightly skewed since the awarding of significant improvement designations began with the second year included in this study. As previously noted in chapters one and three, this method of recognizing community colleges as obtaining a particular measure through an SI award was developed in response to concerns expressed by community colleges after the first year. Since NCCCS and its members believed this element was significant enough to

add it to the process, the author included the designation in this study under a separate code in an effort to record its potential impact on the evaluation process.

The continuous data sections include a review of each North Carolina community college's performance as well as a descriptive analysis of the entire system's performance on each of these measures. Continuous data are recorded as the percent that a community college may have scored on a particular measure. For example, Sandhills Community College reported 85 percent of its basic skills students successfully progressed on the elements required of this standard; therefore, 85 is recorded as the SCC's score for the 1998-99 reporting year.

In an effort to provide a comprehensive review of the rate of progress or success rate for North Carolina community college, each section encompasses a description of the performance standard, an explanation of the categorical data and a review of the data in continuous form.

Performance Measure 1: Progress for Basic Skills Students

Research Question 1A: *Did North Carolina's community colleges demonstrate a successful rate of progress on the first core performance measure—progress of basic skills students—over a three-year period?*

Standard: Community colleges must maintain a standard that at least 75 percent of the basic skills students progress in their studies. All adult literacy students (*e.g.* English as a Second Language, compensatory education, GED, *etc.*) are included in the basic skills

report. According to the *Critical Success Factors Report* (2002), “Progress of basic skills students is the composite measure that includes the percent of student progressing within a level of literacy, the percent of students completing the level entered or a predetermined goal, and the percent of students completing the level entered and advancing to a higher level.” Although basic skills classes are conducted in prisons, immured students are not included in this composite figure.

As was previously mentioned, adjustments to the performance-based budgeting system have been made each year. One of those changes included the addition of significant improvement designations, which began with the second year of data included in this study.

The first measure deals with the progress of students enrolled in basic skills programs. During the three years included in this study, classes offered under basic skills statewide served over 144,960 students for the first year, 151,083 for the second, and 151,071 for the third year (NCCCS, Factbook, 2002). Basic skills programs are a vital component within the continuing education or non-credit component. For example, for the 2000-2001 academic year, community colleges in North Carolina earned approximately 2.26% to 27.65% of their total full-time equivalents (FTEs) through basic skills programs. FTE is important to the North Carolina Community College System since it drives the funding process based on the evaluation of each college’s enrollment size. The formula to determine a college’s FTE incorporates the contact hours per class with difference weights applied to specific areas. Typically, college credit or curriculum programs receive the greatest weight, followed by basic

skills and occupational/workforce training. A very small percent is earned by all of the remaining FTE earning classes within continuing education or non-credit programs.

Data for basic skills programs are compiled and reported using the *Literacy Education Information System (LEIS)*. This reporting method has been used by North Carolina community colleges since 1990. Since the LEIS report includes the data required for the first performance measure, the System office uses these data to formulate the passing rate required for this standard of 75 percent.

Findings:

Categorical Data

The North Carolina Community College System is comprised of 58 community colleges. The sample size, N , for a majority of these elements defaulted to this number unless otherwise indicated. Tables presenting the categorical data indicate how each community college performed on the individual performance measures for each of the three years—1998-1999, 1999-2000, and 2000-2001. Colleges who failed to meet the measure are represented with a “1” or “*.” Those who met the measure with an award of significant improvement by NCCCS are recognized with a “2” or “**.” Finally, community colleges that met the standard based on merit were classified with a “3” or “***.” Since the data for this portion of the study are in categorical form (i.e. 1, 2, or 3), the range for the data is so small that the only descriptive element of value is a review of the frequency at which the variable occurred or what is more commonly referred to as the mode.

Table 4.1 Progress of basic skills students reported as categorical data.

College	1998-99	1999-2000	2000-2001
Alamance CC	***	***	***
Asheville-Buncombe TCC	***	***	***
Beaufort County CC	***	***	***
Bladen CC	***	***	***
Blue Ridge CC	***	***	***
Brunswick CC	***	***	*
Caldwell CC & TI	***	***	***
Cape Fear CC	***	*	***
Carteret CC	***	***	***
Catawba Valley CC	***	***	***
Central Carolina CC	***	*	**
Central Piedmont CC	***	***	***
Cleveland CC	***	***	***
Coastal Carolina CC	***	***	***
College of Albemarle	***	***	***
Craven CC	***	***	***
Davidson County CC	***	***	***
Durham TCC	*	*	**
Edgecombe CC	***	***	***
Fayetteville TCC	***	***	***
Forsyth TCC	*	***	***
Gaston College	*	*	*
Guilford TCC	*	**	**
Halifax CC	***	***	***
Haywood CC	***	***	***
Isothermal CC	***	***	***
James Sprunt CC	***	***	***
Johnston CC	***	*	*
Lenoir CC	***	***	***
Martin CC	*	***	***
Mayland CC	***	***	***
McDowell TCC	***	***	***
Mitchell CC	***	***	***
Montgomery CC	*	*	**
Nash CC	***	***	***
Pamlico CC	***	***	***
Piedmont CC	***	***	***
Pitt CC	*	**	***
Randolph CC	***	***	***
Richmond CC	***	***	***
Roanoke-Chowan CC	***	*	***
Robeson CC	***	***	***
Rockingham CC	***	***	***
Rowan Cabarrus CC	*	**	*
Sampson CC	***	*	*
Sandhills CC	***	***	***
South Piedmont	*	***	***
Southeastern CC	***	***	***
Southwestern CC	***	***	***
Stanly CC	***	***	***
Surry CC	***	***	*
Tri-County CC	***	***	***
Vance-Granville CC	***	***	***
Wake TCC	*	*	*
Wayne CC	***	***	***
Western Piedmont CC	***	***	***
Wilkes CC	***	***	***
Wilson CC	*	***	*

*=1 or failed to meet the measure; **=2 or met because of SI; ***=3 or met the measure based on merit.

Fifty-eight community colleges are included in the sample for each of the three years for the first performance measure. Refer to Table 4.1 for details regarding categorical data on this performance measure. In 1998-1999, 81% of the community colleges in North Carolina met the standard for the progress of basic skills students set at 75 percent. The second year resulted in 85% of the colleges meeting this measure (94% of those based on the merit of their performance and 6% attributed to an significant improvement designation). These community colleges improved only slightly for 2000-2001 when 86% of them successfully complied with the standard (four of which earned SIs), and eight who failed to meet the standard.

Community colleges that maintained an unsatisfactory score throughout the three years reviewed in the study were—Durham Technical Community College, Gaston College, Johnston Community College, Montgomery Community College, and Wake Technical Community College.

Table 4.2 Percent of NC community colleges who met or exceeded the standard required by the first performance measure.

	1998-1999	1999-2000	2000-2001
Percent of community colleges who met the standard at the 75% level	81%	85%	86%
Percent who did not meet the standard at the 75% level	19%	15%	14%

Continuous Data

Descriptive information for the continuous data was obtained using *Excel 2000's* data analysis function, as well as *SAS 8.1*. The descriptive data found in tables 4.3, 4.4, 4.5 and 4.6 were compiled using the scores of North Carolina's 58 community colleges.

Table 4.3 Progress of basic skills students reported as percentages/continuous data.

College	1998-99	1999-2000	2000-2001	Mean
Alamance CC	88	94	93	91.67
Asheville-Buncombe TCC	75	88	75	79.33
Beaufort County CC	85	76	76	79.00
Bladen CC	77	77	91	81.67
Blue Ridge CC	84	79	86	83.00
Brunswick CC	80	82	(73)	78.33
Caldwell CC & TI	94	94	79	89.00
Cape Fear CC	75	(71)	75	73.67
Carteret CC	82	78	82	80.67
Catawba Valley CC	98	88	78	88.00
Central Carolina CC	76	(70)	[73]	73.00
Central Piedmont CC	94	94	76	88.00
Cleveland CC	77	85	92	84.67
Coastal Carolina CC	81	88	83	84.00
College of Albemarle	97	83	82	87.33
Craven CC	83	84	86	84.33
Davidson County CC	86	83	86	85.00
Durham TCC	(60)	(58)	[66]	61.33
Edgecombe CC	79	73	81	77.67
Fayetteville TCC	75	79	80	78.00
Forsyth TCC	(67)	83	80	76.67
Gaston College	(70)	(67)	(65)	67.33
Guilford TCC	(55)	[63]	[73]	63.67
Halifax CC	89	96	91	92.00
Haywood CC	92	90	84	88.67
Isothermal CC	88	90	81	86.33
James Sprunt CC	89	78	93	86.67
Johnston CC	83	(74)	(68)	75.00
Lenoir CC	82	78	77	79.00
Martin CC	(68)	80	91	79.67
Mayland CC	87	91	82	86.67
McDowell TCC	88	84	78	83.33
Mitchell CC	75	76	89	80.00
Montgomery CC	(61)	(59)	[67]	62.33
Nash CC	75	75	80	76.67
Pamlico CC	87	84	78	83.00
Piedmont CC	93	95	81	89.67
Pitt CC	(69)	[71]	75	71.67
Randolph CC	80	74	93	82.33
Richmond CC	77	84	83	81.33
Roanoke-Chowan CC	78	(73)	78	76.33
Robeson CC	86	79	78	81.00
Rockingham CC	75	79	77	77.00
Rowan Cabarrus CC	(67)	[72]	(64)	67.67
Sampson CC	79	(72)	(70)	73.67
Sandhills CC	85	79	79	81.00
South Piedmont	(66)	80	76	74.00
Southeastern CC	83	78	76	79.00
Southwestern CC	76	78	79	77.67
Stanly CC	78	79	75	77.33
Surry CC	85	78	(73)	78.67
Tri-County CC	95	93	93	93.67
Vance-Granville CC	78	76	75	76.33
Wake TCC	(68)	(67)	(69)	68.00
Wayne CC	84	90	94	89.33
Western Piedmont CC	82	82	82	82.00
Wilkes CC	87	84	82	84.33
Wilson CC	(68)	75	(66)	69.67

()=indicates colleges that did not meet the standard; []=colleges awarded SIs

The North Carolina Community College System reports the progress of basic skills students according to the percent who progress from one level to the next. An example might include students who successfully pass the five examinations required to obtain a General Equivalency Diploma (GED). The continuous data, referred to in Table 4.3, offer an overview of the original scores for these colleges. This table provides information on each of the fifty-eight community colleges' performance on the first performance measure for a three-year period, as well as the mean for each college's cumulative performance.

Table 4.4 System-wide results of performance measure one for the 1998-99 reporting year.

Performance Measure 1: 1998-99	
<i>N</i>	58
Mean	80.01724138
Median	80.5
Mode	75
Standard Deviation	9.420938567
Sample Variance	88.75408348
Range	43
Minimum	55
Maximum	98

The typical percent reported in the first performance measure for 1998-99 was 80%. A mean and a median of approximately 80% and a slightly lower mode of 75% support this. The scores ranged from 55% to 98% with a fairly large range, however, the average deviation from the mean gave a standard deviation of 9.42 which was fairly moderate in size.

Table 4.5 System-wide results of performance measure one for the 1999-2000 reporting year.

<i>Performance Measure 1: 1999-2000</i>	
<i>N</i>	58
Mean	79.8275862
Median	79
Mode	78
Standard Deviation	8.6229768
Sample Variance	74.3557169
Range	38
Minimum	58
Maximum	96

Descriptive statistics for the first performance measure for 1999-2000 are summarized in Table 4.5. The average score reported for this year was 80%. Scores for this measure deviated on average 8.62 from the mean, which appears to be a moderate standard of deviation. With a minimum score of 58% and a maximum of 96%, this range of 38 is rather large. The cluster for the frequency distribution includes the mean, the mode and the median. In addition, the mode falls at the same point as the median at 79%.

Table 4.6 System-wide results of performance measure one for the 2000-2001 reporting year.

<i>Performance Measure 1: 2000-2001</i>	
<i>N</i>	58
Mean	79.4482759
Median	79
Mode	75
Standard Deviation	7.76897206
Sample Variance	60.3569268
Range	30
Minimum	64
Maximum	94

Scores for third year are located in Table 4.6. The average score for North Carolina community colleges for the 2000-01 year was 79.45%, with a moderate standard deviation of 7.77. Colleges performed between 64% and 94% to provide a range of 30%—again a broad distribution of scores for these schools to record regarding the performance of basic skills students. Measures of central tendency occur within 4% of one another—mean and median (79%) and mode (75%).

Box Plots make good comparison graphs because they allow one to view summarized data all three years for each performance measure on one graph. The software program, Minitab, was used to generate the graphs for this report.

For performance measure 1, the data for 1998-99 ranged from 55 to 98 percent with one outlier (Guilford Technical Community College) at 55 percent. Data for the first year are represented by a longer box, which demonstrates more diverse data than that found in 1999-00 and 2000-01. For 1998-99, the data are distributed almost equally among the quartiles.

The second year included a range from 58 to 96 percent with two outliers (Durham Technical Community College and Montgomery Community College) at 58 and 59 percent. Data for 1999-00 are slightly more consolidated and balanced than the previous year with what appears to be a more equitable distribution of scores falling between Q1 and Q3. The long lines, or tails, on this box plot indicate that the data are more spread out.

The data for 2000-01 had both the smallest range and the smallest amount of variation within the data. College scores appear to be fairly equitable throughout the quartiles on the first performance measure with an 11% difference between the

minimum and Q1, 4% difference between Q1 and the median, 4% difference between the median and Q3, and 12% difference between Q3 and the maximum score. This data set also lacks outliers, which supports the observation of a well-balanced distribution of scores.

The box plots indicate that overall, there was not much change in performance measure 1 over the period of three years. The medians for each year remain fairly constant in the upper 70's and low 80's. There is a slight dip overall in the maximum percentages from year to year as well as in the 75th percentile. There was a slight increase in the minimum percentages from year to year. The biggest difference, however, appears to be a reduction in the amount of overall variation in the data with decreased variation in 1999 and decreasing further in 2000.

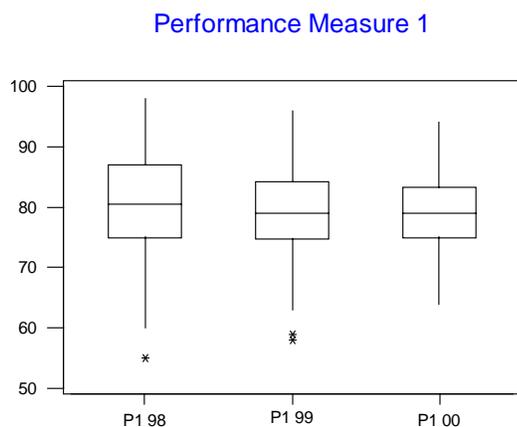


Figure 4.1. *Performance by North Carolina community colleges on the first PBB standard—progress of basic skills students—from 1998-2001.*

Table 4.7 Difference in scores for NC community colleges between 1998-2001 on the first performance measure.

College	Difference between 1st & 2nd years	Difference between 2nd & 3rd years	Overall Difference
Alamance CC	6.00	-1.00	5.00
Asheville-Buncombe TCC	13.00	-13.00	0.00
Beaufort County CC	-9.00	0.00	-9.00
Bladen CC	0.00	14.00	14.00
Blue Ridge CC	-5.00	7.00	2.00
Brunswick CC	2.00	-9.00	-7.00
Caldwell CC & TI	0.00	-15.00	-15.00
Cape Fear CC	-4.00	4.00	0.00
Carteret CC	-4.00	4.00	0.00
Catawba Valley CC	-10.00	-10.00	-20.00
Central Carolina CC	-6.00	3.00	-3.00
Central Piedmont CC	0.00	-18.00	-18.00
Cleveland CC	8.00	7.00	15.00
Coastal Carolina CC	7.00	-5.00	2.00
College of Albemarle	-14.00	-1.00	-15.00
Craven CC	1.00	2.00	3.00
Davidson County CC	-3.00	3.00	0.00
Durham TCC	-2.00	8.00	6.00
Edgecombe CC	-6.00	8.00	2.00
Fayetteville TCC	4.00	1.00	5.00
Forsyth TCC	16.00	-3.00	13.00
Gaston College	-3.00	-2.00	-5.00
Guilford TCC	8.00	10.00	18.00
Halifax CC	7.00	-5.00	2.00
Haywood CC	-2.00	-6.00	-8.00
Isothermal CC	2.00	-9.00	-7.00
James Sprunt CC	-11.00	15.00	4.00
Johnston CC	-9.00	-6.00	-15.00
Lenoir CC	-4.00	-1.00	-5.00
Martin CC	12.00	11.00	23.00
Mayland CC	4.00	-9.00	-5.00
McDowell TCC	-4.00	-6.00	-10.00
Mitchell CC	1.00	13.00	14.00
Montgomery CC	-2.00	8.00	6.00
Nash CC	0.00	5.00	5.00
Pamlico CC	-3.00	-6.00	-9.00
Piedmont CC	2.00	-14.00	-12.00
Pitt CC	2.00	4.00	6.00
Randolph CC	-6.00	19.00	13.00
Richmond CC	7.00	-1.00	6.00
Roanoke-Chowan CC	-5.00	5.00	0.00
Robeson CC	-7.00	-1.00	-8.00
Rockingham CC	4.00	-2.00	2.00
Rowan Cabarrus CC	5.00	-8.00	-3.00
Sampson CC	-7.00	-2.00	-9.00
Sandhills CC	-6.00	0.00	-6.00
South Piedmont	14.00	-4.00	10.00
Southeastern CC	-5.00	-2.00	-7.00
Southwestern CC	2.00	1.00	3.00
Stanly CC	1.00	-4.00	-3.00
Surry CC	-7.00	-5.00	-12.00
Tri-County CC	-2.00	0.00	-2.00
Vance-Granville CC	-2.00	-1.00	-3.00
Wake TCC	-1.00	2.00	1.00
Wayne CC	6.00	4.00	10.00
Western Piedmont CC	0.00	0.00	0.00
Wilkes CC	-3.00	-2.00	-5.00
Wilson CC	7.00	-9.00	-2.00

Table 4.7 illustrates the differences in scores for each of North Carolina's fifty-eight community colleges. For example, Halifax Community College improved by 7% with a score of 89% in 1998-99 and increasing to 96% in 1999-00. From 1999-00 to 2000-01, performance decreased by 5% from 96% to 91%. This progression yielded a two-year difference of -2% from 1998 to 2001. This last score was obtained when the scores representing the differences between year one and two and between years two and three were added together.

The difference in scores from 1998-99 to 1999-00 ranged from an improvement of 16% by Forsyth Community College to a decline of 14% by College of Albemarle. These scores provided a large range of 30%.

According to the statistical software program SAS 8.1, on average, North Carolina community colleges demonstrated an overall decrease on this standard by .38% between 1999-00 and 2000-01. College scores recorded a rather large range of 37% with Randolph Community College making the most significant improvement with an increase of 19%, and Central Piedmont Community College reporting the greatest decline at 18%.

The overall difference in scores from 1998-2001 had a large range of 43%. The maximum score with an improvement of 23% was earned by Martin Community College, and the minimum score was a decline of 20% by Catawaba Valley Community College. Other colleges whose scores demonstrated a significant amount of improvement were: Guilford Technical Community College (18%), and Blue Ridge and Mitchell Community Colleges (14%). Schools with the weakest performance on

this measure and who demonstrated a decline in performance included: Central Piedmont Community College (-18%), and Caldwell Community and Technical Institute (-15%), College of Albemarle (-15%), and Johnston Community College (-15%). There was a notable improvement among these community colleges with 50% of the scores increasing from 1998-99 to 1999-000, and a 48% increase from 1999-00 through 2000-01.

Table 4.8 Summary of descriptive statistics for the first performance measure.

Reporting Year	% of colleges who met or exceeded the standard	% of colleges whose performance improved	Mean scores for all community colleges	Mode scores for all community colleges	Score distribution according to Box Plots
1998-99	81%		80.2	75	Slight skew to the right
1999-00	85%	50%	79.83	78	Fairly balanced
2000-01	86%	48%	79.44	75	Balanced

Conclusion: There was not much difference in the scores among community colleges in North Carolina with respect to the first performance measure. The percent of colleges who met or exceeded the standard was 81 for the 1998-99 reporting year. This number increased to 85% for 1999-00, and rose again slightly to 86% for 2000-01. Therefore, there was no apparent steady rate of progression on this particular element. The percent of colleges whose performance improved from 1998-99 to 1999-00 registered at 50% and for the 1999-00 to 2000-01 reporting year it was 48%. These figures demonstrate a slight decline in improvement among these institutions, yet this is a strong reflection of North Carolina community colleges striving to better themselves on this standard.

The descriptive measures included in the Table 4.8—the mean and the mode—reflect little fluctuation from year to year.

Performance Measure 2: Passing rate for first-time test takers for certification and licensure examinations

Research Question 1B: *Did North Carolina's community colleges demonstrate a successful rate of progress on the second performance measure—the passing rate for first-time test-takers for certification and licensure examinations—over a three-year period?*

Standard: There are two parts to this standard. First, the performance standard requires an aggregate institutional passing rate of 80 percent on all state licensure and certification exams taken for the first time by community college graduates. Second, 70 percent is the minimum accepted score for any program which requires a state licensure or examination. These scores are then submitted to the North Carolina Community College System by the agencies issuing the licensure or certification. Data submitted by community colleges are not acceptable for this standard.

The second measure considers the passing rate for students who take examinations required for either licensure or certification in their field of study. Programs offered through North Carolina's community colleges and included in this standard are: aviation (general, Airframe 1, Power Plant), Basic Law Enforcement Training, cosmetic arts (apprentice, cosmetology, cosmetology teacher, manicurist), dental hygiene, Emergency Medical Technician (EMT, EMT-D, EMT-I, EMT-P, EMD), insurance (life and health, property and liability, medicaid/medicare support), nursing (RN, PN), Opticianry, physical therapist assistant, radiologic technology

(Nuclear Medicine Technology, Radiation Therapy Technology, Radiography), real estate (broker, sales), and veterinary medical technology.

Categorical Data

Use of categorical data for the second performance measure allows for: determination of who did or did not comply with this standard each year, as well as a summary of this measure system-wide. With categorical data, the only descriptive statistic of note is the frequency at which these variables occur. Also, the categorical data for this performance measure include both elements of this standard—aggregate and program scores.

Table 4.9 Progress of first-time test-takers reported as categorical data.

College	1998-99	1999-2000	2000-2001
Alamance CC	*	*	*
Asheville-Buncombe TCC	***	***	*
Beaufort County CC	*	**	*
Bladen CC	*	**	***
Blue Ridge CC	***	*	***
Brunswick CC	*	*	*
Caldwell CC & TI	***	**	***
Cape Fear CC	***	*	***
Carteret CC	***	*	*
Catawba Valley CC	*	*	***
Central Carolina CC	***	*	*
Central Piedmont CC	*	**	***
Cleveland CC	***	**	*
Coastal Carolina CC	*	**	***
College of Albemarle	***	*	***
Craven CC	***	***	***
Davidson County CC	***	***	*
Durham TCC	*	**	***
Edgecombe CC	*	**	*
Fayetteville TCC	***	*	***
Forsyth TCC	***	***	***
Gaston College	***	*	***
Guilford TCC	***	*	*
Halifax CC	*	**	**
Haywood CC	*	*	*
Isothermal CC	*	*	*
James Sprunt CC	***	*	*
Johnston CC	***	**	*
Lenoir CC	*	**	*
Martin CC	*	*	*
Mayland CC	***	*	***
McDowell TCC	***	*	*
Mitchell CC	***	*	***
Montgomery CC	*	*	*
Nash CC	*	*	**
Pamlico CC	*	***	***
Piedmont CC	*	*	***
Pitt CC	***	*	*
Randolph CC	*	**	**
Richmond CC	***	***	***
Roanoke-Chowan CC	*	*	*
Robeson CC	***	***	*
Rockingham CC	*	*	**
Rowan Cabarrus CC	***	*	*
Sampson CC	*	***	***
Sandhills CC	***	*	***
South Piedmont	***	*	***
Southeastern CC	*	***	***
Southwestern CC	***	*	*
Stanly CC	***	*	*
Surry CC	***	*	***
Tri-County CC	*	***	***
Vance-Granville CC	*	*	**
Wake TCC	***	*	*
Wayne CC	***	**	***
Western Piedmont CC	***	*	*
Wilkes CC	***	*	***
Wilson CC	*	***	*

*=1 or failed to meet the measure; **=2 or met because of SI; ***=3 or met the measure based on merit.

Table 4.9 shows the categorical data for the second performance measure, and Table 4.10 presents the results. For the 1998-1999 reporting year, 55% of the schools met this standard and 45% did not. The second year 41% of the colleges fulfilled this requirement outright—19% based on the merit of their performance and 22% met it through an award of significant improvement (SI—and 69% were unsuccessful in this endeavor. More community colleges were successful the third year at 53% (44% merit and 9% SIs) leaving 47% of the colleges who failed to comply with the standard. During this three-year period, seven community colleges were unable to meet this state mandate.

Table 4.10 Percent of NC community colleges who met or exceeded the standard required by the second performance measure.

	1998-1999	1999-2000	2000-2001
Percent of community colleges who met the standard at the 80% level for aggregate scores and 70% for programs	55%	41%	53%
Percent who did not meet the standard at the 80% level for aggregate scores and 70% for programs	45%	69%	47%

Continuous Data

Table 4.11 reports data in its original form as continuous data for all of North Carolina's community colleges. For this section of the study, only the aggregate score was reviewed. This requirement resulted in a response rate of 100 percent or $N=58$.

Table 4.11 First-time, test-takers for licensure/certification exams reported as percentages/continuous data.

College	1998-99	1999-2000	2000-2001	Mean
Alamance CC	(76)	(76)	84	78.67
Asheville-Buncombe TCC	86	94	97	92.33
Beaufort County CC	(66)	84	(72)	74.00
Bladen CC	(76)	80	85	80.33
Blue Ridge CC	84	85	86	85.00
Brunswick CC	(72)	(76)	(71)	73.00
Caldwell CC & TI	83	84	89	85.33
Cape Fear CC	86	94	91	90.33
Carteret CC	83	91	88	87.33
Catawba Valley CC	(70)	91	89	83.33
Central Carolina CC	84	84	(78)	82.00
Central Piedmont CC	(71)	85	93	83.00
Cleveland CC	83	80	86	83.00
Coastal Carolina CC	(78)	88	92	86.00
College of Albemarle	81	84	90	85.00
Craven CC	88	86	86	86.67
Davidson County CC	83	81	81	81.67
Durham TCC	(79)	88	83	83.33
Edgecombe CC	(65)	83	(72)	73.33
Fayetteville TCC	84	86	92	87.33
Forsyth TCC	83	91	91	88.33
Gaston College	81	80	88	83.00
Guilford TCC	80	83	91	84.67
Halifax CC	(62)	(73)	(77)	70.67
Haywood CC	(78)	(76)	81	78.33
Isothermal CC	(75)	81	(74)	76.67
James Sprunt CC	80	(71)	81	77.33
Johnston CC	83	85	83	83.67
Lenoir CC	(77)	82	83	80.67
Martin CC	(71)	(68)	(74)	71.00
Mayland CC	80	(60)	86	75.33
McDowell TCC	81	81	(76)	79.33
Mitchell CC	82	(67)	88	79.00
Montgomery CC	(71)	(73)	(78)	74.00
Nash CC	(76)	80	83	79.67
Pamlico CC	(64)	83	82	76.33
Piedmont CC	(76)	(67)	91	78.00
Pitt CC	83	84	80	82.33
Randolph CC	(73)	(78)	(79)	76.67
Richmond CC	90	100	87	92.33
Roanoke-Chowan CC	(74)	(74)	(69)	72.33
Robeson CC	80	86	(69)	78.33
Rockingham CC	(77)	(75)	81	77.67
Rowan Cabarrus CC	81	85	82	82.67
Sampson CC	(77)	86	89	84.00
Sandhills CC	82	86	95	87.67
South Piedmont	84	(78)	86	82.67
Southeastern CC	(76)	82	92	83.33
Southwestern CC	86	83	83	84.00
Stanly CC	82	83	81	82.00
Surry CC	81	(74)	89	81.33
Tri-County CC	(76)	80	84	80.00
Vance-Granville CC	(74)	(75)	85	78.00
Wake TCC	80	87	87	84.67
Wayne CC	83	89	88	86.67
Western Piedmont CC	82	83	89	84.67
Wilkes CC	81	(75)	86	80.67
Wilson CC	(72)	87	(73)	77.33

()=indicates colleges that did not meet the standard; []=colleges awarded SIs

Table 4.12 System-wide results of performance measure two for the 1998-99 reporting year.

