Student Retention In Florida Community Colleges: ccsse's Retention Index And Florida Accountability Measures

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STUDENT RETENTION IN FLORIDA COMMUNITY COLLEGES: 
CCSSE’S RETENTION INDEX AND FLORIDA ACCOUNTABILITY MEASURES

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A dissertation submitted in partial fulfillment of the requirements
for the Degree of Doctor of Education
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ABSTRACT

Student retention has become a serious topic in the past several decades (Wild and Ebbers, 2002). Problematic, however, is how retention is defined and measured, as well as a lack of multi-institutional studies that support a theoretical model for improving student retention, particularly in community colleges (Bailey & Alfonso, 2005). The Community College Survey of Student Engagement (CCSSE) was launched in 2001. Based on extensive research that pertains to student learning and persistence, CCSSE defined five benchmarks of educational practice. Three of the benchmarks comprise the Retention Index. CCSSE has encouraged additional studies to further validate the relatively new survey instrument.

Florida’s legislature has a keen interest in the performance of educational institutions which are mandated by statute to participate in system-wide data collection from which accountability measures are drawn, including institutional retention rates. Using institutional level data in simple and multiple linear regressions, this study examined the relationship between the Florida Community Colleges’ CCSSE Retention Indices and their retention rate(s) measured by the Florida Accountability Measure. Student level data was also analyzed using a Nested ANOVA to examine mean differences in CCSSE Retention Index scores of students from different racial and gender groups when accounting for the possible influence of institution attended.
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CHAPTER ONE
INTRODUCTION

Much of what impacts higher education today is better understood in context. Long esteemed as a vehicle to promote the common good, higher education experienced a type of fall from grace in the early 1980s when suspect practices were revealed. Exacerbated by mounting fiscal constraints at the state and federal levels, higher education has experienced difficulty in staking its claim for public funding. There has been a corollary push for accountability, productivity, efficiency and effectiveness.

Performance funding models have been adopted in many states to ensure that the high cultural value of efficiency has been cultivated and put into action (Wirt, Mitchell & Marshall, 1988). Retention rates, graduation rates and time to degree completion were among the most frequently reported performance indicators used in community college funding across the nation (Center for Community College Policy, 2000). Problematic, however, is how institutional effectiveness, as retention, is defined and measured, as well as a paucity of empirical multi-institutional studies about institutional policies and practices that would support a theoretical model for improving student success and retention, particularly in community colleges (Bailey & Alfonso, 2005; Pascarella & Terenzini, 2005).

Further amplifying the call for accountability is the widening gap in performance between minority and majority students. Community colleges enroll almost half of American undergraduates (Center for Community College Policy, 2000; McClennen, 2004a; Randall, 2004). They attract high proportions of low-income, first-generation
college students and students of color, those typically underserved by higher education (American Association of Community Colleges, 2005; Laden, 1998; Townsend, Donaldson, & Wilson, 2005). Most community college students have at least one of the risk factors identified by the National Center for Education Statistics that are associated with not completing a degree (Hamm, 2004; Jenkins, 2002; Price, 2004). Swelling enrollments in community colleges will only amplify the complex needs of increasingly diverse students (Evelyn, 2003). With such varied differences and needs, serving the diverse populations will likely be difficult (Recruitment & Retention in Higher Education, April, 2005) and also expensive (Jenkins, 2002; Summers, 2003).

The Community College Survey of Student Engagement (CCSSE) was launched in 2001 as a project of the Community College Leadership Program based at The University of Texas at Austin. Grants from The Pew Charitable Trusts, the Lumina Foundation for Education, the MetLife Foundation and Houston Endowment supported the effort. The purpose was to raise public awareness about the work of community colleges, stimulate discussion and dialogue about how quality is defined and measured, and provide an appropriate assessment tool for their work. Based on extensive research that pertains to student learning and persistence, the CCSSE has defined five benchmarks of educational practice. Three of the benchmarks comprise what CCSSE has termed as an institution’s Retention Index (CCSSE, 2006c). By improving or increasing practices assessed by CCSSE’s benchmarks, including the Retention Index, it stands to reason that institutions will foster improvement in student learning, persistence and retention (CCSSE, 2006a; Marti, 2004). As a relatively new research tool, extensive research has not yet been conducted to validate the CCSSE survey and its benchmarks as predictors of
the outcome of retention, although this has been recommended as a topic of future research (Marti, 2004).

Florida’s legislature has a keen interest in the performance of its educational institutions. This has been evidenced, in part, by the number and comprehensiveness of statutes enacted that govern their operations. Educational entities have been mandated by statute to participate in system-wide data collection from which accountability measures and reports are drawn, including the student Retention and Success report.

All 28 of the Florida community colleges participated in the 2004 fielding of the CCSSE survey. The CCSSE is mentioned several times in the 2005-2006 strategic plan of the Florida Commission of Community Colleges and Workforce Education. Initiative 1.5.2 states that CCSSE results will be shared, along with best practices identified through the Lumina Foundation’s ‘Achieving the Dream’ initiative, to improve student retention, persistence, success. Targeted success indicators include an increase in baseline scores from the 2004 CCSSE results, and improvement in retention, success and completion rates system-wide (Florida Commission of Community Colleges and Workforce Education, 2005) as measured by the accountability measure for Retention and Success.

**Statement of the Problem**

There is no clear road map for improving student retention, particularly in community colleges. Yet from an accountability perspective, community colleges are increasingly held responsible through accountability measures and even performance-based funding, to improve retention and completion rates. More profound is how human
lives are impacted. From a moral perspective, community colleges are obligated to help the students they serve and close the yawning gap in performance and retention between majority and minority students (McClenney, 2004a).

This study proposes to examine the relationship between the Florida community colleges’ CCSSE Retention Indices from the 2004 fielding of CCSSE’s survey instrument, the *Community College Student Report*, and the retention portion of Florida accountability Measure 1, Part 2 (M1P2) for the cohort tracked from Fall 2000 through Winter/Spring 2004. While accountability M1P2 measures both student Retention and Success, this study will focus on the portion of the measure which pertains to retention.

Greene (2005) conducted a study of Florida community college student engagement levels of African American, Hispanic and White students, as measured by the CCSSE constructs that comprise the benchmarks, and the empirical relationship to educational outcomes. However, extensive research has not yet been conducted to validate the CCSSE benchmarks as a predictor of the outcome of retention, although this has been recommended as a topic of research (Marti, 2004). The first and second research questions for this study stem from this problem.

Community colleges nationwide and in Florida are facing increasing pressure to improve retention rates (Pascarella & Terenzini, 2005). Community college enrollments have been increasing in recent years both in Florida and across the United States. Increases are especially noted among minority students (Laden, 1998). While gains have been made in promoting access for these populations, this does not always translate to success (Bailey & Alfonso, 2005). African American, Hispanic and Native American students appear to have higher attrition rates than white or Asian students (Bailey &
After controlling for enrollment variables and demographic characteristics, women also persist and graduate at higher rates than men according to most of the research (Bailey, et al, 2005). In light of the community college mission to both prepare students for transfer to senior institutions and play a significant role in workforce preparation and economic development it is important to note what differences in engagement, as measured by CCSSE benchmarks and the Retention Index exist in students across specific demographics. Furthermore, it is compelling to explore whether the institutions attended have a bearing on these student groups’ engagement levels. CCSSE has recommended that in order to gauge the effectiveness of intervention strategies used with different populations scores be disaggregated to examine the benchmarks of different subgroups of students (CCSSE, 2005; Marti, 2004; Marti, 2006). The third research question stems from the problem of differences in retention rates between subgroups of students.

**Research Questions**

1. Can the 2004 CCSSE Retention Index be used to predict Florida’s state retention rate as measured by the Retention and Success accountability measure?

2. Can the 2004 CCSSE Retention Index be used to predict Florida community colleges’ state retention rate as measured by the Retention and Success accountability measure when controlling for the retention rate of different degree types awarded (Associate of Arts, Associate of Science and Associate of Applied Science, and Postsecondary Vocational Certificate and Applied Technology Diplomas)?
3. What, if any, mean differences are there in the 2004 CCSSE Retention Index scores of males and females from different racial or ethnic groups across the Florida community colleges when accounting for the potential influence of institution attended?

**Definition of Terms**

The following definitions of terms and abbreviations will be used in this study.

**Applied Technical Diploma** is a type of credential, shorter in length than an Associate Degree that provides students primarily with technical skills for entry or advancement in the job market. The term is sometimes used interchangeably with College Credit Certificate and Post Secondary Vocational Certificate.

**Associate of Arts** is a degree type that in the Florida community colleges is intended primarily to prepare students to transfer to a college or university to complete a bachelor’s degree.

**Associate of Science** is a degree type that in the Florida community colleges is intended primarily to prepare students for entry or advancement in the job market.

**Attrition** refers to the reduction in student numbers due to lower student retention (Hagedorn, 2005) and can also be described as student drop-out or stop-out, not continuing in a program of study.

**CCSR** is the *Community College Student Report* which is the survey instrument used by CCSSE.
CCSSE is the Community College Survey of Student Engagement and was launched in 2001 as a project of the Community College Leadership Program at The University of Texas at Austin.

CCTCMIS is the abbreviation for the Florida Community College and Technical Center Management Information System.

Cohort for the Florida accountability measure 1, part 2, (M1P2) Retention and Success, for 2004 includes first time in college (sic.) students from Fall 2000 who took an entry level test, achieved 9 (P.S.V.C., A.T.D.) or 18 (A.A., A.S., A.A.S.) credit hours by Summer 2002 (P.S.V.C., A.T.D.) or Winter/Spring 2004 (A.A., A.S., A.A.S.) and were seeking an A.A., A.S., A.A.S., P.S.V.C., or A.T.D. award as reported on the Student Data Base (CCTCMIS, Accountability Report, 2004).

College Credit Certificate is a type of credential, shorter in length than an Associate Degree that provides students with technical skills for entry or advancement in the job market. The term is sometimes used interchangeably with Applied Technical Diploma and Post Secondary Vocational Certificate.

Completer refers to a student who has finished a program of study at a community college, whether for a certificate or associate degree. This term is virtually synonymous with “graduate”.

Engagement is the quality of effort students devote to “educationally purposeful activities that contribute directly to desired outcomes” (CCSSE, 2006d; Hu and Kuh, 2002, p. 555).

M1P2 is the abbreviation for Florida Accountability Measure 1, Part 2, Retention and Success.
**OPPAGA** is the abbreviation for the Office of Program Policy Analysis and Government Accountability with the Florida state legislature.

**Persistence** refers to student re-enrollment. Closely associated with retention, students must persist in order to graduate, but all those who persist do not necessarily graduate.

**Retention** is a complex concept that continues to remain ambiguous across the literature; generally refers to students staying in school, often synonymous with persistence, but definitions and measures vary depending on perspective and time period measured (Hagedorn, 2005).

**Retention Rate** from Florida Accountability Measure 1, Part 2 is a combination of other rates (Windham, 2000). It consists of the number of students graduated, plus the number enrolled in good standing, plus the number enrolled who are not in good standing as compared to the total cohort.

**Retention Index** is an additive index comprised of scores from three of the five CCSSE benchmarks that assess student engagement. These include: active and collaborative learning, student-faculty interaction, and support for learners (CCSSE, 2006c).

### Design of the Study

The first and second research questions examine institution level data of both the CCSSE Retention Index and the retention portion of the Florida accountability measure for Retention and Success and include the entire population of the 28 Florida community colleges. Secondary data sources received from the Florida Department of Education
after approval by the director of CCSSE provided the values for these two institution level measures.

A correlation and simple linear regression analysis will be conducted to answer the first research question using the CCSSE Retention Index as the independent variable and the state retention rate provided in the Retention and Success accountability measure as the dependent variable. The analysis is intended to examine if there is a linear relationship between these two institutional level variables, measure the strength of the relationship between the variables, and analyze whether the CCSSE Retention Index can be used to predict the state retention rate.

To answer the second research question, a multiple linear regression will be conducted to control for the retention rate of different degree types awarded in exploring whether the CCSSE Retention Index can be used to predict the state retention rate as defined in the Retention and Success accountability measure. This question is a deeper analysis of research question one insofar as it will examine whether the CCSSE Retention Index can predict the overall retention rates for students when controlling for the retention rate of Associate of Arts, Associate of Science, Associate of Applied Science, Post Secondary Vocational Certificate and/or Advanced Technical Diploma programs.

The third research question will examine student level data for the sample of Florida community college classes that were included in the 2004 fielding of CCSSE’s survey instrument, the Community College Student Report. Although it is classes that are sampled, data is provided on the student level.

To answer Research Question 3, a Nested or Hierarchical Analyses of Variance (ANOVA) will be conducted using the 20,581 students’ CCSSE Retention Index scores
computed from their benchmark scores from the three benchmarks that comprise the Retention Index. The analysis is to determine if there are mean differences in the Retention Indices of males and females from different racial or ethnic groups when accounting for the potential influence of institution attended.

**Delimitations and Limitations**

**Delimitations**

1. Analyses will be conducted using data sets received from the Florida Department of Education.

2. Data will not be associated with the Florida community colleges so as to preserve anonymity. The data sets themselves do not associate institutional name, but only a unique identifier so as to distinguish which data is associated with different institutions.

3. No attempt will be made to generalize results of this study to any population beyond the Florida community colleges.

**Limitations**

1. This study will include only public community colleges in Florida.

2. There are 28 public community colleges in Florida. This size of this population may not provide sufficient power for testing statistical significance in the analyses for the first and second questions.
3. It will be assumed that responses to the CCSSE’s *Community College Student Report* survey instrument are accurate and honest.

4. It will be assumed that the institutional retention rates from the Retention and Success accountability measure for the cohort tracked from Fall 2000 through Winter/Spring 2004 from the Florida Department of Education are accurate.

5. It will be assumed that the institutional CCSSE benchmark scores and Retention Indices of the Florida community colleges that were provided by the Florida Department of Education are accurate.

**Significance of the Study**

Retention remains a high focus in the accountability movement and strategic plans of institutions. It seems important not only in the lives of individual students, but relevant to the Florida community colleges, that institutions as well as government entities have greater insight into the relationship between what the CCSSE survey measures and institutional performance in the state Retention and Success accountability measure.

The performance-based funding formula in Florida includes a factor accounting for student completion. State accountability measures track student retention and success. The measure of Retention and Success (M1P2) is not currently part of the funding formula, although the accountability measures remain at least political leveraging points. While funds are not always associated with accountability measures (Ewell, 1999), the aura of their association and potential negative impact on resources can loom large.
The intent of this study through the first and second research questions is to explore the criterion validity of CCSSE’s Retention Index where institution level scores will be compared to the institution level retention rate from Florida’s accountability measure of student Retention and Success. CCSSE recommends disaggregating the data, or breaking it down by different student groups, in order to most effectively analyze the engagement level of different types of students (CCSSE, 2005). The third research question aims to provide information about the level of engagement of students as reflected by student level CCSSE Retention Index scores by demographic variables of gender and race.

Organization of the Dissertation

After the introduction provided in Chapter one, the second chapter is comprised of a review of the literature related to the accountability movement on the national level and in Florida, funding for higher education on both the national level and in Florida, a history of community colleges and the types of students they serve, student retention research and a lack of understanding of how it applies to community colleges, and the genesis of the Community College Survey of Student Engagement. Chapter three is a presentation of the methodology, including the research questions, population and sample, data collection, instrumentation, reliability and validity of the instruments and proposed data analyses to answer the research questions. Chapter four includes the results from analyses conducted to answer the research questions. Chapter five is a summary of the results, discussion of conclusions drawn, and recommendations for further study.
Institutions face increasing pressures to improve retention rates while their funding is informed and influenced, if not threatened by accountability measures of performance that include retention rates. This review of the literature is organized to provide context to the heightened importance of student retention in the accountability movement and the plight of institutions, particularly community colleges, which are without a clear road map to improve retention. The literature review is also intended to provide a context for the research questions examined in this study.

The Community College Survey of Student Engagement (CCSSE) is one of few nationally benchmarked tools developed specifically for use by community colleges to assess and improve practices associated with student learning and persistence. Although both increased retention rates and improved CCSSE benchmarks are cited as success indicators in the 2005-2006 strategic plan of the Florida Community College System, it is not yet known whether there is an empirical relationship between CCSSE’s benchmarks and the state’s accountability measure of student retention.

This literature review first addresses the accountability movement in general and Florida’s system of accountability in particular. This is followed by an overview of budgetary constraints at the federal and state levels, Florida’s performance-based funding system and the impact on funding for higher education. An overview of community colleges follows and a description of the types of students they serve which are different from baccalaureate institutions. The topics of student retention, retention theory, and
shortcomings of theoretical models are reviewed. In closing, the genesis and an overview of the Community College Survey of Student Engagement is introduced.

**Accountability**

Accountability is a high stakes game. Increased demands for accountability from state and federal governments have pressed institutions of higher education to improve productivity (Alfred, Ewell, Hudgins & McClenney, 1999; Ewell, 1999). Pressures for accountability have been paralleled by budget constraints and more recently, by budget adjustments contingent on how institutions perform according to defined measures.

Long valued as serving the common good, institutions of higher education were esteemed for years for their role in developing the human person, and providing opportunity and access to the American dream (McClenney, 2004a). There was a type of social compact between American society and higher education that decreed a college education served not only individuals, but society and as such, these institutions were given both moral and financial support (Burke, 2005b). In recent decades, there was an erosion of public confidence in higher education that came as a type of landslide in the 1980s and 1990s (Blimling & Whitt, 1999; Cook & McClendon, 1998; Pascarella & Terenzini, 1991). The litany of transgressions that contributed to higher education’s fall from grace included problems of earmarked funds for higher education, rising student loan default rates, criticism that rising tuition costs were due to higher education’s greed, misuse of research funds, concerns that the curriculum had become politically motivated and in need of correction, and portrayal of faculty workloads as ridiculously light while institutions did not care about their undergraduates (Cook & McClendon, 1998).
Factions pressing for increased accountability from higher education have expanded from state and federal governments, to accrediting agencies, employers, parents and students (Banta, Lund, Black & Oblander, 1996).

A high cultural value placed on efficiency set the stage for policymakers to enact accountability methods to be used to ensure the value of efficiency is cultivated and put into action (Wirt, Mitchell & Marshall, 1988). Demands on higher education to justify its practices and become more accountable are ratcheted up in an environment of reduced resources and a fall from grace (Burke, 2005). Accountability is not new for higher education insofar as these institutions have been accountable over the centuries to religious orders, to students, accrediting agencies, and now to legislators (Callan & Finney, 2005). But the type of accountability has shifted in recent decades from consideration of inputs and processes to outcomes (Burke, 2005c; Wolff, 2005). The tenor and tone of accountability demands have also shifted so that mistrust, if not also threat and punishment, have become salient characteristics (Burke, 2005).

Demands for increased accountability and quality emanated not only from external stakeholders, but also from those inside academia over concern for improving undergraduate education (Chickering & Gamson, 1999). Accountability demands helped spawn the movement towards increased assessment in higher education (Aper & Hinkle, 1991; Banta, Lund, Black & Oblander, 1996). Regional accrediting bodies became part of the growing accountability wave in their specificity of the types of information they began to require (Ewell & Jones, 1996). The Southern Association of Colleges and Universities (SACS) was the first of the regional accrediting bodies to adopt standards beyond the traditional evaluation of inputs determined by faculty and student credentials,
institutional resources and the physical plant to include evaluation of outputs such as learning outcomes, retention and graduation rates (Aper & Hinkle, 1991).

The changing landscape for higher education has made accountability inescapable. Institutions of higher education have been cautioned to respond to increased criticism not through resistance, avoidance or mere cosmetic efforts, but by raising their stature using leveraging strategies that include outcomes assessment (Alfred & Weissman, 1988). Since accountability appears to be here to stay and efforts to resist it may only be counterproductive (Burke, 2005b; Ewell, 2005), higher education will do well to meet the challenges and play a role in defining and shaping appropriate and acceptable measures to be used for accountability purposes (Burke, 2005b; McClenney, 2004a). Otherwise, the approach and measures will likely be imposed by external entities (Kuh, 2001).

Community colleges have long been focused on providing access to educational opportunity (Witt, Wattenbarger, Gollattscheck & Suppiger, 1994), but the demand for greater accountability which increasingly concentrates on outputs, that focus has shifted to student experiences in general and completion rates in particular (Bailey & Alfonso, 2005; U.S. Department of Education, 2005). Low retention and graduation rates, especially of community colleges (Summers, 2003; Tinto, 1987; Tinto 1993) have amplified the call for accountability. After six years, only 36 percent of first-time in college students who entered a community college in 1995 earned a credential, whether a certificate, associate or bachelor’s degree (Bailey & Alfonso, 2005). Even eight years after enrolling in college, only about 33 percent of community college students received a certificate or degree; 20 percent completed less than ten credits in that time and the rates
are even lower for low-income and minority students (Bailey, Calcagno, Jenkins, Kienzel and Leinbach, January 2005).

Whether corollary or caused by increased competition for scarce resources, higher education has faced the added difficulty in staking its claim for public funding. It has become more difficult for colleges and universities to effectively lobby for their causes (Cook & McClendon, 1998). The Bush administration at the federal level and many Congressional legislators appear to continue the push for greater accountability for post secondary institutions (Leinbach, 2005).

As demands for accountability increased with implications of static or reduced funding, at least in relative terms, institutions of higher education were scrambling, not so much resisting accountability, according to Kay McClenney, Director of the Community College Leadership Program housed at The University of Texas at Austin, but being accountable for the right things (Evelyn, 2003). Research problems associated with this, however, include the difficulty of finding an adequate way in the work of higher education to measure efficiency, which is a high priority of the accountability movement (Aper & Hinkle, 1991). Perhaps because of the paucity of consistently applied reliable measures of the primary product of higher education which is learning, the dominant measure of efficiency has been the cost per student or cost per full-time equivalent (Johnstone, 1998). The measures chosen are problematic in themselves.

Student retention has been identified for decades as an important measure of institutional effectiveness (Wild and Ebbers, 2002). High attrition rates are costly both to individual students and to institutional planners (Tinto, 1987). As such, retention is an important consideration in analyses of cost and efficiency. Students, parents and other
stakeholders also view retention as one of the most common indicators of institutional effectiveness (Hagedorn, 2005). Accordingly, “probably no other issue has been the object of assessment efforts in the past twenty-five years more than student retention” (Shibley & Upcraft, 2001, p. 249).