Performance Measure 2: 1998-99	
<i>N</i>	58
Mean	78.6651724
Median	80
Mode	83
Standard Deviation	6.26197582
Sample Variance	35.2123412
Range	31
Minimum	62
Maximum	93

System-wide performance in this sample reflects little variability. For the 1998-99 year, the average score was 78.67%—slightly lower than the state standard of 80. The measures for central tendency (the mean, the mode and the median) cluster within 4% of one another—78.5% (mean), 83% (mode) and 80% (median). The standard deviation for this data set falls at 6.26, which appears to be a moderate standard deviation. The scores for the first year exhibited a minimum of 62% and a maximum of 93% yielding a fairly large range of 31%.

Table 4.13 System-wide results of performance measure two for the 1999-2000 reporting year.

Performance Measure 2: 1999-2000	
<i>N</i>	58
Mean	81.5689655
Median	83
Mode	83
Standard Deviation	7.26469972
Sample Variance	52.77586
Range	40
Minimum	60
Maximum	100

During the second year, the typical score reported was 81.57%, which was supported by a mode and a median of 83%. The mean score for this year was higher than the standard required for this measure. Scores for the mean, the mode, and the median occurred within 1 percent of each other. The range was rather broad at 40% (60% to 100%). Performance on the aggregate portion of this measure for this sample deviates on average 7.26 from the mean of 81.57%. This is a moderate standard deviation.

Table 4.14 System-wide results of performance measure two for the 2000-2001 reporting year.

Performance Measure 2: 2000-2001	
N	57
Mean	83.89655
Median	85
Mode	86
Standard Deviation	6.674617159
Sample Variance	44.55051422
Range	28
Minimum	69
Maximum	97

The average score for the third year was 83.9% with a midpoint of 85% and the most frequent occurring score at 86%. Each of these statistical measures is differentiated by two percent. Scores deviated from the mean on average of 6.67: this is a moderate standard of deviation. A minimum score of 69% and a maximum of 97% resulted in a moderate difference of 28%.

For 1998-99, the data ranged from 62 to 93 percent for the second performance measure. The data set had two outliers (Pamlico Community College and Halifax Community College) at 64 and 62 percent. Data for the first year are represented by a box similar in size to the third year (2000-01), which seems indicative a slightly more consolidated distribution of scores than 1999-00. Data are distributed almost equally among the quartiles for both 1998-99 and 2000-01.

The second year included a range from 60 to 100 percent with one outlier (Mayland Community College) at 60 percent. Data for 1999-00 are represented by a more elongated box indicating a wider range for scores for this year than in 1998-99 and 2000-01. With longer tails on this box plot, the data appear less concentrated than the other two years. This also gives this box plot the appearance of being skewed slightly to the left.

In 2000-01, the distribution of scores was more closely packed with a range from 69 to 97 percent—also demonstrating less variation among the scores for first-time test-takers. College scores seem to be well balanced throughout the quartiles with the exception of the first quartile—minimum to Q1—where scores seem a little more concentrated. With fairly balanced quartiles and a lack of outliers, this data set appears to have a fairly normal distribution of scores.

According to the box plots for performance measure two, colleges seemed to have gradually improved their scores on this standard. The box plots have a clear upward shift from one year to the next, with increasing minimum, Q1, median, and Q3

scores. This shift indicates improvement for this performance measure. The medians appeared fairly constant in the low to mid-80's for each of the three years. Although the minimum score for each hovered in the 60's, there was a dramatic increase in the maximum percentage from the first to the second year. Further, each year, there was a slight rise in the 75th percentile. Overall, the scores for first-time test-takers of licensure and certification exams improved from one year to the next. Variation was comparable during 1998-99 and 2000-01 and increased slightly from 1998 to 1999.

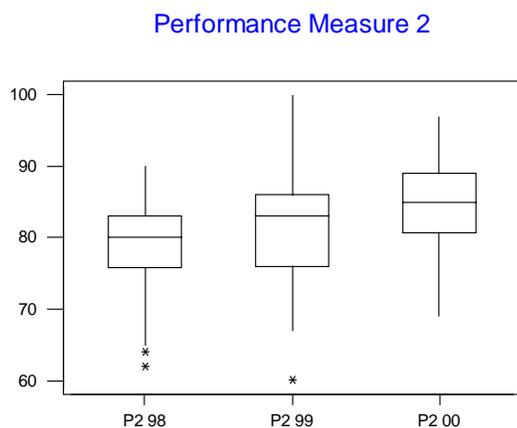


Figure 4.2. *Performance by North Carolina community colleges on second PBB standard—passing rate for first-time test-takers on licensure and certification exams—from 1998-2001.*

Table 4.15 Difference in scores for NC community colleges between 1998-2001 for the second performance measure.

College	Difference between 1 st & 2 nd years	Difference between 2 nd & 3 rd years	Overall Difference
Alamance CC	0.00	8.00	8.00
Asheville-Buncombe TCC	8.00	3.00	11.00
Beaufort County CC	18.00	-12.00	6.00
Bladen CC	4.00	5.00	9.00
Blue Ridge CC	1.00	1.00	2.00
Brunswick CC	4.00	-5.00	-1.00
Caldwell CC & TI	1.00	5.00	6.00
Cape Fear CC	8.00	-3.00	5.00
Carteret CC	8.00	-3.00	5.00
Catawba Valley CC	21.00	-2.00	19.00
Central Carolina CC	0.00	-6.00	-6.00
Central Piedmont CC	14.00	8.00	22.00
Cleveland CC	-3.00	6.00	3.00
Coastal Carolina CC	10.00	4.00	14.00
College of Albemarle	3.00	6.00	9.00
Craven CC	-2.00	0.00	-2.00
Davidson County CC	-2.00	0.00	-2.00
Durham TCC	9.00	-5.00	4.00
Edgecombe CC	18.00	-11.00	7.00
Fayetteville TCC	2.00	6.00	8.00
Forsyth TCC	8.00	0.00	8.00
Gaston College	-1.00	8.00	7.00
Guilford TCC	3.00	8.00	11.00
Halifax CC	11.00	4.00	15.00
Haywood CC	-2.00	5.00	3.00
Isothermal CC	6.00	-7.00	-1.00
James Sprunt CC	-9.00	10.00	1.00
Johnston CC	2.00	-2.00	0.00
Lenoir CC	5.00	1.00	6.00
Martin CC	-3.00	6.00	3.00
Mayland CC	-20.00	26.00	6.00
McDowell TCC	0.00	-5.00	-5.00
Mitchell CC	-15.00	21.00	6.00
Montgomery CC	2.00	5.00	7.00
Nash CC	4.00	3.00	7.00
Pamlico CC	19.00	-1.00	18.00
Piedmont CC	-9.00	24.00	15.00
Pitt CC	1.00	-4.00	-3.00
Randolph CC	5.00	1.00	6.00
Richmond CC	10.00	-13.00	-3.00
Roanoke-Chowan CC	0.00	-5.00	-5.00
Robeson CC	6.00	-17.00	-11.00
Rockingham CC	-2.00	6.00	4.00
Rowan Cabarrus CC	4.00	-3.00	1.00
Sampson CC	9.00	3.00	12.00
Sandhills CC	4.00	9.00	13.00
South Piedmont	-6.00	8.00	2.00
Southeastern CC	6.00	10.00	16.00
Southwestern CC	-3.00	0.00	-3.00
Stanly CC	1.00	-2.00	-1.00
Surry CC	-7.00	15.00	8.00
Tri-County CC	4.00	4.00	8.00
Vance-Granville CC	1.00	10.00	11.00
Wake TCC	7.00	0.00	7.00
Wayne CC	6.00	-1.00	5.00
Western Piedmont CC	1.00	6.00	7.00
Wilkes CC	-6.00	11.00	5.00
Wilson CC	15.00	-14.00	1.00

To better understand the rate of progress among community colleges in North Carolina, Table 4.12 reports the difference in scores of first-time test-takers for state licensure and examinations. This table presents the differences between scores for 1998-99 to 1999-00, from 1999-00 to 2000-01, and the overall difference between those years.

From 1998-99 through 1999-00, these colleges typically improved by 3.09%. North Carolina's community colleges scores generated a broad range of 41%. Catawba Valley Community College experienced an increase of 21%, while Mayland Community College had the most substantial decline of 20%.

A difference in scores for 1999-00 generated an average improvement of 2.33%. The range was considerable at 43%. Mayland Community College made the most notable progression in scores during this time with a growth of 26%. With a decrease of 17%, Robeson Community College experienced the most substantial drop in performance.

From 1999 through 2001, North Carolina community colleges encountered a moderate difference in performance from one year to the next with a range of 33%. Eleven community colleges demonstrated a decline in performance: Brunswick Community College (-1%), Central Carolina Community College (-6%), Craven Community College (-2%), Davidson Community College (-2%), Isothermal Community College (-1%), McDowell Technical Community College (-5%), Pitt Community College (-3%), Richmond Community College (-3%), Roanoke-Chowan

Community College (-5%), Robeson Community College (-11%), Southwestern Community College (-3%), and Stanley Community College (-1%). Improvements were recorded for the remaining forty-seven community colleges. College recording the most significant improvements are as follows: Central Piedmont Community College (22%), Catawba Valley Community College (19%), Pamlico Community College (18%), Southeastern Community College (16%), Halifax Community College (15%), and Piedmont Community College (15%).

Out of the 58 community colleges, 74% of them improved on their performance of the second standard between 1998-99 and 1999-00 and 67% demonstrated an increase in scores from 1999-00 and 2000-01. Overall, 23% of colleges demonstrated a steady rate of progress on the second standard from year-to-year.

Table 4.16 Summary of descriptive statistics for the second performance measure.

Reporting Year	% of colleges who met or exceeded the standard	% of colleges whose performance improved	Mean scores for all community colleges	Mode scores for all community colleges	Score distribution according to Box Plots
1998-99	55%		78.67	83	Skewed to the right
1999-00	41%	74%	81.57	83	Skewed to the left
2000-01	53%	67%	83.9	86	Slight skew to the right

Conclusion: Reviewing the summary data, Table 4.16, the data present mixed results on the progress made by community colleges in North Carolina between 1998-99 through 2000-01. The percent of colleges who met or exceeded the second performance measure declined by 14% from the first to the second year, and increased by 12% from the second to the third year. Although fewer colleges met the standard in 1999-00, 74%

of them improved on their performance from 1998-99 to 1999-00. Only 67% bettered their scores from 1999-00 to 2000-01. Measures of central tendency appear fairly constant throughout this three-year span.

Performance Measure 3: Goal Completion of Program Completers

Research Question 1C: *Did North Carolina's community college demonstrate a successful rate of progress on the third performance measure—goal completion of program completers—over a three-year period?*

Standard: The standard for this performance measure was initially set at 90 percent and changed to 95 percent for 2000-01. General Statute 115D-31.3 states that a given percent of completers will report goal completion or that their primary goal for attending college has been met. Each college is responsible for collecting data for this measure based on a standard set of survey questions administered to completers. Survey questions required of all colleges is located in Appendix G. A response rate of 50 percent and a minimum of 15 respondents to complete the survey are necessary for inclusion in this standard. The term “completers” refers to community college graduates who have earned a certificate, diploma or an associate’s degree. Non-completers were incorporated into this standard during the second year. This classification includes students who withdraw from college-credit classes before earning a certificate, diploma or associate’s degree. Although non-completers remained as part of the accountability report, they were only incorporated into the performance-based budgeting (PBB) component in 1999-00.

The third core performance measure focuses on goal completion of community college graduates. This measure is also the only standard to undergo multiple changes in the first three years. It is also the only standard that relies solely on data submitted by each of the fifty-eight community colleges. Finally, it is the only core measure based on student input rather than the review of a particular process.

Findings: Since the non-completer component was incorporated into the PBB component only for the 1999-2000 academic year, there is a discrepancy among the categorical and continuous variables for that year. The categorical data reflect whether or not the colleges met the measure for that year, which includes the surveys of completers and non-completers. The continuous variables, however, report the goal completion only for “completers” for 1999-2000 in an effort to keep data comparable with that of the other two years.

Categorical Data

The categorical data for this measure includes a sample size, N, of 56 for 1998-99 and 58 for the last two year.

Table 4.17 Goal completion of community college graduates reported as categorical data.

College	1998-1999	1999-2000	2000-2001
Alamance CC		*	***
Asheville-Buncombe TCC	***	***	***
Beaufort County CC	***	***	***
Bladen CC	***	*	***
Blue Ridge CC	***	***	***
Brunswick CC	***	***	***
Caldwell CC & TI	***	***	***
Cape Fear CC	***	***	***
Carteret CC	***	*	***
Catawba Valley CC	***	*	***
Central Carolina CC	***	*	***
Central Piedmont CC	***	***	***
Cleveland CC	***	***	***
Coastal Carolina CC	***	*	***
College of Albemarle	***	*	***
Craven CC	***	*	***
Davidson County CC	***	*	***
Durham TCC	***	***	***
Edgecombe CC	***	***	***
Fayetteville TCC	***	*	***
Forsyth TCC	***	*	***
Gaston College	***	***	***
Guilford TCC	***	*	***
Halifax CC	***	*	***
Haywood CC	***	*	***
Isothermal CC	***	*	***
James Sprunt CC	***	*	***
Johnston CC	***	*	***
Lenoir CC	***	*	***
Martin CC	***	*	***
Mayland CC	***	***	***
McDowell TCC	***	***	***
Mitchell CC	***	*	***
Montgomery CC	***	*	***
Nash CC	***	*	***
Pamlico CC	***	***	*
Piedmont CC	***	*	***
Pitt CC	***	*	***
Randolph CC	***	*	***
Richmond CC	***	*	***
Roanoke-Chowan CC	***	***	***
Robeson CC	***	***	***
Rockingham CC	***	***	***
Rowan Cabarrus CC	***	*	***
Sampson CC	***	***	***
Sandhills CC	***	*	***
South Piedmont	***	*	***
Southeastern CC	***	***	***
Southwestern CC	***	***	***
Stanly CC	***	***	***
Surry CC	***	***	***
Tri-County CC	***	***	***
Vance-Granville CC	***	*	***
Wake TCC	***	*	***
Wayne CC	***	*	***
Western Piedmont CC	***	***	***
Wilkes CC	***	***	***
Wilson CC	***	*	***

*=1 or failed to meet the measure; **=2 or met because of SI; ***=3 or met the measure based on merit.

Categorical data for the third performance measure is referenced in Table 4.17. For the trial year (or the first year included in this study) of the performance-budgeting program, 97%, 56 out of 58, of the community colleges were included in the sample—all of which met the standard. All fifty-eight of North Carolina's community colleges were included in the *Critical Success Factors Report* for the next two years. However, with the inclusion of the non-completers results, the second year saw a sharp decline in performance with only 43% of colleges meeting the standard of 95%. Ninety-eight percent, or 57 out of 58, of these colleges were successful the third year. From 1998-2001, twenty community colleges met this standard each year.

Table 4.18 Percent of NC community colleges who met or exceeded the standard required by the third performance measure.

	1998-1999	1999-2000	2000-2001
Percent of community colleges who met the standard at the 90% level for 1998-99 and 95% level for 1999-00 and 2000-01	97%	43%*	98%
Percent who did not meet the standard at the 90% level for 1998-99 and 95% level for 1999-00 and 2000-01	3%	57%*	2%

* Data for this year includes surveys administered to students classified as completers and non-completers.

Continuous Data

The third performance measure reviews goal completion of community college graduates and requires that 90% for the first year and 95% for the second and third years express satisfaction in meeting their educational goals. Community college scores for this measure are documented in Table 4.19.

Table 4.19 Goal completion of community college graduates reported as percentages/continuous data.

College	1998-1999	1999-2000	2000-2001	Mean
Alamance CC		(98)	100	99.00
Asheville-Buncombe TCC	99.6	100	100	99.87
Beaufort County CC	100	100	100	100.00
Bladen CC	98	(98)	100	98.67
Blue Ridge CC	99.2	99	99	99.07
Brunswick CC	100	100	100	100.00
Caldwell CC & TI	99.1	99	99	99.03
Cape Fear CC	99	98	98	98.33
Carteret CC	97.4	(98)	99	98.13
Catawba Valley CC	100	(100)	95	98.33
Central Carolina CC	93.7	(99)	99	97.23
Central Piedmont CC	92	100	99	97.00
Cleveland CC	99.1	99	100	99.37
Coastal Carolina CC	99.1	(99)	99	99.03
College of Albemarle	100	(99)	98	99.00
Craven CC	97.1	(99)	98	98.03
Davidson County CC	98.8	(97)	98	97.93
Durham TCC	99.2	99	98	98.73
Edgecombe CC	98.3	99	100	99.10
Fayetteville TCC	96.4	(99)	100	98.47
Forsyth TCC	99.5	(100)	99	99.50
Gaston College	100	100	100	100.00
Guilford TCC		(100)	99	99.50
Halifax CC	100	(100)	100	100.00
Haywood CC	96.5	(100)	99	98.50
Isothermal CC	100	(98)	99	99.00
James Sprunt CC	100	(100)	100	100.00
Johnston CC	100	(99)	100	99.67
Lenoir CC	100	(100)	98	99.33
Martin CC	92.9	(100)	99	97.30
Mayland CC	100	100	100	100.00
McDowell TCC	97.2	100	100	99.07
Mitchell CC	100	(100)	100	100.00
Montgomery CC	98.4	(98)	100	98.80
Nash CC	100	(97)	99	98.67
Pamlico CC	100	100	(93)	97.67
Piedmont CC	100	(100)	100	100.00
Pitt CC	98.8	(99)	98	98.60
Randolph CC	100	(99)	98	99.00
Richmond CC	98.5	(100)	100	99.50
Roanoke-Chowan CC	98.7	95	95	96.23
Robeson CC	100	100	99	99.67
Rockingham CC	99.3	99	100	99.43
Rowan Cabarrus CC	98.9	(98)	97	97.97
Sampson CC	100	100	99	99.67
Sandhills CC	95.7	(99)	99	97.90
South Piedmont	90.2	(100)	100	96.73
Southeastern CC	100	100	99	99.67
Southwestern CC	99.3	100	99	99.43
Stanly CC	99.2	100	99	99.40
Surry CC	98.4	100	99	99.13
Tri-County CC	100	99	100	99.67
Vance-Granville CC	98.5	(98)	99	98.50
Wake TCC	95.8	(97)	98	96.93
Wayne CC	98.7	(99)	99	98.90
Western Piedmont CC	100	99	100	99.67
Wilkes CC	100	99	99	99.33
Wilson CC	100	(99)	100	99.67

()=indicates colleges that did not meet the standard. The scores listed for the 1999-00 year include completers only.

Table 4.20 System-wide results of performance measure three for the 1998-99 reporting year.

Performance Measure 3: 1998-99	
<i>N</i>	56
Mean	98.5803571
Median	99.2
Mode	100
Standard Deviation	2.14199734
Sample Variance	4.5881526
Range	9.8
Minimum	90.2
Maximum	100

The descriptive statistical report for the first year of performance measure three includes fifty-six colleges with scores ranging from 90.2% to 100% or equivalent to 10%, which demonstrates a small range. On this performance measure, scores deviated on average 2.14 from the average score of 98.58%. This is a relatively small standard of deviation. This indication that the distribution of scores was small is supported by the fact that the mean (98.6%), the mode (100%), and the median (99.2%) fall within one percent of each another.

Table 4.21 System-wide results of performance measure three for the 1999-2000 reporting year.

Performance Measure 3: 1999-2000	
<i>N</i>	58
Mean	99.1379
Median	99
Mode	100
Standard Deviation	1.0336
Sample Variance	1.0683
Range	5
Minimum	95
Maximum	100

For the 1999-00 reporting year, North Carolina community colleges reported scores with a minimum of 95% to a maximum of 100% for a narrow range of 5%. An extremely small standard of deviation was present as scores deviated on average 1.03 from the mean of 99.14%. Other statistical measures occurred at 99% (median) and 100% (mode).

Table 4.22 System-wide results of performance measure three for the 2000-2001 reporting year.

Performance Measure 3: 2000-2001	
N	58
Mean	98.9655172
Median	99
Mode	100
Standard Deviation	1.35031533
Sample Variance	1.82335148
Range	7
Minimum	93
Maximum	100

The average score for community colleges on the goal completion measure for the 2000-01 year was 98.97%, with an extremely small standard deviation of 1.35. Other primary descriptive statistics were located within a close proximity to one another with the median at 99%, the mean was 98.97% and the mode was 100%. On this particular measure, scores had a moderate range of 7% with a minimum score of 93% and a maximum of 100%.

Each of the box plots for 1998-99, 1999-00 and 2000-01 reflect the consistently high scores by community colleges in North Carolina with respect to the third performance measure—goal completion by program completers. Data for 1998-99 ranged from 90.2 to 100 percent with six outliers (Wake Technical Community College, Sandhills Community College, Central Carolina Community College, Martin Community College, Central Piedmont Community College, and South Piedmont) at 95.8, 95.7, 93.7, 92.9, 92 and 90.2 percent respectively. Although the data for 1998-99 are primarily concentrated between 96.5 and 100 percent, this box is the longest implying the most diverse set of scores for the third performance measure. For 1998-99, approximately 75 percent of the data set is located between Q1 of 98.4 and the maximum score of 100%.

The second and third years of this study show that the performance of these community colleges was exceptional on the third standard with almost 100% of the data falling between 99 and 100%. The exceptions were four outliers for the second year with three colleges scoring 97% (Davidson Community College, Nash Community College and Wake Technical Community College) and one college at 95% (Roanoke-Chowan Community College) and four during the third year at 97% (Rowan Cabarrus Community College), 95% (Central Carolina Community College and Roanoke-Chowan Community College) and 93% (Pamlico Community College).

Overall, the box plots indicated minimal change. This is supported by the fact that the medians for each of these three years fell at 99% and the maximum score at

100%. For 1999-00 and 2000-01, the box plots demonstrate minimal variance except for an increase in the number of outliers during this last year. Data for the first year, however, are represented by a longer box which implies more diverse data than that found in 1999-00 and 2000-01.

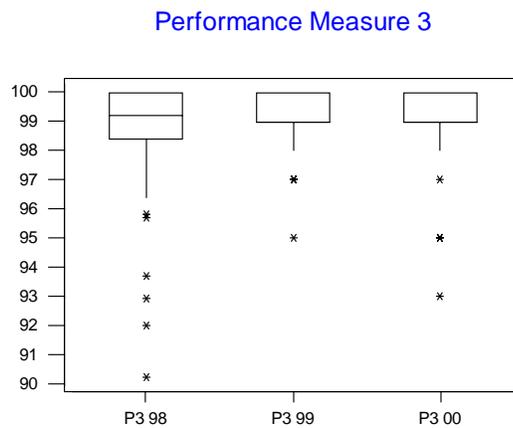


Figure 4.3. *Performance by North Carolina community colleges on third PBB standard—goal completion for program completers—from 1998-2001.*

Table 4.23 Difference in scores for NC community college between 1998-2001 for the third performance measure.

College	Difference between 1 st and 2 nd years	Difference between 2 nd & 3 rd years	Overall Difference
Alamance CC	98	2.00	100.00
Asheville-Buncombe TCC	0.40	0.00	0.40
Beaufort County CC	0.00	0.00	0.00
Bladen CC	0.00	2.00	2.00
Blue Ridge CC	-0.20	0.00	-0.20
Brunswick CC	0.00	0.00	0.00
Caldwell CC & TI	-0.10	0.00	-0.10
Cape Fear CC	-1.00	0.00	-1.00
Carteret CC	0.60	1.00	1.60
Catawba Valley CC	0.00	-5.00	-5.00
Central Carolina CC	5.30	0.00	5.30
Central Piedmont CC	8.00	-1.00	7.00
Cleveland CC	-0.10	1.00	0.90
Coastal Carolina CC	-0.10	0.00	-0.10
College of Albemarle	-1.00	-1.00	-2.00
Craven CC	1.90	-1.00	0.90
Davidson County CC	-1.80	1.00	-0.80
Durham TCC	-0.20	-1.00	-1.20
Edgecombe CC	0.70	1.00	1.70
Fayetteville TCC	2.60	1.00	3.60
Forsyth TCC	0.50	-1.00	-0.50
Gaston College	0.00	0.00	0.00
Guilford TCC	100.00	-1.00	99.00
Halifax CC	0.00	0.00	0.00
Haywood CC	3.50	-1.00	2.50
Isothermal CC	-2.00	1.00	-1.00
James Sprunt CC	0.00	0.00	0.00
Johnston CC	-1.00	1.00	0.00
Lenoir CC	0.00	-2.00	-2.00
Martin CC	7.10	-1.00	6.10
Mayland CC	0.00	0.00	0.00
McDowell TCC	2.80	0.00	2.80
Mitchell CC	0.00	0.00	0.00
Montgomery CC	-0.40	2.00	1.60
Nash CC	-3.00	2.00	-1.00
Pamlico CC	0.00	-7.00	-7.00
Piedmont CC	0.00	0.00	0.00
Pitt CC	0.20	-1.00	-0.80
Randolph CC	-1.00	-1.00	-2.00
Richmond CC	1.50	0.00	1.50
Roanoke-Chowan CC	-3.70	0.00	-3.70
Robeson CC	0.00	-1.00	-1.00
Rockingham CC	-0.30	1.00	0.70
Rowan Cabarrus CC	-0.90	-1.00	-1.90
Sampson CC	0.00	-1.00	-1.00
Sandhills CC	3.30	0.00	3.30
South Piedmont	9.80	0.00	9.80
Southeastern CC	0.00	-1.00	-1.00
Southwestern CC	0.70	-1.00	-0.30
Stanly CC	0.80	-1.00	-0.20
Surry CC	1.60	-1.00	0.60
Tri-County CC	-1.00	1.00	0.00
Vance-Granville CC	-0.50	1.00	0.50
Wake TCC	1.20	1.00	2.20
Wayne CC	0.30	0.00	0.30
Western Piedmont CC	-1.00	1.00	0.00
Wilkes CC	-1.00	0.00	-1.00
Wilson CC	-1.00	1.00	0.00

Table 4.23 reports the progression of North Carolina community colleges on the third performance standard, which requires that 90 to 95 percent of community college completers express satisfaction in meeting their educational goals.

For 1998-99 to 1999-00, the differences in community colleges scores range between -3.7% and 100%, which yields an extremely broad range of 103.7%. The college with the most significant increase of 100% was Guilford Technical Community College, which is also the only outlier for this data set. Two other community colleges made a notable improvement in comparison to the scores of their peers—Central Piedmont Community College (8%) and South Piedmont Community College (9.8%). Colleges with a decline in performance of this measure were minimal with the largest decrease noted by Roanoke-Chowan Community College at -3.7%.

The difference in performance on this measure between the second and third years of performance-based budgeting was moderate with a range for 9%. Four colleges—Alamance Community College, Bladen Community College, Montgomery Community College and Nash Community College—achieved a maximum improvement at 2%, and Pamlico Community College earned a minimum score with a decline of 7%.

A summary of the three-year performance for North Carolina community colleges shows an expansive difference in scores of 106%. Gaston College received the maximum score of 99% and Pamlico Community College obtained the minimum score with a decline of 7%.

Table 4.24 Summary of descriptive statistics for the third performance measure.

Reporting Year	% of colleges who met or exceeded the standard	% of colleges whose performance improved	Mean scores for all community colleges	Mode scores for all community colleges	Score distribution according to Box Plots
1998-99	97%		98.58%	100%	Skewed to the right
1999-00	43%*	66%	99.14%	100%	Skewed to the right
2000-01	98%	66%	98.97%	100%	Skewed to the right

* Data for this year includes surveys administered to students classified as completers and non-completers.

Conclusion: This performance measure saw several adjustments over this three-year period including an elevation in the standard from 90% to 95% and the inclusion of non-completer surveys for 1999-00. The use of the non-completers during the second year significantly skewed the results. Therefore, when testing the continuous data, the non-completers were omitted in an attempt to keep the years relatively comparative. Further, the continuous data were also used when reviewing the rate of progress among the community colleges with 66% of the scores increasing from 1998-99 to 1999-00 and from 1999-00 to 2000-01.

For each of the three years included in this study, the distribution of scores for North Carolina's fifty-eight community colleges was consistently high with means of 98.5%, 99.14%, and 99% respectively. Because of the strength of these scores, excluding the inclusion of non-completers for 1999-00, it is difficult to substantiate improvement on this measure. For the most part, it would appear that many of the colleges initially achieved a high standard and maintained it.

Performance Measure 4: Employment Status of Graduates

Research Question 1D: *Did North Carolina's community college demonstrate a successful rate of progress on the fourth performance measure—the employment status of graduates—over a three-year period?*

Standard: The standard for this measure requires that 90% of community college graduates will be employed within one year of leaving the college. Local unemployment rates are taken into consideration with the 90% standard. The North Carolina Common Follow-up System (CFS) tracks student employment after they graduate. The Employment Security Commission oversees the Common Follow-up System, and submits the data to NCCCS.

Workforce training and development have been identified as key factors for developing the North Carolina Community College System. Although, the importance placed on workforce development is incorporated into three of the twelve performance measures for North Carolina's community colleges—employer satisfaction (curriculum and continuing education), employment status of graduates (curriculum), and business/industry satisfaction with services provided (continuing education)—only one of these is considered a core measure.

Findings:

The sample size for this measure began with 53 community colleges in 1998-99 and concluded with 58 colleges, or 100% participation, for the subsequent two years.

Table 4.25 Employment rate for NC community colleges reported as categorical data.

College	1998-1999	1999-2000	2000-2001
Alamance CC	***	***	***
Asheville-Buncombe TCC	***	***	***
Beaufort County CC	***	***	***
Bladen CC	*	***	***
Blue Ridge CC	***	***	***
Brunswick CC	*	***	***
Caldwell CC & TI	***	***	***
Cape Fear CC	***	***	***
Carteret CC	*	***	***
Catawba Valley CC	***	***	***
Central Carolina CC		***	***
Central Piedmont CC	***	***	***
Cleveland CC	***	***	***
Coastal Carolina CC		***	***
College of Albemarle	***	***	***
Craven CC		***	***
Davidson County CC	***	***	***
Durham TCC	***	***	***
Edgecombe CC	***	***	***
Fayetteville TCC		***	***
Forsyth TCC	***	***	***
Gaston College	***	***	***
Guilford TCC	***	***	***
Halifax CC	***	***	***
Haywood CC	*	***	***
Isothermal CC	***	***	***
James Sprunt CC	***	***	***
Johnston CC	***	***	***
Lenoir CC	***	***	***
Martin CC	*	***	***
Mayland CC	*	***	***
McDowell TCC	***	***	***
Mitchell CC	***	***	***
Montgomery CC	***	***	***
Nash CC	***	***	***
Pamlico CC	***	***	***
Piedmont CC	***	***	***
Pitt CC	***	***	***
Randolph CC	***	***	***
Richmond CC	***	***	***
Roanoke-Chowan CC	***	***	***
Robeson CC	***	***	***
Rockingham CC	***	***	***
Rowan Cabarrus CC	***	***	***
Sampson CC	***	***	***
Sandhills CC	***	***	***
South Piedmont	***	***	***
Southeastern CC	***	***	***
Southwestern CC	*	***	***
Stanly CC	***	***	***
Surry CC	***	***	***
Tri-County CC	***	***	***
Vance-Granville CC	***	***	***
Wake TCC	***	***	***
Wayne CC		***	***
Western Piedmont CC	***	***	***
Wilkes CC	***	***	***
Wilson CC	***	***	***

*=1 or failed to meet the measure; **=2 or met because of SI; ***=3 or met the measure based on merit.

Table 4.26 notes whether the fifty-eight community colleges met the fourth performance measure according to categorical data. For the 1998-99 reporting year, 46 schools met this standard, 7 failed, and 5 did not fulfill the requirements in order to be eligible for inclusion in the report for this year. A notable improvement among these colleges occurred over the following two years with a 100% success rate in meeting the employment standard set at 90%.

Table 4.26 Percent of NC community colleges who met or exceeded the standard required by the fourth performance measure.

	1998-1999	1999-2000	2000-2001
Percent of community colleges who met the standard at the 90% level	79%	100%	100%
Percent who did not meet the standard at the 90% level	21%	0%	0%

Continuous Data

The fourth performance measure tracks the employment rate of community college graduates. Table 4.27 provides information on each of the fifty-eight community colleges' performance on this fourth measure between 1998-2001, as well as the mean for each college's performance during that time span.

Table 4.27 Employment rate of community college graduates reported as percentages/continuous data.

College	1998-1999	1999-2000	2000-2001	Mean
Alamance CC	94	99.76	97.25	97.00
Asheville-Buncombe TCC	93	100	97.44	96.81
Beaufort County CC	95	100	98.3	97.77
Bladen CC	(86)	100	95.83	93.94
Blue Ridge CC	90	100	98.11	96.04
Brunswick CC	(88)	100	98.53	95.51
Caldwell CC & TI	93	100	98.98	97.33
Cape Fear CC	92	100	97.73	96.58
Carteret CC	(83)	100	98.32	93.77
Catawba Valley CC	92	100	97.75	96.58
Central Carolina CC		99.04	96.69	97.87
Central Piedmont CC	90	99.66	98.49	96.05
Cleveland CC	91	100	97.93	96.31
Coastal Carolina CC		99.5	96.36	97.93
College of Albemarle	91	99.54	98.37	96.30
Craven CC		99.3	96.92	98.11
Davidson County CC	95	100	98.52	97.84
Durham TCC	91	100	99.12	96.71
Edgecombe CC	92	99.28	99.19	96.82
Fayetteville TCC		99.87	98.4	99.14
Forsyth TCC	93	100	98.5	97.17
Gaston College	93	100	96.15	96.38
Guilford TCC	93	100	98.11	97.04
Halifax CC	91	99.25	99.46	96.57
Haywood CC	(86)	99.6	94.87	93.49
Isothermal CC	91	100	96.83	95.94
James Sprunt CC	91	99.39	97.09	95.83
Johnston CC	91	99.82	98.11	96.31
Lenoir CC	92	99.22	97.6	96.27
Martin CC	(85)	100	94.96	93.32
Mayland CC	(85)	100	96.72	93.91
McDowell TCC	92	99.26	99.23	96.83
Mitchell CC	96	100	100	98.67
Montgomery CC	92	100	96.08	96.03
Nash CC	96	100	98.76	98.25
Pamlico CC	95	100	98.04	97.68
Piedmont CC	90	100	99.64	96.55
Pitt CC	94	100	98.03	97.34
Randolph CC	96	100	99.18	98.39
Richmond CC	92	100	97.25	96.42
Roanoke-Chowan CC	92	100	98.56	96.85
Robeson CC	92	100	98.27	96.76
Rockingham CC	90	100	97.52	95.84
Rowan Cabarrus CC	97	99.69	96.21	97.63
Sampson CC	97	100	98.05	98.35
Sandhills CC	95	99.68	97.92	97.53
South Piedmont	96	100	99.34	98.45
Southeastern CC	91	100	98.5	96.50
Southwestern CC	(89)	100	98.7	95.90
Stanly CC	90	100	98.62	96.21
Surry CC	95	100	98.03	97.68
Tri-County CC	93	98.59	96.91	96.17
Vance-Granville CC	93	100	95.73	96.24
Wake TCC	91	99.6	97.55	96.05
Wayne CC		99.35	97.55	98.45
Western Piedmont CC	95	99.69	97.7	97.46
Wilkes CC	95	99.56	95.44	96.67
Wilson CC	95	100	96.68	97.23

()=indicates colleges that did not meet the standard; []=colleges awarded SIs

Table 4.28 System-wide results of performance measure four for the 1998-99 reporting year.

Performance Measure 4: 1998-99	
<i>N</i>	53
Mean	91.9811321
Median	92
Mode	91
Standard Deviation	2.85879591
Sample Variance	8.17271
Range	14
Minimum	83
Maximum	97

For the 1998-99 reporting year, the difference in scores included a minimum of 83% and a maximum of 97% yielding a moderate range of 14%. The typical score for this year fell at 91.98% and had a narrow deviation from the mean at 2.86. Both the median and mode fell at the same point, 91%.

Table 4.29 System-wide results of performance measure four for the 1999-2000 reporting year.

Performance Measure 4: 1999-2000	
<i>N</i>	58
Mean	99.804310
Median	100
Mode	100
Standard Deviation	.316294955
Sample Variance	.1000425
Range	1.41
Minimum	98.59
Maximum	100

At .32, there was minimal deviation from the average score of 99.8%. The scores ranged 1.41% (98.59% to 100%). Both the range and the standard deviation

were incredibly small for this year, indicative of little variability among the scores. The frequency distribution of scores includes the mean, the mode and the median, which were separated by only one percent. Further, the mode and the median fall at the same point—100%.

Table 4.30 System-wide results of performance measure four for the 2000-2001 reporting year.

Performance Measure 4: 2000-2001	
<i>N</i>	58
Mean	97.7606897
Median	98.03
Mode	98.11
Standard Deviation	1.17030789
Sample Variance	1.36962057
Range	5.13
Minimum	94.87
Maximum	100

The 2000-01 reporting year results included both a small standard of deviation (1.17%) and range (5.13%). The mean, mode, and median clustered within less than one percent for each other—97.76%, 98.11% and 98.03% respectively.

Data for the fourth performance measure—employment status of community college graduates—yielded several extremely different box plots. For 1998-99, the data set is slightly skewed to the right. Data also seem to cluster between Q1 (91%) and the median (92%). The range for this data set is from 83 to 97 percent with one outlier (Carteret Community College) at 83%.

The second year of the study includes an extremely small distribution of scores with a range of 98.59 to 100 percent. With less than two percent difference in these scores, two outliers appear (Lenior Community College and Tri-County Community College) at 99.2 and 98.59 percent respectively. For 1999-00, only two quartiles are represented in the box plot.

With a range of five percent (94.87 to 100), scores for the third year are more balanced than the previous two years. This is the only date set for the fourth performance measures that does not include outlying scores.

Over this three-year time span, there was a very large increase for the performance measure from '98 to '99 with a small decrease the following year. Scores during this time were primarily at 85 percent and above. However, the box plots indicate a noticeable increase in percentages between '98 and '99. The maximum score rose slightly from the first to the second year and then maintained for the third year. Yet, the minimum score increased drastically from '98 to '99. This was followed by a slight decline for '00. According to the box plots, there was also a dramatic change in the spread of the data with a much larger spread in '98, an extremely small spread in '99 and a slight increase in the spread in '00.

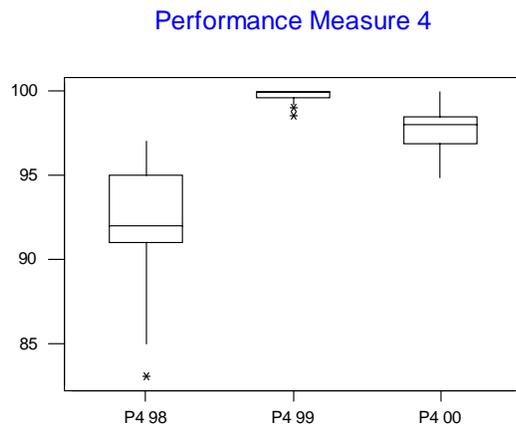


Figure 4.4. *Performance by North Carolina community colleges on fourth PBB standard—employment status of community college graduates—from 1998-2001.*

Table 4.31 Difference in scores for NC community college between 1998-2001 for the fourth performance measure.

College	Difference between 1 st & 2 nd year	Difference between 2 nd & 3 rd years	Overall Difference
Alamance CC	5.76	-2.51	3.25
Asheville-Buncombe TCC	7.00	-2.56	4.44
Beaufort County CC	5.00	-1.70	3.30
Bladen CC	14.00	-4.17	9.83
Blue Ridge CC	10.00	-1.89	8.11
Brunswick CC	12.00	-1.47	10.53
Caldwell CC & TI	7.00	-1.02	5.98
Cape Fear CC	8.00	-2.27	5.73
Carteret CC	17.00	-1.68	15.32
Catawba Valley CC	8.00	-2.25	5.75
Central Carolina CC	99.04	-2.35	96.69
Central Piedmont CC	9.66	-1.17	8.49
Cleveland CC	9.00	-2.07	6.93
Coastal Carolina CC	99.50	-3.14	96.36
College of Albemarle	8.54	-1.17	7.37
Craven CC	99.30	-2.38	96.92
Davidson County CC	5.00	-1.48	3.52
Durham TCC	9.00	-0.88	8.12
Edgecombe CC	7.28	-0.09	7.19
Fayetteville TCC	99.87	-1.47	98.40
Forsyth TCC	7.00	-1.50	5.50
Gaston College	7.00	-3.85	3.15
Guilford TCC	7.00	-1.89	5.11
Halifax CC	8.25	0.21	8.46
Haywood CC	13.60	-4.73	8.87
Isothermal CC	9.00	-3.17	5.83
James Sprunt CC	8.39	-2.30	6.09
Johnston CC	8.82	-1.71	7.11
Lenoir CC	7.22	-1.62	5.60
Martin CC	15.00	-5.04	9.96
Mayland CC	15.00	-3.28	11.72
McDowell TCC	7.26	-0.03	7.23
Mitchell CC	4.00	0.00	4.00
Montgomery CC	8.00	-3.92	4.08
Nash CC	4.00	-1.24	2.76
Pamlico CC	5.00	-1.96	3.04
Piedmont CC	10.00	-0.36	9.64
Pitt CC	6.00	-1.97	4.03
Randolph CC	4.00	-0.82	3.18
Richmond CC	8.00	-2.75	5.25
Roanoke-Chowan CC	8.00	-1.44	6.56
Robeson CC	8.00	-1.73	6.27
Rockingham CC	10.00	-2.48	7.52
Rowan Cabarrus CC	2.69	-3.48	-0.79
Sampson CC	3.00	-1.95	1.05
Sandhills CC	4.68	-1.76	2.92
South Piedmont	4.00	-0.66	3.34
Southeastern CC	9.00	-1.50	7.50
Southwestern CC	11.00	-1.30	9.70
Stanly CC	10.00	-1.38	8.62
Surry CC	5.00	-1.97	3.03
Tri-County CC	5.59	-1.68	3.91
Vance-Granville CC	7.00	-4.27	2.73
Wake TCC	8.60	-2.05	6.55
Wayne CC	99.35	-1.80	97.55
Western Piedmont CC	4.69	-1.99	2.70
Wilkes CC	4.56	-4.12	0.44
Wilson CC	5.00	-3.32	1.68

Table 4.31 displays the difference in performance by each of North Carolina's community colleges for this three-year span. For the 1998-99 to 1999-00 reporting years, several numbers are elevated for several colleges who failed to qualify for inclusion during the first year, and therefore, have a recorded difference of 99.04% (Central Carolina Community College), 99.50% (Coastal Carolina Community College), 99.30% (Craven Community College), 99.87% (Fayetteville Technical Community College), and 99.35% (Wayne Community College). Overall, the colleges' scored an improvement of 2.69% to 99.87% providing a very extensive range of 97.18%. With such a wide-range of scores, the typical rate for improvement was 15.74%.

Analysis of the scores that fell within a normal distribution pattern (excluding those in the 90s) marks a strong improvement by Carteret Community College (17%). Furthermore, it should be noted that all community colleges improved on the fourth performance standard between 1998-99 and 1999-00.

The average difference between scores for the second and third years of performance-based budgeting was a decrease of 2.04%. The range of scores fell at 5.25% (-5.04% to .21%). This is a small range and reflective of the overall high scores achieved by many of these college for 1999-00 and 2000-01.

An overall difference in scores from 1998-2001 had a range of 99.19% (-0.79% to 98.4%). Although several community colleges had improvements recorded as 90% or greater, a normal distribution of scores included high marks of improvement from Carteret Community College (15.32%) and Mayland Community College (11.72%).

The only college represented by a decrease in this column was Rowan-Cabarrus Community Colleges at -0.79% .

Table 4.32 Summary of descriptive statistics for the fourth performance measure.

Reporting Year	% of colleges who met or exceeded the standard	% of colleges whose performance improved	Mean scores for all community colleges	Mode scores for all community colleges	Score distribution according to Box Plots
1998-99	79%		91.98	91	Skewed to the right
1999-00	100%	100%	99.8	100	Skewed to the right
2000-01	100%	3%	97.76	98.11	Skewed to the right

Conclusion: From 1998 to 2001, the distribution of scores for North Carolina's fifty-eight community colleges was consistently high with means of 91.98%, 99.8%, and 97.76% respectively. The other measure of central tendency included in Table 4.32, also reported high scores with modes of 91%, 100%, and 98.11%. Further, the percent of community colleges in North Carolina who either met or exceeded this standard either increased or maintained over this three-year period. After reaching a 100% success rate for the fourth performance measure, many colleges were unable to improve on their high level of performance during 2000-01. Overall, it would appear that many of the colleges initially achieved a high standard and maintained it.

Performance Measure 5: Performance of College Transfer Students

Research Question 1E: *Did North Carolina's community college demonstrate a rate of progress on the fifth performance measure—the performance of college transfer students—over a three-year period?*

Standard: The performance of community college students/graduates once they have transferred to a four-year college or university is the focus of the fifth performance measure. Two cohort analyses are used for this measure. One compares the performance of community college graduates entering public universities in the fall with the performance of “native” juniors at the end of two semesters. The other cohort analysis compares the performance of former community college students, who transferred to four-year, post-secondary institutions after completing 24 or more hours at a community college but did not earn a degree, with the performance of native sophomores. For accountability purposes, there must be at least ten students enrolled at a four-year institution for a community college to participate in this measure. These two cohorts are combined for analysis of this standard that mandates 84.6% of transfers earn a GPA of 2.0 or higher after completing one year at a four-year institution.

Data included in the *Critical Success Factors Report* for this measure are typically two or more years old. For example, the 2001 report presented data from the 1997-98 academic year. The time lag is a result of guidelines that allow students up to two years after leaving the community college to transfer. Another problem arose when the System office discovered that the combined GPA for the two native populations in North Carolina was actually 82.9%, not 84.6%. Due to the inaccuracy of the standard, it

was reviewed and changed by the State Board of Community Colleges for the 2000-01 reporting year.

Findings:

The sample size for this measure greatly fluctuates between 1998 and 2001. For the first year, 42 colleges (N=42) met the qualifications for participation. That number declined by more than fifty percent the second year when only 20 community colleges (N=20) were included in the *Critical Success Factors Report*. The following year saw another rise in participation as 41 schools (N=41) met the requirements set forth in GS115D-31.3.

Categorical Data

The categorical data for the final core performance measure includes both categories of transfer students in this standard—community college graduates as well as students who have earned 24+ credit hours from a community college. Refer to Table 4.33 for details regarding the categorical data for the fifth measure.

Table 4.33 Performance of college transfer students for NC community colleges reported as categorical data.

College	1998-1999	1999-2000	2000-2001
Alamance CC			
Asheville-Buncombe TCC	*	**	***
Beaufort County CC	*	**	
Bladen CC			
Blue Ridge CC		***	***
Brunswick CC	*	**	**
Caldwell CC & TI	*	***	***
Cape Fear CC	*	**	
Carteret CC	*		
Catawba Valley CC	***		**
Central Carolina CC	*	**	***
Central Piedmont CC	*	**	
Cleveland CC	*		**
Coastal Carolina CC	***	***	***
College of Albemarle	***	***	***
Craven CC	*		**
Davidson County CC	*		
Durham TCC	*		**
Edgecombe CC			**
Fayetteville TCC	*	***	***
Forsyth TCC	*	**	**
Gaston College	*		**
Guilford TCC	***		**
Halifax CC			**
Haywood CC	*	**	***
Isothermal CC	*	**	***
James Sprunt CC	*		**
Johnston CC	*		**
Lenoir CC	*	**	**
Martin CC			**
Mayland CC	***		***
McDowell TCC			
Mitchell CC	*	***	
Montgomery CC			
Nash CC	*		**
Pamlico CC			
Piedmont CC	*		***
Pitt CC	*		
Randolph CC		***	
Richmond CC			**
Roanoke-Chowan CC			
Robeson CC	*	**	
Rockingham CC	*		**
Rowan Cabarrus CC	*		**
Sampson CC	*		**
Sandhills CC	*		**
South Piedmont			
Southeastern CC	*	***	***
Southwestern CC			
Stanly CC			**
Surry CC	*		***
Tri-County CC	*		***
Vance-Granville CC	*		***
Wake TCC	*		***
Wayne CC	*		**
Western Piedmont CC	*		**
Wilkes CC	*	**	***
Wilson CC			**

*=1 or failed to meet the measure; **=2 or met because of SI; ***=3 or met the measure based on merit.

For the 1998-99 reporting year, the sample included 42 community colleges with 8% of the colleges that participated successfully meeting the standard and 92% of them were unsuccessful in this endeavor.

Only 20 of the 58 North Carolina community colleges qualified to participate during the 1999-00 reporting year. Of the 20 colleges who were able to participate on the fifth measure, 100% of them met or exceeded the standard—40% of them complied with the standard outright, and 60% met it through a significant improvement award. However, 66% of the 58 colleges were unable to meet the requirements for eligibility.

The following year, community colleges who met the qualifications of the fifth standard almost doubled to 41 schools. Of these colleges, 100% (16 merit-based and 25 significant improvements) of them met the standard of an 82.9 or greater GPA required of students who have transferred from community colleges. Seventeen colleges failed to meet the requirements of this standard for the 2000-01 reporting year. Over this three-year span, two colleges managed to achieve this standard for all three years: Coastal Carolina Community College and College of Albemarle. Seventeen community colleges were unable to comply with this state mandate or to qualify for inclusion during these same years: Alamance Community College, Beaufort County Community College, Bladen Community College, Cape Fear Community College, Carteret Community College, Central Piedmont Community College, Davidson Community College, McDowell Technical Community College, Mitchell Community College, Montgomery Community College, Pamlico Community College, Pitt Community

College, Randolph Community College, Roanoke-Chowan Community College, Robeson Community College, South Piedmont and Southwestern Community College.

Table 4.34 Percent of NC community colleges who met or exceed the standard required by the fifth performance measure.

	1998-1999	1999-2000	2000-2001
Percent of community colleges who met the standard at 84% level	8%	100%	100%
Percent who did not meet the standard at the 84% level	92%	0%	0%

Percentages for this measure are based on the colleges who qualified for participation on this standard (e.g. for 1998-99, $N=42$; for 1999-00, $N=20$; for 2000-01, $N=41$).

Continuous Data

Table 4.35 reports the data for this measure in its original form as percentages or as continuous variables. The table includes the aggregate scores for each community college with respect to the fifth performance measure—performance of college transfer students.

Table 4.35 Performance of college transfer students reported as percentages/continuous data.

College	1998-1999	1999-2000	2000-2001	Mean
Alamance CC		(74)		74
Asheville-Buncombe TCC	(72.2)	[82]	93.5	82.5667
Beaufort County CC	(72.7)	[77]	(76)	75.2333
Bladen CC			(82.4)	82.4
Blue Ridge CC		89	90.3	89.65
Brunswick CC	(52.9)	[62]	[71.9]	62.2667
Caldwell CC & TI	(71.4)	84	85.3	80.2333
Cape Fear CC	(62.7)	[77]	(75.1)	71.6
Carteret CC	(70)		(78.9)	74.45
Catawba Valley CC	100	(62)	[81]	81
Central Carolina CC	(75)	[80]	85	80
Central Piedmont CC	(73.1)	[80]	(80.2)	77.7667
Cleveland CC	(73.9)	(63)	[80]	72.3
Coastal Carolina CC	86.9	84	84.2	85.0333
College of Albemarle	84.4	87	95.4	88.9333
Craven CC	(77.4)	(72)	[75.2]	74.8667
Davidson County CC	(82.8)	(82)	(71.4)	78.7333
Durham TCC	(80.6)	(77)	[78.2]	78.6
Edgecombe CC		(58)	[70.6]	64.3
Fayetteville TCC	(82.8)	89	88.4	86.7333
Forsyth TCC	(55.6)	[73]	[75.3]	67.9667
Gaston College	(55.8)	(60)	[72.9]	62.9
Guilford TCC	85.3	(76)	[79.5]	80.2667
Halifax CC		(60)	[70.6]	65.3
Haywood CC	(65.4)	[74]	82.9	74.1
Isothermal CC	(42.9)	[71]	90	67.9667
James Sprunt CC	(79)	(59)	[71]	69.6667
Johnston CC	(73.3)	(67)	[74.7]	71.6667
Lenoir CC	(73.3)	[77]	[82]	77.4333
Martin CC		(53)	[80]	66.5
Mayland CC	100	(79)	87.5	88.8333
McDowell TCC		(74)	(74.2)	74.1
Mitchell CC	(74.2)	85	(81)	80.0667
Montgomery CC				0
Nash CC	(78.6)	(78)	[81.3]	79.3
Pamlico CC				0
Piedmont CC	(73.3)	(64)	93.8	77.0333
Pitt CC	(77.5)	(79)	(78.1)	78.2
Randolph CC		89	(81.3)	85.15
Richmond CC		(58)	[70.6]	64.3
Roanoke-Chowan CC				0
Robeson CC	(75)	83	(80)	79.3333
Rockingham CC	(79.2)	[75]	[81.6]	78.6
Rowan Cabarrus CC	(68.2)	(66)	[76.4]	70.2
Sampson CC	(83.3)	(63)	[72.4]	72.9
Sandhills CC	(77.2)	(69)	[76.4]	74.2
South Piedmont				
Southeastern CC	(71.4)	91	90.4	84.2667
Southwestern CC		(74)	(69.1)	71.55
Stanly CC		(64)	[75]	69.5
Surry CC	(78.8)	(77)	85	80.2667
Tri-County CC	(83.3)	(75)	96.3	84.8667
Vance-Granville CC	(72.4)	(72)	88.1	77.5
Wake TCC	(81.8)	(82)	93.4	85.7333
Wayne CC	(82.4)	(71)	[78.9]	77.4333
Western Piedmont CC	(82.2)	(73)	[75.2]	76.8
Wilkes CC	(80.6)	[82]	88.8	83.8
Wilson CC		(70)	[81.9]	75.95

()=indicates colleges that did not meet the standard; []=colleges awarded SIs.

Table 4.36 System-wide results of performance measure five for the 1998-99 reporting year.

Performance Measure 5: 1998-99	
<i>N</i>	42
Mean	75.44762
Median	76.1
Mode	73.3
Standard Deviation	10.7850447
Sample Variance	116.3172
Range	57.1
Minimum	42.9
Maximum	100

Table 4.36 presents the data included in the 1998-99 report, which yielded an average score of 75.45%—almost 10 percent lower than the standard of 84 for that year. The median score was 76%; the mode was 73%; and the standard of deviation was 10.79. Scores for this year included a minimum of 43% and a maximum of 100% resulting in a range of 57%. The moderate standard deviation and large range are indicative of outliers or an extremely diverse performance on the part of these colleges.

Table 4.37 System-wide results of performance measure five for the 1999-2000 reporting year.

Performance Measure 5: 1999-2000	
<i>N</i>	52
Mean	73.88462
Median	74.5
Mode	77
Standard Deviation	9.352894
Sample Variance	87.47662
Range	38
Minimum	53
Maximum	91

Only 74% of the colleges qualified for participation on this performance measure for the second year. These scores yielded descriptive statistics that fell within three percent of each other with a mean of 75.44%, and the median and the mode at 78%. The range of 41% (50% to 91%) was rather broad. Scores typically deviated at a moderate level from the mean at 9.32.

Table 4.38 System-wide results of performance measure five for the 2000-2001 reporting year.

Performance Measure 5: 2000-2001	
<i>N</i>	53
Mean	80.7283
Median	80
Mode	80
Standard Deviation	7.17845
Sample Variance	51.53015
Range	27.2
Minimum	69.17
Maximum	96.3

The average score for community colleges on the fifth measure, which focuses on the average grade point average (GPA) earned by college transfer students for the 2000-2001 year, was 78.73%, with a moderate standard deviation of 7.15%. The mode and the median were located at 71.6% and 77.25% respectively. On this particular measure, scores had a range of 28% with a minimum score of 66.7% and a maximum of 95%. This is still a large range, but smaller than the previous year.

The data for the fifth performance measure ranged from 42.9 to 100 percent in 1998-99 with five outliers (Catawba Valley Community College, Gaston College, Forsyth Technical Community College, Caldwell Community College and Technical Institute, and Isothermal Community College) at 100, 55.8, 55.6, 52.9 and 42.9 percent. Excluding outlying scores, the box plot for the first year shows an almost balanced distribution of scores as the data are distributed almost equally among the quartiles.

The second year included a range from 53 to 91 percent. Data for the second year are represented by a slightly longer box, which demonstrates a little more diverse data than 1998-99 and 2000-01. One outlier (Martin Community College) is located at 53%.