It has been debated whether retention and graduation rates should be used as accountability measures for community colleges (Burd, 2004; Lederman, 2005). Performance indicators can be problematic if the same ones, such as completion rates of degrees, are used to assess institutions with different missions, such as universities and community colleges (Phelan, 2000; Strauss, 2001; Taylor, 2003). The mission of community colleges, the tremendous diversity in types of students they serve and the varied intents of their students have been different from those of baccalaureate institutions.

Students who attend baccalaureate institutions are largely there with the express goal of attaining a bachelor’s degree, yet the intentions of students attending two year colleges are notably different (Tinto, 1987). Community college students have a wider variety of goals when they enter college - whether to earn a certificate, associate degree, prepare for entry or re-entry into the workforce, prepare to transfer to a baccalaureate institution, even to explore whether they really want to pursue postsecondary education – and thus sometimes are without the goal of continuing enrollment or of ultimate graduation (Bailey, et al., January 2005; Hagedorn, 2005; Hoachlander, Sikora & Horn, 2003; Summers, 2003; Voorhees, 1987). A recent study by Horn and Nevill (2006) indicated that when given the chance to report multiple reasons for enrolling, only about half of community college students expressed intent to earn a degree.
The research generally indicates that colleges have higher graduation rates when they accept students with higher SAT scores who are from higher income families, when there is a greater proportion of female students and full-time students, and when there are greater funds expended for instructional and academic support (Bailey, et al., October 2005). Baccalaureate institutions, especially those that are larger, more selective and residential have higher retention rates (Pascarella & Terenzini, 1991; Shibley & Upcraft, 2001; Titus, 2004 as noted in Bailey, et al., October 2005).

As open admissions institutions, community colleges are not selective and do not control the types of students they admit, accepting only those who have traits and characteristics associated with higher retention and graduation rates. Students who graduate from high school with lower levels of academic preparation more often attend open admissions institutions; they also earn degrees and certificates at lower rates than their peers (Hoachlander, Sikora & Horn, 2003; Toolkit Revised, 2006). Tinto (1987) asserted that “researchers generally agree that what happens following entry is, in most cases, more important to the process of student departure than what occurs prior to entry” (Tinto, 1987, p. 47). Yet for as relevant and important as this is for community colleges, Tinto focused on baccalaureate institutions which tend to be at least residential and enroll students with a more singular focus on completing a degree.

A majority of the research on institutional effectiveness, as well as retention, has focused on residential four-year colleges and universities and not on community colleges or two year institutions (Marti, 2004; Smart, Kuh & Tierney, 1997; Tinto, 1993). Community colleges were developed well after four-year institutions were established. With a genesis that emanates from both secondary schools and universities, community
colleges – although in existence for more than a century - are not well understood (Witt, et al., 1994). The four year lenses have been used to study two–year institutions and those they serve. “It is not surprising that the 2-year institutions are almost always found lacking because they do not fit 4-year models” (Townsend, Donaldson, & Wilson, 2005, p 133). Not only researchers, but policy makers also often presume that community college and four-year college students are alike – aged 18-24 and attending full-time (Jenkins, 2002). Accountability and performance models lend themselves better to baccalaureate institutions than to community colleges perhaps because there is an underdeveloped understanding of institutional factors that support or determine student success in community colleges (Bailey & Alfonso, 2005; Bailey, et al., January 2005).

Ewell reported in 1999 that many, if not most performance and accountability systems in the United States are intended primarily or purely to ensure that institutions are doing what they are expected to do. Performance indicators in some accountability systems are for this type of pure accountability, as if to keep public institutions honest, while others inform policy or decision making. Still others are used to leverage improvement and others to inform consumer choice (Ewell, 1999).

Funds are not always associated with accountability measures, but the aura of their association and potential negative impact on resource can loom large (Ewell, 1999). Bailey, et al. noted in 2005 that the Rockefeller Institute of Government at the State University of New York at Albany stated that the number of states issuing an annual report card on their colleges increased from 30 in 2000 to 44 by 2003. More than half of the states used some form of performance budgeting with most of them linking funding to meeting specified accountability standards (Bailey, et al., January 2005).
In this era of accountability, with an increasingly wider span of constituents, there has been a parallel demand for simpler, almost exclusively quantitative measures such as report cards issued by state and federal governments and US News and World Reports (Ewell & Jones, 1996). Statistical indicators are almost universally problematic when used in isolation as they are more subject to misinterpretation and misuse (Ewell & Jones, 1996). “As a result, colleges are well advised to report such statistics together with additional information that helps explain why the reported numbers look the way they do” (Alfred, Ewell, Hudgins, & McClennen, 1999, p. 38.). Yet explanatory information is often not provided alongside simple, quantitative snapshots of performance.

A report by the Office of Program Policy Analysis and Government Accountability (OPPAGA) indicated that while the Florida Community College System accountability process had improved, it criticized the community colleges for inflating their graduation rates by excluding from its calculations students who did not complete at least 18 credits (OPPAGA, 2001). Because of the demographics of community college students who predominantly meet at least one of the high risk factors associated with attrition, such as first generation college students, low socio-economic status, part-time enrollment, full-time employment, financial independence and having dependents, these institutions have been and continue to be at risk of having low retention rates (Walters, 2003). OPPAGA recommended that the Florida Community College System increase graduation rates of students in Associate Degree programs, despite its acknowledgement that low graduation rates could be a “natural consequence” of having an open door admissions policy (OPPAGA, 2001).
Despite problems associated with using retention and graduation rates as accountability measures for community colleges, there is also compelling support and merit for their use. On a broad scale, community colleges need to respond more directly to the concerns of a widening sphere of constituents: students, parents, industry and government (Southern Regional Education Board, 1994). Additionally, many community college students largely pursue higher education with the expressed intent of earning a credential (Hoachlander, Sikora & Horn, 2003) and/or more money (Gooden & Matus-Grossman, 2002; Grubb, 2002). While Hoachlander, Sikora and Horn (2003) indicated that an estimated nine out of ten of community college students intended to earn a credential, Horn and Nevill (2006) reported a more modest 49 percent had such an intent. Completion of credentials, but especially Associate degrees as opposed to certificates, appear to have a greater economic benefit to students than merely earning credits (Bailey, et al., January 2005; Gooden & Matus-Grossman, 2002; Grubb, 2002; Hoachlander, Sikora & Horn, 2003; Ruppert, 2003). Completion of degrees and certificates, and therefore retention rates, thus appear to be an appropriate measure of community college effectiveness (Hoachlander, Sikora & Horn, 2003).

The importance of raising students’ aspirations to pursue further education and complete degrees, especially among low-income and minority students, seems also a compelling reason to emphasize community college completion (Bailey, et al., January 2005; Dougherty, 1987). Furthermore, retention pertains to the moral commitment institutions have to their students and as such, it is a topic of central importance to the future of higher education and society (Braxton, Hirschy & McClendon, 2004).
From an accountability perspective, low retention and graduation rates also represent “wasted time” for students and “wasted money” for the state (OPPAGA, March 1999). Student retention, as a part of enrollment management, will become increasingly important as institutions also strive to avoid loss of revenues (Braxton, Hirschy & McClendon, 2004). Yet even those who see a possible benefit, especially to underrepresented groups of students, in using completion rates as a measure of accountability advise that use of raw graduation rates could be short-sighted because of the multitude of student intentions (Hoachlander, Sikora & Horn, 2003) and factors that impact students and their graduation rates (Leinbach, 2005).

The push for efficiency and suspicions of waste in education are not new to the latter 20th and early 21st centuries. The Scientific Management movement in the early part of the 20th century was believed by many to be a panacea for concerns about efficiency, productivity and waste in education (Calahan, 1962).

**Accountability in Florida**

Florida officially joined the growing accountability movement in 1991 when it established through state statute a mandatory process of evaluation (Proctor, 2004). Florida’s legislature has a keen interest in the performance of its educational institutions. This is evidenced, in part, by the number and comprehensiveness of statutes enacted that govern their operations. Educational entities are mandated by statute to participate in system-wide data collection from which accountability measures and reports are drawn, including the student Retention and Success report. Florida was among the first states to
collect and publish retention and graduation rates of its community colleges (Lederman, 2005).

Florida overhauled its higher education governance system in 1998 when voters adopted a constitutional amendment – effective January 2003 – to appoint, rather than elect its Board of Education. In 2001, Senate Bill 1162 authorized the Florida Board of Education to establish and govern a K-20 seamless educational system (Proctor, 2004). The former coordinating boards for the community colleges and the state university system were disbanded. The accountability system also needed revision.

While Florida’s accountability system and its use of accountability measures did not initially link performance with funding, there were movements that pressed for this association. The Office of Program Policy Analysis and Government Accountability (OPPAGA) stated that performance-based program budgeting for its community college system could improve performance by linking goals declared in the Accountability Plan to performance indicators used to distribute funds (OPPAGA, March 1999). Accountability watchdogs lamented that information alone provided through the accountability measures was not stimulating sufficient improved performance. It was noted that gains were made when annual reports were issued to provide information and assisted colleges to focus on issues and populations emphasized in policy, such as performance of African-American males, speakers of English as a Second Language and economically disadvantaged students. Other areas did not see significant gains until after funds were attached through the performance based budgeting approach when “institutions began reviewing their procedures and processes to ensure student (sic) were able to graduate without unnecessary roadblocks. This resulted in more degrees without
a loss of academic rigor” (Office of Student and Academic Success, (n.d.), p. 3). Support for linking performance to funding is further evidenced by a proposed resolution from the chair of Florida’s Board of Governors, which is the statewide governing system of the State University System, to hold back state money and limit institutions from raising tuition if they do not meet specified accountability measures (Yeager, 2004).

Florida is the only state to have a K-20 education governance system and with it a K-20 accountability system “that addresses system wide goals with funding tied to results” (Task Force Final Report, 2003, p. 7). A task force was created to make recommendations for a single, unified K-20 education performance accountability system, as required by F.S. 1008.031 which was amended by the 2003 Legislature. The task force held its final meeting in October 2003 when members remained unwilling to recommend certain indicators that would apply to all components of the previous system, including K-12, community colleges and state universities. The difficulty of establishing common definitions from which to derive measures came to the forefront as they struggled over intricacies and differences of such measures as “graduation rate” (Task Force Final Report, 2003). The task force apparently grappled with problems that Phelan (2000), Strauss (2001) and Taylor (2003) warned were associated with trying to apply the same performance indicators, such as completion rates, to assess institutions with different missions.

As Florida struggled to revise its accountability system to address the K-20 governance system, a representative from its department of education declared that characteristics of a good system of accountability include incentives for good or improved performance and consequences for poor performance (Fletcher, 2002).
Whether or not, and to what extent, a state’s accountability system actually links funding to meeting specified standards, the aura of their association and the potential negative impact on resources can hang like a pall over institutional operations. While fear may serve as a powerful motivator, it may be misdirected and unfocused motivation when there is threat of punishment for failure to improve measures that may be ill defined. While a number of trade-offs “must be made in any information-driven approach to resource allocation” implementing systems of rewarding high performers and punishing low performers may only widen inequity gaps between institutions (Ewell, 1999). Accountability and funding systems that reward achievers and punish low performers might be viewed as Darwinian where only the fittest survive (Daye, n.d.).

**Florida Accountability Measures**

The Florida legislature has enacted a number of statutes that govern operations its educational institutions. Title XLVII is the K-20 Code and includes 14 chapters. Chapter 1008 pertains to assessment and accountability. Florida Statute 1008.31(3) mandates participation in Systemwide (sic) Data Collection in order to provide both the State Board of Education and the legislature with information associated with the accountability system (K-20 Education Code, 2005). This is done through participation in the student data base (SDB). Extensive data elements are collected from each institution at specified times throughout the year. Protocols are exacting regarding the generation, verification and submittal of the data to meet guidelines and criteria established for managing the database (Community College and Technical Center MIS Staff, 2003). Despite the rigor for submitting, editing and validating data submitted to the state-wide Student Data Base,
problems of consistency in defining and coding data elements remain (CCTCMIS Staff, 2003). Millions of dollars have been invested by the state in creating and managing its centralized student data base for K-12, community colleges, technical centers and universities (Office of Student and Academic Success, n.d.). Florida collects more data about its educational system through its Division of Accountability, Research and Measurement than any other state (FL DOE, ARM, 2006). The first year the student data base was in production was 1989-1990 and by 2002 more than 100 data elements were included that collected information about student demographics, entry level test scores, acceleration, program of study, financial aid and completion rates (CCTCMIS Staff, 2003). The Student Data Base serves as a resource with few if any parallels in other states.

Florida Statute 1008.45 addresses the accountability process for community colleges. Section (1) of the statute mandates development of an accountability plan to both assess and improve the quality and efficiency of the state’s community colleges. Elements from the Student Data Base are used to compile the data for the accountability measures that have been defined to meet statutory requirements (OPPAGA, March 1999).

Reports are generated that show how each community college, and the community college system as a whole, performed in a specified period according to information submitted to the Student Data Base. Accountability Measure 1, Part 2 (M1P2) assesses student Retention and Success. Students included in the measure are rather narrowly defined. This measure is a report of the status of first time in college (FTIC) degree or certificate seeking students within a three year tracking period with 18 college credit hours, or 9 vocational credit hours earned. The Retention and Success
report includes the number and percent of students by ethnicity and full-time/part-time status for each community college and the system as well as for Associate in Arts (A.A.), Associate in Science (A.S.), Associate in Applied Science (A.A.S.), Post Secondary Vocational Certificates (P.S.V.C.) and Applied Technical Diploma (A.T.D.) programs of study (CCTCMIS, 2005).

**Funding**

Higher education has traditionally received most of its funding from state appropriations and federal funding; the federal government and States are now facing budget deficits deeper than they have ever been and are growing (Andrews, 2006; Lav & Johnson, 2003; National Association of State Budget Officers, 2004; Rubin, Orszag & Sinai, 2004; Ruppert, 2003). There are also now more competing and compelling demands on state and federal budgets (Robles, 1998). Deficits of significant magnitude, exacerbated by competing demands, jeopardize basic services such as healthcare as well as education (Lav & Johnson, 2003).

Federal and state funds for higher education have been more constrained and unpredictable with competition from K-12 education, Medicaid and prisons (Zusman, 1999). Florida’s budget, perhaps not unlike other states, is further constricted by voters’ demands for no new taxes (Sanchez-Penley, Martinez & Nodine, 1997). It is necessary for institutions of higher education to seek alternative sources of revenue since decreases in federal and state support are coupled with increased student demand as well as rapid advances in technology (Faris, 1998). Seeking these alternative funding sources is cultivating a trend of privatization of public colleges and universities (Zusman, 1999).
College presidents now spend an increasing amount of time – one survey indicated nearly 40 percent – in supporting foundation efforts to raise external funds (Milliron & Wilson, 2004). Funding, as well as governance, instead of student learning, now consumes a disproportionate amount of colleges’ time and energy (Robles, 1998).

As colleges increasingly rely on support from external constituents, they need to be mindful of effectiveness indicators chosen so as to appeal to stakeholders’ demands (Alfred, Ewell, Hudgins, & McClenny, 1999; Banta, Lund, Black & Oblander, 1996). Stakeholders pressing for greater accountability from higher education include state and federal governments, accrediting agencies, employers, parents and students (Banta, Lund, Black & Oblander, 1996) many of whom increasingly view retention as one of the most common indicators of institutional effectiveness (Hagedorn, 2005).

As institutions of higher education play an increasingly significant role in their economic future (Palomba & Banta, 1999) government views these institutions through more economic and utilitarian lenses. It has become critical for educational leaders to justify their existence in terms of quantifiable productivity and performance (Alexander, 2000). Cost effectiveness is unavoidable in the current climate of accountability and fiscal constraint (Pascarella & Terenzini, 1998). By linking funding to performance, policymakers hope to provide a clearer sense of how the public’s investment in higher education is being used. It is a trend unlikely to recede anytime soon (Pascarella & Terenzini, 1998; Phelan, 2000).

Initially developed more than 50 years ago, the primary objective of funding formulas has shifted from addressing adequacy in the 1950s, to growth in the 1960s, equity in the 1970s, stability and quality in the 1980s, and stability, performance and
reform in the 1990s (Marks & Caruthers, 1999). Funding formulas, unlike scientific formulas, are not mathematically exact; there is generally room for the influence of judgment of those who develop the formula (Marks & Caruthers, 1999).

Interest in performance-based accountability stems from taxpayer backlash against a perceived lack of productivity coupled by fiscal constraints (Alexander, 2000). Use of funding formulas and which measures are used in the formulas sends a strong message about what is and is not important in the systems that adopt them (Hufner, 2003; Office of Student and Academic Success, n.d.). Retention rates, graduation rates and time to degree completion were among the most frequently reported performance indicators used in community college funding across the nation (Center for Community College Policy, 2000).

Higher education policy and funding generally favors four-year institutions as evidenced, in part, by the greater proportion of funding they receive (Jenkins, 2002). Two year colleges receive less federal and state support than do four-year colleges and universities, yet are the fastest growing sector of higher education (Faris, 1998). Data regarding size of appropriations and the specific impact of the performance funding formula in Florida are difficult to secure – a statement concurred by the chief financial officers of two Florida community colleges. But a report by the statutorily mandated (F.S. 1008.51) Council for Education Policy Research and Improvement (CEPRI) indicated that in fiscal year 2002-2003, the state university system (SUS) received 12 percent of the state appropriation for education while community colleges received only six percent (Proctor, 2002). In the following year, the allocation for the Florida SUS amounted to over $2.6 billion which included general revenue, student tuition and fees.
and educational enhancement (USF Fact Book, 2003-2004), while community colleges received in 2003-2004 just over $1.3 billion from general revenue, student tuition and fees and lottery funding (FL DOE, 2004).

Local funds provided more than 90 percent of community college funding in 1918, but by the 1960’s, state appropriations became the primary funding stream which accounted for 34 percent of their income (Strauss, 2001). State support continued to increase and comprise a significant portion of allocations. By 1992, state support increased to nearly 46 percent (Center for Community College Policy, 2000). There was a precipitous drop in state support in the 1980s (Center for Community College Policy, 2000) which signaled a longer standing decline in state support for community colleges (Inside Higher Education, January 16, 2006). The portion of state funding provided is increasingly less through direct appropriations and more through funding formulas and performance indicators (Strauss, 2001). As state funding decreases, the general rule of thumb is that more money needs to come from students (Ruppert, 2003). Student tuition and fees now constitute an increasing portion of community college budgets (Center for Community College Policy, 2000). As shown in Figure 1, results of a dissertation by Roessler (2006) show the changing proportion of sources of community college budgets over the past two decades (Fliegler, 2006). Institutions also increasingly rely on institutional foundations (Milliron & Wilson, 2004).
Community colleges have a long history of serving as champions of access, especially for disadvantaged groups. With open admissions, low tuition, flexibility of schedules and locations near low-income communities, these institutions are a gateway to higher education for disadvantaged and non-traditional students, including low-income, low-wage workers, minority, and first generation college students (Dougherty, 1987; Gooden & Matus-Grossman, 2002; Milliron & Wilson, 2004). Increasing numbers of students who enroll in community colleges are in need of greater levels of support and attention in order to be successful (Summers, 2003). Yet such support and attention is expensive while community colleges continue to be poorly funded (Jenkins, 2002). This seems an example of what Burke (2005) describes as public demands and taxpayer support being out of sync. State financial support has declined as need is increasing both
quantitatively as evidenced by increasing enrollments and qualitatively as evidenced by the expanding diversity of students needs (Southern Regional Education Board, 1994).

Enrollments have steadily risen in all sectors of higher education in the past 30 years (Martinez, 2004b). Based on the 2000 census, postsecondary enrollments are expected to increase up through 2015, not only among traditional age students (age 18-24), but also among adult students who comprise nearly half of all college enrollments (Recruitment and Retention, April 2005; Ruppert, 2003). Demographic growth will drive increases in participation in postsecondary education. Florida is considered a high growth state for projected increases from 2000 to 2015 in both 18-24 year olds and those 25 and older (Martinez, 2004b). This has implications for postsecondary access and achievement. Enrollments are projected to increase at the same time state appropriations for education are projected to decline in relative terms (McClenney, 2004a; Vaughan, December 2004); similarly “state funding is cut at the very time that students are flooding into community colleges” (Milliron & Wilson, 2004, p. 56). As a result, some have called for reconsideration of open access, in terms of how to provide it equitably and in a fiscally responsible manner (Vaughan, December 2003; Vaughan & MacDonald, October 2005).

**Florida Performance Funding**

Performance-based budgeting and funding models infer that colleges have control over their students, yet it appears that less-selective institutions, especially open admissions community colleges, have less influence than some have traditionally thought (Alfred, Ewell, Hudgins & McClenney, 1999; Bailey, et al., January 2005; CCSSE, 2004;
Ewell, 1999; Taylor, 2003). Based on survey data collected by the Center for Community College Policy (2000), graduation rates, retention rates and time to degree completion were among the most frequently reported performance indicators used in community college funding across the nation. The types of performance indicators used and to what end becomes a critical concern when institutions are responsible for outputs, such as retention and graduation rates, when inputs such as the variability of students, are not taken into account (Ewell, 1999). Community colleges, as open admissions institutions, cannot control for the qualities that students, as “inputs”, bring to them. Tinto (2002) asserted that less-selective and open admissions institutions do have control over institutional factors that may impact student outcomes, including retention (Tinto, 2002) even if they do not have control over the attributes of admitted students. Yet community colleges are still hampered by a lack of research and understanding of what institutional factors need to be shaped to support student achievement (Bailey & Alfonso, 2005; Bailey, et al., January 2005).