In 2000-01, the data yielded a range from 69.1 to 94 percent. College scores appear to be fairly equitable throughout the quartiles on the fifth performance measure with a 5% difference between the minimum and Q1, 5% difference between Q1 and the median, 5% difference between the median and Q3, and 11% difference between Q3 and the maximum score. The greatest concentration of scores is located in the second quartile. This is the only data set for the third performance measure without any outliers.

From 1998 to 2001, there was not much change in performance measure 5. The medians for each year remain fairly constant in the mid-70's to low-80's. There is a slight dip for both the maximum and the minimum scores from '98 to '99 with a rise from '99 to '00. This pattern is also reflected in the 75th percentile. According to the box plots, the variation in scores increased slightly from year to year.

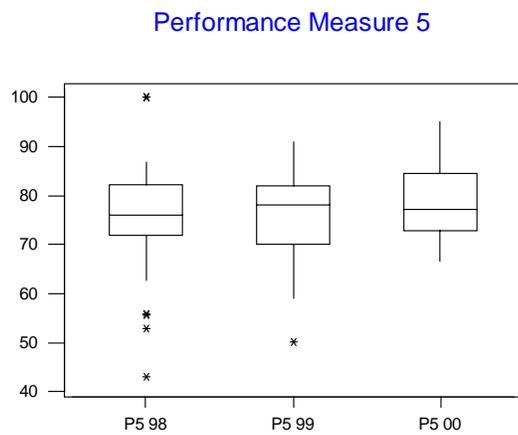


Figure 4.5 *Performance by North Carolina community colleges on fifth PBB standard—success rate for college transfer students—from 1998-2001.*

Table 4.39 Difference in scores for NC community college between 1998-2001 for the fifth performance measure.

College	Difference between 1 st & 2 nd years	Difference between 2 nd & 3 rd years	Overall Difference
Alamance CC	74	-74	0
Asheville-Buncombe TCC	9.8	11.5	21.3
Beaufort County CC	4.3	-1	3.3
Bladen CC	0	82.4	82.4
Blue Ridge CC	89	1.3	90.3
Brunswick CC	9.1	9.9	19
Caldwell CC & TI	12.6	1.3	13.9
Cape Fear CC	14.3	-1.9	12.4
Carteret CC	-70	78.9	8.9
Catawba Valley CC	-38	19	-19
Central Carolina CC	5	5	10
Central Piedmont CC	6.9	0.2	7.1
Cleveland CC	-10.9	17	6.1
Coastal Carolina CC	-2.9	0.2	-2.7
College of Albemarle	2.6	8.4	11
Craven CC	-5.4	3.2	-2.2
Davidson County CC	-0.8	-10.6	-11.4
Durham TCC	-3.6	1.2	-2.4
Edgecombe CC	58	12.6	70.6
Fayetteville TCC	6.2	-0.6	5.6
Forsyth TCC	17.4	2.3	19.7
Gaston College	4.2	12.9	17.1
Guilford TCC	-9.3	3.5	-5.8
Halifax CC	60	10.6	70.6
Haywood CC	8.6	8.9	17.5
Isothermal CC	28.1	19	47.1
James Sprunt CC	-20	12	-8
Johnston CC	-6.3	7.7	1.4
Lenoir CC	3.7	5	8.7
Martin CC	53	27	80
Mayland CC	-21	8.5	-12.5
McDowell TCC	74	0.2	74.2
Mitchell CC	10.8	-4	6.8
Montgomery CC	0	0	0
Nash CC	-0.6	3.3	2.7
Pamlico CC	0	0	0
Piedmont CC	-9.3	29.8	20.5
Pitt CC	1.5	-0.9	0.6
Randolph CC	89	-7.7	81.3
Richmond CC	58	12.6	70.6
Roanoke-Chowan CC	0	0	0
Robeson CC	8	-3	5
Rockingham CC	-4.2	6.6	2.4
Rowan Cabarrus CC	-2.2	10.4	8.2
Sampson CC	-20.3	9.4	-10.9
Sandhills CC	-8.2	7.4	-0.8
South Piedmont			
Southeastern CC	19.6	-0.6	19
Southwestern CC	74	-4.9	69.1
Stanly CC	64	11	75
Surry CC	-1.8	8	6.2
Tri-County CC	-8.3	21.3	13
Vance-Granville CC	-0.4	16.1	15.7
Wake TCC	0.2	11.4	11.6
Wayne CC	-11.4	7.9	-3.5
Western Piedmont CC	-9.2	2.2	-7
Wilkes CC	1.4	6.8	8.2
Wilson CC	70	11.9	81.9

The rate of progress among North Carolina community colleges regarding the performance of graduates once they have transferred to a four-year college or university is illustrated in Table 4.39. This table presents the difference—according to percentages—in scores from 1998-99 to 1999-00 and 1999-00 to 2000-01. Table 4.39 lists the overall difference during these three years.

There was an average difference of 11.81% between the first and second years of this study. A distribution of scores included a minimum of -70% and a maximum of 89%, resulting in an expansive range of 159%. This data set is impacted by several outliers: Alamance Community College (89%), Blue Ridge Community College (89%), Carteret Community College (-70%), Catawba Valley Community College (-38%), Edgecombe Community College (58%), Halifax Community College (60%), McDowell Technical Community College (74%), Randolph Community College (89%), Richmond Community College (58%), Southwestern Community College (74%), and Stanly Community College (64%). An element shared by these outliers was the failure to record a score for either 1998-99 or 1999-00. Excluding the outliers, the school demonstrating the greatest improvement was Isothermal Community College at 28.10%, and Sampson Community College recorded the poorest performance with a decline of 20.3%.

The difference in scores between 1999-00 and 2000-01 resulted in an average improvement of 7.67%. The range was comparable to the previous year at 156.4% (-74% to 82.4%). The data for these years contained two outliers—Bladen Community College (82.4%) and Carteret Community College (78.9%). Taking into consideration the colleges within the normal distribution of scores, top marks go to Piedmont

Community College, which improved by 29.8%; whereas, Davidson Community College reported the greatest decline from 82% to 71.4% or a decrease of 10.6%.

A summary of the community college scores reports twelve community colleges with an overall decline in performance: Catawba Valley Community College (-19%), Coastal Carolina Community College (-2.7%), Craven Community College (-2.2%), Davidson Community College (-11.4%), Durham Technical Community College (-2.4%), Guilford Technical Community College (-5.8%), James Sprunt Community College (-8%), Mayland Community College (-12.50%), Sampson Community College (-10.9%), Sandhills Community College (-0.8%), Wayne Community College (-3.5%), and Western Piedmont Community College (-7%). Improvements were recorded by the remaining 40 colleges who qualified for this standard with several outstanding performances by the following: Asheville-Buncombe Technical Community College (21.3%), Forsyth Technical Community College (19.7%), Gaston College (17.1%), Haywood Community College (17.5%), Piedmont Community College (20.5%), and Southeastern Community College (19%). Overall performance also contains twelve outliers: Bladen Community College (82.4%), Blue Ridge Community College (90.3%), Edgecombe Community College (70.6%), Halifax Community College (70.6%), Isothermal Community College (47.1%), Martin Community College (80%), McDowell Technical Community College (74.2%), Randolph Community College (81.3%), Richmond Community College (70.6%), Southwestern Community College (69.1%), Stanly Community College (75%), and Wilson Community College (81.9%).

Table 4.40 Summary of descriptive statistics for the fifth performance measure.

Reporting Year	% of colleges who met or exceeded the standard	% of colleges whose performance improved	Mean scores for all community colleges	Mode scores for all community colleges	Score distribution according to Box Plots
1998-99	8%*		75.45	73.3	Skewed to the right
1999-00	100%*	53%	75.44	78	Slight skew to the right
2000-01	100%*	74%	78.73	71.6	Slight skew to the left

*Percentages for this measure are based on the colleges who qualified for participation on this standard (e.g. for 1998-99, $N=42$; for 1999-00, $N=20$; for 2000-01, $N=41$).

Conclusion: The fifth performance measure, which focuses on the GPA of transfer students from community colleges versus those of students native to four-year colleges and universities, saw an important adjustment to the standard in 2000-01 when it was lowered from 84% to the state average of 82.9%. Also, the adjustment to the standard accompanied by the award for significant improvements by NCCCS beginning with 1999-00 may have impacted the percent of community colleges who met or exceeded the standard as well as the percent of colleges whose performance improved from year-to-year. Of the North Carolina's fifty-eight community colleges, only 9% were successful in meeting this standard for 1998-99. This figure rose dramatically in 1999-00 and 2000-01 when 100% of the colleges met this standard.

For each of the three years included in this study, the distribution of scores for North Carolina's fifty-eight community colleges was consistently below the aggregate standards of 84% (for 1998-99 and 1999-00) and 82.9% (for 2000-01) at 75.45%, 75.44%, and 78.73% respectively. The most frequently occurring scores, the modes, were also below the level set by this standard at 73.3%, 78% and 71.6%. Based on the rate of improvement among these colleges in meeting the standard and the percent who

have steadily improved upon their performance, it would appear that these schools are making greater strides toward consistently achieving this measure. However, when reviewing the measures of central tendency included in Table 4.40, there is some doubt about the overall success of this performance since none of these scores are above the established standard.

Research Question 2

Research Question 2: *What is the impact, if any, of certain independent variables on dependent values or performance measures? For more details regarding the variables incorporated into this part of the study, refer to the schematic outlining this process on the following page.*

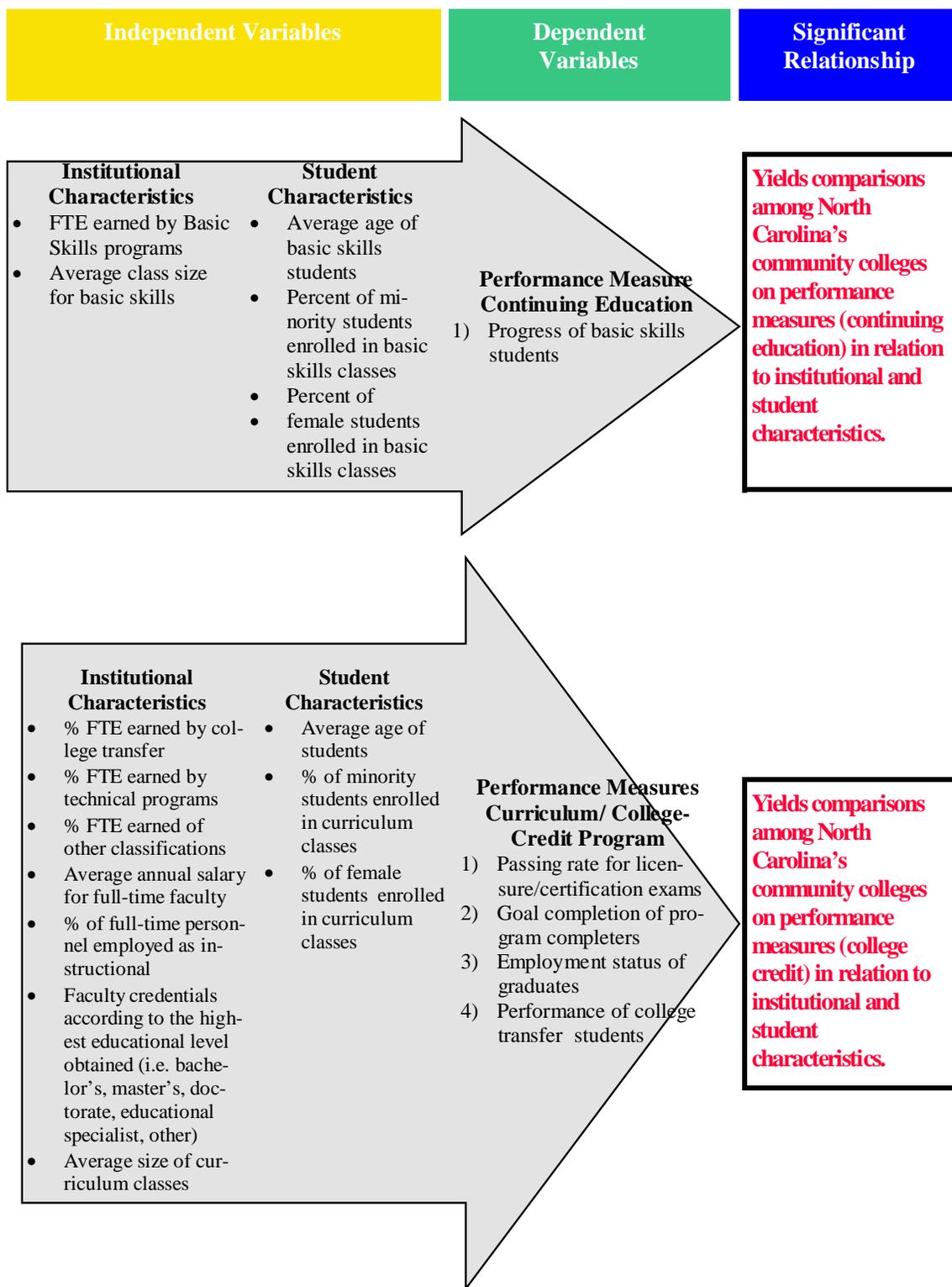


Figure 4.6 Conceptual Schema for dissertation study with respect to correlation and regression analyses.

The purpose of the second research question was to determine if any statistically significant relationships existed between a community college's performance on each of the five core measures and several independent variables classified as institutional and student characteristics. In each case, these characteristics were selected in terms of their relevance to the performance measure. The independent variables were selected as they provided a wide-range of information about each community college that for the most part remains fairly static from year-to-year. These variables were significant to this particular study since they offer a comprehensive picture of college and student demographics. For example, full-time equivalents (FTEs) were selected as it represents information vital in several areas. FTE is representative of the size of a community college based on contact hours. Further, in accordance with state guidelines, FTE also functions on a monetary level as well, since it determines the operational budget awarded to a community college by the North Carolina Community College System. Variables for this study are defined in Table 4.41.

Table 4.41 Definitions of variables used in correlation testing and regression analyses.

Code	Definition
Dependent Variables	
<u>Perf100</u>	Percent of students who progress within the basic skills program. The standard for this performance measures requires that 74% of them to progress for the 2000-01 reporting year.
<u>Perf200</u>	Percent of first-time, test takers for certification and licensure examinations that who are successful on such tests. The standard for the second performance measure requires an aggregate institutional passing rate of 80% for the 2000-01 reporting year.
<u>Perf300</u>	Percent of community college graduates (completers) who express satisfaction in meeting their educational goals while in attendance at a community college. For 2000-01, this standard was set at 95%.
<u>Perf400</u>	Percent of community college graduates who are employed within one year of completing their studies. The standard for this measure requires that 90% of community college graduates will be employed within one year of leaving college.
<u>Perf500</u>	Percent of students who have completed 24+ hours at a community college and community colleges graduates who maintain a GPS of 2.0 or higher after one year at a four-year institution. For the 2000-01 reporting year, this standard was set at 82.9%.
Independent Variables	
<u>FTEBS</u>	The percent of total FTE earned by Basic Skills Programs
<u>BSClass</u>	Average class size for Basic Skills classes.
<u>BSAge</u>	Average age for students enrolled in Basic Skills classes.
<u>BSMinor</u>	Percent of students enrolled in Basic Skills classes that are non-Caucasian.
<u>BSFemale</u>	Percent of female students enrolled in Basic Skills classes.
<u>FTECT</u>	The percent of total FTE earned through students enrolled in College Transfer programs
<u>FTET</u>	The percent of total FTE earned through students enrolled in terminal, technical or vocational programs
<u>FTEOther</u>	The percent of total FTE earned through curriculum or college-credit students enrolled as special students or other programs not classified as either college transfer or technical programs.
<u>Fac Salary</u>	Average faculty salary per month (multiplied x12 to get a yearly figure)
<u>FT</u>	Full-time personnel
<u>FCOther</u>	Percent of college credit instructional staff whose highest degree is less than a bachelor's degree.
<u>FCBach</u>	Percent of college credit instructional staff whose highest degree is a bachelor's degree.
<u>FCMast</u>	Percent of college credit instructional staff whose highest degree is a master's degree.
<u>FCDoct</u>	Percent of college credit instructional staff whose highest degree is a doctoral degree.
<u>FCEdSpec</u>	Percent of college credit instructional staff whose highest degree is an education specialist.
<u>CCClass</u>	Average class size for college credit programs
<u>CCAge</u>	Average age of students enrolled in college credit classes
<u>CCMinor</u>	Percent of students enrolled in college credit classes that are non-Caucasian.
<u>CCFemale</u>	Percent of female students enrolled in college credit classes.

Data used to answer the second research question were obtained from the System's data warehouse program for the 2000-01 academic year or from the 2002 *Critical Success Factors Report*.

Steps taken for each performance measure in addressing this research question included:

- 1) Independent and dependent variables were plotted in an effort to look for linear and quadratic relationships;
- 2) Tests of correlation were run to analyze the possible sharing of information among independent and dependent variables. The goal of this step was to look for independent variables that are significantly correlated with each other and/or with the dependent variable or performance measure;
- 3) The correlations matrix was reviewed to determine if issues of multicollinearity between independent variables existed and could affect the reliability of the test results;
- 4) Test for curvature in scatter plots to determine the possible existence quadratics;
- 5) Hypothesis testing (Nested F tests) were performed to determine if the model should be modeled as linear, quadratic or interaction;
- 6) Additional hypothesis testing tested 1st order terms to find the best fit model;
and
- 7) Results from the hypothesis testing examined residuals for lack of fit of the model, outliers and deviations from the assumption in multiple regression.

Performance Measure 1: Progress of Basic Skills Students

H₀ Statement 1: *There is no relationship between the progress of basic skills students and pertinent institutional and student characteristics—1) percent of total FTE earned from basic skills programs (FTEBS), 2) average size for basic skills class (BSCClass), 3) average age of basic skills students, 4) percent of non-Caucasian students enrolled in basic skills classes (BSMinor) and 5) percent of female students participating in the basic skills program (BSFemale).*

Findings: Results for each of the performance measures were analyzed using both bivariate correlation and multivariate regression.

The relationship between the five core performance measures and a variety of institutional and students characteristics was explained using data from Pearson Correlation Coefficient and multiple regression models. Pearson Correlation Coefficient is one of the more appropriate instruments for analyzing continuous data as it assesses the nature of the relationship between two or more variables—including the possibility of a linear relationship between the dependent and independent values (Hatcher, 1999). In this case, the variables used were measured on a ratio scale.

Descriptive information for each of the individual variables is included in Table 4.42. Scatterplots were observed and any outliers that would significantly skew the results were removed so as to find the line (or curve) that best fit the majority of the data. Outliers were removed from full-time equivalents earned by basic skills programs (FTEBS) and the average basic skills class size (BSCClass).

Table 4.42 Univariate statistics for independent/dependent variables for the first performance measure.

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Perf100	58	79.44828	7.76897	4608	64.00000	94.00000
FTEBS	55	9.48274	4.12746	521.55060	2.26449	21.34345
BSClass	57	26.10526	8.13213	1488	13.00000	46.00000
BSAge	58	29.89655	2.33689	1734	22.80000	37.70000
BSMinor	58	57.00511	19.73999	3306	10.02088	87.38462
BSFemale	58	48.61333	9.66069	2820	28.82533	76.61795

The individual means, standard deviations, and sample sizes can be viewed in Table 4.43 for Perf100 (the first core performance measures reviewing the rate of progress for basic skills students), BSAge (average age of students enrolled in basic skills classes), BSMinor (percent of basic skills students classified as minority or non-Caucasian), BSFemale (percent of female students enrolled in basic skills classes), FTEBS (the percent of FTE a college earns through basic skills enrollments), and BSClass (average basic skills class size). Standard deviations appear small to moderate with the exception of the percent of minority students participating in basic skills classes at 19.74. The range of scores for these variables also seems moderate; however, wider ranges are apparent for BSMinor with a minimum score of 10% to a maximum of 87.38% and BSFemale from 28.83% to 76.62%.

Table 4.43 Pearson Correlation for Progress of Basic Skills students.

Pearson Correlation Coefficients, N = 58						
Prob > r under H0: Rho=0						
	Perf100	FTEBS	BSClass	BSAge	BSMinor	BSFemale
Perf100	1.00000	-0.04848 0.7252	0.02652 0.8447	0.10493 0.4331	-0.23446 0.0765	0.13191 0.3236
FTEBS	-0.04848 0.7252	1.00000	-0.11960 0.3890	-0.15019 0.2737	0.26938 *0.0467	-0.20813 0.1273
BSClass	0.02652 0.8447	-0.11960 0.3890	1.00000	-0.12501 0.3542	-0.08927 0.5090	-0.06476 0.6322
BSAge	0.10493 0.4331	-0.15019 0.2737	-0.12501 0.3542	1.00000	-0.08078 0.5467	0.24658 0.0621
BSMinor	-0.23446 0.0765	0.26938 *0.0467	-0.08927 0.5090	-0.08078 0.5467	1.00000	-0.37024 *0.0042
BSFemale	0.13191 0.3236	-0.20813 0.1273	-0.06476 0.6322	0.24658 0.0621	-0.37024 *0.0042	1.00000

*Indicates correlations significant at the .05 level.

Bold items indicate multicollinearity.

The correlation between each predictor variable and the progress of basic skills students (the first performance measure) are summarized in the Pearson Correlation Coefficient Matrix, Table 4.42. When the entire sample was considered, only one predictor variable, the percent of minority students enrolled in basic skills programs (BSMinor), was slightly correlated with this performance measure. The correlation between these values was minimal with an $r = -0.23446$ and a $p\text{-value} = 0.0765$. Correlations were also computed between the various independent measures with only two relationships of note: first, the percent of minority students enrolled in the basic skills programs (BSMinor) with the percent of female students enrolled in these classes (BSFemale), $r = -0.37024$, $p < .01$, and second, BSMinor with the percent of total FTE earned by basic skills programs (FTEBS), $r = 0.26938$, $p < .05$. These results indicate that as colleges record a greater percent of minority students enrolled in their basic skills programs, both the overall performance on this core measure and the percent of

female students enrolled in these classes decline. However, colleges earning a higher percent of FTE from basic skills program also had a larger percentage of minority students enrolled in these classes.

Each of these correlational relationships between independent measures also has a *p-value* less than or comparable to the alpha level of .05. This is statistically significant as the data indicate that there is a strong relationship between BSMInor and FTEBS, and BSMInor and BSFemale. Correlational relationships evident among several of the independent variables may also point out issues involving multicollinearity, and may work counteractively with each other during the regression process. This information is pertinent to the regression analysis since some of the variables may be providing some similar information which could impact the overall results. According to Agresti (1997), multicollinearity is fairly common with social science research when the explanatory, or predictor, variables are highly correlated. With regard to multiple regression, the impact is typically minimal when predictor variables are highly correlated with one another. However, one indicator of multicollinearity might be evident with a slight increase in R^2 . Since the explanatory variables may be sharing information, any single variable may specifically explain little variation with a given performance measure, but collectively, these variables could explain a lot of variation, R^2 .

Table 4.44 Stepwise Regression Model for Progress of Basic Skills Students.

The REG Procedure
Model: MODEL1
Dependent Variable: Perf100

Summary of Stepwise Selection

Step	Variable Entered	Number Vars In	Partial R-Square	Model R-Square	C(p)	F Value	Pr > F
1	BSMinor	1	0.0670	0.0670	-1.1603	3.73	0.0588

Data were then subjected to a stepwise multiple regression model. This process allows all five of the predictor variables to be examined simultaneously with the performance of basic skills students from each of the North Carolina community colleges. The model supporting this theory is as follows:

$$\text{Performance of Basic Skills (Perf100)} = 84.89264 + (-0.09853) \cdot \text{BSMinor}$$

This model implies that one of the independent variables—BSMinor—has the potential to impact a college’s performance on the first measures. For every 1 unit increase in the Performance of Basic Skills, the percent of minority students enrolled in basic skills classes (BSMinor) decreases by .0985. The stepwise regression noted that BSMinor also accounted for 7% of the sample variation in performance on the progress of basic skills students, $F 3.73, p = .0588, R^2 = .067$.

Conclusion: Although no strong correlations were found, one of the five variables—BSMinor—did show weak but significant correlation with the dependent variable, performance of basic skills students. This finding allows for the rejection of H_0 . The remaining four variables (FTEBS, BSFemale, BSAge, and BSCClass) were not found to be linearly related to the performance of basic skills. Furthermore, a regression model was created using these two variables to predict performance on basic skills programs. However, the coefficient of determination, $R^2 = .07$ suggests that the model is not very effective in predicting the performance on basic skills. This is a result of the fact that correlations between these two independent variables and the performance of basic skills were weak.

Performance Measure 2: Passing rate for first-time test-takers for certification and licensure examinations

H_0 Statement 2: *There is no relationship between the passing rate for first-time test-takers for certification and licensure examinations and pertinent institutional and student characteristics: passing rate for first-time test-takers for certification and licensure exams for the 2000-01 reporting year (Perf200), percent of a college's total FTE that is earned by students enrolled under a college transfer code (FTECT), percent of total FTE earned from students with a technical or vocational code (FTET), percent of total FTE earned from students enrolled as special students or other miscellaneous categories (FTEOther), average annual salary earned by full-time faculty (Fac_Salary),*

percent of full-time personnel employed as instructional for curriculum programs (FT), percent of full-time faculty whose educational background does not include a bachelor, master, doctorate or educational specialist (FCOther), percent of full-time faculty whose highest degree earned is a bachelor's degree (FCBach), percent of full-time faculty whose highest degree earned is at a master's level (FCMast), percent of full-time faculty with an educational specialist as their highest educational attainment (FCEdSpec), percent of full-time faculty who have earned a doctorate (FCDoct), average class size for curriculum/college credit programs (CCClass), percent of curriculum students classified as a minority or non-Caucasian (CCMinor), and percent of female curriculum students (CCFemale), and average age of curriculum students (CCAge)

Findings: A similar process to the one outlined in this chapter under the second research questions as well as with the first performance measure was used with each of these performance measures. Table 4.45 presents the individual sample sizes, means and standard deviations for the dependent value—Perf200—as well as each of the fourteen independent values—FTECT, FTET, FTEOther, Fac_Salary, FT, FCOther, FCBach, FCMast, FCDoct, FCEdSpec, CCClass, CCMinor, CCFemale, and CCAge.

Once again, scatterplots were reviewed to determine if any outliers should be discarded. Outliers were removed from seven of the independent measures—FTECT, FTET, FTEOther, FT, FCBach, FCDoct and CCAge.

Table 4.45 Univariate Statistics for First-Time Test-Takers for Licensure and Certification Exams.

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Perf200	58	83.89655	6.67462	4866	69.00000	97.00000
FTECT	57	17.76881	7.38224	1013	6.12772	38.92912
FTET	56	46.52671	7.90762	2605	27.69187	64.72399
FTEOther	57	8.96392	5.05863	510.94360	2.03794	24.20429
Fac_Salary	58	47006	3287	2726364	39972	55896
FT	57	19.60757	4.54700	1118	10.04184	29.65517
FCOther	58	16.95903	6.69925	983.62386	4.61538	38.70968
FCBach	54	24.91961	7.32781	1346	9.67742	48.38710
FCMast	58	51.98366	8.25149	3015	31.57895	68.75000
FCDoct	57	5.57547	3.41937	317.80198	0	14.78261
FCEdSpec	58	0.61294	1.63343	35.55062	0	9.67742
CCClass	58	13.29310	2.39889	771.00000	7.0000	18.00
CCAge	55	29.72764	.95200	1635	27.5900	31.62000
CCMinor	58	32.79728	18.46830	1902	4.39895	80.13817
CCFemale	58	61.47651	5.38097	3566	51.20841	75.12581

Table 4.45 shows that the standard deviations for these variables appear small to moderate except for the difference in the percent of minority students enrolled in curriculum programs at 18.47. The range for these variables also seems moderate; however, a broad range is present with CCMinor with a minimum score of 4.3% and a maximum of 80.14%.

The Pearson Correlation Coefficient Matrix, Table 4.46, presents the correlational relationships for the second performance measure in their entirety.