The Division of Community Colleges was established in Florida in 1957. Initially, these institutions were funded through a full-time equivalent (FTE) formula approach (FL DOE, 2004). The funding mechanism was modified in the 1980s to one of incremental increases from the previous year, plus funds for special initiatives (Financial and Business Services, 2004). The formula has essentially remained a base-plus approach, despite the shift from FTE to performance (Financial and Business Services, 2004). Although Florida community colleges have a funding formula, by its nature, it is not mathematically exact (Marks & Caruthers, 1999), and it has not been applied consistently by the legislature (Proctor, 2002).
Galvanized by the federal Government Performance and Accountability Act of 1994 which instigated Florida’s performance-based budgeting reform, the Florida Community College System was among the first to implement performance-based funding (PBF) and performance program budgeting (Albertson, 2002; Finance and Business Services, 2004; FL DOE, 2004). It was fiscal year 1996-97 when the Florida Legislature began funding its community college system under a performance-based program budget (Finance and Business Services, 2004; OPPAGA, March 1999).

The performance funding system in Florida has been modified a number of times since its inception. Incentive funding that was performance-based was initially used to fund workforce education where a modest amount of funds could be earned, above and beyond the base budgets (Jenkins, 2002). In 1997, the legislature modified the formula to one of performance-based funding. A separate allocation was devoted to workforce development and 15 percent of the funds for workforce development programs in community colleges and school districts would need to be recovered, or earned, based on performance by competing with other institutions for more relative points (Finance and Business Services, 2004; Jenkins, 2002). Points were accrued when students completed education and training and then were placed in high skill, high demand, and high-wage jobs (Fletcher, 2002; Jenkins, 2002). While additional points were earned for enrolling, graduating and placing students from disadvantaged, target populations of low socio economic status, what emerged was an understanding that disadvantaged students, with greater needs, were more expensive to support and at higher risk of not completing these types of programs (Jenkins, 2002).
By 2001, Senate Bill 1162 was approved by the Governor and incorporated into Chapter 2001-170 which required that “…at least 10 percent of the state funds appropriated for the K-20 education system are conditional upon meeting or exceeding established performance standards.” In 2003, the budgeting program divided about $7.5 million among the state’s 28 community colleges based on completions (Taylor, 2003).

It is debated how effective accountability systems are that link performance to funding (Burke, 2005c). The impact of accountability systems on improvement may be small, in part, because the percent of the overall budget impacted by performance – including Florida - is relatively small, amounting to approximately 5 percent of the overall budget (Jenkins, et al., 2006). But even a relatively small financial impact can impose a significant fiscal and emotional impact, especially in times of tight budgets.

Although 10 percent of the system’s funding was tied to accountability measures, the legislative requirement for this was “removed by the last (2005) legislative session” (P. Windham, personal communication, February 27, 2006). It appears that while the accountability measures are not funded in the performance-based system per se, the data they contain is “a replication of the results of M4P1 in the performance based Program Budgeting process which is specifically funded” (P. Windham, personal communication, February 27, 2006).

Whether or not Florida community colleges are funded directly from defined state accountability measures, it appears that data from at least some of the measures are in fact used to determine funding. Since more than half of the states use some form of performance budgeting where most link funding to meeting specified accountability standards (Bailey, et al., January 2005), it supports Ewell’s (1999) caution that while
funds are not always associated with accountability measures, the aura of their association and potential negative impact on resource can loom large.

**Community Colleges**

While there is much confusion about the origins of community colleges (Witt, Wattenbarger, Gollattscheck, and Suppiger, 1994), William Rainey Harper, who served as president of the University of Chicago at the turn of the twentieth century, is often credited with promoting the concept and model of these institutions (Wattenbarger & Albertson, 2004). American democracy fueled the expansion of community colleges as un-served, average citizens were the institutions’ target demographic (Witt, et al., 1994). Community colleges became more comprehensive and far-reaching through the work of the Truman Commission on Higher Education in 1947, which called for a national system of low-cost, public community colleges that were to be intimately tied to the life of the communities they served (McClenny, 2004a; Witt, et al., 1994). They further expanded with Baby Boom enrollments in the 1960s (Milliron & Wilson, 2004). At the height of their growth in the United States, a new community college was opened every week (Center for Community College Policy, 2000).

Community colleges in Florida, not unlike those in other states, began in the private sector (Wattenbargar & Albertson, 2004). St. Petersburg Junior College was founded in 1927 as a private two year college (Albertson, 2002). Palm Beach Junior College, founded in 1947, was the first public junior college in Florida, while Pasco-Hernando Community College was the last one established in 1972 and “marked the completion of a state master plan for a system of 28 community colleges that were within
commuting distance of 99 percent of the state’s population” (Albertson, 2002, p. 4). The 1960s marked a period when the colleges changed their name from “junior” to “community” in part, to capture the broader missions of the institutions (Wattenbarger & Albertson, 2004). Florida went through a period of desegregation of all sectors of education in the mid-1960s. As part of the state’s plan, 12 black colleges were merged with local community and junior colleges (Albertson, 2002; FL DOE, 2004).

Community colleges are uniquely American (Wattenbarger & Albertson, 2004) in their genesis and are founded on democratic traditions that are jeopardized by declining public investments and concurrent rising enrollment demands (Phelan, 2000). Their missions are distinct and diverse, evolving far beyond providing the first two years of a bachelor’s degree, to encompassing educational, economic and social development (Milliron & Wilson, 2004).

The missions of community colleges, including those in Florida, now include preparing students for transfer to four-year institutions, vocational education, contract education for local employers, remediation of basic skills, and even community services (Wattenbarger & Albertson, 2004; FL DOE, 2004; Gooden & Matus-Grossman, 2002). Historically open admissions institutions, community colleges in Florida are required by statute 1004, section 65(5) to be “open access”. Community colleges now serve as a major component in the higher education system in Florida (FL DOE, 2004) as well as the United States (Dougherty, 1987; Pascarella & Terenzini, 2005; Phillippe & Sullivan, 2005).

Providing remedial or developmental education is a distinguishing characteristic and mission of community colleges as opposed to four-year colleges (Townsend,
Donaldson, & Wilson, 2005). Increasing numbers of community college students require remedial education (Milliron & Wilson, 2004; Schemo, 2006). “Developmental/remedial education exemplifies the social role of community colleges. As more students enter community colleges, increasing numbers of them lack the academic or social preparation to succeed in education” (Milliron & Wilson, 2004, p. 54).

Florida Statute 1004.65 (6c) mandates that its community colleges are to provide remedial and tutorial services to ensure student success. Slightly over one-third of entering community college students in Florida are college ready, another third requires remediation in one area, and the final third needs college preparatory instruction in two or more areas (OPPAGA, 2005). Increasing remedial needs in Florida also represent increased spending on college preparatory programs (OPPAGA, August 1998).

Community college advocates have argued that these institutions serve larger societal roles by providing access, social mobility and thus serve a type democratizing function (Dougherty, 1987; Pascarella & Terenzini, 2005). Critics, however, view community colleges as diverting rather than democratizing opportunity when viewed as cooling out aspiration and degree attainment (Pascarella & Terenzini, 2005). Policy groups also take an interest in the work of community colleges insofar as they play a potential role in alleviating poverty by expanding access to postsecondary education and the careers and wages that are associated with advanced education and training (Jenkins, 2002). Higher education was once reserved for only society’s elites, but community colleges have afforded average citizens with the opportunities that education provides (Witt, et al, 1994). By providing non-elites with educational opportunities that open doors to employment and higher paying jobs, community colleges help to build the tax base and
develop persons who contribute to the political and local community, are less likely to be
dependent on welfare or in prison and are more likely able to provide for their families

There has been some debate about whether community colleges, as compared to
four-year institutions, dampen educational aspirations and thus reinforce the social
appears to support the premise that access to postsecondary education, including
community colleges, has a substantial impact on expanding students’ educational
aspirations, even those from disadvantaged backgrounds (Leigh & Gill, 2004). Another
study demonstrated that students who attended community college and then earned a
bachelor’s degree appeared similar to bachelor degree graduates who had never attended
community college in their aspirations, work and financial situations (McPhee, 2006).

Because community colleges serve as a major vehicle to prepare people for the
workforce, and employers need increasing numbers of knowledge workers to remain
competitive, these institutions are viewed as a significant player in the economic
development of their local communities (Jenkins, 2002). Although preparing students for
transfer to a senior institution is an important function of community colleges, nearly half
of their enrollments are specifically for career or vocational preparation (Townsend,
Donaldson, & Wilson, 2005). With a headcount of more than 900,000 in 2003-2004,
enrollments in Florida community colleges according to the 2003-2004 Student Data
Base indicate closer to 40 percent for career or vocational preparation as defined by
students enrolled in Associate of Science, Post Secondary Vocational, Post Secondary
Adult Vocational, Continuing Workforce Education and Basic and Secondary Education
programs (Florida DOE, 2005). When enrollments in vocational and college preparatory instruction are factored into the calculation, nearly 60 percent of enrollments in Florida in 2003-2004 were in career and vocational programs. Regardless of these different ways of analyzing the data, the Florida community colleges are widely seen as the lynchpin of workforce development (Financial and Business Services, 2004).

Individual and collective well-being depends in part on opportunities for advanced learning. Access to education beyond high school is fundamental to both individuals and to society as a whole for social and economic development (Carnevale & Desrochers, 2004; Education Commission of the States: U.S. profile, October 2003). “Without universal and lifelong access to the benefits of a college education, the nation simply will fail to meet the social and economic challenges of the years ahead.” (Ruppert, 2003, p. 7). Some assert that it is because of the important role that higher education plays in the nation’s economic engine and both business and political leaders’ frustration with the loss of global stature and competitiveness, that has amplified the push for accountability, including improving retention rates as a means of holding these institutions accountable (Lederman, 2005).

Types of Students

Community colleges enroll almost half of American undergraduates (Center for Community College Policy, 2000; McClenny, 2004a; Randall, 2004). They attract high proportions low-income, first-generation college students and students of color, those typically underserved by higher education (American Association of Community Colleges, 2005; Phillippe & Sullivan, 2005; Townsend, Donaldson, & Wilson, 2005).
They also enroll nearly half of minority undergraduates in the United States (Laden, 1998; McClenney, 2004a).

Community colleges have been seen largely as serving students who are older than those who attend baccalaureate institutions (Riesman, 1981 as noted in Bean & Metzner, 1985) although almost half of their students are now between 18-24 years of age (Martinez, 2004a; Wilson, 2004). Community college students are often described as non-traditional as compared to traditional college students who attend a residential college full-time immediately after high school graduation, are aged 18-24, and have a primary focus on school (Bean & Metzner, 1985). More than 25 years ago, Bean and Metzner (1985) described the difficulty of defining and adequately describing what constituted a non-traditional student because there were so many possible factors. McClenney (2004a) draws on the definition from the National Center for Education Statistics and describes a non-traditional student as “financially independent, attends part-time, works full-time, delays enrollment after high school, has dependents, is a single parent, or does not have a high school diploma” (McClenney, 2004a, p. 9). Non-traditional students, and likewise, community college students, have multiple commitments, are multi-tasking, often struggle to balance work, family and school, and are commuters, in part, because community colleges are largely non-residential (Gooden & Matus-Grossman, 2002; Tinto, 1993; Voorhees, 1987). As shown in Table 1, most community college students have at least one of the characteristics of non-traditional students and as such, display risk factors and face barriers associated with those factors at much higher rates than students who attend four year institutions (Hamm, 2004; Jenkins, 2002; Price, 2004). Non-traditional students not only self-report taking longer to
complete their programs of study in order to accommodate demands from work, family, or to earn additional income (Gooden & Matus-Grossman, 2002), but data suggest they are also at higher risk of not completing a degree or certificate (Hamm, 2004; Wilson, 2004).

Table 1: Percentage Distribution of Students by Risk Factor and Institution Type

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Public Two-Year Institution</th>
<th>Public Four-Year Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delayed Enrollment</td>
<td>45.6</td>
<td>18.0</td>
</tr>
<tr>
<td>GED/HS dropout</td>
<td>12.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Part-time Attendance</td>
<td>47.4</td>
<td>11.2</td>
</tr>
<tr>
<td>Financial Independence</td>
<td>34.5</td>
<td>8.1</td>
</tr>
<tr>
<td>One or More Children</td>
<td>20.6</td>
<td>4.2</td>
</tr>
<tr>
<td>Single Parent</td>
<td>10.0</td>
<td>2.4</td>
</tr>
<tr>
<td>Work Full-time</td>
<td>35.1</td>
<td>10.5</td>
</tr>
</tbody>
</table>


Increasing diversity of American undergraduates has been noted in both four and two year institutions (Pascarella & Terenzini, 1998; Ruppert, 2003). Future enrollments in community colleges are projected to increase between 2000 and 2015 both because of demographic changes and because increasing percentages of the population will pursue higher education for the opportunities they offer (Boswell, 2004; Martinez, 2004a).
Among traditional-aged college students, those aged 18-22 according to Pascarella and Terenzini (1991) or aged 18-24, according to Price (2004), most of the increase will be of students of color and those from low-income households (Price, 2004).

Community colleges serve as a type of portal to higher education for underserved populations (Phillippe & Sullivan, 2005). Students of color and poor students are disproportionately represented in community college enrollments (McClenney, 2004a; McPhee, 2006; Price, 2004). Often referred to as non-traditional, at risk, or disadvantaged students, nearly “40 percent of first-time community college freshman take at least one remedial course. In colleges that serve large numbers of minority students, the proportion is higher” (Jenkins, 2002, p. 2.). It is important to note that these differences reflect differences in the quality of education usually afforded minority students.

Policymakers will likely look to community colleges to accommodate the enrollment demands since “expenditures per student at community colleges are less than at baccalaureate institutions” (Martinez, 2004a, p. 23). Based on survey data collected by the Center for Community College Policy (2000), four-year state universities in Florida spent on average nearly twice the amount per full-time equivalent (FTE) in 1998-99 than did the community colleges. Swelling enrollments in community colleges will only amplify the complex needs of increasingly diverse students (Evelyn, 2003). With such varied differences and needs, serving the diverse populations will likely be difficult (Recruitment & Retention in Higher Education, April 2005). It will also be expensive (Jenkins, 2002; Summers, 2003).

On the national level, the following emerge as the demographics of community college students: average age of 29; 64 percent attend part-time; 44 percent work more
than 20 hours per week; about half work full-time; 35 percent have dependents; more than half (51.4 percent) are the first in their families to attend college; 59 percent have a primary goal of obtaining job-related skills and 47 percent attend with stated intent of transfer to a 4-year college; nearly half are age 25 and older (Gooden & Matus-Grossman, 2002; Jenkins, 2002; Randall, 2004). Jenkins (2002) summarizes NCES 2000 data as indicating that nearly half of African-American undergraduates (46.3 percent) are enrolled in community colleges, while 60 percent of Hispanics who are enrolled in undergraduate programs in this country attend community colleges.

Students in the Florida Community Colleges are comparably diverse. In Florida, approximately 34.6 percent of the state’s population is designated as minority (Education Commission of the States: Florida profile, April 2003) as compared to 30.8 percent of the population in the United States (Education Commission of the States: U.S. profile, October 2003). Florida community colleges serve as the major entry point into postsecondary education for Black and Hispanic students who graduated from public high schools in the previous year (Windham, 2000). Eighty percent of the minority students pursuing higher education in a public institution in the state begin their postsecondary education at the community college (FL DOE, 2003).

The Student Data Base of Florida provides information to generate the profile of a typical Florida community college student who is a 31-year old, white female freshman who attends part-time, is not disabled. She is seeking an Associate of Arts degree. Other sources indicate that she is working and helping to support a family (FL DOE, 2000).
Student Retention

Retention or persistence refers to student re-enrollment. Persistence is often a student measure, while retention is an institutional measure (Hagedorn, 2005). Retention is often associated with completion of a degree. There is a large amount of literature about student retention in higher education, but it is rife with single institution studies with methodological differences, if not problems (Pascarella & Terenzini, 1991) that do not lend them to being applied to other institutions, and the studies are largely based on four year residential colleges (Bailey et al. January 2005). The following sections provide overviews of the growing importance of retention, prominent models of student retention, caveats on their applicability to community colleges, and student retention in Florida.

The Evolving Importance of Retention

While retention is a widely discussed if not controversial topic in contemporary higher education, it seems to have been less of an issue in the early history of American institutions. Completion of a degree was apparently not emphasized by the colonial colleges in their earliest years (Thelin, 2004). Enrollments increased in the 19th century (Potts, 1977), but it is conjecture what was the impact on student retention. It appears that graduation took on some level of increased importance with time as it became associated with the social function of launching young men’s entrance into adult life and corresponding positions of power (Thelin, 2004). Although students who completed two years at a normal school could, by 1892, complete a baccalaureate at the university in another two years (Ogren, 1989), it is unclear how prevalent this was.
As student enrollment increased more than five fold between the two World Wars, there was apparently a growing dis-ease among college administrators that they bore an increasing degree of risk and responsibility for the students admitted. Yet, when Student Affairs departments were developed, they were not for the purpose of increasing student retention (Thelin, 2004), but to maintain campus discipline (Ping, 1999). High numbers of students were admitted with the anticipation that attrition would also be high.

Student retention has become an increasingly critical topic in the past several decades in American higher education as student retention has been identified as an important measure of institutional effectiveness (Wild and Ebbers, 2002). High attrition rates are costly to individual students and to institutional planners alike since loss of tuition revenue can jeopardize the financial stability of institutions (Tinto, 1987; Tinto, 1993). Because of the demographics of community college students who predominantly meet at least one of the high risk factors associated with attrition, community colleges have been and continue to be at risk of having low retention rates (Walters, 2003). Despite the difficulties community colleges face in improving student retention, there are mounting fiscal, political, social and moral demands to improve it (Summers, 2003). It is now generally agreed that higher education must meet the challenge to improve student learning, retention rates, and credential completion rates in order to meet the needs of the nation and the world (Kuh, Kinzie, Schuh, and Whitt, 2005).

Prominent Models of Student Retention

While there is a significant amount of literature by many different authors about student retention in higher education, there is general agreement that most models of
Retention are based on the work of Tinto which enjoys almost paradigmatic stature (Braxton, Hirschy & McClendon, 2004; Hagedorn, 2003). Tinto’s hallmark emphasis was on the importance of academic and social integration (Bailey, et al., October 2005; Summers, 2003; Wild & Ebbers, 2002). Modified over time, the model was focused on student attributes, social and academic integration in 1975, addressed the role of student intentions, the importance of student interaction with faculty and faculty teaching styles in 1987, and incorporated the acknowledgement in its 1993 version that academic integration was more important than social integration for commuting students, and that not all students attended four year residential colleges (Henningsen, 2003).

Retention work conducted by others in addition to Tinto has been cited as highly influential (Bailey & Alfonso, 2005; Henningsen, 2003; Pascarella & Terenzini, 2005; Summers, 2003). Selected theorists and a brief explanation of their research follow.

Pascarella (1980) developed a model that drew mostly on the work of Tinto (1975) and Astin (1975), but the model took into account not only characteristics of students, but institutional factors, as well as college experiences in examining attrition and retention. Pascarella noted the influence of socialization on persistence, including the importance of non-classroom student-faculty contacts. He further noted that institutions may be able to influence the quality and impact of student-faculty contact “in ways other than through the kinds of students they enroll” (Pascarella, 1980, p. 65).

Bean and Metzner (1985) drew on the work of Spady (1971), Tinto (1975) and Pascarella (1980) but focused on nontraditional students and challenged the impact of social integration on students (Summers, 2003) who were largely part-time with competing demands of work and family life. Bean and Metzner’s model ascribes attrition
decisions to academic performance, intent to leave, background and defining factors, and environmental factors. Variables pertaining to social integration are excluded from this model as primary factors in describing departure of non-traditional students since the students were found to be less influenced by social integration than traditional students, and more influenced by the external environment (Bean & Metzner, 1985). Bean and Metzner also reported that non-traditional students have higher drop out rates than other students. Pascarella and Terenzini (1991) later reported that social integration models are not as applicable to commuter colleges as residential colleges (As noted in Bailey, et al, October 2005; Hagedorn, 2006; Summers 2003). More recent studies, one of which was conducted at a Florida community college, also found results that questioned the importance of social integration for community college students (Borglum & Kubala, 2000).

Braxton, Hirschy and McClendon (2004) later developed a model that drew on the work of Tinto, but attempted to address the particular issues associated with commuter students. In noting the lack of empirical support for Tinto’s theory to explain student departure, especially in commuter institutions, they modified it to place more importance on academic integration than social integration. Bailey and Alfonso (2005) noted that while this model focuses on the importance of building linkages in the classroom and connecting with students’ significant others, it does not distinguish between two and four year commuter institutions and does not mention developmental or remedial education which is central to community college retention.
Student Retention in Florida

Not unlike community colleges in other states, Florida’s focus was initially on providing students with access to higher education. The commitment to access clearly remains, as the 2005-2006 Strategic Plan for the Florida Community Colleges includes goals and success indicators for providing and increasing access (Florida Community Colleges and Workforce Education, 2006). But the shift in focus from one on access to one of continuing access coupled with success is evident in part through the system’s strategic plans. The Florida Community Colleges’ Master Plan for 1993 included among its eight goals, “preserving open access and increase student success in community college programs.” (FL DOE, 2005). By 1998, the Strategic Plan for all of postsecondary education required that all of Florida’s higher education sectors ”meet rising student demand while increasing program and degree completion and maintaining standards of excellence” (FL DOE, 2005, p. 5).

Florida was among the first states to collect and publish retention and graduation rates of its community colleges (Lederman, 2005). Florida Accountability Measure 1 tracks student completions of programs of study. Accountability Measure 1, Part 2, tracks student Retention and Success. According to the Student Data Base, completion rates, by headcount, steadily rose from 1999-2000 through 2003-2004 for students in Associate of Arts and Associate of Science programs. Certificate completions, by headcount, increased overall, but with a slight drop from 2001-2002 to 2002-2003; there was a gain in certificate completions in 2003-2004, but still not equivalent to that of 2001-2002 (FL DOE, 2005). Minority student completions in these programs also increased steadily during this time period.
Florida’s community colleges ranked among the best in the nation in terms of degrees awarded to non-traditional and minority students based on 1994-95 graduation data (Wattenbarger & Albertson, 2004). Yet, U.S. Census Bureau data from 2002 indicates that eighteen and a half percent of Blacks in Florida who are aged 25 and older have earned an associate degree or higher versus 20 percent at the national level (Education Commission of the States: Florida Profile, April 2003; Education Commission of the States: U.S. Profile, October 2003). The majority of awards received by African American females are associate degrees while the majority awards received by African American males continue to be certificates (FL DOE, 2003). Twenty-three point eight percent of Hispanics earn an associate degree or higher versus 14.7 percent at the national level; 32 percent of whites in Florida earn an associate degree or higher as compared to 33.6 percent of whites nationally (Education Commission of the States: Florida profile, April 2003; Education Commission of the States: U.S. profile, October 2003). These data however do not account for enrollment rates or percent of completions of these populations.