Pearson Correlation Coefficients, N = 58 Prob > r under H0: Rho=0															
	Perf 200	FTECT	FTET	FTE Other	Fac_ Salary	FT	FC Other	FC Bach	FC Mast	FC Doct	FCEd Spec	CC Class	CC Age	CC Minor	CC Female
Perf 200	1.00	0.52685 **<.0001	-0.47746 **0.0002	0.25421 *0.0564	0.13846 0.3000	0.01360 0.9200	-0.31781 *0.0151	-0.30149 *0.0267	0.33961 **0.0091	0.31469 *0.0171	0.01174 0.9303	0.31749 *0.0152	-0.41794 **0.0015	-0.21321 0.1081	-0.43404 **0.0007
FTECT	0.52685 **<.0001	1.00	-0.54193 <.0001	-0.11007 0.4603	0.24622 0.0648	-0.08083 0.5537	-0.45677 **0.0004	-0.27891 *0.0411	0.40668 **0.0017	0.46761 **0.0002	0.03837 0.7769	0.49477 **<.0001	-0.32924 *0.0141	-0.18759 0.1623	-0.24080 0.0712
FTET	-0.47746 **0.0002	-0.54193 **<.0001	1.00	-0.26357 *0.0519	-0.09419 0.4899	0.23442 0.0850	0.38873 **0.0031	0.29588 *0.0298	-0.40708 **0.0018	-0.37600 **0.0043	0.00279 0.9837	-0.19193 0.1565	-0.01202 0.9312	-0.04473 0.7434	0.04787 0.7261
FT Other	0.25421 *0.0564	-0.10069 0.4603	-0.26357 *0.0519	1.00	-0.13229 0.3266	-0.06073 0.6566	-0.05161 0.7030	0.01975 0.8884	-0.04490 0.7401	0.17569 0.1952	0.01247 0.9267	-0.09504 0.4819	0.11261 0.4175	0.05057 0.7087	-0.23613 0.0770
Fac_ Salar	0.13846 0.3000	0.24622 0.0648	-0.0942 0.4899	-0.13229 0.3266	1.00	-0.0816 0.5534	-0.19265 0.1474	-0.22531 0.1014	0.18728 0.1592	0.36099 **0.0058	0.05732 0.6691	0.41118 **0.0013	-0.10869 0.4296	0.19810 0.1361	0.06639 0.6205
FT	0.01360 0.9200	-0.08083 0.5537	0.23442 0.0850	-0.06073 0.6566	-0.08016 0.5534	1.00	0.27110 *0.0414	0.28801 *0.0365	-0.33108 *0.0119	-0.22160 0.1007	-0.11600 0.3902	0.04520 0.7385	0.01019 0.9417	0.19123 0.1542	-0.03049 0.8219
FC Other	-0.31781 *0.0151	-0.45677 **0.0004	0.38873 **0.0031	-0.05161 0.7030	-0.19265 0.1474	0.27110 0.0414	1.00	0.02012 0.8852	-0.61816 **<.0001	-0.39917 **0.0021	-0.22419 0.0907	-0.29532 *0.0244	0.07230 0.5999	0.14426 0.2800	0.10788 0.4202
FC Bach	-0.30149 0.0267	-0.27891 *0.0411	0.29588 *0.0298	0.01975 0.8884	-0.22531 0.1014	0.28801 *0.0365	0.02012 0.8852	1.00	-0.69269 **<.0001	-0.37889 **0.0047	-0.17538 0.2046	-0.28944 *0.0338	0.29799 *0.0319	0.02882 0.8361	-0.18715 0.1754
FC Mast	0.33961 **0.0091	0.40668 **0.0017	-0.4071 **0.0018	-0.04490 0.7401	0.18728 0.1592	-0.3311 *0.0119	-0.61816 **<.0001	-0.69269 **<.0001	1.00	0.19785 0.1401	0.07671 0.5671	0.39947 **0.0019	-0.34271 **0.0104	-0.09825 0.4631	0.09677 0.4699
FC Doct	0.31469 *0.0171	0.46761 **0.0002	-0.3760 **0.0043	0.17569 0.1952	0.36099 **0.0058	-0.2216 0.1007	-0.39917 *0.0021	-0.37889 **0.0047	0.19785 0.1401	1.00	0.13526 0.3158	0.22891 0.0868	0.04020 0.7708	0.00547 0.9678	-0.08391 0.5349
FCEd Spec	0.01174 0.9303	0.03837 0.7769	0.00279 0.9837	0.01247 0.9267	0.05732 0.6691	-0.1160 0.3902	-0.22419 0.0907	-0.17538 0.2046	0.07671 0.5671	0.13526 0.3158	1.00	-0.13323 0.3188	0.10930 0.4270	-0.24786 0.0607	-0.05013 0.7086
CC Class	0.31749 *0.0152	0.49477 **<.0001	-0.1919 0.1565	-0.09504 0.4819	0.41118 0.0013	0.04520 0.7385	-0.29532 *0.0244	-0.28944 *0.0338	0.39947 **0.0019	0.22891 0.0868	-0.13323 0.3188	1.00	-0.29268 0.0301	0.23732 0.0729	-0.00800 0.9525
CC Age	-0.41794 **0.0015	-0.32924 *0.0141	-0.0120 0.9312	0.11261 0.4175	-0.10869 0.4296	0.01019 0.9417	0.07230 *0.5999	0.29799 *0.0319	-0.34271 0.0104	0.04020 0.7708	0.10930 0.4270	-0.29268 *0.0301	1.00	0.20557 0.1322	0.32095 0.0169
CC Minor	-0.21321 0.1081	-0.18759 0.1623	-0.0447 0.7434	0.05057 0.7087	0.19810 0.1361	0.19123 0.1542	0.14426 0.2800	0.02882 0.8361	-0.09825 0.4631	0.00547 0.9678	-0.24786 0.0607	0.23732 0.0729	0.20557 0.1322	1.00	0.35061 **0.0070
CC Femal	-0.43404 **0.0007	-0.24080 0.0712	0.04787 0.7261	-0.23613 0.0770	0.06639 0.6205	-0.0305 0.8219	0.10788 0.4202	-0.18715 0.1754	0.09677 0.4699	-0.08391 0.5349	-0.05013 0.7086	-0.00800 0.9525	0.32095 *0.0169	0.35061 **0.0070	1.00

Table 4.46 Pearson Correlation for the Second Performance Measure.

*Correlations significant at the .05 level.
**Correlations significant at the .01 level.

Each of the predictor variables was examined individually within the performance of first-time test-takers for licensure and certification examinations. Significant relationships at the $<.0001$ alpha level were observed between scores on the second performance measure and only one of the predictor variables—the percent of students enrolled as college transfer students (FTECT). The correlational relationship between these values was moderate with an $r = 0.52685$ and a $p\text{-value} = <.0001$. Results from the Pearson Correlation Coefficient matrix also found significant relationships between Perf200 and several predictor variables:

Table 4.47 Statistically significant relationships between dependent and independent values for the second performance measure.

Alpha levels <.01	r	p-value
Perf200 & percent of total FTE earned from students enrolled in college transfer programs (FTECT)	0.52685	<.0001
Perf200 & percent of total FTE earned from students enrolled in technical programs (FTET)	-0.47746	0.0002
Perf200 & percent of full-time faculty whose highest educational degree is a master's (FCMast)	0.33961	0.0091
Perf200 & the average age of students enrolled in college credit programs (CCAge)	-0.41794	0.0015
Perf200 & the percent of female enrolled in curriculum programs (CCFemale)	-0.43404	0.0007
Alpha levels <.05		
Perf200 & percent of total FTE earned for programs designated as special, misc. or other (FTEOther)	0.25421	0.0564
Perf200 & percent of full-time faculty with minimal credentials— i.e. high school, GED, professional certificates or associate's degree (FCOther)	-0.31781	0.0151
Perf200 & percent of full-time faculty who are credentialed with a bachelor's degree (FCBach)	-0.30149	0.0267
Perf200 & percent of full-time faculty whose highest academic degree is a doctorate (FCDoct)	0.31469	0.0171
Perf200 & the average class size for college credit programs (CCClass)	0.31749	0.0152

Although these relationships appear statistically significant based on the *p-values*, the correlational relationships are weak to moderate. Tables 4.46 and 4.47 indicate that the dependent variable has correlational relationships with 10 of the independent variables. The correlations are indicative of whether the variables share a

positive or negative relationship with the performance of first-time test-takers. Two of the variables (FCBach and FCOther) shared a weak negative relationship with the dependent value while three (FTET, CCAge, CCFemale) had a moderate negative relationship. This means that as the independent variable decreased, the dependent variable tends to increase. The opposing factor includes positive relationships which tend to correspond with one another: as the dependent variable increases, so does the correlating independent variable. For the second performance measure, there were three variables (CCClass, FCDoct, and FTEOther) with a weak positive correlation and one variable with a moderate positive relationship (FCMast). For example, these results imply that as colleges exhibit a larger passing rate among first-time test-takers on licensure and certification exams, then there is typically a greater percent of full-time instruction staff with master and doctoral degrees, FTE earned by other/miscellaneous/special programs is higher, and the average class size is also higher. However, the second performance measure is negatively correlated with the percent of FTE earned from technical programs, the average student age, the percent of females enrolled in curriculum classes, and the percent of faculty with low academic credentials.

Table 4.48 Statistically significant relationships between independent values for the second performance measure

Alpha levels <.01	r	p-value
FTET & FTECT	-0.54193	<.0001
FTECT & FCOther	-0.45677	0.0004
FTECT & FCMast	0.40668	0.0017
FTECT & FCDoct	0.46761	0.0002
FTECT & CCClass	0.49477	<.0001
FTET & FCOther	0.38873	0.0031
FTET & FCMast	-0.40708	0.0018
FTET & FCDoct	-0.37600	0.0043
Fac_Salary & FCDoct	0.36099	0.0058
Fac_Salary & CCClass	0.41118	0.0013
FCOther & FCMast	-0.61816	<.0001
FCOther & FCDoct	-0.39917	0.0021
FCBach & FCMast	-0.69269	<.0001
FCBach & FCDoct	-0.37889	.0047
FCMast & CCClass	0.39947	0.0019
FCMast & CCAge	-0.34271	0.0104
CCMinor & CCFemale	0.35061	0.0070
Alpha levels <.05		
FTECT & FCBach	-0.27891	0.0411
FTECT & CCAge	-0.32924	0.0141
FTET & FTEOther	-0.26357	0.0519
FTET & FCBach	0.29588	0.0298
FT & FCOther	0.27110	0.0414
FT & FCBach	0.28801	0.0365
FT & FCMast	-0.33108	0.0119
FCOther & CCClass	-0.29532	0.0244
FC Bach & CCClass	-0.28944	0.0338
FCBach & CCAge	0.29799	0.0319

In addition, there are 27 instances of moderately to highly correlated independent variables with one another. These relationships among the independent values have the potential to affect the results of the study, since the information from these variables may overlap. With this many possible instances of multicollinearity, there is a greater potential that the results will be affected by the shared information.

A positive correlation implies that as one variable increases, so does the other. For instance, a moderate, positive correlation exists between the FTE earned from college transfer students (FTECT) and average curriculum class size (CCClass) with a coefficient of 0.49477. There were eight positive correlations and nine negative ones with alpha levels less than .01 (p-value). Several of these are extremely appropriate since these variables are opposing values. For example, FTE earned by a community college typically falls under several program headings such as college transfer (curriculum), technical/vocational programs (curriculum), other (curriculum), basic skills (continuing education), workforce/occupational training (continuing education) and other (continuing education). The second null hypothesis statement includes three of these components: FTECT, FTET, FTEOther. One would expect that as the percent of FTE earned by students classified as college transfer increases, then the FTE earned by those individuals enrolled in technical programs would decrease. According to Table 4.48, FTET and FTECT are negatively correlated with a coefficient of -0.54193 . Two other instances involving highly correlated independent values include subcategories of faculty credentials: FCOther and FCMast are negatively correlated with $r = -0.61816$, $p = <.0001$ as are FCBach and FCMast with $r = -0.69269$, $p = <.0001$.

Table 4.49 Stepwise Regression Model for First-time Test-takers for Certification and Licensure Examinations.

The REG Procedure								
Model: MODEL1								
Dependent Variable: Perf200								
Summary of Stepwise Selection								
Step	Variable Entered	Variable Removed	Number Vars In	Partial R-Square	Model R-Square	C(p)	F Value	Pr > F
1	FTECT 0.0002		1	0.2253	0.2253	15.0613	16.28	
2	CCFemale 0.0030		2	0.1157	0.3410	6.7436	6.74	
3	FTEOther 0.0046		3	0.0920	0.4330	0.5428	8.76	
4	FCMast 0.0311		4	0.0481	0.4811	-1.7408	4.91	

According to the stepwise selection, four variables have the potential to impact the variation of a community college's performance on this particular measure. Collectively, these four variables yielded an R^2 of .4811 implying that 48% of the total variation with the second performance measure can be impacted based on FTE earned from college transfer students, FTE earned from miscellaneous or other programs, the percent of full-time faculty who have earned a master's degree, and the percent of females enrolled in curriculum classes. The following model explains the results of this regression analysis:

$$\text{Performance of first-time test-takers} = 93.32781 + 0.32 \cdot \text{FTECT} + 0.3389 \cdot \text{FTEOther} + 0.089 \cdot \text{FCMast} + (-0.4648) \cdot \text{CCFemale}$$

This model illustrates the impact of the four independent measures—FTECT, FTEOther, FCMast, and CCFemale—upon the dependent variable or the performance measures. When FTEOther, FCMast, and CCFemale are held constant, FTECT increases by .32 for every 1 unit increase in the performance of first-time test-takers for licensure and certification examinations. Likewise, there are also increases among two of the other independent variables—FTEOther (0.3389) and FCMast (0.089)—for every unit increase for the second performance measure. However, for every unit increase in the performance of first-time test-takers for licensure and certification exams, the percent of females enrolled in college credit classes declines by 0.4648.

Conclusion: The results from tables 4.46 and 4.49 provide a basis for the rejection of Hypothesis 2. Ten of the 14 independent variables—FTECT, FTET, FCMast, CCAge, CCFemale, FTEOther, FCOther, FCBach, FCDoct, and CCClass—demonstrated primarily moderate but significant correlations. The remaining four variables (Fac_Salary, FT, FCEdSpec, and CCMinor) were not found to be linearly related to the performance of first-time test-takers of licensure and certification exams. The rejection of the null hypothesis was further supported by the stepwise regression model, which suggests that four variables can impact the performance of the second standard with a sample variance of 48%. About half of the sample variation in Perf200 can be explained by FTET, CCFemale, FTEOther and FCMast. Therefore, indicating that this model is not a strong model for predicting, but does suggest that these variables definitely do provide significant information in explaining the dependent variable.

Performance Measure 3: Goal Completion of Program Completers

H₀ Statement 3: *There is no relationship between the rate of progress of program completers and pertinent institutional and student characteristics. For additional information regarding the variables relevant to the third performance measures, refer to the schematic on p. 46.*

Findings: Table 4.49 provides an overview of the univariate statistics for the dependent (Perf300) and independent variables (FTECT, FTET, FTEOther, Fac_Salary, FT, FCOther, FCBach, FCMast, FCDoct, FCEdSpec, CCClass, CCMInor, CCFemale, and CCAge) included in the analysis of the third performance measure, which reviews goal completion by community college graduates. Scatterplots for this core measure revealed outliers from the following independent measures: FTECT, FTEOther, Fac_Salary, FT, FCBach and FCMast.

Table 4.50 Univariate Statistics for Goal Completion by Program Completers.

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Perf300	58	98.96552	1.35032	5740	93.00000	100.00000
FTECT	57	17.51481	6.87266	998.34437	6.12772	34.01478
FTET	58	46.27587	7.90757	2684	27.69187	64.72399
FTEOther	57	8.96392	5.05863	510.94360	20.3794	24.20429
Fac_Salary	56	47198	3166	2643060	39972	55896
FT	54	20.12257	4.08758	1087	12.95238	29.65517
FCOther	58	16.95903	6.69925	983.62386	4.61538	38.70968
FCBach	55	24.56943	7.12571	1351	9.67742	48.38710
FCMast	54	53.06971	7.41709	2866	31.57895	68.75000
FCDoct	58	5.78723	3.75335	335.65912	0	17.85714
FCEdSpec	58	0.61294	1.63343	35.55062	0	9.67742
CCCclass	58	13.29310	2.39889	771.00000	7.0000	18.00
CCAge	58	29.62086	1.04609	1718	26.8500	31.62000
CCMinor	58	32.79728	18.46830	1902	4.39895	80.13817
CCFemale	58	61.47651	5.38097	3566	51.20841	75.12581

Similar to the data from the second performance measure, these values demonstrate a small to moderate standard deviation for all variables with the exception of the percent of minority students enrolled in college credit classes (CCMinor) at 18.4683. Further, the range of scores for each of these variables is small to moderate excluding CCMinor with a range of 75.74.

Pearson Correlation Coefficients, N = 58 Prob > r under H0: Rho=0															
	Perf 300	FTECT	FTET	FTE Other	Fac_ Salary	FT	FC Other	FC Bach	FC Mast	FC Doct	FCed Spec	CC Class	CCAge	CC Minor	CC Female
Perf 300	1.00	-0.01203 0.9292	-0.01528 0.9094	0.15522 0.2489	-0.04645 0.7339	0.03161 0.8205	-0.05231 0.6966	-0.05558 0.6869	0.15481 0.2637	0.04345 0.7461	0.12491 0.3502	0.06817 0.6111	0.03902 0.7712	-0.09656 0.4709	0.17076 0.2000
FTECT	-0.01203 0.9292	1.00	-0.53773 **<.0001	-0.07299 0.5929	0.22372 0.0914	-0.1113 0.4055	-0.44111 **0.0005	-0.28605 *0.0295	0.39144 **0.0024	0.47040 **0.0002	0.03208 0.8111	0.48140 **0.0001	-0.29208 *0.0261	-0.19373 0.1451	-0.21435 0.1062
FTET	-0.01528 0.9094	-0.53773 **<.0001	1.00	-0.23374 0.0774	-0.07401 0.5809	0.24569 0.0630	0.35942 **0.0056	0.30788 *0.0187	-0.38003 **0.0033	-0.40493 **0.0016	0.01484 0.9120	-0.18571 0.1628	-0.05231 0.6965	-0.04919 0.7138	-0.00603 0.9641
FTE Other	0.15522 0.2489	-0.07299 0.5929	-0.2337 0.0774	1.00	-0.16348 0.2201	-0.0934 0.4855	0.03542 0.7918	0.00293 0.9826	-0.02140 0.8733	-0.01847 0.8905	-0.01409 0.9164	-0.11804 0.3775	0.07549 0.5733	0.11518 0.3893	-0.02454 0.8549
Fac_ Salar	-0.04645 0.7339	0.22372 0.0914	-0.0740 0.5809	-0.16348 0.2201	1.00	-0.0599 0.6549	-0.19265 0.1474	-0.17826 0.1806	0.18728 0.1592	0.25745 *0.0511	0.05732 0.6691	0.41118 **0.0013	-0.19397 0.1446	0.19810 0.1361	0.06639 0.6205
FT	0.03161 0.8205	-0.11131 0.4055	0.24569 0.0630	-0.09342 0.4855	-0.05994 0.6549	1.00	0.19455 0.1433	0.18588 0.1624	-0.18612 0.1619	-0.24507 0.0637	-0.12200 0.3616	0.05985 0.6554	0.05522 0.6806	0.17335 0.1931	-0.09615 0.4728
FC Other	-0.05231 0.6966	-0.44111 **0.0005	0.35942 **0.0056	0.03542 0.7918	-0.19265 0.1474	0.19455 0.1433	1.00	-0.00776 0.9539	-0.61816 **<.0001	-0.32071 *0.0141	-0.22419 0.0907	-0.29532 *0.0244	0.10101 0.4506	0.14426 0.2800	0.10788 0.4202
FC Bach	-0.05558 0.6869	-0.28605 *0.0295	0.30788 *0.0187	0.00293 0.9826	-0.17826 0.1806	0.18588 0.1624	-0.00776 0.9539	1.00	-0.65634 **<.0001	-0.40078 **0.0018	-0.15735 0.2382	-0.24044 0.0691	0.27967 *0.0335	0.04491 0.7378	-0.19825 0.1358
FC Mast	0.15481 0.2637	0.39144 **0.0024	-0.3800 **0.0033	-0.02140 0.8733	0.18728 0.1592	-0.1861 0.1619	-0.61816 **<.0001	-0.65634 **<.0001	1.00	0.13928 0.2971	0.07671 0.5671	0.39947 **0.0019	-0.32071 *0.0141	-0.09825 0.4631	0.09677 0.4699
FC Doct	0.04345 0.7461	0.47040 **0.0002	-0.4049 **0.0016	-0.01847 0.8905	0.25745 *0.0511	-0.2451 0.0637	-0.32071 *0.0141	-0.40078 **0.0018	0.13928 0.2971	1.00	0.10044 0.4531	0.17522 0.1883	-0.06931 0.6052	-0.02352 0.8609	0.00118 0.9930
FC EdSpe	0.12491 0.3502	0.03208 0.8111	0.01484 0.9120	-0.01409 0.9164	0.05732 0.6691	-0.1220 0.3616	-0.22419 0.0907	-0.15735 0.2382	0.07671 0.5671	0.10044 0.4531	1.00	-0.13323 0.3185	0.13541 0.3108	-0.24786 0.0607	-0.05013 0.7086
CC Class	0.06817 0.6111	0.48140 **0.0001	-0.1857 0.1628	-0.11804 0.3775	0.41118 **0.0013	0.05985 0.6554	-0.29532 0.0244	-0.24044 0.0691	0.39947 **0.0019	0.17522 0.1883	-0.13323 0.3188	1.00	-0.30869 *0.0184	0.23732 0.0729	-0.00800 0.9525
CCAge	0.03902 0.7712	-0.29208 *0.0261	-0.0523 0.6965	0.07549 0.5733	-0.19397 0.1446	0.05522 0.6806	0.10101 0.4506	0.27967 *0.0335	-0.32071 *0.0141	-0.06931 0.6052	0.13541 0.3108	-0.30869 *0.0184	1.00	0.08858 0.5085	0.27033 *0.0401
CC Minor	-0.09656 0.4709	-0.19373 0.1451	-0.0492 0.7138	0.11518 0.3893	0.19810 0.1361	0.17335 0.1931	0.14426 0.2800	0.04491 0.7378	-0.09825 0.4631	-0.02352 0.8609	-0.24786 0.0607	0.23732 0.0729	0.08858 0.5085	1.00	0.35061 **0.0070
CC Femal	0.17076 0.2000	-0.21435 0.1062	-0.0060 0.9641	-0.02454 0.8549	0.06639 0.6205	-0.0692 0.4728	0.10788 0.4202	-0.19825 0.1358	0.09677 0.4699	0.00118 0.9930	-0.05013 0.7086	-0.00800 0.9525	0.27033 *0.0401	0.35061 **0.0070	1.00

Table 4.51 Pearson Correlation for Goal Completion by Program Completers.

*Correlations significant at the .05 level.
**Correlations significant at the .01 level.

According to these data, there are not any significant correlational relationships between the goal completion of community college graduates and the 14 independent variables. However, Table 4.52 reports several moderate to strong correlations between several independent variables.

Table 4.52 Statistically significant relationships between independent values for the third performance measure.

Alpha levels <.01	r	p-value
FTET & FTECT	-0.53773	<.0001
FTECT & FCOther	-0.44111	0.0005
FTECT & FCMast	0.39144	0.0024
FTECT & FCDoct	0.47040	0.0002
FTECT & CCClass	0.48140	0.0001
FTET & FCOther	0.35942	0.0056
FTET & FCMast	-0.38003	0.0033
FTET & FCDoct	-0.40493	0.0016
Fac_Salary & CCClass	0.41118	0.0013
FCOther & FCMast	-0.61816	<.0001
FCBach & FCMast	-0.65634	<.0001
FCBach & FCDoct	-0.40078	0.0018
FCMast & CCClass	0.39947	0.0019
CCMinor & CCFemale	0.35061	0.0070
Alpha levels <.05		
FTECT & FCBach	-0.28605	0.0295
FTECT & CCAge	-0.29208	0.0261
FTET & FCBach	0.30788	0.0187
Fac_Salary & FCDoct	0.25745	0.0511
FCOther & FCDoct	-0.32071	0.0141
FCOther & CCClass	-0.29532	0.0244
FC Bach & CCAge	0.27967	0.0335
FCMast & CCAge	-0.32071	0.0141
CCClass & CCAge	-0.30869	0.0184
CCAge & CCFemale	0.27033	0.0401

This large a representation among the independent variables may once again imply limitations with this study because of multicollinearity among these values. This third core performance measure includes 14 statistically significant relationship at the alpha level of $<.01$. Some of the more significant relationships occur between: FTET and FTECT ($r = -.53773$), FTECT and CCClass ($r = .48140$), FCOther and FCMast ($r = -.61816$) and FCBach and FCMast ($r = -.65634$).

Conclusion: The stepwise regression model indicated that there were no statistically significant relationships for this performance measure. In addition, the correlational analysis (Table 4.51) yields no significant results between goal completion for program completers and the independent variables. Therefore, this portion of the study failed to reject Hypothesis 3.

Performance Measure 4: Employment Status of Graduates

H₀ Statement 4: *There is no relationship between the rate of progress in the employment status of community college graduates and pertinent institutional and student characteristics.*

Table 4.53 Univariate Statistics for Employment Status of Graduates.

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Perf400	58	97.76069	1.17031	5670	94.87000	100.00000
FTECT	58	17.88403	7.36961	1037	6.12772	38.92912
FTET	58	46.27587	7.90757	2684	27.69187	64.72399
FTEOther	57	8.96392	5.05863	510.94360	2.03794	24.20429
Fac_Salary	58	47006	3287	2726364	39972	55896
FT	57	19.60757	4.54700	1118	10.04184	29.65517
FCOther	58	16.95903	6.69925	983.62386	4.61538	38.70968
FCBach	57	24.93604	7.01421	1421	12.5000	48.38710
FCMast	58	51.98366	8.25149	3015	31.57895	68.75000
FCDoct	58	5.78723	3.75335	335.65912	0	17.85714
FCEdSpec	58	0.61294	1.63343	35.55062	0	9.67742
CCClass	58	13.29310	2.39889	771.00000	7.0000	18.00
CCAge	58	29.62086	1.04609	1718	26.8500	31.62000
CCMinor	58	32.79728	18.46830	1902	4.39895	80.13817
CCFemale	55	61.17453	4.88126	3365	51.20841	73.29293

Findings: The descriptive statistics (means, standard deviations and ranges) for the dependent variable (Perf400) as well as for each of the independent values (FTECT, FTET, FTEOther, Fac_Salary, FT, FCOther, FCBach, FCMast, FCDoct, FCEdSpec, CCClass, CCMinor, CCFemale, and CCAge) are displayed in Table 4.53. These statistics show comparable results to the previous two performance measures as CCMinor was the only variable to yield a large standard deviation at 18.47 and range of 75.74%. The remaining variables all demonstrate small to moderate numbers for standard deviation and range. With only six outliers involved with this data set, most of the variables included all 58 North Carolina community colleges. Three of the

independent variables—FTEOther, FT and FCBach—have an N of 57 and one variable—CCFemale—has an N of 55.

Table 4.54 Pearson Correlation for the Employment Status of Graduates.

OPearson Correlation Coefficients, N = 58 Prob > r under H0: Rho=0															
	Perf 400	FTECT	FTET	FTE Other	Fac_ Salary	FT	FCOther	FCBach	FCMast	FCDoct	FCEd Spec	CC Class	CCAge	CC Minor	CC Female
Perf 400	1.00	0.01186 0.9296	-0.02537 0.8501	0.15149 0.2606	-0.10989 0.4115	0.19989 0.1360	-0.15170 0.2556	-0.18188 0.1757	0.03405 0.7997	0.27812 0.0345	0.13886 0.2986	0.13578 0.3095	-0.02093 0.8761	0.12771 0.3394	0.15250 0.2664
FTECT	0.01186 0.9296	1.00	-0.535773 **<.0001	-0.11481 0.3951	0.22372 0.0914	-0.10908 0.4193	-0.44111 **0.0005	-0.35960 **0.0060	0.39144 **0.0024	0.47040 **0.0002	0.03208 0.8111	0.48140 **0.0001	-0.29208 0.0261	-0.19373 0.1451	-0.12958 0.3457
FTET	-0.02537 0.8501	-0.53580 **<.0001	1.00	-0.21558 0.1073	-0.07401 0.5809	0.25796 *0.0527	0.35942 **0.0056	0.33901 **0.0099	-0.38003 **0.0033	-0.40493 **0.0016	0.01484 0.9120	-0.18571 0.1328	-0.05231 0.6965	-0.04919 0.7138	0.05028 0.7154
FTE Other	0.15149 0.2606	-0.11481 0.3951	-0.21558 0.1073	1.00	-0.13229 0.3266	-0.06073 0.6566	-0.05161 0.7030	0.01044 0.9391	-0.04490 0.7401	0.09869 0.4652	0.01247 0.9267	-0.09504 0.4819	0.07099 0.5998	0.05057 0.7087	-0.20633 0.1307
Fac_ Salar	-0.10989 0.4115	0.22372 0.0914	-0.07401 0.5809	-0.13229 0.3266	1.00	-0.08016 0.5534	-0.19265 0.1474	-0.20027 0.1353	0.18728 0.1592	0.25745 *0.0511	0.05732 0.6691	0.41118 **0.0013	-0.19397 0.1446	0.19810 0.1361	0.14022 0.3072
FT	0.19989 0.1360	-0.10908 0.4193	0.25796 0.0527	-0.06073 0.6566	-0.08016 0.5534	1.00	0.27110 *0.0414	0.27802 *0.0380	-0.33108 *0.0119	-0.30795 *0.0198	-0.11600 0.3902	0.04520 0.7385	0.14883 0.2692	0.19123 0.1542	0.03363 0.8092
FC Other	-0.15170 0.2556	-0.44111 **0.0005	0.35942 **0.0056	-0.05161 0.7030	-0.19265 0.1474	0.27110 *0.0141	1.00	0.12979 0.3359	-0.61816 **<.0001	-0.32071 *0.0141	-0.22419 0.0907	-0.29532 *0.0244	0.10101 0.4506	0.14426 0.2800	-0.05379 0.6965
FC Bach	-0.18188 0.1757	-0.35960 **0.0060	0.33901 **0.0099	0.01044 0.9391	-0.20027 0.1353	0.27802 *0.0380	0.12979 0.3359	1.00	-0.68479 **<.0001	-0.48690 **0.0001	-0.17842 0.1842	-0.28940 0.0290	0.37408 **0.0042	0.09346 0.4893	-0.10519 0.4447
FC Mast	0.03405 0.7997	0.39144 **0.0024	-0.38003 **0.0033	-0.04490 0.7401	0.18728 0.1592	-0.33108 *0.0119	-0.61816 **<.0001	-0.68479 **<.0001	1.00	0.13928 0.2971	0.07671 0.5671	0.39947 **0.0019	-0.32071 *0.0141	-0.09825 0.4631	0.08281 0.5478
FC Doct	0.27812 *0.0345	0.47040 **0.0002	-0.40493 **0.0016	0.09869 0.4652	0.25745 *0.0511	-0.30795 *0.0198	-0.32071 *0.0141	-0.48690 **0.0001	0.13928 0.2971	1.00	0.10044 0.4531	0.17522 0.1883	-0.06931 0.6052	-0.02352 0.8609	0.12059 0.3805
FCEd Spec	0.13886 0.2986	0.03208 0.8111	0.01484 0.9120	0.01247 0.9267	0.05732 0.6691	-0.11600 0.3902	-0.22419 0.0907	-0.17842 0.1842	0.07671 0.5671	0.10044 0.4531	1.00	-0.13323 0.3188	0.13541 0.3108	-0.24786 0.0607	-0.03263 0.8130
CC Class	0.13578 0.3095	0.48140 **0.0001	-0.18571 0.1628	-0.09504 0.4819	0.41118 **0.0013	0.04520 0.7385	-0.29532 *0.0244	-0.28940 *0.0290	0.39947 0.0019	0.17522 0.1883	-0.13323 0.3188	1.00	-0.30869 *0.0184	0.23732 0.0729	0.03191 0.8171
CCAge	-0.02093 0.8761	-0.29208 *0.0261	-0.05231 0.6965	0.07099 0.5998	-0.19397 0.1446	0.14883 0.2692	0.10101 0.4506	0.37408 **0.0042	-0.32071 0.0141	-0.06931 0.6052	0.13541 0.3108	-0.30869 *0.0184	1.00	0.08858 0.5085	0.22575 0.0975
CC Minor	0.12771 0.3394	-0.19373 0.1451	-0.04919 0.7138	0.05057 0.7087	0.19810 0.1361	0.19123 0.1542	0.14426 0.2800	0.09346 0.4893	-0.09825 0.4631	-0.02352 0.8609	-0.24786 0.0607	0.23732 0.0729	0.08858 0.5085	1.00	0.26330 *0.0521
CC Femal	0.15250 0.2664	-0.12958 0.3457	0.05028 0.7154	-0.20633 0.1307	0.14022 0.3072	0.03363 0.8092	-0.05379 0.6965	-0.10519 0.4447	0.08281 0.5478	0.12059 0.3805	-0.03263 0.8130	0.03191 0.8171	0.22575 0.0975	0.26330 *0.0521	1.00

*Correlations significant at the .05 level.
**Correlations significant at the .01 level

Table 4.54 presents the results of the correlational analysis of the employment status of community college graduates with relevant student and institutional characteristics. These results indicate a lack of significant interactions between the performance measure and the independent variables.

Table 4.55 Statistically significant relationships between independent values for the fourth performance measure

Alpha levels <.01	r	p-value
FTET & FTECT	-0.5358	<.0001
FTECT & FCOther	-0.44111	0.0005
FTECT & FCBach	-0.35960	0.0060
FTECT & FCMast	0.39144	0.0024
FTECT & FCDoct	0.47040	0.0002
FTECT & CCClass	0.48140	0.0001
FTET & FCOther	0.35942	0.0056
FTET & FCBach	0.33901	0.0099
FTET & FCMast	-0.38003	0.0033
FTET & FCDoct	-0.40493	0.0016
Fac_Salary & CCClass	0.41118	0.0013
FCOther & FCMast	-0.61816	<.0001
FCBach & FCMast	-0.8479	<.0001
FCBach & FCDoct	-0.48690	<.0001
FCBach & CCAge	0.37408	0.0042
FCMast & CCClass	0.39947	0.0019
Alpha levels <.05		
FTET & FT	0.25745	0.0511
Fac_Salary & FCDoct	0.25745	0.0511
FT & FCOther	0.27110	0.0414
FT & FCBach	0.27802	0.0380
FT & FCMast	-0.33108	0.0119
FT & FCDoct	-0.30795	0.0198
FCOther & FCDoct	-0.32071	0.0141
FCOther & CCClass	-0.29532	0.0244
FCMast & CCAge	-0.32071	0.0141
CCClass & CCAge	-0.30869	0.0184
CCMinor & CCFemale	0.26330	0.0521

Significant correlations between several independent variables, however, can be found with the fourth performance measure. Although there are several moderate to strong correlations for this measure, all of the relationships between these independent values are statistically significant. With 16 correlational relationships at the alpha levels of $<.01$ and 11 at alpha levels of $<.05$, the concern with shared information among these variable, or multicollinearity, is apparent once again.

Conclusion: The stepwise regression model and the correlation matrix indicate that there are no statistically significant relationships for this performance measure. These statistical tests failed to reject Hypothesis 4.

Performance Measure 5: Performance of College Transfer Students

H₀ Statement 5: *There is no relationship between the performance of college transfer students and pertinent institutional and student characteristics.*

Findings: The fifth performance measure—performance for college transfer students—requires North Carolina community colleges to meet both elements of the standard described earlier in this chapter. Tests to check the null hypothesis in this case evaluated the dependent measures (Perf500) against the independent measures (FTECT,

FTET, FTEOther, Fac_Salary, FT, FCOther, FCBach, FCMast, FCDoct, FCEdSpec, CCClass, CCMInor, CCFemale, and CCAge).

Table 4.56 Univariate Statistics for Performance of College Transfer Students.

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Perf500	53	80.72830	7.17845	4279	69.10000	96.30000
FTECT	57	17.51481	6.87266	998.34437	6.12772	34.01478
FTET	58	46.27587	7.90757	2684	27.69187	64.72399
FTEOther	57	8.96392	5.05863	510.94360	2.03794	24.20429
Fac_Salary	56	47198	3166	2643060	39972	55896
FT	54	20.12257	4.08758	1087	12.95238	29.65517
FCOther	58	16.95903	6.69925	983.62386	4.61538	38.70968
FCBach	55	24.56943	7.12571	1351	9.67742	48.38710
FCMast	54	53.06971	7.41709	2866	31.57895	68.75000
FCDoct	58	5.78723	3.75335	335.65912	0	17.85714
FCEdSpec	58	0.61294	1.63343	35.55062	0	9.67742
CCClass	58	13.29310	2.39889	771.00000	7.0000	18.00
CCAge	58	29.62086	1.04609	1718	26.8500	31.62000
CCMinor	58	32.79728	18.46830	1902	4.39895	80.13817
CCFemale	58	61.47651	5.38097	3566	51.20841	75.12581

Table 4.56 reviews the descriptive information, which shows that eight of the 15 variables included all North Carolina community colleges ($N=58$). Scatterplots were instigated to determine outliers that might prohibit a linear relationship. Outliers were removed from FTECT, FTEOther, Fac_Salary, FT, FCBach and FCMast contributing to the following sample sizes for the remaining seven variables: 53 (Perf500), 57 (FTECT), 57 (FTEOther), 56 (Fac_Salary), 54 (FT), and 54 (FCMast). Once again, the measures for standard deviation and range fell within a normal distribution of scores

except for the percent of non-Caucasian students enrolled in curriculum classes (CCMinor).

Pearson Correlation Coefficients, N = 58 Prob > r under H0: Rho=0															
	Perf 500	FTECT	FTET	FTE Other	Fac_ Salary	FT	FC Other	FC Bach	FC Mast	FC Doct	FCed Spec	CC Class	CC Age	CC Minor	CC Female
Perf 500	1.00	0.13870 0.3268	-0.15782 0.2591	0.20772 0.1395	-0.38505 **0.0053	-0.13414 0.3582	-0.07577 0.5897	-0.14659 0.3097	0.14403 0.3235	-0.15768 0.2595	0.13545 0.3335	-0.03410 0.8085	0.12142 0.3865	-0.23013 0.0974	-0.34569 *0.0112
FTECT	0.13870 0.3268	1.00	-0.53773 **<.0001	-0.07299 0.5929	0.22639 0.0965	-0.19240 0.1675	-0.46370 **0.0003	-0.30465 *0.0251	0.33863 *0.0131	0.50970 **<.0001	0.05547 0.6819	0.46387 **0.0003	-0.21632 0.1061	-0.17390 0.1958	-0.16097 0.2316
FTET	-0.15782 0.2591	-0.53773 **<.0001	1.00	-0.21558 0.1073	-0.11337 0.4054	0.26405 *0.0537	0.35942 **0.0056	0.28469 *0.0351	-0.29935 *0.0279	-0.40493 **0.0016	0.01484 0.9120	-0.18571 0.1628	-0.05231 0.6965	-0.04919 0.7138	-0.00603 0.9641
FTE Other	0.20772 0.1395	-0.07299 0.5929	-0.21558 0.1073	1.00	-0.17530 0.2005	-0.10774 0.4426	-0.05161 0.7030	0.04384 0.7529	-0.04841 0.7307	0.09869 0.4652	0.01247 0.9267	-0.09504 0.4819	0.07099 0.5998	0.05057 0.7087	-0.23613 0.0770
Fac_ Salary	-0.38505 **0.0053	0.22639 0.0965	-0.11337 0.4054	-0.17530 0.2005	1.00	-0.05918 0.6738	-0.21768 0.1071	-0.08941 0.5203	0.01226 0.9313	0.33869 *0.0107	0.03721 0.7854	0.40308 **0.0021	-0.18911 0.1627	0.15059 0.2679	0.07588 0.5783
FT	-0.13414 0.3582	-0.19240 0.1675	0.26405 0.0537	-0.10774 0.4426	-0.05918 0.6738	1.00	0.26003 0.0576	0.29184 *0.0358	-0.21675 0.1306	-0.21654 0.1158	0.18334 0.1845	0.05563 0.6895	0.04473 0.7481	0.28539 *0.0365	0.06749 0.6278
FC Other	-0.07577 0.5897	-0.46370 **0.0003	0.35942 **0.0056	-0.05161 0.7030	-0.21768 0.1071	0.26003 *0.0576	1.00	0.01262 0.9271	-0.50142 **0.0001	-0.32071 *0.0141	-0.22419 0.0907	-0.29532 *0.0244	0.10101 0.4501	0.14426 0.2800	0.10788 0.4202
FC Bach	-0.14659 0.3097	-0.30465 *0.0251	0.28469 *0.0351	0.04384 0.7529	-0.08941 0.5203	0.29184 *0.0358	0.01262 0.9271	1.00	-0.70198 **<.0001	-0.35941 **0.0070	-0.17797 0.1936	-0.27763 *0.0401	0.22286 0.1020	0.04789 0.7284	-0.20499 0.1333
FC Mast	0.14403 0.3235	0.33863 *0.0131	-0.29935 *0.0279	-0.04841 0.7307	0.01266 0.9313	-0.21675 0.1306	-0.50142 **0.0001	-0.70198 **<.0001	1.00	0.09662 0.4870	0.05849 0.6744	0.44532 **0.0007	-0.35794 **0.0079	-0.11641 0.4019	0.14068 0.3103
FC Doct	-0.15768 0.2595	0.50970 **<.0001	-0.40493 **0.0016	0.09869 0.4652	0.33869 *0.0107	-0.21654 0.1158	-0.32071 *0.0141	-0.35941 **0.0070	0.09662 0.4870	1.00	0.10044 0.4531	0.17522 0.1883	-0.06931 0.6052	-0.02352 0.8609	0.00118 0.9930
FCed Spec	0.13545 0.3335	0.05547 0.6819	0.01484 0.9120	0.01247 0.9267	0.03721 0.7854	-0.18334 0.1845	-0.22419 0.0907	-0.17797 0.1936	0.05849 0.6744	0.10044 0.4531	1.00	-0.13323 0.3188	0.13541 0.3108	-0.24786 0.0607	-0.05013 0.7086
CC Class	-0.03410 0.8085	0.46387 **0.0003	-0.18571 0.1628	-0.09504 0.4819	0.40308 **0.0021	0.05563 0.6895	-0.29532 *0.0244	-0.27763 *0.0401	0.44532 **0.0007	0.17522 0.1883	-0.13323 0.3188	1.00	-0.30869 *0.0184	0.23732 0.0729	-0.00800 0.9525
CCAge	0.12142 0.3865	-0.21632 0.1061	-0.05231 0.6965	0.07099 0.5998	-0.18911 0.1627	0.04473 0.7481	0.10101 0.4501	0.22286 0.1020	-0.35794 **0.0079	-0.06931 0.6052	0.13541 0.3108	-0.30869 0.0184	1.00	0.08858 0.5085	0.27033 *0.0401
CC Minor	-0.23013 0.0974	-0.17390 0.1958	-0.04919 0.7138	0.05057 0.7087	0.15059 0.2679	0.28539 *0.0365	0.14426 0.2800	0.04789 0.7284	-0.11641 0.4019	-0.02352 0.8609	-0.24786 *0.0607	0.23732 0.0729	0.08858 0.5085	1.00	0.35061 **0.0070
CC Female	-0.34569 0.0112	-0.16097 0.2316	-0.00603 0.9641	-0.23613 0.0770	0.07588 0.5783	0.06749 0.6278	0.10788 0.4202	-0.20499 0.1333	0.14068 0.3103	0.00118 0.9930	-0.05013 0.7086	-0.00800 0.9525	0.27033 *0.0401	0.35061 **0.0070	1.00

Table 4.57 Pearson Correlation for the Performance of College Transfer Students.

*Correlations significant at the .05 level.
 **Correlations significant at the .01 level

Table 4.58 Statistically significant relationships between dependent and independent values for the fifth performance measure.

Alpha levels <.01	r	<i>p-value</i>
Perf500 & the average annual salary for full-time faculty with curriculum programs (Fac_Salary)	-0.38505	0.0053
Alpha levels <.05		
Perf500 & percent of female students enrolled in college credit courses (CCFemale)	-0.34569	0.0112

The correlational analysis of fifth core measure contains two significant bivariate correlations with the performance of transfer students (Perf500). Average faculty salary (Fac_Salary) ($r = -.3851$, $p = 0.0053$) and the percent of female students (CCFemale) enrolled in curriculum classes ($r = -.24569$, $p = .00112$) both have a moderate, negative correlation with the performance of college transfer students. Further, these correlations meet the alpha level of .01 or less. These negative relationships indicate that colleges who perform well on the fifth standard tend to experience lower faculty salaries on average and a lower percent of curriculum, female students.

Table 4.59 Statistically significant relationships between independent values for the fifth performance measure.

Alpha levels <.01	r	p-value
FTET & FTECT	-0.5358	<.0001
FTECT & FCOther	-0.46370	0.0003
FTECT & FCDoct	0.50970	<.0001
FTECT & CCClass	0.46387	0.0003
FTET & FCOther	0.35942	0.0056
FTET & FCDoct	-0.40493	0.0016
Fac_Salary & CCClass	0.40308	0.0021
FCOther & FCMast	-0.50142	<.0001
FCBach & FCMast	-0.70198	<.0001
FCBach & FCDoct	-0.35941	0.0070
FCMasy & CCClass	0.44532	0.0007
FCMast & CCAge	-0.35794	0.0079
CCMinor & CCFemale	0.35061	0.0070
Alpha levels <.05		
FTECT & FCBach	-0.30465	0.0251
FTECT & FCMast	0.33863	0.0131
FTET & FT	0.26405	0.0537
FTET & FCBach	0.28469	0.0351
FTET & FCMast	-0.29935	0.0279
Fac_Salary & FCDoct	0.33869	0.0107
FT & FCBach	0.29184	0.0358
FT & CCMinor	0.28539	0.0365
FCOther & FCDoct	-0.32071	0.0141
FCOther & CCClass	-0.29532	0.0244
FCBach & CCClass	-0.27763	0.0401
CCClass & CCAge	-0.30869	0.0184
CCAge & CCFemale	0.27033	0.0401

Further, there are 26 instances of moderately to highly correlated independent variables. As with the other four performance measures, the issue of multicollinearity potentially could impact the results of the regression analysis since so many of the variables appear to share information.

There were 13 moderate correlations with a statistical significant alpha level of <.01, and 13 weak to moderate correlations with an alpha level of <.05. The stronger

correlations with a p -value of $<.01$ were evident between the percent of total FTE earned from students enrolled in technical programs (FTET) and the percent of FTE awarded for students enrolled in college transfer programs (FTECT), FTECT and the percent of full-time faculty who highest academic degree is a doctorate (FCDoct), individuals with minimal faculty credentials (FCOther) and those who have earned a master's degree (FCMast), and full-time faculty whose highest educational degree is a bachelor's (FCBach) and FCMast. Of these four interactions, the only positive correlation is between FTECT and FCDoct ($r = 0.50970$, $p = <.0001$) indicating that as FTE earned by students enrolled in college transfer programs increases so does the percent of full-time faculty credentialed with a doctoral degree. The three remaining correlations are negative with the most significant relationship between FCBach and FCMast with a correlation coefficient of -0.70198 and a p -value of $<.0001$.

Table 4.60 Stepwise Regression Model for First-Time Test-Takers for Certification and Licensure Examinations.

The REG Procedure								
Model: MODEL1								
Dependent Variable: Perf500								
Summary of Stepwise Selection								
Step	Variable Entered	Variable Removed	Number Vars In	Partial R-Square	Model R-Square	C(p)	F Value	Pr > F
1	FTET		1	0.1231	0.1231	0.3515	5.48	
	0.0245							
2	Fac_Salary		2	0.0932	0.2163	-1.6182	4.52	
	0.0401							
3	CCFemale		3	0.0495	0.3295	-1.7256	2.49	
	0.1229							
4	FCBach		4	0.0637	0.3295	-2.4385	3.42	
	0.0727							

The regression analysis began with 14 independent variables, and through the stepwise process of eliminating variables with little or no predictability upon the dependent measure, only three were found to significantly impact the dependent variable. Results from the stepwise process indicated that four of the variables—CCFemale (the percent of curriculum students identified as female), Fac_Salary (the average annual salary for full-time faculty), FTET (FTE earned from students enrolled in technical or vocational classes) and FCBach (percent of full-time faculty whose highest educational attainment includes a bachelor's degree)—have the potential to impact variation regarding the performance of transfer students. Overall, these four variables provided an R^2 value of .3295 implying that 33% of the total variation with the fifth core performance measure can be impacted based on the percent of female students enrolled in curriculum classes, the average annual salary for full-time faculty, FTE earned from technical or vocational programs and the percent of full-time faculty credentialed with a bachelor's degree. The model to explain this process is:

$$\text{Performance of transfer students} = 142.68663 + (-0.237)*\text{FTET} + (-0.00049)*\text{Fac_Salary} + (-.2863)*\text{FCBach} + (-0.3775)*\text{CCFemale}$$

The model supports the results from the regression analysis by detailing the impact of each of the four independent variables per unit increase among the performance measure. For example, per 1 unit increase in the performance of transfer students, FTET decreases by 0.237 when Fac_Salary, FCBach and CCFemale are held

constant. It is worth noting that all of the variables with the potential to impact a college's performance on this particular measure decline as performance increases.

Conclusion: Taking into consideration the results of the correlation coefficients and the regression model presented in Tables 4.57 and 4.60, the data support the rejection of Hypothesis 5. Two of the 14 independent variables—Fac_Salary and CCFemale—demonstrated moderate but significant correlations. The remaining 12 variables (FTECT, FTET, FTEOther, FT, FCOther, FCBach, FCMast, FCDoct, FCedSpec, CCClass, CCAge and CCMinor) were not found to be linearly related to the performance of college transfer students. The rejection of the null hypothesis was further supported by the stepwise regression model, which suggests that three variables can impact the performance of the fifth standard with a sample variance of 33%. Approximately a third of the sample variance in Perf500 can be explained by CCFemale, Fac_Salary, FCBach and FTET. Although this model is not a strong one for predicting, these results suggest that these independent variables provide significant information in explaining the performance of college transfer students.

Summary

A summary of the comparative and correlational tests conducted in Chapter Four include:

- Overall, the rate of progression among community colleges in North Carolina appeared either slow and steady or erratic. (Appendix H).

- A comprehensive review of the results for the five core performance measures are provided in Appendix I. This table identifies each college and its performance on all five measures for each reporting year. The most successful community colleges met 13 out of 15 of the performance standards. Six colleges excelled during these three years by achieving the highest score: Asheville-Buncombe Technical Community College, Blue Ridge Community College, Caldwell Community College and Technical Institute, College of Albemarle, Southeastern Community College, and Wilkes Community College. On the other end of the spectrum, Montgomery Community College recorded the worst performance by meeting only 6 of the 15 standards during this three-year time span.
- Several independent values were analyzed to determine if relationships existed between them and the core performance measures. After reviewing the results from the correlational and regression analyses, the more significant relationships were obtained by the following independent variables: the percent of minority students enrolled in basic skills classes (BSMinor), average age of basic skills students (BSAge), FTE earned by students enrolled in technical (FTET) or other programs (FTEOther), the percent of full-time faculty credentialed with a bachelor's degree (FCBach) or a master's degree (FCMast), percent of female students enrolled in curriculum classes (CCFemale), and average

annual salary earned by full-time curriculum faculty (Fac_Salary).

Details regarding these results are provided later in this summary.

- According to Pearson's Correlation, only two performance measures had significant relationships with dependent variables. The second performance measure demonstrated moderate, but significant relationships with 10 of the 14 independent variables. The fifth performance measure was significantly correlated with two of the 14 independent values.
- There were several instances when the independent variables were highly correlated with one another, implying occurrences of multicollinearity or shared information.
- The percent of minority students enrolled in basic skills classes is the predictor for the first performance measure with a sample variance of 7 percent.
- The second performance measure—passing rate for first-time test-takers of licensure and certification examinations—included four predictor variables. These variables (FTE earned by students enrolled in technical programs, FTE earned by miscellaneous categories, the percent of full-time faculty credentialed with a master's degree, and the percent of females enrolled in curriculum classes) accounted for approximately half (48%) of the sample variance.
- No significant relationships were found for the third performance measure, goal completion of program completers.

- No significant relationships were found for the fourth performance measure, employment status of graduates.
- The final core measure focuses on the performance of college transfer students. Four variables—the percent of females enrolled in college credit classes, average faculty salary, FTE earned by students enrolled in technical programs, and the percent of full-time faculty whose highest educational level is with a bachelor's degree—explain almost a third (32%) of the sample variance in the performance of college transfer students.

The research models and results for each of the five core measures were the focus of the fourth chapter. Although these results were not as dynamic as the author had hoped, this study expands the body of research conducted on performance-based initiatives and attempts to provide a better understanding of community college performance on the core standards mandated by the North Carolina legislature.

An interpretation of these results as well as implications for practitioners and future study are presented in the subsequent chapter.

Chapter 5

Conclusions, Implications, and Recommendations

Rationale of the Study

The purpose of this study was two-fold: 1) to evaluate the performance of North Carolina community colleges on the core performance-based budgeting measures, and 2) to determine if various student and institutional characteristics have the potential to impact these measures. This performance-based initiative is driven by two factors—expenditures by North Carolina’s community colleges and accountability to the state for those expenditures. It is important to study performance-based initiatives within this context to determine if these initiatives encourage colleges to achieve higher levels of performance while maintaining the standard of accountability set forth in general statute 115D-31.3.

In an attempt to create a formalized system of accountability, the General Assembly enacted GS115D-31.3 in 1999, which requires each community college in North Carolina to maintain or exceed the twelve performance measures previously outlined in chapter one. Although twelve measures are incorporated into the accountability requirements, only five are required of all community colleges for the performance-based budgeting (PBB) component. As a part of the PBB program, all

fifty-eight community colleges are required to participate with respect to each of the five core measures (progress of basic skills students, passing rate for first-time test-takers on licensure and certification examinations, goal completion for program completers, employment status of graduates, and performance of college transfer students), and each college is also required to select an additional measure from the remaining seven standards for a total of six measures. Colleges who meet five of these six measures are considered superior schools by NCCCS and, according to the PBB component, may qualify for incentive funding at the end of the year.

This new system of accountability based on performance initiatives took effect with the 1999-2000 academic year, and the results were published in the *2001 Critical Success Factors Report*. Initially, the North Carolina Community College System had anticipated 1998-99 to be the first year of the performance-based initiative. Since many colleges had prepared for this date and the data were available for that year, the author opted to begin the study with the 1998-99 reporting year.

Chapter 4 of this study presented the results of a comparative and a correlational analysis to determine if, in fact, performance-based budgeting is the optimum accountability tool for the state's community colleges and if there is a discernible correlation between performance measures and various independent variables. The research questions that guided this study were developed in an effort to provide an initial assessment of the program, as well as to build a foundation for future studies on this topic.

Research Questions

Two research questions directed this study. First, the overall rate of progress on each of the core measures by North Carolina community colleges was examined in Research Question One. Second, the possible interaction between the performance measures and a select group of independent variables classified as institutional and student characteristics were explored in Research Question Two.

Descriptive statistics were used to address the first research question.

Descriptive statistics cannot provide a basis to reject a null hypothesis; this method can, however, answer the research question of whether or not North Carolina's community colleges demonstrated a successful rate of progress on five core performance measures from 1998 through 2001. The first question encompassed a variety of descriptive or univariate statistics (both in categorical and continuous forms), tables, and graphs in an effort to thoroughly address this question.

The second research question included five hypotheses statements. Bivariate correlations and multivariate regression analyses were used to determine whether to accept or reject the five hypotheses.

Data were compiled from archival documents published by the North Carolina Community College System Office and a database program entitled Data Warehouse. Two software programs were used to analyze this data—Excel 2000 and SAS 8.1. A summary of the research questions/hypotheses statements, conclusions and rationales are listed in Appendix H.

The remainder of this chapter is organized around the findings and interpretation of the results pertaining to each of the five core performance measures and concludes

with a review of the implications of these results for practitioners in higher education and suggestions for further research.

Summary of Results

Research Question 1A: Did North Carolina's community colleges demonstrate a successful rate of progress on the first core performance measure—progress of basic skills students—over a three-year period?

The first research question, which focuses on the progress of basic skills students, was addressed by using a variety of univariate statistics. A review of these tests provided mixed results. For example, colleges demonstrated a decline on the first performance measure from 1998-99 to 1999-00 by 10% followed by a rise of 7% the next year. After this determination, the analysis took the data one step further to review how many of these colleges were actually improving on their performance from year to year. The number of community colleges whose performance improved from the first to the second year was twenty-nine. This figure declined slightly between the second and third years with twenty-eight colleges indicating an improvement in their scores for this measure. With performance varying according to the different statistical components—mean and mode scores, percent able to meet or exceed the standard, number of colleges who improved on their performance and box plots—there was insufficient evidence to demonstrate a steady rate of progress among community colleges in North Carolina.