Caution for Community Colleges

Student retention has been identified for decades as an important measure of institutional effectiveness (Wild and Ebbers, 2002) for which institutions are increasingly held accountable. Despite seventy years of empirical attention and the prevalence of articles, journals and books devoted to the topic of student retention, no template or blueprint exists for successful student retention programs (Braxton, Hirschy & McClendon, 2004; Tinto, 1993).
Most research on student retention has consisted of single institution studies that pertain to residential baccalaureate institutions (Henningsen, 2003; Pascarella & Terenzini, 1998) that do not lend themselves to generalizability (Bailey & Alfonso, 2005; Pascarella & Terenzini, 1991). With a paucity of literature and research about student retention in community colleges (Bailey & Alfonso, 2005), models of student persistence, then, are largely informed by research focused on four year institutions and the typical traditional aged white and affluent demographic (Braxton, Hirschy & McClendon, 2004; Pascarella & Terenzini, 2005; Voorhees, 1987).

Retention literature for community colleges largely offers suggestions of various intervention strategies employed to boost retention, such as orientation programming, formalized mentoring relationships, establishment of women’s centers, but these represent an alternative to the difficult task of identifying predictive characteristics (Brawer, 1996) or developing theoretical models. Prior to Spady (1971) and Tinto (1975), early retention studies were largely descriptive rather than theory based (Henningsen, 2003). Student and institutional variables that appeared to be related to student dropout were studied and yielded a wealth of statistically reliable associations, but without a framework to focus the studies or interpret the results in a conceptual way (Pascarella & Terenzini, 1980). The development and use of theoretical models is highly desirable “since theory guides research and brings some degree of order to the chaotic array of variables available to the researcher of dropout.” (Bean, 1983, p. 129).

Researchers and authors have warned of problems associated with using theoretical perspectives based primarily on four year college models. Even Tinto’s model of near paradigmatic stature (Braxton, Hirschy, & McClendon, 2004) has been
questioned in its applicability to community colleges. Tinto’s model “was meant to explain attrition at residential institutions, emphasized social integration, and excluded variables from the external environment” (Bean & Metzner, 1985, p. 528); “Empirical tests of these models have not yielded strong support for their application to community colleges” (Bailey & Alfonso, 2005, p. 2); and the “conceptual basis for applying such models to community colleges is weak” (Bailey et al, Jan. 2005, p. 14). Tinto himself acknowledged that the “patterns and roots of departure among commuting colleges are not identical to those observed among residential institutions” (Tinto, 1987, p. 85).

Community college advocates assert the need for new models to be developed that effectively address the unique factors of community college settings that impact retention (Wild and Ebbers, 2002).

Also compounding the difficulty of addressing retention in community colleges is that there are differences in the definition of retention (Pantages & Creedon, 1978; Wild and Ebbers, 2002), the closely related term of persistence (Henningsen, 2003) and in the measures of retention and persistence (Hagedorn, 2005). The lack of common definitions and common measures for retention and graduation rates seems to have further eroded the value of much of the retention research (Shibley & Upcraft, 2001). The lack of common or consistent definitions and measures have also contributed to the lack of understanding as well as a lack of comprehensive data about community college retention and graduation rates which are an important tool for institutions dedicated to improvement (Hayes, 2006; Summers, 2003).

Some institutions and studies have examined re-enrollment from year to year; others have defined it as re-enrollment from term to term until completion of a degree,
certificate or intended objective. It is required that graduation rates be reported to the U.S. Department of Education since the 1990 Student Right to Know Act (Lederman, 2005). The federal definition of graduation rate provides a widely used definition, but has inherent problems: it does not account for part-time students who comprise the majority of community college enrollments, and the rate considers only students who start and graduate from the same institution, which again skews the rates as an increasing number of students transfer, or take courses from multiple institutions in order to continue their education (Bailey, et al., January 2005; Lederman, 2005; Recruitment and Retention, December 2005b). Transfer rates negatively impact institutional retention and graduation rates because in many cases, the rates are defined so as to count transfers as having dropped out (Burd, 2004). Many states thus use their own definitions of retention and graduation rates. Institutions may also define and track retention rates differently from the state for their own purposes. In addition, there are also different varieties of retention: institutional, system-wide, discipline-specific and individual courses (Hagedorn, 2005).

Community colleges are often noted for poor retention rates, especially compared to four-year institutions (Bailey, Jenkins & Leinbach, 2005; Hagedorn, 2006; Horn & Nevill, 2006; Tinto, 1987). It was revealed in a recent study conducted by the Community College Research Council that only 53 percent of students seeking an associate’s degree or higher had either earned a degree or transferred to a senior institution within eight years of beginning their studies (AACC, 2005). Gooden and Matus-Grossman (2002) refer to a study by Tinto (1993) in which it was reported that less than half of students who attend public community colleges earn a degree within
three years. Minority students show higher drop out rates than their majority classmates (Lederman, 2005; Szelenyi, 2001; Voorhees, 1987; Zamani, 2000). According to the Community College Research Center, white students graduate with associate and bachelor’s degrees within a six-year window at six times the rate of Black students (Leinbach, 2005). Graduation rates are also lower among students of lower socio-economic status when compared to students from wealthier backgrounds (Lederman, 2005). Another factor in low retention and graduation rates of community colleges is the prevalence of remedial need and lack of success of students in these courses. “Research suggests that more than a quarter of remedial students do not complete their prescribed remedial coursework. In general, the more remedial courses students are required to take, the less likely they are to earn a degree.” (Jenkins, 2002, p. 2). Jenkins further explains that “This is clearly a key cause of the low degree completion rates for which community colleges are often criticized” (p. 14).

Community colleges have been cautioned to align their definition of retention with the model of retention theorist Alexander Astin. He stated that success is best measured by students meeting their intended goals, regardless of whether it is taking a single class, earning a certificate or a degree (Walters, 2003). Despite this caution by Astin, retention still appears to be often, if not predominantly defined in terms of re-enrollment towards completion of certificates or degrees within time frames that are not consistent, ranging from two years to eight years. Different measures of college graduation rates have been criticized as “anachronistic formulas that do not track students through increasingly complex paths to degrees. As a result, we do not really understand what is going on” (Toolbox Revisited, 2006).
Definitional issues, however, are rarely transparent to users of retention statistics, but may have a significant impact on both their validity and suitable use (Ewell, 1999). Further complicating the situation is that retention rates can be misleading when “more than half the variance in institutional retention rates can be attributed directly to differences in the kinds of students who initially enroll, rather than to any differential institutional effect” (Astin, 1997, p. 648).

There does appear to be consensus that retention is a complex phenomenon best understood through examination of both institutional characteristics and student perceptions and behaviors (Hutto, 2002; Summers, 2003). Yet Hagedorn (2005) notes that although the problems associated with a lack of a common definition and measure of retention have been noted for years, a standard formula has not yet been accepted even after advocated four decades ago by Summerskill (1962).

**Engagement as a Promising Construct**

Community colleges have broad missions, have open door admissions policies, have increasing enrollments and serve students of more diverse backgrounds, who have competing demands and multiple educational needs. As such, these institutions must define quality in ways different from those often used by four year institutions (CCSSE, 2004a). How quality is defined will inform those things for which they are accountable. Traditional criteria of rankings usually have little to do with educational outcomes and include acceptance ratio, reputation, or institutional resources (Aper & Hinkle, 1991; Manzo, 2001; Pascarella & Terenzini, 1998). Based on their mission, these are not suitable criteria to evaluate community colleges. Selection of criteria and standards is a
critical component in evaluation (Posavac and Carey, 2003) and shapes how institutions held to those criteria perform and are perceived. Appropriate criteria are needed to both evaluate and help institutions improve the learning outcomes, educational experiences and the persistence of the students they serve.

Despite the lack of a substantial amount of research that provides clear direction on improving student retention in community colleges, there is a “broad body of research and theoretical perspectives indicating that positive educational outcomes are associated with student engagement” (Marti, 2006, p. 4). Although the expanse of research on engagement is not in any way covered here, key authors provide broad brushstrokes of what engagement encompasses.

Pace (1984) conducted studies on the quality of effort invested by students. The breadth of student involvement in various aspects of college life was found to be related to the breadth of student gains in important higher education goals (Pace, 1984). Astin (1984) posed a theory of student development which associated the proportion of student learning to both the quality and quantity of student involvement. According to Astin, “student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience” (Astin, 1984, p. 297). Effective educational practices are those which elicit investment of sufficient student energy (Astin, 1984). There has been strong support for the argument that heavy involvement had a positive impact on student academic and personal development (Astin, 1993; Astin, 1999; Pascarella & Terenzini, 2005). Tinto (1987) emphasized the importance of academic and social integration to student learning and persistence. He later described integration as student involvement (Tinto, 1993). Chickering and Gamson (1987) developed what have
been termed by Kuh (2003) as engagement indicators in their seminal work of the “Seven Principles for Good Practice in Undergraduate Education.” Building on the volume of research conducted in the four year sector of higher education, the National Survey of Student Engagement (NSSE) was developed and field tested in 1998 (Kuh, 2001) to assess and benchmark student activities that measure the “time and energy students devote to educationally purposeful activities” or student engagement (Kuh, 2003). An instrument appropriate for use by community colleges soon followed.

**Community College Survey of Student Engagement**

The Community College Survey of Student Engagement (CCSSE) was launched in 2001 as a project of the Community College Leadership Program based at The University of Texas at Austin. Grants from The Pew Charitable Trusts, the Lumina Foundation for Education, the MetLife Foundation and Houston Endowment supported the effort. The purpose was to raise public awareness about the work of community colleges, stimulate discussion and dialogue about how quality is defined and measured, and provide an appropriate assessment tool for their work. Based on extensive research that pertains to student learning and persistence, the CCSSE has defined five benchmarks of educational practice (CCSSE, 2006b). Three of the benchmarks comprise an institution’s Retention Index. CCSSE provides formative measures to benchmark and improve retention efforts (CCSSE, 2006a; Hayes, 2006).

As community colleges across the country respond to increasing demands for accountability, including quality and performance, they need assessments that are appropriate to their mission and population, and that can provide guidance for
improvement (CCSSE, 2006a). Community colleges, with open door admissions policies, must define quality and effectiveness in ways different from traditional criteria according to CCSSE. Used in the popular media, traditional criteria, which are often commercially motivated (Ewell, 1999), typically include consideration of an institution’s financial resources and rankings based on the ratio of those accepted as compared to those who applied. These popular criteria and associated rankings have little to do with student learning (Kuh, 2001). *Money* uses 16 criteria to assess quality and rank institutions, including four-year graduation rates, retention rates, instructional budget, percentage of students entering from to the top of their class and faculty, library, instructional, student services budgets (Money, 1996). Considering a student’s educational experience as a measure of quality entails focusing on institutional practices and student behaviors that research has shown to be connected to student learning and persistence – or retention (McClenney, 2004b). The CCSSE is anchored in extensive research about effective practices associated with student learning and retention.

Considered the “daughter” of the National Survey of Student Engagement (NSSE), which is used by four-year institutions to obtain information about learning practices and student engagement, the CCSSE addresses the unique mission and student characteristics of community colleges (Ouimet, 2001). The NSSE helps institutions assess quality by measuring student engagement, which research shows is the best indicator of student learning and development (Astin, 1993; Pace, 1980 as noted in Kuh, 2003; Pascarella & Terenzini, 1991). There is a significant amount of intentional overlap between questions used in both the CCSSE and the NSSE instruments although
similarities and differences between the respective organizations and their survey instruments are addressed on the CCSSE website.

Five benchmarks of effective educational practice, one of CCSSE’s most significant contributions, have been defined through the instrument (McClenney, 2004b). Each benchmark consists of a group of conceptually related items that pertain to good educational practice (CCSSE, 2006b). The benchmarks are based upon the work of many researchers, including Chickering and Gamson’s (1987) landmark publication on good practices of undergraduate education (Kuh, 2003). The seven principles were developed by a task force of scholars of policy, organizational and economic issues in higher education as well as those who had conducted research on the college experience (Chickering & Gamson, 1999). The CCSSE benchmarks are: active and collaborative learning, student-faculty interaction, student effort, academic challenge and support for learners. The benchmark scores are standardized to a mean of 50 for all participating students and then can be used by institutions to compare themselves to the mean as well as gauge the impact of efforts intended to improve student learning and persistence (CCSSE, 2006b). According to McClenney, Director of CCSSE, community colleges are stepping up to plate through their participation and are “declaring both their commitment to continuous improvement and their willingness to be accountable for providing the kind of quality that matters most” (Manzo, 2003).

The CCSSE, used across multiple community colleges over time, stands to offer a frame of reference to benchmark educational practices and study student characteristics that can serve as valuable resources to develop strategies to improve student learning and persistence of different groups of students who may have very different needs.
Community college enrollments have been increasing in recent years both in Florida and across the United States (Proctor, 2002). Increases are especially noted among minority students. While gains have been made in promoting access for these populations, this does not always translate to success (Bailey & Alfonso, 2005; McClenney, 2004a; Ruppert, 2003; Wilson, 2004). Access is critical, but alone is not sufficient (Bailey, et al., October 2005). African American, Hispanic and Native American students appear to have higher attrition rates than white or Asian students (Bailey & Alfonso, 2005; Education Commission of the States, October 2003; Kalsner, 1991; Zamani, 2000). In Florida, minority students neither participate nor succeed in postsecondary education at the rates of their majority peers as of those aged 25 and older, nearly 32 percent of whites in Florida have earned a college degree while only 23.8 percent of Latinos and Hispanics, and 18.5 percent of African Americans possess a postsecondary degree (Ruppert, 2003). After controlling for enrollment variables and demographic characteristics, women also persist and graduate at higher rates than men according to most of the research (Bailey, et al, January 2005).

Sited in the 2005-2006 strategic plan of the Florida Commission of Community Colleges and Workforce Education, benchmark scores from the CCSSE survey will be used as a success indicator. As indicted 1.5.1 the CCSSE survey results and baseline scores for the system are targeted to steadily increase. Another success indicator, 1.5.2, is improvement in the system retention, success, and completion rates. (Florida Community Colleges and Workforce Education, 2006). “The measure for Success Indicator 1.5.2 of the FCCS Strategic Plan is our current accountability Measure 1, Part 2” (P. Windham, personal communication, February 28, 2006).
As one of few benchmarked tools designed specifically for use by community colleges, the CCSSE instrument is held out as a means to guide improvements in student learning and persistence. By improving and increasing practices assessed by CCSSE’s benchmarks, including the Retention Index, it stands to reason that institutions will foster improvement in student learning, persistence and retention (CCSSE, 2006a; Marti, 2004). Extensive research has not yet been conducted to validate the CCSSE benchmarks as a predictor of the outcome of retention, although this has been recommended as a topic of future research (Marti, 2004) and is a focus of this dissertation study.
CHAPTER THREE

METHODOLOGY

Introduction

This chapter includes descriptions of the quantitative approach taken to examine the empirical relationship between the CCSSE Retention Index and the Florida accountability measure of student retention as well as the approach taken to examine mean differences in Retention Index scores of students from different subgroups based on race and sex while accounting for the possible influence of institution attended.

The statement of the problem and basis for the research questions are reiterated, followed by a description of the population and sample used in the study. An overview of instrumentation follows, including the Student Data Base from which the Florida accountability measures are drawn, and CCSSE’s Community College Student Report. The reliability and validity of the SDB and CCSR are described. Although this study entails use of secondary data sets, the data collection procedures used for the SDB and CCSR are described. Following these are descriptions of the data analyses used to address the research questions before closing the chapter with a summary.

Statement of the Problem

There is not yet a clear road map for improving student retention, particularly in community colleges. Yet community colleges are increasingly held responsible through
accountability measures and even performance-based funding, to improve retention and completion rates.

This study proposes to examine the relationship between the institutional CCSSE Retention Index scores from the 2004 fielding of CCSSE’s survey in the 28 Florida community colleges, and the retention portion of Florida accountability measure 1, Part 2 (M1P2) for the cohort tracked from Fall 2000 through Winter/Spring 2004. While the Florida accountability measure of student Retention and Success measures both student retention and success as operationally defined, this study will focus on the portion of the measure which pertains to retention.

Targeted success indicators of the 2005-2006 strategic plan for the Florida Community Colleges and Workforce Education include an increase in baseline scores from the 2004 CCSSE results, and improvement in retention, success and completion rates system-wide (Florida Community Colleges and Workforce Education, 2005). Extensive research has not yet been conducted to validate the CCSSE benchmarks as a predictor of the outcome of retention, although Greene (2005) examined student level data in a research study that demonstrated an empirical relationship between engagement and student outcomes of Florida community college students. Still, examination of whether the CCSSE benchmarks can predict the outcome of retention per se has been recommended as a topic of research (Marti, 2004). The first and second research questions for this study stem from this problem.

Community college students are diverse in age, socio-economic, educational and cultural backgrounds, ability and aspirations. In light of the community college mission to both prepare students for transfer to senior institutions and play a significant role in
workforce preparation and economic development, as well as rising enrollment rates in community colleges in Florida, it is compelling to note what differences exist in CCSSE Retention Index scores of students across specific demographics. African American, Hispanic and Native American students appear to have higher attrition rates than white or Asian students (Bailey & Alfonso, 2005; Kalsner, 1991). After controlling for enrollment variables and demographic characteristics, women also persist and graduate at higher rates than men according to most of the research (Bailey, et al, 2005). There are a myriad of academic, social, political and moral reasons to address and close the persistence and performance gaps (Braxton, Hirschy & McClendon, 2004; McClenney, 2004a; Summers, 2003). Survey questions providing demographic information allow for comparisons in engagement levels between sub-groups, which is encouraged by CCSSE (Marti, 2004). The third research question stems from the problem of differences in retention rates between subgroups and a desire to examine differences in engagement between these groups as measured by the CCSSE Retention Index while also accounting for the potential influence of the institution attended.

**Population and Sample**

The first and second research questions examine institution level data of both the CCSSE Retention Index and the retention portion of the Florida accountability measure for Retention and Success for the 28 Florida community colleges. Secondary data sources provided the values for these two institution level measures. The entire population of the Florida community colleges is included in the first two research questions. The institutional CCSSE Retention Index is calculated by averaging a
college’s scores in three of the five benchmarks: active and collaborative learning, student-faculty interaction, and support for learners (CCSSE, 2006c).

The institutional level retention rate from the Retention and Success accountability measure consists of the number of students graduated, plus the number enrolled in good standing, plus the number enrolled who are not in good standing as compared to the total cohort. The Winter/Spring 2004 cohort includes only first time in college students from Fall 2000 who took an entry level test and achieved nine credits in a PSVC or ATD program, or 18 credits in an AA, AS or AAS program by Summer 2002 or Winter/Spring 2004 (FL DOE, October 2004).

The third research question examines student level data for a sample of Florida community college classes. “We sample classes, but data is on the student level” (N. Marti, personal communication, February 20, 2006). The sample consists of Florida community college classes included in the 2004 fielding of CCSSE’s survey instrument, the Community College Student Report.

CCSSE designates a person at each institution to administer the survey according to protocols. A stratified random cluster sample scheme is used to capture a random, representative sample of classes from each institution (Marti, 2004; Marti, 2006). Each class represents a cluster which contains multiple students while a three level stratification is based on classes beginning between specified times in the morning, afternoon and evening (Marti, 2004). Based on Integrated Postsecondary Education Completions Data Files - or what are commonly referred to as IPEDS data - submitted to CCSSE, participating institutions were instructed to survey a minimum number of college credit sections of classes. According to the CCSSE web site, the required number of
course sections and students to be surveyed is established based on the total sample size needed to reduce sampling error and to ensure valid results. The sample and population demographics for the *Community College Student Report* closely match as indicated by comparison with data from the Integrated Postsecondary Education Data System, except in that full-time students were overrepresented (Marti, 2004). The data are weighted to accommodate for differences in the sampling rates between full and part-time students (Marti, 2006). A weight “is the inverse of the probability of selection” (Kish as noted in Hahs-Vaughn, 2005, p. 224). Although the relevance of weights has been debated (Pfeffermann as noted in Hahs-Vaughn & Lomax, 2006) evidence supports the premise that they are “required to produce estimates that are representative of the intended population” (Hahs-Vaughn, 2005, p. 224).

Over sampling is not part of the sampling design used by CCSSE, however participating colleges can elect to oversample students at their own institutions. "There is a variable in the master data set that indicates whether a respondent was in the primary or oversample" (N. Marti, personal communication March 20, 2006). There were 25,040 student responses to the 2004 fielding of the CCSSE survey, 4459 of which were oversamples. Since oversamples can distort results of statistical analyses and compromise the generalizability of the results unless they are addressed through statistical means (e.g., through weighting the data) (Hahs-Vaughn, 2005), the oversamples were excluded upon request from the student level data set provided by the Florida Department of Education. The resulting sample included 20,581 student responses.
Florida Accountability Measure of Retention and Success

Florida Statute 1008.45 (1) mandates development of an accountability plan to both assess and improve the quality and efficiency of the state’s community colleges. The Student Data Base (SDB) serves as the state repository of student information. Elements from the SDB are used to compile the data for the accountability measures (CCTMIS, 2005; OPPAGA, 1999).

Accountability Measure 1, Part 2 (M1P2) is one of eight state accountability measures and is used to assess student Retention and Success. This measure is a report of the status of first time in college degree or certificate seeking students within a three year tracking period with 18 college credit hours, or 9 vocational credit hours earned. Use of this measure was criticized in a report by OPPAGA (1999) but defended in a response by the Executive Director of the Florida State Board of Community Colleges who argued that the measure was chosen to more accurately represent the system’s results (OPPAGA, 1999). The Retention and Success report includes the number and percent of students by ethnicity and full-time/part-time status for each community college and the system as well as for Associate in Arts (A.A.), Associate in Science (A.S.), Associate in Applied Science (A.A.S.), Post Secondary Vocational Certificates (P.S.V.C.) and Applied Technical Diploma (A.T.D.) programs of study (CCTCMIS, 2005). The retention rate from the Florida accountability measure of Retention and Success will be used as the dependent variable in the first two research questions.
Community College Student Report

CCSSE’s survey instrument is the *Community College Student Report* (Marti, 2004). The survey was designed to help community colleges measure student engagement and focus on both institutional practices and student behaviors that are positively associated with student learning and retention (CCSSE, 2006c). The development of benchmarks for use across and within institutions was a primary intent of the CCSR (Marti, 2004).