Research Question 1B: Did North Carolina's community colleges demonstrate a successful rate of progress on the second core performance measure—the passing rate for first-time test-takers for certification and licensure examinations—over a three-year period?

The standard for first-time test-takers for certification and licensure examinations consists of two parts: 1) each college must meet or exceed an aggregate institutional passing rate of at least 80%, as well as 2) each college must record a standard of 70% or greater on all reported licensure/certification examinations. Descriptive statistics failed to show a steady rate of progress in the performance of North Carolina's community colleges on the second performance measure.

First, the percent of colleges who met or exceeded the standard declined by 14% from 1998-99 to 1999-00 and then increased by 12% from 1999-00 to 2000-01. Second, the overall performance of these colleges during a three-year period declined by 7%. Third, the mean scores for first-time test-takers of licensure and certification examinations rose by several percent each year. Finally, the mode was the same from year one to year two followed by an increase of 3% for year two to year three. Again, univariate statistical tests yielded mixed results unable to support the hypothesis that these colleges could maintain a successive progression on this performance measure.

Research Question 1C: Did North Carolina's community colleges demonstrate a successful rate of progress on the third core performance measure—goal completion for program completers—over a three-year period?

For the initial year (1998-99), all colleges performed so well on this 90% standard that the North Carolina Community College System office raised the standard to 95% and mandated the inclusion of non-completers in this standard for 1999-00. Initially, this standard solely evaluated the goal completion among program completers or students who recently received a certificate, diploma or associate's degree. The changes affecting this standard also required colleges to survey non-completers—students who had withdrawn from classes. The decision to include non-completers created several challenges: meeting the required response rate for students no longer enrolled in classes and receiving a satisfactory score on this survey from students who probably had challenges to overcome and were not happy with their educational experience. Overall, this change yielded mixed results by North Carolina community colleges.

According to the data presented in chapter 4, there were no consistent rate of progress among these colleges for this third performance measure. For example, categorical data showed that the percent of community colleges who met or exceeded the standard declined drastically (54%) from 1998-99 to 1999-00. Then, from 1999-00 to 2000-01, the scores recorded for the third performance measure increased by 55%. This decline might be attribute to the inclusion of non-completers as a part of the performance-based budgeting component. The subsequent increase from 1999-00 to

2000-01 was a result from another change in this standard—a return to surveying only those students classified as completers for the PBB component.

For consistency, continuous data included only the scores recorded by program completers for all three years. These results included: an improvement of 66% by North Carolina community colleges from 1998-99 to 1999-00 as well as from 1999-00 to 2000-01. By contrast, the mean scores of 98.5%, 99.14%, and 99% (excluding non-completers) showed little variation during this time period and the mode was the same for all three years suggesting minimal improvement on the part of individual colleges. Because of the strength of these scores, excluding non-completers for 1999-00, it is difficult to substantiate improvement on this measure. With these results, there is not enough evidence to demonstrate that a rate of progress from 1998 through 2001.

Research Question 1D: Did North Carolina's community colleges demonstrate a successful rate of progress on the fourth core performance measure—employment status of graduates—over a three-year period?

The results of the fourth performance measure generally demonstrated a steady and successful rate of progress for community colleges in North Carolina. This measure resulted in a majority of community colleges achieving extremely high scores the second year.

From 1998-99 to 1999-00, the percent of colleges who met or exceeded this standard saw a tremendous increase of 79%. This increase was a reflection of not only improved scores, but also because 100% of the colleges were able to meet the required

standard for 1999-00. In 2000-01, again 100 percent of the colleges were successful in their endeavor to attain this standard.

A review of the rate of progress among these institutions of higher education shows 100 percent improvement in performance from 1998-99 to 1999-00. The average score for the second year was 99.8. With such a high overall achievement, the possibility of improving upon their performance from the second to third year became more of a challenge. This challenge was apparent when 3 percent of the community colleges improved their scores from 1999-00 to 2000-01.

Results for the fourth performance measure experienced little variation with colleges scoring between 83 and 97 percent for 1998-99, 98.59 to 100 percent for 1999-00, and 95 to 100 percent for 2000-01. Both of the measures of central tendency, mean and mode, rose slightly from year one to year two and then slightly decreased. On average, community colleges in North Carolina reported an employment rate of 92% (1998-99), 100% (1999-00), and 98% (2000-01). Statistics used to review the fourth performance measure demonstrated a mixed rate of progress; therefore, this study was unable to refute Research Question 1D.

Research Question 1E: Did North Carolina's community colleges demonstrate a successful rate of progress on the fifth core performance measure—performance of college transfer students—over a three-year period?

North Carolina community colleges made vast strides on the fifth performance measure between 1998 and 2001. Of North Carolina's fifty-eight community colleges, schools able to meet or exceed this standard experienced a notable increase from 9% in

1998-99 to 24% in 1999-00 to 71% in 2000-01. In addition, the scores recorded marked improvements with 53% of the schools recording better scores from year one to year two and 74% from year two to year three. Progress was also noted in the mean scores for college transfer students, which rose slightly each year.

The mode scores were the only descriptive element not to support the conclusion that the fifth performance measure saw a steady rate of progress. On average, the colleges experienced a 5% increase in the overall mode scores from 1998-99 to 1999-00 followed by a decrease of 6% from 1999-00 to 2000-01.

Overall, the univariate tests demonstrated that community colleges in North Carolina made the greatest improvement on the fifth performance measure. The most notable achievement occurred when the percent of the 58 colleges able to meet or exceed this standard dramatically increased from 9% to 71% over a three-year time span.

The following hypotheses statements were derived from the second research question.

H₀ Statement 1: There is no relationship between the progress of basic skills students and pertinent institutional and student characteristics.

Pearson Correlation found no significant relationships between the dependent value (progress of basic skills students) and the independent values [FTE earned from basic skills classes (FTEBS), average basic skills class size (BSClass), average age for basic skills students (BSAge), percent of students enrolled in basic skills classes classified as non-Caucasian (BSMinor), and the percent of females enrolled

(BSFemale)]. A stepwise regression analysis indicated that one of the variables when included in a regression model, BSMInor—demonstrated weak, but a significant relationship with the dependent variable. The model containing this variable was able to explain 7% of the sample variation in the progress of basic skills students.

H₀ Statement 2: There is no relationship between the passing rate for first-time test-takers for certification and licensure examinations and pertinent institutional and student characteristics.

For performance measures 2, 3, 4, and 5 the same fourteen independent variables were used to study any potential relationships with the respective independent value: the percent of FTE earned from students enrolled under the college transfer code, technical and vocational codes, and special or miscellaneous programs (FTECT, FTET, and FTEOther respectively); average annual salary earned by full-time curriculum faculty (Fac_Salary); the percent of full-time personnel employed as curriculum faculty (FT); the percent of faculty credentialed with a bachelor's degree, master's degree, doctorate, educational specialist certificate and other (FCBach, FCMast, FCDoct, FCEdSpec, and FCOther); the average class size for a college credit course (CCClass); the average age for a curriculum student (CCAge); the percent of students enrolled in college credit classes who are non-Caucasian (CCMinor); and, the percent of female students enrolled in curriculum classes (CCFemale).

Rejection of the null hypothesis was supported by both the correlation and regression analyses. For the correlational analysis, ten of the 14 independent variables—FTECT, FTET, FCMast, CCAge, CCFemale, FTEOther, FCOther, FCBach,

FCDoct, and CCClass—demonstrated primarily moderate, but significant relationships with the passing rate for first-time test-takers for certification and licensure examinations (Table 4.46).

The stepwise regression model suggested that four variables—FTET, FTEOther, CCFemale, and FCMast—have the potential to impact performance on the second performance measure with a combined R^2 of .4811 (Table 4.49). For the second performance measure, 48% of the sample variation is explained by these four variables with a regression model.

H₀ Statement 3: There is no relationship between goal completion for program completers and pertinent institutional and student characteristics.

Both the correlation and the regression analyses concluded there were no significant relationships between goal completion for program completers and the independent measures. The lack of variation is apparent when reviewing the ranges for these three years: scores ranged from 90.2 to 100% for 1998-99, from 90.2 to 100% during 1999-00, and from 93 to 100% for 2000-01. Overall, the percent of completers who expressed satisfaction with meeting their goals was extremely high. With a limited variation in scores, it would be difficult to discover any strong correlational relationships between the dependent and independent measures.

Failure to reject the null hypotheses was evident as the correlational analysis yielded no significant results between the dependent and independent variables, and the stepwise regression model indicated no statistically significant relationships.

H₀ Statement 4: There is no relationship between employment status of graduates and pertinent institutional and student characteristics.

There were not any significant relationships for the fourth performance measure as determined by the Pearson Correlation Coefficient Matrix and the Stepwise Regression Model resulting in a failure to reject the null hypothesis. Once again, the scores recorded by community colleges in North Carolina were incredibly high, which allowed for little sample variance. With scores reported primarily between 95 and 100%, there was minimal differentiation to identify any potential relationships between the employment status of graduates and the independent values.

H₀ Statement 5: There is no relationship between the performance of college transfer students and pertinent institutional and student characteristics.

For hypothesis statement 5, a Pearson Correlation analysis and a stepwise multiple regression process were used to examine the data. The Pearson Correlation Matrix (Table 4.57) showed two of the 14 independent variables—Fac_Salary and CCFemale—demonstrated moderate, but significant relationships with the dependent variable, performance of college transfer students. The existence of an established relationship between the dependent and several of the independent values was further supported by the stepwise regression process. According to the regression model, 33% of the variation can be explained by four of the independent variables—CCFemale, Fac_Salary, FCBach, and FTET. The null hypothesis was rejected based on the results from both the correlation and regression tests.

Conclusions and Interpretations

Performance-based initiatives, as defined by current literature, consider the following elements to be instrumental in the success of such an endeavor: develop a program that emphasizes quality over efficiency; create standards that focus on institutional effectiveness and/or support strategic planning; develop measures that can utilize existing data; and consider the state's educational priorities within the present political structure (Albright, 1998; Burke, 1999; Christal 1998). Sanchez and Laanan (1998) cite a report published by the American Association of Community Colleges (AACC) with regard to the overall effectiveness of performance-based programs. The report encourages community colleges to:

1. Engage in positive partnerships with external audiences (publics);
2. Compare performance on established standards/measures with the needs and expectations of those involved in the process; and,
3. Generate awareness of the process and the performance with the general public in ways that show how the performance initiatives support the college's mission and purpose. (Sanchez and Laanan, 1998)

Fuhrman (1999) also believes in the importance of developing partnerships in order to insure the stability and longevity of performance-based programs. He suggests that forming partnerships for assessment; stronger ties with government; increased faculty involvement; and, development of an assessment program with a "shared vision of outcomes" are vital to a successful accountability program.

These views and the literature review presented in Chapter 2 offer a broad view for success with accountability initiatives like performance-based budgeting. The

problem occurs, however, with the fact that not much has been studied regarding particular performance measures or the overall performance of colleges in their endeavors to meet established performance standards.

Research Question One

The first research question focused on the rate of progress among North Carolina's community colleges for the core performance measures described in GS115D-31.3. Conversations with personnel in the System office and in the community colleges themselves revealed a need for an inclusive study with data in both categorical and continuous forms. Use of data in both categorical and continuous forms allowed for a more comprehensive review of each college's performance as well as an overall evaluation.

With regard to the first research question, it is hard to make an absolute determination. Results for each of the performance measures were varied. Considerable statistical evidence in this study indicated that many of the community colleges in North Carolina are progressing at some level on each of these performance measures. The problem occurred, however, when colleges were unable to demonstrate a steady rate of progression on all of the statistical elements incorporated into this study. Overall, that progression is probably considered moderate for measures 1-3 and slightly stronger on measures 4 and 5.

Performance-based budgeting literature recommends that the first couple of years are a time of trial and error spent developing, adjusting and improving performance measures, data collection and reporting (Albright, 1998; Burke, 1999;

Nichols, 1995; Paulsen, 2001; Christal, 1998). This idea was evident between 1998 to 2001 when North Carolina modified the standards for goal completion for program completers and the performance of college transfer students, as well as the data content for the third standard (*e.g.* goal completion for program completers versus goal completion for program completers and non-completers).

Research Question Two

The conclusion and interpretation section for Research Question Two is limited because of the present amount of literature available with respect to these specific performance measures and/or the evaluation of a statewide performance-based system. As indicated in Chapter Two, the performance-based literature deals more with concepts, strengths/weaknesses and recommendations. This limitation might be resolved if states using either performance-based budgeting or performance-based funding included a more in-depth evaluation of the overall performance of community colleges statewide rather than solely reporting on the results in their annual report, such as North Carolina's *Critical Success Factors*. This information would provide future research projects with comparative data that could be used to develop a more comprehensive study.

The key findings of this study were based on the interaction, or potential relationships, between the dependent values (performance measures) with the independent values. Five independent variables were studied in relation to performance measure 1 and fourteen independent variables with respect to measures 2-5. These

independent values were selected in an effort to review a wide-range of institutional and student characteristics. The researcher selected the independent variables in an effort to provide an overview of college and student demographics in order to provide a comprehensive review of the performance-based budgeting program in North Carolina.

Performance Measure 1: Performance of Basic Skills Students

Several of the independent variables included in this study appeared to impact community college performance. Scores for the first performance measure—progress of basic skills students—indicated that the percent of minorities enrolled in these classes and the average age of the students have the potential to affect how a college performs on this particular measure. However, as both the correlation and the regression analyses indicated, this impact is minimal at best. For the regression analysis, the parameter estimate for the intercept fell at 84.89264 and for BSMInor at -0.09853 . As mentioned in Chapter 4, the model for the regression analysis indicates that for every unit increase in the performance reported by basic skills programs, the percent of minority students enrolled in these classes decreases by -0.09853 . This observation is interesting as the percent of minority students enrolled in these classes range from 10 to 87 percent for the 2001 reporting year. According to the data, one might deduce that programs with a lower percent of minority students tend to perform better on this performance measure.

Scores on the first performance measure included ranges of 43, 38 and 30 percent. With such a noticeable variation in scores by these community colleges, there is probably some untested variable(s) that has the potential to interact with the performance of basic skills students.

Performance Measure 2: Passing rate for first-time test-takers for certification and licensure examinations

The key finding of this study was based on the analysis of the relationship between the passing rate for first-time test-takers for certification and licensure examinations and fourteen independent variables. Research Question Two examined the impact of the independent variables via bivariate and multivariate analyses.

The correlational analysis for the second performance measure yielded interesting results for both the interactions between the dependent variable with ten of the independent variables, as well as distinguishing relationships between the independent variables themselves. The independent values which demonstrated moderate, but significant relationships with the performance of first-time test-takers of licensure and certification examinations included: FTECT, FTET, FTEOther, FCOther, FCBach, FCMast, FCDoct, CCClass, CCAge, and CCFemale, with coefficients for these relationships at .5269, -.4774, .2542, -.3178, -.3015, .3396, .3147, .3175, -.4179, and -.4340 respectively. As indicated in Chapter 4, the strongest positive and negative relationships occurred with full-time equivalents (FTE). For the purpose of this study, FTE was delineated according to several classifications: FTECT, FTET and FTEOther. Two of these variables, FTECT and FTET, were found to have strong interactions with the second performance measure. FTECT included contact hours earned from students enrolled in college transfer programs. A positive relationship was apparent with FTECT. Therefore, the results from the Pearson Correlation indicated that as the scores for the second performance measure increased, so did the FTE earned

from students classified as college transfer. This idea was further supported when a decline in performance occurred for first-time test-takers of licensure and certification exams when FTE earned from student enrolled in technical programs (FTET) increased. The negative correlation between the second performance measure and the FTE earned from technical programs is worth noting, since it is a majority of the students or graduates from these programs (i.e. nursing, Respiratory Care, Therapeutic Massage, BLET, etc.) who are required to pass licensure and certification exams prior to employment. The implication, therefore, is that community colleges who earn less FTE from technical programs than college transfer programs tend to perform better on licensure and certification examinations.

The strength of four independent values (FTECT; FTEOther; the percent of females enrolled in college credit classes, CCFemale; and, the percent of full-time faculty whose highest educational degree earned was the master's level) was moderate. According to the regression model, these four variables have the potential to impact sample variance by 48%. It is worth noting that three of these variables (FTECT, FTEOther, and FCMast) react positively to an increase in performance among first-time test-takers for certification and licensure exams. The regression model explains that a unit increase in performance is indicative of a 0.32 increase by FTECT if the remaining three variables are held constant. One might expect an increase in FTE earned by college transfer and special/miscellaneous programs to coincide with this performance measure, since a higher percentage of FTE earned by either of these avenues results in less FTE earned by technical programs. A majority of the individuals tested for licensure and certification are graduates of technical or vocational programs. Careful

consideration of this model explains that smaller technical classes typically result in a stronger performance on this PBB standard. On the other hand, the model also indicated that as the performance of graduates taking licensure and certification exams for the first-time increases, the percent of female students enrolled in college credit or curriculum programs declines. Rejection of the null hypothesis was based on these correlational relationships, as well as relationships and interactions between the dependent variable and FTECT, FTEOther, CCFemale, and FCMast.

Performance Measure 3: Goal Completion by Program Completers

According to Pearson's correlation, performance measure three indicated that there is no relationship at the .05 level of significance between goal completion of completers and the fourteen independent variables included in this portion of the study. However, Table 4.51 reported several moderate to strong correlations between some of the independent values. The third core performance measure included fourteen statistically significant relationships between independent measures at the alpha level of $<.01$. This large a representation among the independent measures may imply limitations with this study as a result of multicollinearity among these variables. Multicollinearity indicates shared information among the independent values, which may inhibit interactions or correlations between the dependent and independent variables (Agresti, 1998). For example, it might be inferred that a majority of these relationships involved FTE and faculty credential variables. These variables probably share some information since credentials to teach with a college transfer program (FTECT) require a minimum of 18 graduate hours. In addition, credentials for teaching

with a technical or vocational program are much lower—requiring only a high school diploma with the appropriate work experience or an associate’s degree. One might expect, therefore, that FTET, FTECT, and FTEOther would provide overlapping information with several of the variables related to faculty credentials.

In conclusion, Pearson’s correlation yielded no interaction between the dependent and independent variables, as well as no significant relationships evolved from the stepwise regression model. This performance measure might be better evaluated with the elimination of several independent variables to avoid instances of multicollinearity. The author believes, however, that regardless of issues involving multicollinearity, it would be difficult to make a determination on this performance measure since there was little variation in the scores recorded by North Carolina community colleges between 1998 and 2001.

Performance Measure 4: Employment Status of Graduates

For the fourth performance measure, the results of the Pearson correlation indicated that there are no relationships at the .05 level of significance. Additionally, the stepwise regression model yielded no statistically significant relationships.

Although the measure is primarily outcome-oriented, it is an important element. In Ewell’s (1985) opinion, higher education can achieve excellence by demonstrating change that is consistent with institutional objectives, student educational goals, and the needs of the community. North Carolina’s fourth performance measure, employment status of graduates, incorporates each of these elements mentioned by Ewell. The guiding vision for community colleges is typically represented in their mission

statements. Frye (2002) recommends that college mission statements ought to be the source for assessment and, in turn, an indicator for what should be measured. Many of the colleges in North Carolina incorporate something regarding the preparation of students for the workforce or job placement as an institutional objective, a part of the mission statement. Further, the main objective for many students who enroll at a community college is to eventually obtain employment either through skills learned in a technical program or classes geared toward college transfer. This measure also benefits the general public by providing for a well-trained workforce and contributing to the economic stability and development of the community. Ewell (1985) considers incorporating the needs of the community as an essential element for community colleges because of the ongoing relationship these colleges have with their service area. This relationship leads to the importance of a college not only servicing its public, but also being accountable for those services rendered and the expectations therein.

Performance Measure 5: Performance of College Transfer Students

Significant differences were found in the investigation of the fifth core performance measure with fourteen independent variables. The strength and the predictive value of the statistical findings according to Pearson correlation, however, were moderate. The analysis of this performance measure according to the correlation analysis suggested that the average annual salary for full-time instructional staff with curriculum programs (Fac_Salary) and the percent of females enrolled in curriculum classes (CCFemale) had the potential to impact the performance of college transfer students. Further, evidence from the regression analysis of the fifth performance

measure also confirmed that four variables (Fac_Salary, CCFemale, FCBach, and FTECT) has the potential to impact the performance of college transfer students with a sample variance of 32%. The model explaining the regression analysis showed that each of the four variables exhibits a negative relationship with the fifth performance measure. For example, a per unit increase in the performance of transfer students corresponds with a decrease of 0.237 in the FTE earned from technical programs. This implies that colleges who earn a lower percent of FTE from technical programs tend to respond better on this measure. If the stronger performing colleges are earning less FTE from technical programs, then they are also earning a greater percent of their curriculum FTE from either college transfer or special/miscellaneous programs. Fifty-two community colleges earned less than 15% of the curriculum FTE from special or miscellaneous program. Therefore, the implication is that the more successful colleges earn a greater percent of their FTE from students enrolled in college transfer programs. This study implies that colleges with a larger percent of students enrolled in this program tend to perform better of the fifth measure.

Mentioned earlier in this chapter, data collection for this particular measure is labored by the fact that the North Carolina Community College System receives this information from various four-year colleges and universities. This often delays the transfer of information for several years. Outcalt and Rabin (1998) suggest that data are a vital part of the accountability process and can inhibit its effectiveness if poor data collection techniques or misunderstood data are used.

Wellman (2001) expressed another concern that outcomes are being included as standards for many states. His concern lies with the interpretation and use of

educational outcomes such as graduation rates, transfer rates, and retention. These are actually institutional outcomes, since they do not impact change on the students while they are enrolled at a college or university (Wellman, 2001; Burke, 1999; Layzell, 1998; Albright, 1998). Yet, many states opt to include transfer rates as a part of their performance-based program. According to the SHEEO survey administered to both two and four-year colleges in 1997, transfer rates was the second most frequently used standard.

Summary

In evaluating the overall effectiveness of North Carolina's performance-based budgeting program, the study indicated that there was not an evident steady rate of progress by the state's community colleges on the five core performance measures. Further, that the interaction of these core measures with certain independent variables can impact a college's performance with regard to the rate of progress for basic skills students, the passing rate of first-time test-takers for licensure and certification examinations, and the performance of college transfer students. Two of the models failed to demonstrate significant relationships—goal completion for program completers and employment status of graduates—and one exhibited a mild relationship—the progress of basic skills students. This failure to yield significant results for three of the core measures is also noteworthy and indicative of a need for further analysis.

As one of the first studies to evaluate the effectiveness of newly established accountability programs like PBB, these results provide a foundation for further exploration by both practitioners and researchers.

Implications for Practice

Are performance-based programs a good idea for community colleges? The state of North Carolina has several extraneous factors that could impact how it answers this question. One critical issue not addressed in this study deals with the incentive funding component. Because of state budgetary restraints and cutbacks, the incentive funding established for community colleges meeting the superior or exemplary status has not been fulfilled. These funds are no longer available by year-end. In addition, many of these community colleges have been growing at an alarming rate of 3-12 percent per year over the past three years. With the current budget situation, many of the schools are under-funded and yet are still expected to maintain a superior level of performance. Through interviews and meetings, this issue kept coming to the forefront. If these funds are not made available to North Carolina's community colleges, what will be the fate of the PBB program? Therefore, an assessment of the importance and necessity of the incentive funding component for North Carolina's performance-based budgeting program could prove insightful to the stability and the longevity of this program.

Additionally, practitioners need to determine if the performance measures truly evaluate processes important to the educational experience. Performance-based programs are generally based on the ideologies of institutional effectiveness, which

encourage us to look at the process instead of the outcomes derived from various higher education programs. Yet, a majority of North Carolina's performance measures tend to focus more on outcomes than on the process of learning. Performance literature acknowledges that the development of performance standards is crucial to the success of a performance-based program. Further, to develop measures that are process-oriented rather than outcome-based can be particularly challenging since outcome-based measures are typically easier to assess and to explain (Albright, 1998; Burke, 1999; and Christal, 1998).

NCCCS needs to study colleges who have been successful with the PBB measures to determine if certain programs or criteria could help schools struggling to obtain the same standards. The results for the performance of North Carolina community colleges from 1998-2001 on the five core performance measures are provided in Appendix H. This table identifies each college and its performance on all five measures for each reporting year. The most successful community colleges met 13 out of 15 of the performance standards over this three-year time span. Six colleges excelled by achieving the highest score: Asheville-Buncombe Technical Community College, Blue Ridge Community College, Caldwell Community College and Technical Institute, College of Albemarle, Southeastern Community College, and Wilkes Community College. On the other end of the spectrum, Montgomery Community College recorded the worst performance by meeting only 6 of the 15 standards between 1998 and 2001. In order to better understand why certain colleges tend to perform consistently better than others, the author suggests a qualitative study to fully examine the results of this quantitative study. An investigation into why the top six colleges

performed so well might assist colleges such as Montgomery Community College who tend to struggle with these standards.

NCCCS needs to evaluate the current data collection and reporting methods to ascertain overall effectiveness and efficiency with these processes. Another consideration lies with the novelty of North Carolina's PBB program. Mentioned earlier in this chapter, Burke (1999) asserts that any new performance program needs to experience and include a period of trial-and-error. North Carolina has done an admirable job of adjusting standards as needed. For example, the third performance measure—goal completion for program completers—has undergone several changes in this short time. When a majority of these community colleges were achieving this standard, the response by NCCCS was to increase the standard from 90 to 95% and to include non-completers for the 1999-00 reporting year. When the performance of this standard experienced a vast downward shift, NCCCS attributed it to the inclusion of non-completers and withdrew this element from PBB for the following year. With the fifth performance measure, which focuses on the performance of college transfer students, NCCCS once again tried to evaluate the measure and respond with corrections to even the playing field. Originally, this standard was set at 84.6%. However, when college personnel realized that the standard was higher than both the state and the national average, it was lowered to accommodate the state average of 82.9%. Among community college planners and researchers, this standard still raises some debate. There are two concerns: one includes the collection process of the data by four-year universities and the ensuing delay in sharing this information with NCCCS that results from this process and second, the standard should be comparable to the national average

GPA for college transfer students. Although the North Carolina Community College System and its member institutions are making strides to develop a fair and timely process, they need to conduct an extensive evaluation of the data collection and reporting process to determine how best to improve upon this evolving accountability program. It might be too early in this process to determine whether PBB is an adequate means for accountability and evaluation of performance. However, the time is quickly approaching when the state will be held accountable for an inadequate system for accountability if steps are not taken to improve the current situation.

Recommendations for Future Study

1. Further research on performance-based programs could provide greater insight into the implementation, evaluation and execution of the various programs and the standards they utilize. However, the author would recommend studies with a more limited scope than this particular study. Studies in the future might include a thorough review of only one or two performance measure(s).
2. The potential impact of the incentive funding component of PBB warrants further study. According to interviews with NCCCS personnel and senior administrators at several community colleges, this is something that could evolve into a crucial concern for the longevity and effectiveness of PBB. The potential impact of this issue leads to a vital question—“Have other community college systems experienced a similar situation resulting in the demise, revisions, and/or continuance of such a program?”

3. Further investigation could explore different independent variables—especially with regard to the first performance measure (progress of basic skills students).
A study on some of the more specific elements of this program might prove beneficial. Some of the variables that might be worth further investigation include: instructional styles, computer usage in the classroom and/or testing, computer literacy of students, or instructor qualifications/credentials. These or other variables might help to shed some light on what actually impacts a college's performance on this measure. Further study might also help delineate other factors that may contribute to a better understanding of the colleges who tend to excel and those that often struggle with this standard.
4. A review the second performance measure—success rate of first-time test-takers of licensure and certification examinations—could provide insights into factors that affect this particular standard. There are several implications from this study with one of them including the possibility that smaller technology programs tend to yield better scores. Other, undetermined factors could also attribute to this result. For example, one factor to consider is the elimination of a program or reduction in its size in order to meet both elements of this standard. For example, several community colleges have opted not to offer Fundamentals of Real Estate classes since the passing rate for first-time test takers was frequently below the program standard of 70 percent. What were the factors that contributed to such a poor score from these students? How many community colleges have made similar decisions? And, why? These questions could be

addressed in a future study on the educational and economic impact of the second performance measure.