The CCSR was adapted with permission from Indiana University (Marti, 2006) from the National Survey of Student Engagement which is used in four year colleges and universities (Marti, 2004). There was an intentional high degree of overlap between the instruments – 71 percent of the questions were common to both instruments in 2003 (Marti, 2004) and 67 percent in 2005 (Marti, 2006). The CCSR, however, is focused on the two year sector which is distinct from the four year sector in institutional mission and populations served (Marti, 2004).

Five benchmarks of effective educational practice have been defined through the *Community College Student Report* and are seen as one of CCSSE’s most significant contributions (McClenney, 2004). The five benchmarks are: active and collaborative learning, student-faculty interaction, student effort, academic challenge, and support for learners. Three of the five benchmarks comprise an institution’s Retention Index and include: active and collaborative learning, student-faculty interaction and support for learners (CCSSE, 2005). Only the three benchmarks comprising the Retention Index are used in this study.
Each benchmark consists of a group of conceptually related items that pertain to good educational practice (CCSSE, 2006b). Benchmarks were created through exploratory factor analysis (EFA) and then confirmatory factor analysis (CFA) to establish a goodness of fit of questions to comprise each benchmark (Marti, 2004). Because of limitations of CFA, a panel of experts in educational research was used to further narrow the field of possible benchmarks and the questions that comprise them by using the factor analysis, reliability tests and expert judgment (Marti, 2004).

“When the CCSSE benchmarks were created we started with a factor analysis to find the groupings. That was the beginning. Then we worked with a group of experts in the community college realm. These experts made up of people such as community college presidents, faculty, researchers in the field etc., then reviewing the groupings and made suggestions as to where they thought things should fall….. both through factor analysis and the review of the experts….” (J. Crumpley, Senior Research Associate, CCSSE - personal communication, February 11, 2005). This summarizes the process of how the benchmarks were established.

In order to create the benchmark scores, it is explained on the CCSSE website that the items associated with a benchmark were rescaled so that all items are on the same scale (0 to 1). The benchmark scores are standardized to a mean of 50 for all participating students, weighted by full and part-time attendance status, and a standard deviation of twenty-five. Benchmark scores are then computed by averaging the scores on the associated items (CCSSE, 2004b). Benchmarks can then be used by institutions to compare themselves to the mean as well as to compare themselves to themselves and
gauge the impact of efforts intended to improve student learning and persistence (CCSSE, 2006b).

**CCSSE’s Retention Index**

Three of CCSSE’s five benchmarks of student engagement, active and collaborative learning, student-faculty interaction and support for learners comprise what CCSSE has termed the Retention Index (CCSSE, 2006c). Theoretically, institutions can improve student learning and retention, and their institutional retention rates by improving and increasing practices measured by this index (CCSSE, 2006a; Marti, 2004). The CCSSE Retention Index will serve as the independent variable in the first two analyses and as the dependent variable in the third research question and analysis.

**Active and Collaborative Learning**

According to the CCSSE website, the basis for the benchmark for active and collaborative learning (ACL) is described as follows: “Students learn more when they are actively involved in their education and have opportunities to think about and apply what they are learning in different settings. Through collaborating with others to solve problems or master challenging content, students develop valuable skills that prepare them to deal with the kinds of situations and problems they will encounter in the workplace, the community, and their personal lives” (CCSSE, 2006). Students absorb more through collaborative learning and team effort which reinforces skills in communication and problem-solving (Ewell, & Jones, 1996). More succinctly, “good learning, like good work, is collaborative and social…” (Chickering & Gamson, 1987, p.
4). Insofar as involvement and integration play a role in retention, collaborative programming, especially in the classroom, is particularly important in commuter institutions where student attachments may be weak (Tinto, 1993). Activities associated with active learning include discussion, pair and group work, role playing and cooperative learning (Braxton, Hirschy & McClendon, 2004). This benchmark consists of seven questions from the CCSSE survey instrument. (See Appendix C).

**Student-Faculty Interaction**

Student interaction with faculty, whether inside or outside of class (Chickering & Gamson, 1987; Lau, 2003; Pascarella & Terenzini, 1991, 2005; Tinto, 1993), and whether on class projects, committee or community work appears to help students both learn more effectively and to persist in their academic and career goals (Ewell & Jones, 1996; Kalsner, 1991; Pascarella, 1980; Pascarella & Terenzini, 1980; Pascarella & Terenzini, 1991). Both the quality and frequency of faculty-student interaction appear to have an impact on student persistence (Pascarella & Terenzini, 1991). Informal contacts between students and faculty emerged in Pascarella’s (1980) view to be most influential when they bridge the intellectual content to the student’s life outside the classroom. These associations have been found to be statistically significant even when student characteristics were controlled in the study (Pascarella, 1980). Student-faculty interaction is critical to student retention (CCSSE, 2005). Low rates of student retention are generally found in institutions with low rates of interaction between students and faculty (Tinto, 1987). There are six survey items that comprise the student-faculty interaction (SFI) benchmark. (See Appendix C).
Support for Learners

The support for learners (SFL) benchmark assesses practices associated with supporting student success through cultivation of positive social and working relationships on campus, providing services targeted to assist them with the development of academic skills, as well as academic and career planning (CCSSE, 2006). The support for learners benchmark accounts for research supporting the premise that students achieve more when they experience the institution as supportive and having an abiding concern for their success. Interactions with institutional representatives, be they faculty or staff, may affect departure insofar as they reflect the level of commitment to individual student welfare (Tinto, 1987). Focus groups conducted with low-wage working students from six community colleges further supports this in mention of the importance of support and services and interest in their well-being by college faculty and staff (Gooden & Matus-Grossman, 2002). There are seven survey items that comprise this benchmark. (See Appendix C).

Reliability and Validity

Indicators of the score reliability and validity of the Florida accountability measures appear to be limited to narratives about promoting the accuracy and consistency of the Student Data Base (CCTMIS, 2003; CCTMIS, 2005; OPPAGA, 1999). A commitment to ensuring the reliability and validity of data used to calculate the accountability measures is evidenced by protocols outlined in workbooks distributed and facilitated discussions surrounding the topic at the Management Information Systems (MIS) annual reports workshop for the 28 community college reports coordinators.
Definitions of data elements and procedures for submitting, validating and verifying the data are prescribed. In an e-mail exchange about the reliability and validity of the SDB with the Vice Chancellor responsible for much of its oversight, it was noted that “One underlying principle to remember is that the SDB was established as a reporting/compliance database not a research database so we have taken something established for one purpose and are using it for another” (P. Windham, personal communication, April 8, 2006).

As previously noted, CCSSE’s instrument, the Community College Student Report, has its genesis in NSSE’s instrument, the College Student Report, and shares a number of common survey questions. The score reliability and validity of the NSSE have been extensively explored and demonstrated (Kuh, Hayek, Carini, Ouimet, Gonyea & Kennedy, 2001, Kuh, 2002 as noted in Marti, 2004). Psychometric analyses were conducted on the NSSE instrument after five different administrations of the survey to test the score reliability and validity (Kuh, 2003). Survey responses were normally distributed and skewness and kurtosis values were acceptable (Kuh, 2003). Furthermore, focus groups were used to ensure that students understood the NSSE survey questions in the manner intended and cognitive interviewing was conducted on questions revised for the 2001 version of the instrument, both of which lend further credibility to the quality of the questions that comprise the instrument.

The Community College Student Report benchmarks also closely approximate a normal distribution and acceptable skewness and kurtosis values are reported by Marti (2004). Normality is important with the CCSSE since benchmarks are presented in a standardized format.
The score reliability of the CCSR and its component benchmarks were measured through use of Cronbach’s alpha (Marti, 2004). Cronbach’s alpha is a generalized form of the Kuder-Richarson formulas (Beckman, Ghosh, Cook, Erwin & Mandrekar, 2004) “which estimates the reliability coefficient from the item inter-correlations” (Nunnally & Bernstein, 1994, p. 246). It is used to determine if items are related to one another. Benchmarks that comprise the Retention Index had the following values for alpha: active and collaborative learning (.67); student-faculty interaction (.72) and support for learners (.76) (Marti, 2004). Cronbach’s alpha values for the benchmarks are strong, despite not all exceeding the “gold standard of .70” (Marti, 2006, p. 10).

Test-retest reliability was evaluated by comparing students’ responses to the survey administered in more than one of their classes although only one survey from each individual was included in overall analyses (Marti, 2006). Year to year comparisons between 2003, 2004 and 2005 indicate that the instrument is measuring the same constructs across time and that differences between subgroups are due to real differences in means, variances and co-variances as opposed problems associated with the instrument (Marti, 2006). Test-retest correlation values for the benchmarks that comprise the Retention Index are: active and collaborative learning ($r = .73$), student-faculty interaction ($r = .73$) and support for learners ($r = .73$) (Marti, 2006).

The score construct validity of the CCSR has been demonstrated through analyses associating the benchmarks with the student outcome of grade point average (GPA) (Marti, 2004). Two of the three benchmarks that comprise the Retention Index showed a positive relationship between the benchmark and GPA: active and collaborative learning, $t (1, 52,705) = 18.90, p < .001$ and student-faculty interaction, $t (1, 52,650) = 12.72, p <$
.001. The support for learners benchmark did not show a positive relationship with GPA: 

\[ t(1, 52,685) = .78, p = .44 \] (Marti, 2004). Although further research is recommended by CCSSE, an explanation for the weaker relationship offered by CCSSE is that the support for learners benchmark was intentionally designed to measure student services practices that have been associated with student retention in previous research (Chaney, et al., 1998 as noted in Marti, 2006) as opposed to the other benchmarks which were designed to more clearly measure student learning (Marti, 2004). Another explanation is that students who have particular needs often have lower GPAs and often utilize student services more frequently (Marti, 2006).

As a relatively new survey instrument, there is still validation work to be done. There is an ongoing quest, by both NSSE and CCSSE for further evidence of concurrent validity (Kuh, 2003; Marti, 2004). In an overview of the psychometric properties of the CCSR, Marti (2004) states “While student engagement is certainly not the only factor contributing to student success, future work should examine how it relates to direct assessments of student learning outcomes in community colleges and to other important outcomes including retention, transfer, graduation, and career successes” (Marti, 2004, p. 25). As previously stated, the first and second research questions of this study are intended to test the validity of the CCSSE Retention Index as it relates to the student outcome of retention as measured by the Florida accountability measure of student Retention and Success.
Data Collection

The first and second research questions address institution level data. Data collection was through secondary data sources consisting of survey results from CCSSE’s survey instrument, the *Community College Student Report*, and retention rates for each institution from the Florida state accountability measure of Retention and Success.

CCSSE institutional Retention Index scores for 2004 of the 28 Florida community colleges were calculated from a partial data set of CCSR results provided by the Florida Department of Education. The data set was received after approval of a Data Use Agreement by the director of CCSSE.

Data used to calculate the Retention and Success accountability measure are drawn from the statutorily mandated Student Data Base, which serves as the state repository for student information. The accountability measures are computed and issued by the Community College and Technical Center MIS (CCTMIS) bureau of the Florida Department of Education. The measures are sent to the community colleges’ institutional research officers on a regular basis. The report of the Retention and Success accountability measure includes the numbers and percentages of students in the cohort by degree program, ethnicity and part-time or full-time status for each college and for the whole system (CCTMIS, 2005).

In order to preserve the anonymity of the institutions’ CCSSE data, the Florida Department of Education provided a cross-walk in the data set that matched each institution’s CCSSE Retention Index and Florida accountability measure retention rate. The author did not receive data that linked particular results to named institutions.
The third research question addresses student level data. As previously mentioned, data collection was through a secondary data source consisting of selected survey results from CCSSE’s survey instrument. The 2004 *Community College Student Report* consisted of more than 120 survey questions, all of which were not pertinent to this study. The data set was received from the Florida Department of Education after approval of a Data Use Agreement by the director of CCSSE. The CCSSE data set consists of 20,581 student responses to the survey questions that comprise the Retention Index as well as to requested demographic questions. Also included are institutional level variables that distinguish each of the 28 colleges without revealing their identity, and indicate the size of each institution, as operationally defined by CCSSE. Oversamples were excluded, as requested, from the partial data set sent by the Florida Department of Education.

**Analysis Procedures**

In order to answer Research Question 1, a correlation and simple linear regression analysis will be conducted, using the CCSSE Retention Index as the independent variable and the state retention rate provided in the Retention and Success accountability measure as the dependent variable. Institutional level variables will be used. The accountability measure retention rate for a cohort of students consists of the number of students graduated, plus the number enrolled in good standing, plus the number enrolled who are not in good standing as compared to the total cohort (CCTCMIS, 2005). The first research question will examine if there is a linear relationship between these two institutional level variables, measure the strength of the relationship between the
variables, and analyze whether the CCSSE Retention Index can be used to predict the state retention rate.

To answer Research Question 2, a multiple linear regression will be conducted to control for the retention rate of award type in exploring whether the CCSSE Retention Index can be used to predict the state retention rate as defined in the Retention and Success accountability measure. Institutional level variables will be used for this analysis. The analyses used for the first and second research questions can detect only one particular type of relationship between the variables, “namely, the linear relationship between X and Y, or the relationship that can be described by a straight line” (Keppel & Zedek, 1989, p. 55).

To answer Research Question 3, a Nested or Hierarchical Analysis of Variance (ANOVA) will be conducted using the 20,581 students’ responses to survey items that comprise the CCSSE Retention Index. This will entail use of student level variables. The analysis is to determine if there are mean differences in the Retention Indices of males and females from different racial or ethnic groups while accounting for the nested or potential nuisance variable of institution. Assuming a crossed design when neglecting the potential impact of a nested variable can lead to incorrect interpretation of the results (Lomax, 2001; Roberts, 2000). As stated previously, institutions are not identified by name in the dataset. A variable does indicate that the student level data is from one of the 28 Florida community colleges, which allows for the analysis of the nested factor.
Summary

Secondary data sources will be used to conduct analyses to answer three different research questions pertaining to CCSSE’s Retention Index. The first two questions will be analyzed using institution level data and the third question will be analyzed using student level data. The purpose of the first two questions is to further examine the validity of CCSSE’s Retention Index against the student outcome of retention as measured by the retention rate from Florida’s Retention and Success accountability measure. Validating CCSSE benchmarks against the student outcome of retention has been recommended by CCSSE (Marti, 2004; Marti, 2006). The purpose of the third question is to examine whether there are mean differences in the Retention Index scores of different sub-groups of students, a practice also recommended by CCSSE in order to gauge the effectiveness of intervention strategies used with different populations (Marti, 2004; Marti, 2006).
CHAPTER 4

RESULTS

This chapter includes the findings from quantitative analyses conducted with data collected through secondary data sources that included 2004 results of the Community College Survey of Student Engagement and retention rates of the Florida community colleges from the Fall 2000 cohort (who were tracked through Spring 2004) from the Florida accountability measure of Retention and Success. Institution level data was examined to explore the relationship between CCSSE’s Retention Index and the Florida retention rate from the state accountability measure of Retention and Success. This was undertaken, in part, since CCSSE has recommended ongoing validation of its relatively new survey instrument (Marti, 2004). Student level data was also examined to explore if there were differences in the CCSSE Retention Index scores of students from different racial and gender groups when accounting for the potential influence of institution attended.

Providing further context, the sample for the institutional level data consisted of the Florida community colleges. The sample for the question that examined student level data was Florida community college students.

There are 28 public community colleges in Florida that, during the 2003-2004 academic year, enrolled more than 800,000 students. Collectively, the colleges have 52 campuses and 172 sites and are within commuting distance for more than 90 percent of the state’s population. The smallest college reported a headcount of 1130 in Fall 2004, and the largest reported a headcount of 57,026 (FL DOE, 2005). CCSSE operationally
defines colleges as small (less than 4,500 students), medium (4,500-7,999), large (8,000-14,999) and extra-large (15,000 plus). According to CCSSE, Florida has six small community colleges, six medium sized colleges, nine large and seven extra-large community colleges (CCSSE, 2004b; CCSSE, 2006e).

Most students are classified as seeking Associate of Arts degrees whether considering only college credit programs, or when considering enrollments in adult education, career and workforce education, as well as recreation and leisure where they then comprise 30 percent of enrollments. Associate of Science degree seeking students comprise nearly 10 percent of the enrollments and College Credit Certificate or Applied Technical Diploma students comprise less than 2 percent of the enrollments (FL DOE, 2005). The student body is mostly female (61%), attending part-time (62%) with an average student age of 27 years (FL DOE, 2005). Thirty-nine percent of the headcount during the 2003-2004 academic year consisted of minority students. Blacks comprised 44 percent of minority enrollments and Hispanics constituted 48 percent of the minority student population (FL DOE, 2004).

According to the U.S. Department of Education, nearly 55 percent of students who attended community colleges in 2002 received some type of financial aid, which is considered an indication that most students came from middle and low socioeconomic strata (Boulard, 2004). Another source indicated that only 47 percent of community college students received some form of financial aid, most of which (40 percent) was in the form of grants (Horn & Nevill, 2006). Relatively few community college students take out student loans, which is explained in part by the large percentage of these students who work full time, nearly full-time, and attend part-time (Horn & Nevill, 2006).
Research Question 1

Research Question 1 was stated as follows: Can the 2004 CCSSE Retention Index be used to predict Florida’s state retention rate as measured by the Retention and Success accountability measure? Data for the first research question were collected through secondary data sources provided by the Florida Department of Education. Institutional identities were not provided in the data set. CCSSE institutional benchmark scores for each of the 28 Florida community colleges were provided by DOE after approval by CCSSE. The institutional CCSSE Retention Index scores were then calculated by the author after consultation with CCSSE, by averaging the scores of the three benchmarks that comprise the Index: active and collaborative learning, student-faculty interaction and support for learners. The institutional retention rates, as defined by the Florida accountability measure for Retention and Success, were also provided by DOE. The retention rate from the accountability measure consists of the number of students graduated, plus the number enrolled in good standing, plus the number enrolled who are not in good standing as compared to the total cohort. The cohort of students tracked to determine the retention rate includes only first time in college students who took an entry level test, and earned at least 18 credit hours if enrolled in an A.A., A.S. or A.A.S. or earned at least 9 credit hours if enrolled in a P.S.V.C. or A.T.D. program. Descriptive statistics generated in SPSS yielded measures of variability and central tendency as reported in Table 2.
Table 2: Comparison of Independent and Dependent Variables, Research Question 1

<table>
<thead>
<tr>
<th></th>
<th>Retention Index</th>
<th>Retention Rate Accountability Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>49.7143</td>
<td>63.327</td>
</tr>
<tr>
<td>Median</td>
<td>49.3000</td>
<td>64.9500</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.71002</td>
<td>6.59683</td>
</tr>
<tr>
<td>Variance</td>
<td>7.344</td>
<td>43.518</td>
</tr>
<tr>
<td>Range</td>
<td>11.30</td>
<td>28.03</td>
</tr>
<tr>
<td>Minimum</td>
<td>46.10</td>
<td>47.90</td>
</tr>
<tr>
<td>Maximum</td>
<td>57.40</td>
<td>75.93</td>
</tr>
</tbody>
</table>

Note. The CCSSE Retention Index was the independent variable. The Retention rate from the Florida Accountability Measure was the dependent variable. 

Two variables were used in the first analysis: the independent variable was the institutional CCSSE Retention Index (RINDEX) and the dependent variable was the institutional retention rate for all degree types (RRALLPCT) as calculated for the Florida accountability measure of Retention and Success. Since CCSSE benchmarks scores are standardized to a mean of 50 for all participating institutions across the country, the mean of the independent variable (49.7143) indicates that the average Retention Index of the Florida community colleges is slightly below that of other institutions that participated in the survey. The Retention Index scores of the Florida community colleges range from (46.10) to (57.40). The mean of the dependent variable (63.327) (RRALLPCT) is not a standardized score. There is greater variability in the retention rates as noted in the range of (28.03) for the dependent variable and (11.30) in the independent variable as well as
the variance which was (43.518) for the dependent variable and (7.344) for the independent variable. The average dispersion or standard deviation of each of the distributions was (2.71002) for the Retention Index and (6.59683) for the retention rate.

A simple linear regression analysis was conducted to examine the relationship between institutional CCSSE Retention Index scores and institutional retention rates from the Florida accountability measure for Retention and Success for the 28 community colleges in Florida. The intent was to determine if a linear relationship exists between the two and whether the CCSSE Retention Index can be used to predict the institutional retention rate from the Florida accountability measure. The null hypothesis was that the regression coefficient (i.e. the slope) was equal to zero.

Initial review of a scatterplot showed little evidence of a linear relationship. Since a line of best fit depicted a hint of a slope the regression analysis was conducted to determine if there was a relationship of statistical significance. Simple linear regression assumptions were tested yielding mixed results with several causes for concern. Review of scatterplots for Cook’s distance and the DFBETA for the independent variable suggested several influential points. The influential points were not removed both because of the relatively small sample size, but also because the regression was conducted primarily as an exercise to further validate the observation of little or no linear relationship evidenced in the scatterplot.

The small value of the correlation coefficient ($R = .058$) indicated a weak relationship between the independent and dependent variables. The proportion of variance explained by the model, or the effect size ($R^2 = .003$) was very small, indicating that three tenths of a percent of the variation in the state retention rate is accounted for by
its linear relationship with the CCSSE Retention Index. Furthermore, Adjusted $R^2$ as a negative value (-.035) indicated that the model fits the data very poorly. The Regression sum of squares was small (4.012) compared to the Residual sum of squares (1170.979) and total sum of squares (1174.991). The Residual sum of squares reflects the regression error (Garson, 2006). In addition to $R^2$ which is the coefficient of determination, the large Residual sum of squares value (1170.979), and large regression error it reflects, as well as the relatively small value of the Regression sum of squares (4.012) indicate that the model does not explain much of the variability in the dependent variable (Pedhazur, 1997).

The regression equation for predicting the state retention rate as a result of the CCSSE Retention Index is: $\text{State Retention Rate} = (56.256) + (.142) \times (\text{CCSSE Retention Index})$. The model predicts that a one unit change in the CCSSE Retention Index results in an increase of .142 in the state retention rate. The regression model is not statistically significant ($p = .768$). Based on institution level data, the CCSSE Retention Index does not appear to be a good predictor of the Florida retention rate from the state accountability measure for Retention and Success, $F (1, 28) = .089, p = .768$.

Ancillary Analysis

Scatterplots were run to determine if there was evidence of a linear relationship between each of the three benchmarks that comprise the CCSSE Retention Index and the retention rate from the Florida accountability measure of Retention and Success. This was done both because of curiosity and upon recommendation by CCSSE in their review of the author’s proposal for this study. “The more you aggregate the data for analysis the
less powerful your analyses are likely to be. For that reason, you may wish to consider at a minimum looking at retention relationships with the benchmarks one at a time, rather than (or in addition to) the combined benchmarks in the ‘retention index’” (K. McClenney, personal communication, January 20, 2006).

Initial review of the scatterplots, including lines of best fit, showed little if any linear relationship. The slopes of the lines of best fit were almost non-existent and seemed comparable to that noted in the scatterplot of the CCSSE Retention Index and the Florida retention rate. With little to no evidence of linear relationships between the three individual benchmarks that comprise the CCSSE Retention Index and the institutional retention rate, as well as the intent of this study to examine not only the Florida accountability measure that calculates institutional retention rates, but the CCSSE Retention Index per se, no additional regression models were generated to further verify this observation.

**Research Question 2**

Research Question 2 was stated as: Can the 2004 CCSSE Retention Index be used to predict an institution’s state retention rate as measured by the Florida Retention and Success accountability measure when controlling for the retention rate of different degree types awarded (Associate of Arts, Associate of Science and Associate of Applied Science, and Postsecondary Vocational Certificate and Applied Technology Diplomas)?

Data for the second research question were collected in the same manner as that explained above for data collection for the first research question. There were four independent variables that consisted of the retention rates of Associate of Arts students
(RRAAPCT), Associate of Science and Associate of Applied Science (RRASPCT), and Post Secondary Vocational Certificate and Advanced Technical Diploma seeking students (RRATDPCT) as well as the CCSSE Retention Index of the 28 Florida community colleges (RINDEX). Although each institution’s retention rates were calculated based on the number of degrees and certificates awarded by each school, the total number of awards granted in the state were as follows: A.A. degrees ($n = 13,484$), A.S. and A.A.S. degrees ($n = 2653$) and A.T.D. certificates ($n = 792$). The dependent variable was the overall institutional retention rate which includes all college credit award types as calculated for the Florida accountability measure (RRALLPCT). Descriptive statistics generated in SPSS yielded measures of variability and central tendency as reported in Table 3.

There were 28 valid scores for each variable. Measures of central tendency and variability of the CCSSE Retention Index and the dependent variable were reported above under Research Question One. The mean (82.7571) and median (87.500) of the institutional retention rates of A.T.D. seeking students were greater than those of either A.A. seeking students which had a mean of (62.9171) and a median of (64.1250) or A.S. and A.A.S. seeking students (60.9407) and a median of (62.0700). The institutional retention rates of A.T.D. seeking students also had the greatest variance of all the variables (448.398) and the largest standard deviation (21.17541) with a minimum value of (0.00) and a maximum value of (100.00).
Table 3: Comparison of Independent and Dependent Variables, Research Question 2

<table>
<thead>
<tr>
<th></th>
<th>Retention Index</th>
<th>Retention Rate from FL Accountability Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AA Degree</td>
<td>AS Degree</td>
</tr>
<tr>
<td>Mean</td>
<td>49.7143</td>
<td>62.9171</td>
</tr>
<tr>
<td>Median</td>
<td>49.3000</td>
<td>64.1250</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.71002</td>
<td>7.31631</td>
</tr>
<tr>
<td>Variance</td>
<td>7.344</td>
<td>53.528</td>
</tr>
<tr>
<td>Range</td>
<td>11.30</td>
<td>32.34</td>
</tr>
<tr>
<td>Minimum</td>
<td>46.10</td>
<td>48.98</td>
</tr>
<tr>
<td>Maximum</td>
<td>57.40</td>
<td>81.32</td>
</tr>
</tbody>
</table>

*Note.* Independent variables were the CCSSE Retention Index, the Retention Rates for AA Degrees, AS Degrees, and Applied Technical Diplomas. The dependent variable was the Retention rate for all awards from the Florida Accountability Measure.

\( n = 28 \)
A multiple linear regression analysis was conducted to determine if the overall Florida retention rate of community colleges from the state accountability measure can be predicted by the CCSSE Retention Index as well as the retention rates of Associate of Arts, Associate of Science and Associate of Applied Science, and Post Secondary Vocational Certificate and Advanced Technical Diploma seeking students. The null hypothesis was that the regression coefficients or the slopes of the predictor variables were equal to zero.

Initial review of Cook’s distance, centered leverage values, and scatterplots suggested that there may be leverage points. An observed Cook’s Distance value of 1.009 is troublesome; a Centered Leverage Value of .663 also causes concern. A scatterplot of studentized residuals suggests an outlier in the retention rate of Post Secondary Vocational Certificate and Advanced Technical Diploma seeking students. A scatterplot of Standardized DFBeta for this same variable revealed a data point that fell beyond an absolute value of two, which further supports the possibility of a leverage point.

Regression assumptions were tested and met but with reservations. Scatterplots for the dependent to independent variables indicated that at least two of the independent variables – the retention rate for AA degree seeking students, and the retention rate of AS and AAS degree seeking students - were linearly related, which causes concerns, among them, redundancy (StatSoft, 2006). The relationship appeared weak at best for the other two independent variables. Scatterplots of studentized residuals to unstandardized predicted values and to each independent variable indicated that the assumption of
linearity was met as the data points were primarily, although not completely, located within a band of an absolute value of two.

Unstandardized residuals were reviewed for normality. Skewness (.219) and kurtosis (-.170) statistics indicated that the assumption of normality was met, as did the Shapiro Wilks tests ($W = .978$, $df = 28$, $p = .800$). The Q-Q plot indicated normality, while the histogram and stem and leaf plots indicated some non-normality which could be due to the relatively small sample size of 28. The boxplot of both unstandardized and studentized residuals revealed no outliers.

The assumption of independence was supported by scatterplots of studentized residuals to unstandardized predicted values and by scatterplots of studentized residuals to each of the independent variables with one exception. Residuals in the scatterplot of the retention rate for PSVC and ATD students displayed all but one of the data points clustered above values of 55. Such a pattern suggests that the assumption of independence may have been violated with this particular variable, although the pattern may also be due to the small sample size.

A scatterplot of studentized residuals to unstandardized predicted values appeared to support the assumption of homogeneity as there was no clear pattern to the data points despite some clustering. This suggests that the variance of one group, the dependent variable, is not different from the independent variables (Lomax, 2001).

Scatterplots of independent variables did not suggest that multicollinearity was a problem, nor did Tolerance values which were all greater than .10 (.915, .827, .871, .825). Variance inflation factor, as shown in Table 4, also did not cause concern as all
values were well under 10, ranging from 1.092 to 1.213. However, multiple eigenvalues that were close to zero, ranging from .001 to .043 were problematic as were at least three of the condition indices that were close to 15 (14.521), in excess of 15 (24.532) and in excess of 30 (62.822). Eigenvalues and conditional indices suggest that as many as three of the independent variables are highly intercorrelated and that there is a problem of multicollinearity (see Table 4). Since multicollinearity restricts the usefulness of a model, it has been suggested that one way of dealing with the problem is to remove one or more of the correlated independent variables (Lomax, 2001). This, however, would likely render use of a simple linear regression with the same variables used in the first research question.

Table 4: Collinearity Diagnostics of Independent Variables

<table>
<thead>
<tr>
<th>Factor</th>
<th>Tolerance</th>
<th>VIF</th>
<th>Eigenvalue</th>
<th>Condition Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td>4.925</td>
<td>1.000</td>
</tr>
<tr>
<td>Retention Index</td>
<td>.916</td>
<td>1.092</td>
<td>.043</td>
<td>10.757</td>
</tr>
<tr>
<td>AA Retention Rate</td>
<td>.827</td>
<td>1.210</td>
<td>.023</td>
<td>14.521</td>
</tr>
<tr>
<td>AS Retention Rate</td>
<td>.871</td>
<td>1.149</td>
<td>.008</td>
<td>24.532</td>
</tr>
<tr>
<td>ATD Retention Rate</td>
<td>.825</td>
<td>1.213</td>
<td>.001</td>
<td>62.822</td>
</tr>
</tbody>
</table>

*Note.* Independent variables were the CCSSE Retention Index, the Retention Rates for AA Degrees, AS Degrees, and Applied Technical Diplomas.  
*n* = 28
A large value of the multiple correlation coefficient ($R = .986$) indicated a strong relationship between the independent and dependent variables. The coefficient of multiple determination, or effect size ($R^2 = .973$) indicated that 97% of the variation in the dependent variable (RRALLPCT) is explained by the independent variables (Green & Salkind, 2005; Keppel & Zedeck, 1989). Since the coefficient of multiple determination shows greater bias with a small sample size ($n = 28$) and a large number of predictors ($m = 4$), it is important to note an Adjusted $R^2$ value (.968) which compensates for a typical overestimation of the population effect size (Green & Salkind, 2005).

The relatively large Regression Sum of Squares (1143.339) as compared to the Total Sum of Squares (1174.991) indicated that the model explained much of the variability. The model is statistically significant ($p = .000$). Collectively, the independent variables appear to be a good predictor of the institutions’ state retention rates from the Florida’s state accountability measure for Retention and Success $F (4, 28) = 207.704$.

Partial correlation coefficients of the independent variables with the dependent variable (RRALLPCT) were as follows: CCSSE Retention Index (.041), retention rate for A.A. degrees (.979), retention rate for A.S. and A.A.S. degrees (.795) and retention rate for Applied Technical Diplomas (.362) (Table 5).
Table 5: Correlation Coefficients: Relationship of Independent Variables to Dependent Variable

<table>
<thead>
<tr>
<th>Factor</th>
<th>Zero-Order</th>
<th>Partial</th>
<th>Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention Index</td>
<td>.058</td>
<td>.041</td>
<td>.007</td>
</tr>
<tr>
<td>AA Retention Rate</td>
<td>.957</td>
<td>.979</td>
<td>.792</td>
</tr>
<tr>
<td>AS Retention Rate</td>
<td>.477</td>
<td>.795</td>
<td>.215</td>
</tr>
<tr>
<td>ATD Retention Rate</td>
<td>.430</td>
<td>.362</td>
<td>.064</td>
</tr>
</tbody>
</table>

*Note.* Independent variables were the CCSSE Retention Index, the Retention Rates for AA Degrees, AS Degrees, and Applied Technical Diplomas. 

\[ n = 28 \]

By squaring the partial correlation coefficients, the model indicates that less than 1 percent (.17%) of the variance in the dependent variable that is not explained by the other independent variables is explained by the CCSSE Retention Index. Likewise, the percent of variance in the dependent variable explained by the remaining independent variables is as follows: retention rate of A.A. degree awards (96%); retention rate of A.S. and A.A.S degree awards (63%) and retention rate of A.T.D. awards (13%). Beta coefficients also indicated that two of the independent variables contribute the most to the model. A strong correlation, however, does not infer causality; it only establishes that two variables are related in some way (Lomax, 2001)

The retention rates for both A.A. degrees and A.S./A.A.S. degrees thus appear to be much more influential in the model. This may be explained, at least in part, by the greater number of these types of awards as compared to the number of A.T.D. awards
granted. Again, although each institution’s retention rates are calculated by DOE based on the number of degrees and certificates awarded by each institution, data available indicate that, the number of awards granted in the state were as follows: A.A. degrees \( n = 13484 \), A.S. and A.A.S. degrees \( n = 2653 \) and A.T.D. certificates \( n = 792 \). The high proportion of A.A. degrees that comprise the overall institutional retention rate, as compared to the number of A.S./A.A.S. and A.T.D. awards, may be cause for concern insofar as it acts as a common element in the correlation ratios, thus lending itself to a potential for bias or spurious correlation (Dunlap, Dietz & Cortina, 1997). There has been much debate about the prudence of correlating ratio variables that share components (Dunlap, Dietz & Cortina, 1997; Kritzer, 1990), although studies have demonstrated that these are valid forms of analysis that do not distort or bias the relationship between ratio variables with common elements (Kasarda and Nolan (1979) as noted in Macmillan and Daft, 1980; Macmillan and Daft, 1980).

**Research Question 3**

Research Question 3 was stated as: What, if any, mean differences are there in the 2004 CCSSE Retention Index scores of males and females from different racial or ethnic groups across the Florida community colleges when accounting for the potential influence of institution attended? Data were collected through secondary data sources as described at the beginning of this chapter, as well as in Chapter Three. There were 20,581 students in the dataset, some of which had missing data. There were 618 cases with one or more missing values; some students had multiple missing values.
Frequencies and cross-tabs indicated an unbalanced design, which is not unusual with large datasets (Payne, 2003). The independent variable for race (RERACE) had seven levels: American Indian or other Native American; Asian, Asian-American or Pacific Islander; Native Hawaiian; Black, or African American, Non-Hispanic; White, Non-Hispanic; Hispanic, Latino, Spanish; and Other. The independent variable for gender (SEX) had two levels: Male and Female. The smallest cell size from a crosstab of race and sex, was of Native Hawaiian females which contained 17 cases, while the largest cell size from the crosstab, which was for White females, contained 7874 cases. There are differing opinions and recommendations for dealing with unbalanced designs (Karpinski, 2004). Although statistical packages such as SPSS can accommodate unbalanced designs, especially when using Type III Sum of Squares (Green & Salkind, 2005; Lomax, 2001) there remain concerns about the reasons for the imbalance which compromises the ability to accurately interpret results (Keppel & Wickens, 2004).

Therefore, only the three most represented levels of race in the dataset were considered in the analyses. The unweighted cases consisted of the following: Blacks, or African Americans \( (n = 2574) \); Whites, Non-Hispanics \( (n = 13140) \); and Hispanic, Latinos \( (n = 2483) \). Since this dataset would also generate an unbalanced design, the analysis was run twice: first with the unbalanced dataset, and a second time with a randomly selected group of Whites that more closely approximated the size of the other two groups. This approach responded to differing expert opinions and allowed for comparison of results between the balanced and unbalanced analysis. Unweighted sample sizes for the balanced analysis were: Blacks, or African Americans \( (n = 2574) \); Whites, Non-
Hispanics \( (n = 2498) \); and Hispanic, Latinos \( (n = 2483) \). Results of both analyses are discussed under separate headings below.

Students are nested within the 28 institutions. Therefore, syntax was applied in SPSS to indicate that students, by race and sex (RERACE*SEX) were nested within the institution (ccsse_id). The variable provided by CCSSE to weight cases (iweight) was applied to accommodate for the disproportionate number of full-time students in the sample so that the sample more closely reflected the community college student population which is comprised mostly of part-time students. The dependent variable was student level CCSSE Retention Index (STRINDEX) scores.

**Unbalanced Design**

The dataset was generated by excluding cases other than Whites \( (n = 13,140) \), Blacks \( (n = 2574) \) and Hispanics \( (n = 2483) \) so that it was comprised of 18,197 total cases. The dataset consisted of 14 percent Black, 72 percent White and 14 percent Hispanic students. There were 23 missing cases of sex. A large number of outliers were depicted in boxplots of the data examined prior to running the analysis as well as in the boxplot of residuals that were reviewed after running the analyses. Keppel and Wickens (2004) recommend particular consideration of outliers that extend three or more standard deviations from the mean. More than thirty outliers were found upon examination of standardized residuals of three or greater. Outliers were not removed for three primary reasons: 1) most datasets, especially large ones, contain some extreme or “overdispersed” scores which “are a valid part of the distribution and should be included
in the analysis” (Keppel & Wickens, p. 146, 2004); 2) results from both a balanced and unbalanced analysis of the data are presented; and 3) similar results were found from an exploratory analysis run on the balanced dataset after removing 117 outliers from the initial boxplot and 2 outliers identified by the boxplot of residuals. The 119 outliers removed in the exploratory analysis represent approximately one and a half percent of the sample size of the balanced design.

A two factor fixed-effects nested ANOVA was conducted: 1) to determine mean differences in the CCSSE Retention Index scores of students based on race; 2) to determine mean differences in the CCSSE Retention Index scores of students based on sex; 3) to determine mean differences in the CCSSE Retention Index scores of students based on the interaction of race and sex; and 4) to determine mean differences in the CCSSE Retention Index scores of students between institutions who are from the same race and gender group. Students were nested within institution. This necessitated a nested or hierarchical ANOVA since this is not a crossed design in which students’ scores could be considered as if they had attended each of the 28 institutions. Institutions were thus included as a nested factor with 28 levels (28 different community colleges in Florida). Since these institutions were the only ones available, the institution variable (ccsse_id) was included as a fixed, rather than random, effect.

The following null hypotheses were tested at an alpha of .05:

\[ H_{0i} \]: The mean CCSSE Retention Index scores for each level of race (RERACE) are equal
\( H_{0i} \): The mean CCSSE Retention Index scores for each level of sex (SEX) are equal

\( H_{0i} \): The mean CCSSE Retention Index scores for each level of race and sex together, or interacting (RERACE*SEX) are equal

\( H_{0i} \): The mean CCSSE Retention Index scores of students of the same racial and gender groups between institutions are equal.

The assumptions of normality and homogeneity of variance were reviewed. Values of skewness (.531) and kurtosis (.359) supported the assumption of normality as did the general appearance of a histogram, stem and leaf plot, and Q-Q plots of residuals. Despite the value of the Kolmogorov-Smirnov (\( p = .000 \)) which did not support this assumption, the balance of the data testing normality implies that the assumption of normality is reasonable. Levene’s Test results with \( F(167, 17983) = 1.090, \) and \( (p = .203) \) support the assumption of homogeneity of variance. These results are comparable to results of tests of the assumptions with the balanced dataset.

Results of the nested ANOVA indicated statistically significant mean differences in students’ CCSSE Retention Index scores when considering three factors: race \( F(2, 17,983) = 60.926; \ p = .000 \), sex \( F(1,17,983)= 6.407; \ p = .011 \) and race and sex nested within institution \( F(168, 17,983) = 2.788; \ p = 0.000 \). A statistically significant \( F \) test was not found for the interaction of race and sex \( F(2, 17,983) = 1.185; \ p = .306 \). There were statistically significant differences found in the CCSSE Retention Index scores of students of different races, of students of different genders, and of students of different races and gender when nested within different institutions. These results imply, having
tested at a significance level of .05, that there is about a 95 percent chance that differences in students’ CCSSE Retention Index scores were likely due to real differences as opposed to mere chance.

Calculation of eta squared, however, which is based on the sum of squares of the factor divided by total sum of squares, indicated that very little of the variation in CCSSE Retention Index scores was accounted for by the factors considered. Although partial eta squared is automatically generated by SPSS, eta squared was calculated and reported due to its additive nature (Levin & Hullet, 2002). (see Table 6). Values of eta squared indicate that although the factors were found to be statistically significant, the effect size, or proportion of the variance in the mean CCSSE Retention Index scores accounted for by each factor or the nested factor were all less than one percent.

Table 6: Results of Unbalanced Nested ANOVA

<table>
<thead>
<tr>
<th>Factor</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td>2 / 17983</td>
<td>60.926</td>
<td>.000*</td>
<td>.0009</td>
</tr>
<tr>
<td>Sex</td>
<td>1 / 17983</td>
<td>6.407</td>
<td>.011*</td>
<td>.00005</td>
</tr>
<tr>
<td>Race and Sex</td>
<td>2 / 17983</td>
<td>1.185</td>
<td>.306</td>
<td>.00002</td>
</tr>
<tr>
<td>Students by Race and Sex</td>
<td>162 /17983</td>
<td>2.788</td>
<td>.000*</td>
<td>.0032</td>
</tr>
</tbody>
</table>

* p < .05

n = 18,197
The observed power was low for testing race and sex (.261) indicating there may not have been sufficient power in the test to detect a difference in means based on the interaction of these factors if there really was a difference. There was sufficient power to test the differences in the dependent variable, or the means of students CCSSE Retention Index scores, based on race (1.000) and institution nested within race and sex (1.000), and sufficient or nearly sufficient power to test the variable of sex (.716).

Review of descriptive statistics and estimated marginal means shed some light on findings from the omnibus $F$ test. Race was found to be a statistically significant factor in mean differences found in students’ CCSSE Retention Index scores, with Blacks having the highest mean (54.061) and Whites having the lowest mean (48.315). (see Table 7). Multiple comparisons using Tukey HSD indicated that there were statistically significant differences in students’ CCSSE Retention Index scores between all groups for all group comparisons. The greatest mean difference in students’ CCSSE Retention Index scores was between Blacks and Whites (5.9443) and the least mean difference was between Whites and Hispanics (-1.9818), with a mean difference of (3.9625) between Blacks and Hispanics.