5. Other possible considerations for further study with respect to the second performance measure might include current methods for collection and reporting performance data. For instance, several of the agencies that provide the data for this measure have had problems with either collecting the data in a timely manner or with issues of privacy concerning the release of this information to NCCCS. A future study might review the data collection process—strengths and weaknesses—as well as how concerns with privacy have been addressed by other states
6. Further study into the impact of faculty credentials and instructional methods with respect to the second and the fifth performance measures could shed light on the performance of first-time test-takers of licensure and certification examinations as well as the performance of college transfer students. SACS requirements for faculty in college transfer programs are very stringent requiring a minimum of 18 graduate hours in the field of instruction. With many of the technical programs, however, there is much more flexibility in the hiring of instructional personnel. In some instances, faculty members may not have an associate's degree or an associate's degree is the highest educational degree obtained by the instructor. The correlation portion of this study indicated that faculty credentials often share a relationship with these performance measures. However, with issues involving multicollinearity, there appeared to be a conflict

with other variables sharing similar information. An investigation focusing solely on credentials might be more beneficial.

7. A future study might evaluate the difficulty many colleges have with meeting the fifth performance measure, which considers college transfer students. With so few colleges meeting this standard based on merit, what issues could be involved? Of the five core performance measures, this one tends to hinder most colleges in obtaining the superior classification required by PBB. What programs or services could be developed to strengthen the performance of colleges on this standard? A study of existing programs at the more successful colleges in North Carolina, as well as in other states, might prove beneficial to the many of the community colleges who struggle to obtain this standard of 82.9%.
8. A comparison study at one of the four-year universities might offer some insights into the behavioral and cognitive factors involved with the two student groups involved in the college transfer measures—students native to the four-year college and students who have transferred from a community college. College transfer students, who are probably on their own for the first time, are being compared with students who have had one or two years to acclimate themselves to the independence often associated with the four-year experience. Regardless, college transfer students might be dealing with a different set of time management, disciplinary, moral, ethical and behavioral issues than before. How could these factors affect grades? And, what are the four-year colleges and

universities doing to help these students successfully adjust to a new set of expectations?

9. Another study might analyze if employment affects the performance of college transfer students. Another assumption, community college students typically do not come from families that are as affluent as those who might immediately enroll in four-year colleges and universities. Tuition might be more of a challenge that requires transfer students to work in order to offset the cost. How does employment affect this formula? Do both groups work? If so, is there a discrepancy in the amount of hours worked per week? Employment issues might bring forth another element that could affect the GPA of students who have transferred from a community college.

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Appendices

Appendix A: Performance summary by state according to the SHEEO survey

State	Accountability Reporting	Consumer Information	In Budgetary Process
Arizona	1993		1993
California	1991		
Colorado	1993	1996	1993
Connecticut	1993		1992
Delaware	1996		1996
Florida	1991		1997
Hawaii	1995		1995
Idaho	1995		1995
Kentucky	1992		
Louisiana	1993	1993	
Maine	1996		1996
Minnesota	1995		1995
Mississippi			1994
New Jersey	1994	1994	
New Mexico		1990	
North Carolina	1989		1993
Ohio			1994
Oklahoma	1988	1941/1990 (a)	
Rhode Island	1996	1996	1996
South Carolina	1988, 1992		1996
Tennessee	1984		
Texas	1991		1991
Utah	1992		
Virginia	1996	1996	1996
Washington	1993		
West Virginia	1991	1991	

Appendix B: Performance use and link to college budgets

	Direct Link to Budget	Considered, But No Direct Linkage	Not Used, But Plans to Use	Not Used, No Plans to Use
Alabama				X
Arizona		X		
Arkansas	X			
California				X
Colorado	X			
Connecticut		X		
Delaware		X		
Florida	X			
Georgia				X
Hawaii		X		
Idaho		X		
Illinois		X		
Indiana			X	
Iowa		X		
Kansas		X		
Kentucky	X			
Louisiana			X	
Maine			X	
Maryland			X	
Michigan				X
Minnesota			X	
Mississippi		X		
Missouri	X			
Montana		X		
Nebraska				X
Nevada				X
New Hampshire				X
New Jersey				X
New Mexico				X
New York				X
North Carolina		X		
North Dakota				X
Ohio	X			
Oklahoma				X
Oregon		X		
Pennsylvania				X
Rhode Island		X		
South Carolina	X			

South Dakota			X	
Tennessee	X			
Texas		X		
Utah			X	
Vermont				X
Virginia			X	
Washington		X		
West Virginia				X
Wisconsin				X
Wyoming			X	

*Information is from Albright's report, *The Transition from Business as Usual to Funding for Results: State Efforts to Integrate Performance Measures in the Higher Education Budgetary Process*.

Appendix C: Use of Performance Measures According to SHEEO Survey*

State	Inform Consumers	In Budget Process
Arizona	X	X
Arkansas	X	X
California		X
Colorado	X	X
Connecticut		X
Delaware	X	X
Florida		X
Hawaii	X	X
Idaho		X
Illinois	X	X
Indiana	X	
Iowa	X	X
Kansas		X
Kentucky		X
Louisiana	X	
Maine	X	
Mississippi		X
Missouri	X	X
Montana		X
New Jersey	X	
New Mexico	X	
North Carolina	X	X
Ohio		X
Oklahoma	X	
Oregon	X	X
Rhode Island	X	X
South Carolina	X	X
South Dakota	X	
Tennessee		X
Texas		X
Utah	X	
Virginia	X	
Washington	X	X
West Virginia	X	
Wisconsin	X	

Appendix D: Involvement of Various Organizations in the Development of Performance Measures*

State	Governor's Office	Legislature	System Governing Boards	Institution
Arizona	Heavy	Moderate	Heavy	Heavy
Arkansas	Minimum	Minimum	N/a	Heavy
California	None	Heavy	Moderate	Minimum
Colorado	Heavy	Heavy	Heavy	Heavy
Connecticut	Heavy	Minimum	Heavy	Minimum
Delaware	Heavy	Heavy	None	None
Florida	Heavy	Heavy	Heavy	Moderate
Hawaii	None	Minimum	Heavy	Moderate
Idaho	None	Minimum	Moderate	Heavy
Illinois	Minimum	Minimum	Moderate	Heavy
Iowa	None	None	Heavy	Heavy
Kansas	Heavy	Moderate	Heavy	Heavy
Kentucky	None	Heavy	N/a	Heavy
Maine	Heavy	Moderate	No response	No response
Maryland	None	Minimum	Heavy	Heavy
Minnesota	No response	No response	Heavy	No response
Mississippi	Minimum	Moderate	Minimum	Minimum
Missouri	Moderate	Moderate	Heavy	Moderate
Montana	Heavy	Moderate	Heavy	Heavy
New Jersey	Moderate	Minimum	N/a	Heavy
New Mexico	Heavy	Minimum	None	None
North Carolina	None	Heavy	Heavy	Moderate
Ohio	Minimum	Moderate	Heavy	Heavy
Oklahoma	Minimum	Heavy	Minimum	Moderate
Oregon	Moderate	Heavy	Heavy	Heavy
Rhode Island	Moderate	Moderate	Heavy	Moderate
South Carolina	Moderate	Heavy	Heavy	Moderate
South Dakota	None	Minimum	Heavy	Moderate
Tennessee	None	Heavy	Heavy	Heavy
Texas	Heavy	Moderate	Minimum	Moderate
Utah	None	Heavy	Heavy	Moderate
Virginia	Moderate	Moderate	N/a	Heavy
Washington	None	Minimum	N/a	Moderate
West Virginia	Moderate	Heavy	Heavy	Heavy
Wisconsin	Moderate	Moderate	Heavy	Minimum

Appendix E: Performance Measures Used by Each State*

State	Degrees Awarded	Graduation Rates	External Research Funds	Admissions Standards	Number/Percent Accredited Programs	Student Credit Hour Produced
Arizona	X	X	X			X
Arkansas		X				
California	X	X		X		X
Colorado		X				
Connecticut	X	X	X			
Delaware						
Florida	X	X	X	X	X	X
Hawaii	X	X	X	X	X	X
Idaho	X	X	X		X	X
Illinois	X	X	X	X		X
Iowa	X	X	X	X	X	X
Kansas		X	X	X	X	X
Kentucky	X	X	X		X	X
Maine		X				
Maryland		X	X			
Minnesota		X		X		
Missouri	X	X	X	X	X	
Montana		X	X			
New Jersey		X	X	X	X	
North Carolina	X	X	X	X		X
Ohio		X				X
Oklahoma	X	X		X	X	X
Oregon	X	X	X	X	X	
Rhode Island	X	X	X	X		X
South Carolina	X	X	X	X	X	X
South Dakota	X	X				X
Tennessee	X	X	X	X	X	X
Texas		X	X			
Utah	X	X	X	X	X	X
Virginia		X	X			
Washington	X	X				X
West Virginia	X	X	X	X		X
Wisconsin		X	X	X		X

Appendix E, continued

State	Remedial Activities	Transfer Rate	Licensure Pass Rates	Placement Data on Graduates	Follow-up Satisfaction Studies	Faculty Workload
Arizona		X			X	X
Arkansas	X	X	X		X	X
California	X	X				
Colorado				X	X	
Connecticut			X		X	
Delaware						
Florida	X	X	X	X	X	X
Hawaii	X	X	X	X	X	X
Idaho	X	X	X		X	X
Illinois	X	X	X	X	X	X
Iowa	X	X		X	X	X
Kansas	X	X	X	X	X	X
Kentucky	X	X	X		X	X
Maine						
Maryland	X	X	X	X	X	X
Minnesota		X		X		
Missouri	X	X	X	X	X	X
Montana		X	X	X	X	X
North Carolina	X	X	X	X	X	X
Ohio	X	X		X	X	X
Oklahoma	X	X				X
Oregon			X	X		
Rhode Island	X		X	X	X	
South Carolina	X	X	X	X	X	X
South Dakota		X	X		X	
Tennessee	X	X	X	X	X	X
Texas		X	X			
Utah	X	X	X	X	X	X
Virginia		X		X	X	X
Washington	X	X			X	X
West Virginia	X		X			X
Wisconsin	X	X	X	X	X	X

*According to the SHEEO 1998 survey.

Appendix F: Code Sheet

Performance Measures/Dependent Variables

Perf198cat—data reported in categorical form for the 1st performance measure for the 1998-1999 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf198—actual scores, reported in percent, earned by each NC community college for the 1st performance measure for the 1998-1999 reporting year.

Perf298cat— data reported in categorical form for the 2nd performance measure for the 1998-1999 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf298— actual scores, reported in percent, earned by each NC community college for the 2nd performance measure for the 1998-1999 reporting year.

Perf398cat— data reported in categorical form for the 3rd performance measure for the 1998-1999 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf398— actual scores, reported in percent, earned by each NC community college for the 3rd performance measure for the 1998-1999 reporting year.

Perf498cat— data reported in categorical form for the 4th performance measure for the 1998-1999 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf498— actual scores, reported in percent, earned by each NC community college for the 4th performance measure for the 1998-1999 reporting year.

Perf598cat— data reported in categorical form for the 5th performance measure for the 1998-1999 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf598— actual scores, reported in percent, earned by each NC community college for the 5th performance measure for the 1998-1999 reporting year.

Perf199cat— data reported in categorical form for the 1st performance measure for the 1999-2000 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf199— actual scores, reported in percent, earned by each NC community college for the 1st performance measure for the 1999-2000 reporting year.

Perf299cat— data reported in categorical form for the 2nd performance measure for the 1999-2000 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf299— actual scores, reported in percent, earned by each NC community college for the 2nd performance measure for the 1999-2000 reporting year.

Perf399cat— data reported in categorical form for the 3rd performance measure for the 1999-2000 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf399— actual scores, reported in percent, earned by each NC community college for the 3rd performance measure for the 1999-2000 reporting year.

Perf499cat— data reported in categorical form for the 4th performance measure for the 1999-2000 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf499— actual scores, reported in percent, earned by each NC community college for the 4th performance measure for the 1999-2000 reporting year.

Perf599cat— data reported in categorical form for the 5th performance measure for the 1999-2000 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf599— actual scores, reported in percent, earned by each NC community college for the 5th performance measure 1999-2000 reporting year.

Perf100cat— data reported in categorical form for the 1st performance measure for the 2000-2001 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf100— actual scores, reported in percent, earned by each NC community college for the 1st performance measure for the 2000-2001 reporting year.

Perf200cat— data reported in categorical form for the 2nd performance measure for the 2000-2001 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf200— actual scores, reported in percent, earned by each NC community college for the 2nd performance measure for the 2000-2001 reporting year.

Perf300cat— data reported in categorical form for the 3rd performance measure for the 2000-2001 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf300— actual scores, reported in percent, earned by each NC community college for the 3rd performance measure for the 2000-2001 reporting year.

Perf400cat— data reported in categorical form for the 4th performance measure for the 2000-2001 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf400— actual scores, reported in percent, earned by each NC community college for the 4th performance measure for the 2000-2001 reporting year.

Perf500cat— data reported in categorical form for the 5th performance measure for the 2000-2001 reporting year (1=did not meet the measure; 2=met the measure passed on a significant improvement granted by the system office; 3=met the measure based on merit).

Perf500— actual scores, reported in percent, earned by each NC community college for the 5th performance measure for the 2000-2001 reporting year.

Independent Variables: (2000-2001)

FTE—Total full-time equivalents earned by a community college.

FTECC—FTE earned by college credit or curriculum programs.

FTECT—FTE earned through students enrolled in College Transfer programs.

FTET—FTE earned through students enrolled in terminal, technical or vocational programs.

FTEOther—FTE earned through students enrolled as special students, dually enrolled, Huskins, etc.

Fac Salary—Average faculty salary per month (multiplied x12 to get a yearly figure).

FTInstruct—The number of full-time instructional staff employed to teach curriculum classes at a community college.

Total FT Staff—The total number of full-time employees at a community college.

FT—The percent of full-time instructional staff employed to teach curriculum classes at a community college.

FCOther—Percent of college credit instructional staff whose highest degree is less than a bachelor's degree.

FCBach—Percent of college credit instructional staff whose highest degree is a bachelor's degree.

FCMast—Percent of college credit instructional staff whose highest degree is a master's degree.

FCDoct—Percent of college credit instructional staff whose highest degree is a doctoral degree.

FCEdSpec—Percent of college credit instructional staff whose highest educational achievement is an education specialist certificate.

CC Class—Average class size for college credit programs.

CC Age—Average age of students enrolled in college credit classes.

CCMinority—Number of minority students enrolled in curriculum/college credit classes.

CC Minor—Percent of students enrolled in college credit classes that are non-caucasian.

CCFem—Number of female students enrolled in college credit classes.

CC Female—Percent of female students enrolled in college credit classes.

Total cc studs—Total # of college credit students enrolled at each community college.

FTEBS—FTE earned by Basic Skills programs.

BSClass—Average class size for Basic Skills classes.

BSAge—Average age for students enrolled in Basic Skills classes.

BSMinority—Number of students enrolled in Basic Skills classes classified as non-caucasian.

BS Minor—Percent of students enrolled in Basic Skills classes that are non-caucasian.

BS Fem—Number of female students enrolled in Basic Skills classes.

BS Female—Percent of students enrolled in Basic Skills classes that are female.

Total BS Stud—Total number of students enrolled in a Basic Skills program.

Appendix G Survey questions required of North Carolina's fifty-eight community colleges with regard to the fourth performance measure—goal completion by program completers.

Completer Survey Questions

1. What were your goals in attending this community college? (Check all the apply.)
 - Receiving a degree, diploma, or certificate
 - Preparing for or getting a new job
 - Improving existing job skills
 - Transferring to a four-year college or university
 - Personal interest
 - Other

2. If you complete your degree/diploma/certificate and graduate, will your goals (indicated above) have been achieved by the time you leave college?
 - Yes, completely
 - Yes, partially
 - No

3. If you did not accomplish your goal(s), which of the following best describes why you did not achieve your goal(s)? (Check all that apply.)
 - Job conflict
 - New employment
 - Family circumstances
 - Financial hardship
 - Joined military
 - Childcare problems
 - Medical problems
 - Moved to a new area
 - Lack of interest in pursuing course of study
 - Dissatisfied with services offered by the college
 - Dissatisfied with quality of instruction

4. My program at this community college adequately prepared me to transfer to a 4-year college or university.
 - Yes, completely
 - Yes, partially
 - No
 - Do not plan on transferring to a four-year school

5. If you were to begin again (that is, if you had to do it over again), would you choose to attend this community college?

Yes

No

6. Please rate each of the following.

Area	Don't know	Very dissatisfied	Dissatisfied	Satisfied	Very satisfied
a. Quality of instruction in program area courses					
b. Quality of instruction in other courses					
c. Overall quality of academic program					
d. Quality of services					
Academic advising					
Library					
Registration & admission					
Counseling services					
Career counseling services					
Student activities					
Campus security					
e. Overall quality of the college					

7. Are you employed?

Full-time

Part-time

Not employed

8. Are you or will you be employed in the field for which you prepared while at this community college?

Yes

No

Appendix H Overview of results for the first research question as determined by this study.

Question	Conclusion	Rationale
<p><u>Research Question 1A:</u> Did North Carolina's community colleges demonstrate a successful rate of progress on the first core performance measure—progress of basic skills students—over a three-year period?</p>	<p>Insufficient evidence to demonstrate a significant rate of progress among NC community colleges.</p>	<p>Descriptive statistics failed to show a steady rate of progress for these colleges on the first performance measure:</p> <ul style="list-style-type: none"> • The percent of colleges who met or exceeded the standard rose slightly from 81% in 1998-99 to 85% in 2000-01. • Overall, performance by NC community colleges declined by 2% during this three-year period. • The mean scores for colleges regarding the progression of basic skills students declined by approximately .5% per year. • The mode increased from year one to year two and then declined from year two to year three.
<p><u>Research Question 1B:</u> Did North Carolina's community colleges demonstrate a successful rate of progress on the second performance measure—the passing rate for first-time test-takers for certification and licensure examinations—over a three-year period?</p>	<p>Insufficient evidence to demonstrate a significant rate of progress among NC community colleges.</p>	<p>Descriptive statistics failed to show a steady rate of progress for these colleges on the second performance measure:</p> <ul style="list-style-type: none"> • The percent of colleges who met or exceeded the standard declined by 14% from 1998-99 to 1999-00 and then increased by 12% from 1999-00 to 2000-01. • Overall, performance by NC community colleges declined by 7%. • The mean scores for colleges for first-time test-takers of licensure and certification exams rose by several percent each year. • The mode was the same for 1998-99 and 1999-00 and then increased by 3%.
<p><u>Research Question 1C:</u> Did North Carolina's community college demonstrate a successful rate of progress on the third performance measure—goal completion of program completers—over a three-year period?</p>	<p>Insufficient evidence to demonstrate a significant rate of progress among NC community colleges.</p>	<p>Descriptive statistics failed to show a steady rate of progress for these colleges on the third performance measure:</p> <ul style="list-style-type: none"> • The percent of colleges who met or exceeded the standard declined drastically (54%) from 1998-99 to 1999-00, due in part to the inclusion of non-completers during the second year, and increased 55% from 1999-00 to 2000-01. • Overall, performance by NC community colleges for goal completion of program completers was the same as 66% of the schools demonstrated improvement from 1998-99 to 1999-00 and from 1999-00 to 2000-01.

		<ul style="list-style-type: none">• The mean scores showed little variation.• The mode was the same for all three years.
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<p><u>Research Question 1D:</u> Did North Carolina's community college demonstrate a successful rate of progress on the fourth performance measure—the employment status of graduates—over a three-year period?</p>	<p>Insufficient evidence to demonstrate a significant rate of progress among NC community colleges.</p>	<p>Descriptive statistics failed to show a steady rate of progress for these colleges on the fourth performance measure:</p> <ul style="list-style-type: none"> • The percent of colleges who met or exceeded the standard saw a tremendous increase from 79% in 1998-99 100% in 2000-01. The colleges then maintained this score from the second to the third years. • With 100% of NC community colleges improving on this measure between year one and year two, only 3% were able to show improvement between year two and year three. • The mean scores for colleges with respect to goal completion by completers experienced a roller coaster affect with an increase of 8% followed by a decline of 2%. • The mode increased from year one to year two and then declined from year two to year three.
<p><u>Research Question 1E:</u> Did North Carolina's community college demonstrate a rate of progress on the fifth performance measure—the performance of college transfer students—over a three-year period?</p>	<p>Evidence demonstrates a steady rate of progress among NC community colleges.</p>	<p>Descriptive statistics failed to show a steady rate of progress for these colleges on the fifth performance measure:</p> <ul style="list-style-type: none"> • The percent of colleges who met or exceeded the standard experienced a noticeable increase from 9% in 1998-99 to 34% in 1999-00 to 71% in 2000-01. • Overall, performance by NC community colleges saw significant improvements with 53% of the schools recording better scores from year one to year two and 74% from year two to year three. • The mean scores for college transfer students rose slightly each year. • The mode was the only descriptive element not to support the conclusion that the fifth performance measure saw steady rate of progress. On average, these colleges experienced a 5% increase from 1998-99 to 1999-00 followed by a decrease of 6% from 1999-00 to 2000-01.

Appendix I Overview of results for the second research question as determined by this study.

Ho Statement	Conclusion	Rationale
<i>H₀ Statement 1:</i> There is no relationship between the progress of basic skills students and pertinent institutional and student characteristics.	Reject Hypothesis 1.	Regression analysis indicated that two of the variables—BSMinor and BSAge—demonstrated weak, but significant correlations with the dependent variable.
<i>H₀ Statement 2:</i> There is no relationship between the passing rate for first-time test-takers for certification and licensure examinations and pertinent institutional and student characteristics.	Reject Hypothesis 2.	Rejection of the null hypothesis was supported by both the correlation and regression analyses. <ul style="list-style-type: none"> • Ten of the 14 independent variables—FTECT, FTET, FCMast, CCAge, CCFemale, FTEOther, FCOther, FCBach, FCDoct and CCClass—demonstrated primarily moderate, but significant correlations with the dependent variable. • The stepwise regression model suggests that four variables—FTET, CCAge, CCFemale, CCClass—have the potential to impact performance on the second standard with a sample variance of 49%.
<i>H₀ Statement 3:</i> There is no relationship between goal completion of program completers and pertinent institutional and student characteristics.	Failed to reject Hypothesis 3.	Failure to reject the null hypothesis was evident as the correlational analysis yielded no significant results between the dependent variable and independent variables, and the stepwise regression model indicated no statistically significant relationships.
<i>H₀ Statement 4:</i> There is no relationship between the employment status of community college graduates and pertinent institutional and student characteristics.	Failed to reject Hypothesis 4.	Failure to reject the null hypothesis was apparent as the correlational matrix and the stepwise regression model indicated no statistically significant relationships.
<i>H₀ Statement 5:</i> There is no relationship between the performance of college transfer students and pertinent institutional and student characteristics.	Reject Hypothesis 5.	Rejection of the null hypothesis was supported by both the correlation and regression analyses. <ul style="list-style-type: none"> • Two of the 14 independent variables—Fac_Salary and CCFemale—demonstrated moderate, but significant correlations. • The stepwise regression model suggests that a third of the sample variance can be explained by three of the independent variables—CCFemale, Fac_Salary, and FTET.

Appendix J Performance of North Carolina community colleges from 1998-2001 on the five core performance measures.

Community Colleges	Performance Measure 1			Performance Measure 2			Performance Measure 3			Performance Measure 4			Performance Measure 5		
	98-99	99-00	00-01	98-99	99-00	00-01	98-99	99-00	00-01	98-99	99-00	00-01	98-99	99-00	00-01
Alamance CC	✓	✓	✓						✓	✓	✓	✓			
Asheville-Buncombe	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓*	✓
Beaufort County CC	✓	✓	✓		✓*		✓	✓	✓	✓	✓	✓		✓*	
Bladen CC	✓	✓	✓		✓*	✓	✓		✓		✓	✓			
Blue Ridge CC	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓
Brunswick CC	✓	✓					✓	✓	✓		✓	✓		✓*	✓*
Caldwell CC & TI	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓
Cape Fear CC	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓		✓*	
Carteret CC	✓	✓	✓	✓			✓		✓		✓	✓			
Catawba Valley CC	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓		✓*
Central Carolina CC	✓		✓*	✓			✓		✓		✓	✓		✓*	✓
Central Piedmont CC	✓	✓	✓		✓*	✓	✓	✓	✓	✓	✓	✓		✓*	
Cleveland CC	✓	✓	✓	✓	✓*		✓	✓	✓	✓	✓	✓			✓*
Coastal Carolina CC	✓	✓	✓		✓*	✓	✓		✓		✓	✓	✓	✓	✓
College of Albemarle	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓
Craven CC	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓			✓*
Davidson County CC	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓			
Durham TCC			✓*		✓*	✓	✓	✓	✓	✓	✓	✓			✓*
Edgecombe CC	✓	✓	✓		✓*		✓	✓	✓	✓	✓	✓			✓*

✓ Indicates that the performance standard was met based on merit. ✓* Indicates that the performance standard was met due to an award of significant improvement by NCCCS. A blank space indicates that the college failed to meet qualifications for participation.

Community Colleges	Performance Measure 1			Performance Measure 2			Performance Measure 3			Performance Measure 4			Performance Measure 5		
	98-99	99-00	00-01	98-99	99-00	00-01	98-99	99-00	00-01	98-99	99-00	00-01	98-99	99-00	00-01
Fayetteville TCC	✓	✓	✓	✓		✓	✓		✓		✓	✓		✓	✓
Forsyth TCC		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓*	✓*
Gaston College				✓		✓	✓	✓	✓	✓	✓	✓			✓*
Guilford TCC		✓*	✓*	✓					✓	✓	✓	✓	✓		✓*
Halifax CC	✓	✓	✓		✓*	✓*	✓		✓	✓	✓	✓			✓*
Haywood CC	✓	✓	✓				✓		✓		✓	✓		✓*	✓
Isothermal CC	✓	✓	✓				✓		✓	✓	✓	✓		✓*	✓
James Sprunt CC	✓	✓	✓	✓			✓		✓	✓	✓	✓			✓*
Johnston CC	✓			✓	✓*		✓		✓	✓	✓	✓			✓*
Lenior CC	✓	✓	✓		✓*		✓		✓	✓	✓	✓		✓*	✓*
Martin CC		✓	✓				✓		✓		✓	✓			✓*
Mayland CC	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓		✓
McDowell TCC	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓			
Mitchell CC	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓		✓	
Montgomery CC			✓*				✓		✓	✓	✓	✓			
Nash CC	✓	✓	✓			✓*	✓		✓	✓	✓	✓			✓*
Pamlico CC	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓			
Piedmont CC	✓	✓	✓			✓	✓		✓	✓	✓	✓			✓
Pitt CC		✓*	✓	✓			✓		✓	✓	✓	✓			

Appendix J, continued

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Community Colleges	Performance Measure 1			Performance Measure 2			Performance Measure 3			Performance Measure 4			Performance Measure 5		
	98-99	99-00	00-01	98-99	99-00	00-01	98-99	99-00	00-01	98-99	99-00	00-01	98-99	99-00	00-01
Randolph CC	✓	✓	✓		✓*	✓*	✓		✓	✓	✓	✓		✓	
Richmond CC	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓			✓*
Roanoke-Chowan CC	✓		✓				✓	✓	✓	✓	✓	✓			
Robeson CC	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓*	
Rockingham CC	✓	✓	✓			✓*	✓	✓	✓	✓	✓	✓			✓*
Rowan Cabarrus CC		✓*		✓			✓		✓	✓	✓	✓			✓*
Sampson CC	✓				✓	✓	✓	✓	✓	✓	✓	✓			✓*
Sandhills CC	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓			✓*
South Piedmont CC		✓	✓	✓		✓	✓		✓	✓	✓	✓			
Southeastern CC	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Southwestern CC	✓	✓	✓	✓			✓	✓	✓		✓	✓			
Stanly CC	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓			✓*
Surry CC	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓			✓
Tri-County CC	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓			✓
Vance-Granville CC	✓	✓	✓			✓*	✓		✓	✓	✓	✓			✓
Wake TCC				✓			✓		✓	✓	✓	✓			✓
Wayne CC	✓	✓	✓	✓	✓*	✓	✓		✓		✓	✓			✓*
Western Piedmont CC	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓			✓*
Wilkes CC	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓*	✓
Wilson CC		✓			✓		✓		✓	✓	✓	✓			✓*

Appendix J, continued

✓ Indicates that the performance standard was met based on merit. ✓* Indicates that the performance standard was met due to an award of significant improvement by NCCCS. A blank space indicates that the college failed to meet qualifications for participation.