The $F$ test indicated there were statistically significant ($p = .011$) differences in scores based on sex; descriptive statistics showed mean scores of males (50.434) and females (51.894) which are depicted in Table 7. No statistical significance was found in the mean differences of CCSSE Retention Index scores of students across all institutions based on both race and sex. (see Table 7).
Descriptive statistics showed differences in mean scores of students from the same racial and gender groups between institutions and ranged from a low score of 38.157 to a high score of 70.071. (see Table 7).
Table 7: Differences in CCSSE Retention Index Scores, Unbalanced Nested ANOVA

<table>
<thead>
<tr>
<th>Factor</th>
<th>M</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacks</td>
<td>54.061*</td>
<td>.506</td>
</tr>
<tr>
<td>Whites</td>
<td>48.315*</td>
<td>.190</td>
</tr>
<tr>
<td>Hispanics</td>
<td>51.116*</td>
<td>.675</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>50.435*</td>
<td>.477</td>
</tr>
<tr>
<td>Females</td>
<td>51.894*</td>
<td>.323</td>
</tr>
<tr>
<td>Blacks Males</td>
<td>53.450</td>
<td>.849</td>
</tr>
<tr>
<td>Females Males</td>
<td>54.671</td>
<td>.552</td>
</tr>
<tr>
<td>Whites Males</td>
<td>47.112</td>
<td>.299</td>
</tr>
<tr>
<td>Females Males</td>
<td>49.518</td>
<td>.235</td>
</tr>
<tr>
<td>Hispanics Males</td>
<td>50.741</td>
<td>1.114</td>
</tr>
<tr>
<td>Females Males</td>
<td>51.492</td>
<td>.762</td>
</tr>
<tr>
<td>Blacks Males Nested</td>
<td>65.461*</td>
<td>4.791</td>
</tr>
<tr>
<td>Males Nested</td>
<td>44.995*</td>
<td>6.177</td>
</tr>
<tr>
<td>Females Nested</td>
<td>68.137*</td>
<td>3.320</td>
</tr>
<tr>
<td>Females Nested</td>
<td>44.582*</td>
<td>4.956</td>
</tr>
<tr>
<td>Whites Males Nested</td>
<td>55.055*</td>
<td>2.297</td>
</tr>
<tr>
<td>Males Nested</td>
<td>43.218*</td>
<td>1.806</td>
</tr>
<tr>
<td>Females Nested</td>
<td>56.404*</td>
<td>1.601</td>
</tr>
<tr>
<td>Females Nested</td>
<td>44.515*</td>
<td>1.072</td>
</tr>
<tr>
<td>Hispanics Males Nested</td>
<td>70.071*</td>
<td>14.407</td>
</tr>
<tr>
<td>Males Nested</td>
<td>38.157*</td>
<td>3.678</td>
</tr>
<tr>
<td>Females Nested</td>
<td>62.995*</td>
<td>10.955</td>
</tr>
<tr>
<td>Females Nested</td>
<td>42.686*</td>
<td>3.384</td>
</tr>
</tbody>
</table>

Note. As per reported nested results, mean scores of students from all 28 institutions are not depicted. Only the highest and lowest mean scores of students nested within the institutions are presented.

\[ n = 18,197 \]

*p < .05
The results infer that there is a difference in students’ CCSSE Retention Index scores, on average, based on race (RERACE) and based on sex (SEX). The results also suggest that there is a difference in students’ CCSSE Retention Index scores (STRINDEX), on average, between institutions (ccsse_id) when examining the scores of students from the same race and gender groups. Furthermore, the results suggest that there are no statistically significant differences in students’ CCSSE Retention Index scores, on average, based on the interaction of race and sex (RERACE*SEX) across institutions.

**Balanced Design**

There was a total of 18,197 cases in the dataset comprised of Blacks \((n = 2574)\), Whites \((n = 13,140)\), and Hispanics \((n = 2483)\). An approximately balanced dataset was generated by choosing commands in SPSS to randomly select 19 percent of the 13,140 cases of Whites, yielding 2498 cases which is the approximate sample size of the other races represented in the analysis. These 2498 cases of Whites were merged with all the cases of Blacks and Hispanics to generate a dataset comprised of 7555 cases. The sample consisted of 34 percent Black, 33 percent White and 33 percent Hispanic students. Sample sizes are unweighted. There were 22 cases in the dataset that were missing some data. Boxplots depicted a large number of outliers. Although more than 100 were identified through a successive series of boxplots, these outliers comprised approximately one percent of the sample. They were not removed prior to running the analysis. Boxplots of standardized residuals also showed a large number of outliers. Thirty-four
outliers - less than one half of one percent of the sample - with a standard deviation of three or greater were counted in the standardized residuals. The outliers were not removed for three primary reasons: 1) most data sets, especially large ones, contain some extreme scores, or are “overdispersed” which “are a valid part of the distribution and should be included in the analysis” (Keppel & Wickens, p. 146, 2004); 2) results from both a balanced and unbalanced analysis of the data are provided; and 3) similar results were found from an exploratory analysis run on only the balanced dataset after removing 117 outliers from the boxplots reviewed prior to running the analysis and 2 outliers identified by the boxplot of residuals. The 119 outliers removed in the exploratory analysis comprised 1.6 percent of the total sample of 7555.

A two factor fixed-effects nested ANOVA was conducted: 1) to determine mean differences in the CCSSE Retention Index scores of students based on race; 2) to determine mean differences in the CCSSE Retention Index scores of students based on sex; 3) to determine mean differences in the CCSSE Retention Index scores of students based on the interaction of race and sex; and 4) to determine mean differences in the CCSSE Retention Index scores of students between institutions who are from the same race and gender group. Students were nested within institution. This necessitated a nested or hierarchical ANOVA since this is not a crossed design in which students’ scores could be considered as if they had attended each of the 28 institutions. Institutions were thus included as a nested factor with 28 levels (28 different community colleges in Florida). Since these institutions were the only ones available, the institution variable (ccsse_id) was included as a fixed, rather than random, effect.
The following null hypotheses were tested at an alpha of .05:

\( H_{01} \): The mean CCSSE Retention Index scores for each level of race (RERACE) are equal

\( H_{02} \): The mean CCSSE Retention Index scores for each level of sex (SEX) are equal

\( H_{03} \): The mean CCSSE Retention Index scores for each level of race and sex together, or interacting (RERACE*SEX) are equal

\( H_{04} \): The mean CCSSE Retention Index scores of students of the same racial and gender groups between institutions are equal.

The assumptions of normality and homogeneity of variance were reviewed. Values of skewness (.462) and kurtosis (.234) supported the assumption of normality as did the appearance of a histogram, stem and leaf plot, and Q-Q plots of residuals. However, Kolmogorov-Smirnov \((p = .000)\) did not support this assumption. Violations of normality are not of great concern since ANOVA can withstand moderate violations and they are minimal with balanced or nearly balanced designs (Lomax, 2001). Therefore, the assumption of normality seems reasonable. Levene’s Test results with \(F(167, 7365) = 1.031\), and \((p = .377)\) supports the assumption of homogeneity of variance. These results are comparable to results of tests of the assumptions with the unbalanced dataset.

Results of the ANOVA indicated a statistically significant effect on the dependent variable of students’ CCSSE Retention Index scores from three factors: race \(F(2, 7365) = 31.274; p = .000\), sex \(F(1, 7365) = 5.071; p = .024\) and race and sex nested within
institution $F (162, 7365)= 1.792; p = 000)$. A statistically significant $F$ test was not found for the interaction of race and sex $F = (2, 7365) = .756; p = .469$ on the dependent variable. That is, statistically significant differences in students’ CCSSE Retention Index scores could be accounted for by the factor of race, the factor of sex, and the interaction of the factors for race and sex nested within the institution. These results imply, having tested at a significance level of .05, that there is about a 95 percent chance that differences detected in students’ CCSSE Retention Index scores were likely due to real differences as opposed to mere chance.

Calculation of eta squared, however, which is based on the sum of squares of the factor divided by total sum of squares, indicated that very little of the variation in CCSSE Retention Index scores was accounted for by the factors considered. Although partial eta squared is automatically generated by SPSS, eta squared was calculated and reported due to its additive nature (Levin & Hullett, 2002). (see Table 8). Values of eta squared indicate that although the factors were found to be statistically significant, the effect size, or proportion of the variance in the mean CCSSE Retention Index scores accounted for by each factor or the nested factor were all less than one percent.
Table 8: Results of Balanced Nested ANOVA

<table>
<thead>
<tr>
<th>Factor</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td>2/7365</td>
<td>31.274</td>
<td>.000*</td>
<td>.0011</td>
</tr>
<tr>
<td>Sex</td>
<td>1/7365</td>
<td>5.071</td>
<td>.024*</td>
<td>.0001</td>
</tr>
<tr>
<td>Race and Sex</td>
<td>2/7365</td>
<td>.758</td>
<td>.469</td>
<td>.00003</td>
</tr>
<tr>
<td>Students by Race and Sex</td>
<td>162/7365</td>
<td>1.792</td>
<td>.000*</td>
<td>.0049</td>
</tr>
<tr>
<td>Nested within Institution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$n = 7555$

*p < .05

The observed power was low for testing the interaction of race and sex (.179) indicating there may not have been sufficient power in the test to detect a difference in the dependent variable, or the students’ CCSSE Retention Index scores, based on these factors if there really was a difference. There was sufficient power to test the differences in the means of the dependent variable based on race (1.000) and institution nested within race and sex (1.000), and sufficient, or nearly sufficient power to test the variable of sex (.615).

Review of descriptive statistics and estimated marginal means shed light on findings from the omnibus $F$ test. Race was found to be a statistically significant factor in mean differences found in students’ CCSSE Retention Index scores, with Blacks having the highest mean (54.096) and Whites having the lowest mean (48.570). (see Table 9). Multiple comparisons using Tukey HSD indicated that there were statistically significant differences in students’ CCSSE Retention Index scores between all groups.
with \( p = .000 \) for comparisons between Blacks and Whites, and Blacks and Hispanics and with \( p = .006 \) for comparisons between Whites and Hispanics. The greatest mean difference in students’ CCSSE Retention Index scores was between Blacks and Whites (5.7156) and the least mean difference was between Whites and Hispanics (-1.7039), with a mean difference of (4.0117) between Blacks and Hispanics.

As depicted in Table 9, descriptive statistics showed mean scores of males (50.524) and females (51.997); the \( F \) test indicated there were statistically significant \( p = .024 \) differences in scores based on sex (see Table 8 and 9). Descriptive statistics also shed light on a lack of statistical significance found in the CCSSE Retention Index scores of students across all institutions based on the interaction of race and sex. (see Table 9).

Descriptive statistics showed differences in mean scores of students from the same racial and gender groups between institutions ranged from a low score of 38.157 to a high score of 70.071. (see Table 9).
Table 9: Differences in CCSSE Retention Index Scores, Balanced Nested ANOVA

<table>
<thead>
<tr>
<th>Factor</th>
<th>M</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacks</td>
<td>54.096*</td>
<td>.517</td>
</tr>
<tr>
<td>Whites</td>
<td>48.570*</td>
<td>.470</td>
</tr>
<tr>
<td>Hispanics</td>
<td>51.116*</td>
<td>.689</td>
</tr>
</tbody>
</table>

|     | Males      | 50.524*    | .540      |
|     | Females    | 51.997*    | .370      |

|     | Males      | 53.521     | .866      |
|     | Females    | 54.671     | .564      |
| Whites | Males      | 47.311     | .759      |
|     | Females    | 49.830     | .555      |
| Hispanics | Males     | 50.741     | 1.137     |
|     | Females    | 51.492     | .778      |

|     | Males      | 65.461*    | 4.892     |
|     | Females    | 44.995*    | 6.307     |

|     | Males      | 44.582*    | 3.390     |
|     | Females    | 44.852*    | 5.061     |

|     | Males      | 38.920*    | 10.461    |
|     | Females    | 54.236*    | 2.717     |

|     | Males      | 43.498*    | 2.307     |
|     | Females    | 43.498*    | 2.307     |

|     | Males      | 70.071*    | 14.711    |
|     | Females    | 38.157*    | 3.756     |

|     | Males      | 62.995*    | 11.186    |
|     | Females    | 42.686*    | 3.455     |

*Note. As per reported nested results, mean scores of students from all 28 institutions are not depicted. Only the highest and lowest mean scores of students nested within the institutions are presented.

n = 7555

*p < .05
The results infer that there is a difference in students’ CCSSE Retention Index scores, on average, based on race (RERACE) and based on sex (SEX). The results also suggest that there is a difference in students’ CCSSE Retention Index scores (STRINDEX), on average, between institutions (ccsse_id) when examining the scores of students from the same race and gender groups. Furthermore, the results suggest that there are no statistically significant differences in students’ CCSSE Retention Index scores based on the interaction of race and sex (RERACE*SEX) across institutions.

Summary of Findings from Unbalanced and Balanced Designs

Two analyses, one unbalanced, and one balanced, were conducted using a nested or hierarchical ANOVA to determine if there were mean differences in the CCSSE Retention Index scores of students based on race, sex, the interaction of race and sex, and also to determine mean differences in students’ Retention Index scores between institutions when examining the interaction of race and sex of students. Both analyses were conducted to accommodate for the debate about the ability to accurately interpret results of unbalanced designs (Keppel & Wickens, 2005).

The findings of both analyses were similar and for practical purposes, the same. Tests of assumptions of homogeneity of variance and normality yielded the same findings for interpretation purposes, although the values were not exactly the same. The factors of race (RERACE), sex (SEX) and the interaction of race and sex (RERACE*SEX) nested within institution (ccsse_id) were found to be statistically significant in both analyses, with similar or the same effect size, and observed power. Likewise, the interaction of
factors race and sex (RERACE*SEX) were not found to be statistically significant in either analysis, had comparably small effect sizes in both analyses, and comparable values of observed power. The same groups between the balanced and unbalanced designs had the highest means and lowest means for the factors of race and sex. Black males and females, Hispanic males and females and White males with the highest and lowest CCSSE Retention Index scores were nested within the same institutions between designs. White males with the lowest scores were from different institutions between the balanced and unbalanced design, as were White females with highest and lowest scores. Although three of the four hypotheses were found to be statistically significant, values of eta squared for the effect size indicated that the factors analyzed accounted for less than one percent of the variation or mean differences of students’ CCSSE Retention Index scores.
CHAPTER 5
CONCLUSIONS

The following chapter is a discussion and interpretation of the findings from a quantitative examination of both the relationship between the institutional level CCSSE Retention Index and the institutional retention rate from the Florida accountability measure of Retention and Success, as well as examination of mean differences in student level CCSSE Retention Index scores of individuals from different gender and racial/ethnic groups when accounting for the possible influence of the institution in which the students enrolled. The purpose of the study was to validate whether the CCSSE Retention Index, which is comprised of three of the five benchmarks from the CCSSE survey instrument, can be used to predict the Florida community college institutional retention rate as noted in the state accountability measure for Retention and Success. The purpose was also to note if and what mean differences exist in the CCSSE Retention Index scores of students from different gender and racial/ethnic groups while considering the possible influence of institution attended.

The context which explains the relevance of the research questions and what they offer to the body of literature was previously noted in the second chapter. Community colleges, like all sectors of education, have been pressed in recent decades to be more accountable (Alfred, Ewell, Hudgins & McClenny, 1999; Ewell, 1999; Keeling, 2004), more performance oriented to justify their existence, at least as recipients of public money when there are a growing number of competing and compelling demands for
those funds (Burke, 2005). The stakes are high in that education is seen as an avenue, if not a requisite, to opportunity both for individuals aspiring to enter the middle class or beyond or to escape poverty, as well as to the economic health of the nation. The accountability movement has also generated increased assessment and greater emphasis on improvement (Aper & Hinkle, 1991; Banta, Lund, Black & Oblander, 1996). Accountability measures can be useful tools to gauge how institutions are doing in predetermined areas of focus. They can be also be problematic when ill-defined, inconsistently defined or if applied across institutions with differing missions (Ewell, 1999; Klein, 2006).

Student retention as an accountability measure is compelling as it pertains to the lives of individual students, to institutional effectiveness, to the future health of the nation and its inhabitants. Yet problems remain about its application as a measure, in part, because of the varying definitions and measures of retention, the preponderance of research that has emanated from and pertains to baccalaureate degree granting, residential institutions and the relatively nascent research that reflects current enrollment trends (Toolbox Revisited, 2006) – including attendance at multiple institutions, or “swirling” (Hamm, 2004) - is more relevant to community colleges and can be generalized beyond many of the single institutions studied.

Engagement has emerged as a promising construct that provides direction for ways to improve student retention as well as student learning. Even Tinto (1993) who has long held near paradigmatic stature in the retention literature asserted that the primary
goal should be student learning as opposed to retention, but to improve student learning would bear the fruit of improved retention rates.

The CCSSE survey, based on engagement theory, provides an appropriate tool specifically for community colleges to assess its practices. It also provides a practical tool with a theoretical basis, to inform decisions about how to improve student learning, student experiences and student retention (CCSSE, 2006a; Marti, 2004).

In general, analyses for the first and second research questions suggest that institutional CCSSE Retention Index scores are not a good predictor of community college retention rates as measured by the Florida accountability measure for Retention and Success. The Florida accountability measures are, by design, institutional measures. The nature and properties of aggregated data used to calculate institutional CCSSE Retention Index scores and institutional retention rates for the accountability measure may have influenced these findings. The way Florida defines the cohorts used to calculate institutional retention rates may also be a factor that influenced these findings. Mean differences in student level CCSSE Retention Index scores that were found in the analysis of the third research question indicate that there are statistically significant mean differences between the independent variables of race, sex, and the nesting factor of institution and the dependent variable of students’ Retention Index scores. Statistically significant mean differences between the interaction of race and sex and students’ CCSSE Retention Index scores were not found. However, the effect size of each of the statistically significant influences is less than one percent indicating that for practical
purposes, these variables do not explain much of the variation in students’ CCSSE Retention Index scores.

The remainder of this chapter is organized into three subsections. The first is an examination and discussion of the findings of the first and second research questions which examined institution level data. The second section is an examination and discussion of findings from the third research question which examined student level data. The third section includes implications for practice and recommendations for further study.

**Institutional Level Data**

The correlation and simple linear regression conducted to examine the relationship between the CCSSE Retention Index and institutional retention rates measured by the Florida state accountability measure of Retention and Success indicated that there is not a statistically significant relationship. Based upon examination of the 2004 data from the Florida community colleges, an institution’s CCSSE Retention Index score does not appear to be a good predictor of the institution’s retention rate as measured by Florida’s state accountability measure. Ancillary analyses were conducted to determine if there was a linear relationship between any of the three institutional level CCSSE benchmarks that comprise the Retention Index, namely active and collaborative learning, student-faculty interaction, and support for learners, and the institutional retention rate from the Florida accountability measure. None were depicted in scatterplots as having a linear relationship.
The correlation and multiple linear regression conducted to examine the relationship between the CCSSE Retention Index and institutional retention rate measured by the Florida state accountability measure of Retention and Success when controlling for the retention rate of degree types awarded indicated that there is not a statistically significant relationship. That is, even when controlling for the retention rates of different degree types awarded, which comprise the institutional retention rate from the accountability measure, the institutional CCSSE Retention Index does not appear to be a good predictor of the institutional retention rate.

While many factors surrounding these findings may be relevant, three seem particularly worthy of mention. First, as previously established as a limitation to this study, there are only 28 public community colleges in Florida. “It should be noted for inferential tests of correlations that sample size plays a role in determining statistical significance….“ (Lomax, 2001, p. 181). It was noted that the size of this population may not provide sufficient power for testing statistical significance in the analyses for the first and second questions. Statistical power pertains “to the probability of correctly rejecting the null hypothesis” (Keppel & Zedek, 1989, p. 106); it relates to the probability of a Type II error in which there is a failure to reject a false null hypothesis. The loss of statistical power with aggregated data was also noted in CCSSE’s response to this author’s proposed study and request to use the data. CCSSE recommended disaggregating the data, at least to examine the relationship between the individual benchmarks that comprise the Retention Index and their relationship to the state accountability measure of retention. To this end, ancillary analyses were conducted...
which also indicated the lack of a linear relationship. In further discussions with CCSSE after the study was conducted, it was noted that the null effects of the Retention Index may be due not only to a lack of power, “but a lack of sensitivity. In other words, relationships that occur on the student level may not be detectable on the institution level regardless of the statistical power” (Kay McClenny, personal communication, October 6, 2006).

Insofar as institutional level data, which is aggregated, is limited in providing direction for improvement, institutional level data do help to paint a picture. Furthermore, despite their limitations, they are also widely used for various purposes, including accountability which further highlights the caution, concern and debate about how accountability measures are defined, calculated and used. It is also noteworthy that it was the author’s interest in CCSSE’s Retention Index – as an index of retention – that was of particular interest in undertaking this study.

A second factor is the nature of Florida’s Student Data Base. As noted by Florida’s Vice Chancellor responsible for much of its oversight, “One underlying principle to remember is that the SDB was established as a reporting/compliance database not a research database so we have taken something established for one purpose and are using it for another” (P. Windham, personal communication, April 8, 2006). As previously stated, the Florida Student Data Base was established, and institutions are mandated by statute to participate, in order to provide both the State Board of Education and the legislature with information associated with the accountability system (K-20 Education Code, 2005).
A third factor to consider when examining these results is the definition of the retention rate and the cohort used to calculate the Florida accountability measure. The retention rate from the accountability measure consists of the number of students graduated, plus the number enrolled in good standing, plus the number enrolled who are not in good standing as compared to the total cohort. The cohort of students tracked to determine the retention rate includes only first time in college (sic.) students who took an entry level test, and earned at least 18 credit hours if enrolled in an A.A., A.S. or A.A.S. or earned at least 9 credit hours if enrolled in a P.S.V.C. or A.T.D. program. Some have taken issue with the exclusion of students who have not earned the minimum number of credits to be included in the cohort which serves to inflate the retention rates (OPPAGA, 2001). Florida’s definition of its retention rate for accountability purposes has been defended, but points to the broader problem addressed in the literature review of a lack of a common definition and measure of retention across and even within the states.

Institutions might do well to broaden the understanding of the accountability measures at appropriate times within their institutional lives. Information about what they are, how measures are calculated, what they imply and how they are used may well be relevant to more than only upper level administrators and institutional researchers who are likely the ones familiar with them.

**Student Level Data**

The nested or hierarchical ANOVA conducted with student level CCSSE data resulted in rejecting three of the four null hypotheses tested. That is, for three of the four
factors tested, there were statistically significant mean differences in students’ CCSSE Retention Index scores. These were for the factor of race (RERACE), the factor of sex (SEX) and the interaction of race and sex nested within institution (ccsse_id). No statistically significant mean differences were found in students’ CCSSE Retention Index scores when examining the interaction of race and sex.

The nested ANOVA was conducted with both a balanced design with comparable numbers of students in each racial group considered, and with an unbalanced design, in which all student data from the dataset for Blacks, Whites and Hispanics were used. Both analyses produced findings which lead to the same conclusions.

The findings of statistical significance with the factor of race and the factor of sex, as well as the factor of race and sex nested within institution are in keeping with the literature and research base addressed in Chapter 2 insofar as they indicated that some groups are more at risk than others, and that institutional factors may play a part in student retention (Hutto, 2002; Summers, 2003; Bailey, et al, January 2005). It bears repeating that the factor of race often signals differences in socioeconomic status and the opportunities associated with higher SES. Two facets of the statistically significant findings are noteworthy. First, for the factor of race and the factor of sex, the groups most at risk, racial minorities, and the gender of female which is most likely to face external pressures that can derail their educational endeavors (Chacon, Cohen and Strover, 1983 as noted in Tinto, 1987) were the groups with highest levels of engagement as reflected in the Retention Index. Second, while statistical significance was found with three of the four factors tested, the effect size of each of them was negligible.
Large sample sizes alone can yield statistically significant findings since larger samples increase statistical power thereby increasing the chances of a Type I error in which the null hypothesis is incorrectly rejected (Lomax, 2001; Zimmerman, 2004). It is therefore important, particularly with large sample sizes such as that used with the student level data in this study, to look beyond statistical significance to other measures such as effect size when drawing conclusions (Zimmerman, 2004).

The proportion of variance explained by the model, or the effect size was very small. The factor of race (RERACE) had a value of eta squared of (.0009) in the unbalanced design and an eta squared value of (.0011) in the balanced design. This indicates that less than .09 of a percent (unbalanced) and less than .11 of a percent (balanced) of the variation in the students’ CCSSE Retention Index scores can be accounted for by race. Eta squared for the factor of sex (SEX) was (.00005) in the unbalanced design and (.0001) in the balanced design. This indicated that less than .005 of a percent (unbalanced) or less than .01 of a percent (balanced) of the variation in the students’ Retention Index scores could be explained by the factor of sex. Eta squared for the third statistically significant factor, the nesting factor of institution (ccsse_id) was comparably small. With eta squared of .0032 in the unbalanced design and .0049 in the balanced design, this factor accounts for less than three tenths (unbalanced) or less than one half of one percent of the variation in the students’ Retention Index scores. In light of these findings, while there are statistically significant differences in mean Retention Index scores when examining these factors, in practical terms, these factors do not explain much of the variation in students’ CCSSE Retention Index scores within the 2004
dataset from Florida. The effect size of findings in this study raise the question, and the need for heightened awareness, of effect sizes found in the body of research. There is only “a growing recognition of the importance for reporting estimates of effect size” and they have often been misrepresented or not reported at all (Levin & Hullett, 2003, p. 52).

**Implications and Recommendations**

Results of this study lend support to advice of exercising caution when reviewing or distributing quantitative data, especially if only quantitative data is examined, or is examined without explanation of probable influences and context. While current society seems to crave quick, succinct, quantitative snapshots or report cards of institutional performance, such data can be misleading without corresponding explanations of what the data mean and what contributes to the values (Alfred, Ewell, Hudgins, & McClenney, 1999; Ewell & Jones, 1996). While institutional CCSSE Retention Index scores do not appear to be a good predictor of institutional retention rates measured by the Florida accountability measure, the genesis and definitions of these measures are important considerations when examining their values independently and their relationship, or lack of one, when examined together.

Accountability and measures of accountability are compelling and warrant serious consideration by educators and non-educators alike, but the “devil is in the details” (Klein, 2006). As documented in Chapter 2, many accountability measures, including retention rates, have been criticized because the measures are inconsistently defined and the same measures are applied to different types of institutions with different missions.
This study examined retention rates from an accountability measure defined specifically for community colleges in Florida, as well the Retention Index defined by an engagement assessment instrument also specifically designed for community colleges. Yet it seems to remain true that there is difficulty in the details or a need to explain how this community college retention rate is defined, and what it tells us alone or in comparison to the CCSSE Retention Index.

Although the institutional CCSSE Retention Index scores are not a good predictor of retention rates as measured by the Florida accountability measure, it is the CCSSE that provides not only a means to assess, but research-based strategies to benchmark and improve student learning and retention. The retention rate and other measures from the state accountability measures are also important considerations for institutions as they are yardsticks for measuring performance to meet accountability demands. Multiple measures provide greater breadth and depth to understanding an area of focus. Student retention is no different.

The CCSSE survey provides a practical tool to help community colleges assess how well they are engaging their students, while providing a theoretical framework – and a growing body of research – to guide ways to improve student performance. While this study provides evidence that the 2004 CCSSE Retention Index is not a good predictor of an institution’s state retention rate as reflected in Florida’s accountability measure of Retention and Success, this should not be construed as indicating that engagement levels measured by the CCSSE benchmarks – including the Retention Index – are not related to student learning and retention. The correlation and simple linear regression and the
correlation and multiple regression analyses used in the first and second research questions are used only to detect a linear relationship, not every or any kind of relationship. Engagement levels have been shown to be strongly related to student learning, student retention and achievement of student goals, at least among students attending baccalaureate degree granting, residential institutions (Kuh, 2001). Greene (2005) conducted a study of student level CCSSE results – also from 2004 - of Florida community college students and their educational outcomes from the same Student Data Base (SDB) from which the accountability measures are drawn. His purpose was “to establish empirically the existence of the engagement – outcome relationship and then identify and describe some of the more compelling educational practices the data suggested mattered most to enhancing the academic success of African American and Hispanic community college students” (Greene, 2005, p. 256). Greene’s analysis demonstrated that a significant relationship exists between student levels of engagement as assessed by CCSSE and desirable educational outcomes for community college students as measured by the Florida Student Data Base.

Community college educators do well to consider an array of strategies to meaningfully and intentionally engage their multi-tasking, largely at-risk students (Gooden & Matus-Grossman, 2002; McClenny, 2004a) in the moments and activities where college staff – at all levels – and students meet. The classroom is central to this, but support services and the quality of student experiences both inside and outside the classroom – however limited – seem also important. It is advocated in some of the literature that to improve quality and learning, all college personnel need to collaborate
and resources – those in both academic affairs and student affairs – be mobilized and integrated to improve student learning (ACPA & NASPA, 1998; Blimling & Whitt, 1999; Bourassa & Kruger, 2001; Keeling, 2004; Srikanthan & Dalrymple, 2002; Tinto, 1993).

CCSSE reported in its 2005 annual report some of the findings from the national dataset. Highlights included findings that seemed counterintuitive: engagement levels of different groups of high risk students, including minority students, were higher than majority students. This is different than what has been found among students attending baccalaureate degree granting institutions where higher engagement levels are related to higher achievement levels (Astin, 1993; Kuh, 2001). That is, at-risk students, including Blacks, Hispanics and Native Americans were found to report higher levels of engagement in community colleges than White students (CCSSE, 2005; Recruitment and Retention, December 2005a). Results of the third research question support these findings. Blacks (54.061) and Hispanics (51.116) were shown to have higher mean CCSSE Retention Index scores – to be more engaged on average as assessed by the benchmarks of active and collaborative learning, student-faculty interaction and support for learners - than Whites (48.315). CCSSE speculates (2005) that less engaged high risk students may have already dropped out before the survey is administered in the Spring term, and that those high risk students who are surveyed are working harder, partaking in more engaging activities, than their peers. Still, these students overall, based on responses to survey questions, have lower aspirations and based on outcomes data, are achieving less than their peers. CCSSE also noted in its 2005 national report that there were only small differences in the engagement levels of students of color as compared to
White students on three of the five benchmarks, two of which comprise the Retention Index, active and collaborative learning and student-faculty interaction. These small differences may have played a part in the small effect sizes found between groups in the examination of the Retention Index. In light of the small differences between racial groups on two of the benchmark scores that comprise the Retention Index as reported by CCSSE, and the findings of this study which indicated near negligible effect sizes between groups, it raises the question – not of what the CCSSE survey results tell us – but what the Retention Index as an Index can tell us, particularly about approaches to reduce departure rates of minority students, which is a particular concern of CCSSE’s (Manzo, 2003).

Engagement remains a promising construct for improving student learning and retention rates in both baccalaureate degree granting and associate degree granting institutions as noted the second chapter. Yet the general construct of engagement in community colleges, as well as the Retention Index, needs further study for validation, deeper understanding and application.

The CCSSE survey collects a number of demographic variables. CCSSE has already identified the seeming compensatory factor of high risk students as an area for further study. Institutions would do well to further examine their own data across multiple variables, even individual survey questions, to detect differences in engagement levels and thereby unveil strategies that may be more effective with some student groups than others.
There is some debate in the literature about whether to focus retention research on student characteristics (Lederman, 2005; Toolbox Revisited, 2006) or institutional and student characteristics (Bailey, et al., January 2005; Hutto, 2002; Summers, 2003; Tinto, 1987). Analyses using nested ANOVA provides one avenue for examining both student characteristics and institutional influence, albeit in a limited way.

One vein of research that seems related to the construct of engagement is that of organizational culture. Literature and studies have supported at the basic education level that there is a relationship between institutional or organizational culture and student outcomes (Cunningham, 2003; Center for Research and Intervention on Academic Success, 1994; Wagner & Masden-Copas, 2002). Insofar as engagement is related to culture, it may be helpful to explore and discuss research findings, including those of CCSSE, within the context of culture as has been suggested or implied (McClenney and Greene, 2005).

Additional recommendations for future study are to follow the ongoing discussions, studies conducted and evolving understanding of student and institutional factors. There is a need to validate if and how levels of student engagement, as measured by CCSSE’s survey instrument, relate not only to student learning outcomes, but also to student retention. CCSSE provides a rich data source to conduct further studies. Examination of student level data as opposed to institutional level data will likely provide greater opportunity to detect meaningful differences in survey item responses and engagement levels of various sub-groups. Demographic variables collected through the CCSSE survey provide ample research opportunities to examine the connection between
demographic factors such as first generation college student, marital status and age and
their relationship to levels of engagement. Although the CCSSE survey and dataset do
not provide information about respondents’ socioeconomic status, it seems a worthy
study to find data sources that used in tandem with CCSSE data would allow for
exploration of the relationship between socioeconomic status and engagement level of
community college students. While race has been found to be associated with
performance outcomes, it is likely the socioeconomic status of persons of different racial
or ethnic groups that has a greater bearing. Likewise, first generation college student may
be viewed as a proxy for socioeconomic status. The socioeconomic status demographic
was the only one found in a major study to be related to degree completion for students
who attended four year institutions, although not in a substantial manner (Toolbox
Revisited, 2006). Examination of CCSSE benchmarks in light of race, first generation
college student and socioeconomic status stands to shed more light on the topic than mere
examination of the factor of race. Furthermore, it is important to continue examination of
benchmark scores and even individual survey questions, and their relationship to
institutional and student outcomes.

Researchers will need to look at other sources of data collected on student
outcomes such as offices of institutional research or departments of education that have
state data warehouses to examine relationships between engagement levels assessed by
CCSSE and targeted outcomes. Such studies are essential in further validating the
engagement-outcome relationship for community college students, but also to better
understand the nuances of the relationship and its implications for strategies to improve student learning and retention.
March 3, 2006

Marcia A. Roman
900 South Magnolia Avenue
Sanford, FL 32771

Dear Ms. Roman:

The University of Central Florida’s Institutional Review Board (IRB) received your protocol IRB #06-3308 entitled “Retention in Florida Community Colleges: CCSE’s Retention Index and Florida Accountability Measures.” The IRB Chair reviewed the study on 2/23/2006 and did not have any concerns with the proposed project. The Chair has indicated that under federal regulations (Category #1, research conducted in established or community accepted educational settings, involving normal educational practices) this research is exempt from further review by our IRB, so an approval is not applicable and a renewal within one year is not required.

Please accept our best wishes for the success of your endeavors. Should you have any questions, please do not hesitate to call me at 407-823-2901.

Cordially,

[Signature]

Barbara Ward, CIM
UCF IRB Coordinator
(IRB00001138, FWA00000351, Exp. 5/12/07)

Copies: IRB File
Rosemarye Taylor, Ph.D.

12443 Research Parkway • Suite 302 • Orlando, FL 32826-3252 • 407-823-3778 • Fax 407-823-3209
An Equal Opportunity and Affirmative Action Institution
APPENDIX B

COMMUNITY COLLEGE STUDENT REPORT
Used with permission from The Community College Survey of Student Engagement, 2004. The University of Texas at Austin.
6. During the current school year, about how much reading and writing have you done at this college?  

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>1 to 4</th>
<th>5 to 10</th>
<th>11 to 20</th>
<th>More than 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Number of assigned textbooks, manuals, books, or book-length packs of course readings</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. Number of books read on your own (not assigned) for personal enjoyment or academic enrichment</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c. Number of written papers or reports of any length</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

7. Mark the response that best represents the extent to which your examinations during the current school year have challenged you to do your best work at this college.

- Extremely challenging
- Extremely easy

8. Which of the following have you done, are you doing, or do you plan to do while attending this college?

<table>
<thead>
<tr>
<th></th>
<th>I have done</th>
<th>I plan to do</th>
<th>I have not done nor plan to do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Internship, field experience, co-op experience, or clinical assignment</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. English as a second language course</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c. Developmental/remedial reading course</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d. Developmental/remedial writing course</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e. Developmental/remedial math course</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>f. Study skills course</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>g. Honors course</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>h. College orientation program or course</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>i. Organized learning communities (linked courses/study groups led by faculty or counselors)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

9. How much does this college emphasize each of the following?

<table>
<thead>
<tr>
<th></th>
<th>Very much</th>
<th>Quite a bit</th>
<th>Some</th>
<th>Very little</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Encouraging you to spend significant amounts of time studying</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. Providing the support you need to help you succeed at this college</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c. Encouraging contact among students from different economic, social, and racial or ethnic backgrounds</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d. Helping you cope with your non-academic responsibilities (work, family, etc.)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e. Providing the support you need to thrive socially</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>f. Providing the financial support you need to afford your education</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>g. Using computers in academic work</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
10. About how many hours do you spend in a typical 7-day week doing each of the following?  

<table>
<thead>
<tr>
<th>Task</th>
<th>None</th>
<th>1-5</th>
<th>6-10</th>
<th>11-20</th>
<th>21-30</th>
<th>More than 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Preparing for class (studying, reading, writing, rehearsing,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>doing homework, or other activities related to your program)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Working for pay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Participating in college-sponsored activities (organizations,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>campus publications, student government, intercollegiate or</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>intramural sports, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Providing care for dependents living with you (parents, children,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>spouse, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Commuting to and from classes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Mark the number that best represents the quality of your relationships with people at this college.  
Your relationship with:

<table>
<thead>
<tr>
<th>Relationship Type</th>
<th>Friendly, supportive, sense of belonging</th>
<th>Unfriendly, unsupportive, sense of alienation</th>
<th>Available, helpful, sympathetic</th>
<th>Unavailable, unhelpful, unsympathetic</th>
<th>Helpful, considerate, flexible</th>
<th>Unhelpful, inconsiderate, rigid</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Other Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Instructors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Administrative Personnel &amp; Offices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. How much has YOUR EXPERIENCE AT THIS COLLEGE contributed to your knowledge, skills, and personal development in the following areas?  

<table>
<thead>
<tr>
<th>Area</th>
<th>Very much</th>
<th>Quite a bit</th>
<th>Some</th>
<th>Very little</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Acquiring a broad general education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Acquiring job or work-related knowledge and skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Writing clearly and effectively</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Speaking clearly and effectively</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Thinking critically and analytically</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Solving numerical problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Using computing and information technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Working effectively with others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Learning effectively on your own</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. Understanding yourself</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Understanding people of other racial and ethnic backgrounds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l. Developing a personal code of values and ethics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m. Contributing to the welfare of your community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n. Developing clearer career goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o. Gaining information about career opportunities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. This section has three parts. Please answer all three sections, indicating (1) HOW OFTEN you use the following services, (2) HOW SATISFIED you are with the services, and (3) HOW IMPORTANT the services are to you AT THIS COLLEGE.

<table>
<thead>
<tr>
<th>(1) Frequency of Use</th>
<th>(2) Satisfaction</th>
<th>(3) Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
<td>Some-times</td>
<td>Rarely</td>
</tr>
<tr>
<td>a. Academic advising/planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Career counseling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Job placement assistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Peer or other tutoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Skill labs (writing, math, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Child care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Financial aid advising</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Computer lab</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Student organizations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. Transfer credit assistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Services to students with disabilities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. How likely is it that the following issues would cause you to withdraw from class or from this college? (Please respond to each item)

Move and Live

<table>
<thead>
<tr>
<th></th>
<th>Very likely</th>
<th>Likely</th>
<th>Somewhat likely</th>
<th>Not likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Working full-time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Caring for dependents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Academically unprepared</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Lack of finances</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Transfer to a 4-year college or university</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. How supportive are your friends of your attending this college?  
Exremely | Somewhat | Quite a bit | Not very |
-------------|----------|-------------|-----------|

16. How supportive is your immediate family of your attending this college?  
Exremely | Somewhat | Quite a bit | Not very |
-------------|----------|-------------|-----------|

17. Indicate which of the following are your reasons/goals for attending this college. (Please respond to each item)

Move and Live

<table>
<thead>
<tr>
<th>Primary goal</th>
<th>Secondary goal</th>
<th>Not a goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Complete a certificate program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Obtain an associate degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Transfer to a 4-year college or university</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Obtain or update job-related skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Self-improvement/personal enjoyment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Change careers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
18. Indicate which of the following are sources you use to pay your tuition at this college? (Please respond to each item)

- a. My own income/savings
- b. Parent or spouse/significant other's income/savings
- c. Employer contributions
- d. Grants and scholarships
- e. Student loans (bank, etc.)
- f. Public assistance

19. Since high school, which of the following types of schools have you attended other than the one you are now attending? (Please mark all that apply)

- Proprietary (private) school or training program
- Public vocational-technical school
- Another community or technical college
- 4-year college or university
- None

20. When do you plan to take classes at this college again?

- I will accomplish my goal(s) during this term and will not be returning
- I have no current plan to return
- Within the next 12 months
- Uncertain

21. At this college, in what range is your overall college grade average?

- A
- A- to B+
- B
- B- to C+
- C
- C- or lower
- Do not have a GPA at this school
- Pass/fail classes only

22. When do you most frequently take classes at this college? (Mark one only)

- Day classes (morning or afternoon)
- Evening classes
- Weekend classes

23. How many TOTAL credit hours have you earned at this college, not counting the courses you are currently taking this term?

- None
- 1-14 credits
- 15-29 credits
- 30-44 credits
- 45-60 credits
- Over 60 credits
24. At what other types of institutions are you taking classes this term? (Please mark all that apply)
   - None
   - High school
   - Vocational/technical school
   - Another community or technical college
   - 4-year college/university
   - Other

25. How many classes are you presently taking at OTHER institutions?
   - None
   - 1 class
   - 2 classes
   - 3 classes
   - 4 classes or more

26. Would you recommend this college to a friend or family member?
   - Yes
   - No

27. How would you evaluate your entire educational experience at this college?
   - Excellent
   - Good
   - Fair
   - Poor

28. Do you have children who live with you?
   - Yes
   - No

29. Mark your age group.
   - Under 18
   - 18 to 19
   - 20 to 21
   - 22 to 24
   - 25 to 29
   - 30 to 39
   - 40 to 49
   - 50 to 64
   - 65+

30. Your sex:
   - Male
   - Female

31. Are you married?
   - Yes
   - No

32. Is English your native (first) language?
   - Yes
   - No
33. Are you an international student or foreign national?
   ☐ Yes  ☐ No

34. What is your racial identification? (Mark only one)
   ☐ American Indian or other Native American
   ☐ Asian, Asian American or Pacific Islander
   ☐ Native Hawaiian
   ☐ Black or African American, Non-Hispanic
   ☐ White, Non-Hispanic
   ☐ Hispanic, Latino, Spanish
   ☐ Other

35. What is the highest academic credential you have earned?
   ☐ None
   ☐ High school diploma or GED
   ☐ Vocational/technical certificate
   ☐ Associate degree
   ☐ Bachelor’s degree
   ☐ Master’s/doctoral/professional degree

36. What is the highest level of education obtained by your:
   Father  Mother
   a. Not a high school graduate
   b. High school diploma or GED
   c. Some college, did not complete degree
   d. Associate degree
   e. Bachelor’s degree
   f. Master’s degree/1st professional
   g. Doctorate degree
   h. Unknown

37. Using the list provided, please fill in the bubbles that correspond to the code indicating your program or major. Using the first column, indicate the first number in the program code, using the second column, indicate the second number in the program code.
APPENDIX C
SURVEY QUESTIONS OF THE RETENTION INDEX
Active and Collaborative Learning
Survey items: 4a, 4b, 4f, 4g, 4h, 4i, and 4r

Student-Faculty Interaction
Survey items: 4k, 4l, 4m, 4n, 4o, and 4q

Support for Learners
Survey items: 9b, 9c, 9d, 9e, 9f, 13a and 13b
### CCSSE 2004 Codebook

Please note the following for the CCSSE dataset:
- Invalid responses are coded as missing ".".

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
<th>Response Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ENTER</td>
<td>Did you begin college at this college or elsewhere?</td>
<td>1=Started here</td>
</tr>
<tr>
<td>2</td>
<td>ENRLMT</td>
<td>Thinking about this current academic term, how would you characterize your enrollment at this college?</td>
<td>1=Less than full-time</td>
</tr>
<tr>
<td>3</td>
<td>SRVAGAIN</td>
<td>Have you taken this survey in another class this term?</td>
<td>1=Yes</td>
</tr>
</tbody>
</table>

4) In your experiences at this college during the current school year, about how often have you done each of the following?

**NOTE:** All items below have the following response values:

- 1=Never
- 2=Sometimes
- 3=Often
- 4=Very often

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>4a</td>
<td>CLQUEST</td>
<td>Asked questions in class or contributed to class discussions</td>
</tr>
<tr>
<td>4b</td>
<td>CLPRESEN</td>
<td>Made a class presentation</td>
</tr>
<tr>
<td>4c</td>
<td>REWROPAP</td>
<td>Prepared two or more drafts of a paper or assignment before turning it in</td>
</tr>
<tr>
<td>4d</td>
<td>INTEGRAT</td>
<td>Worked on a paper or project that required integrating ideas or information from various sources</td>
</tr>
<tr>
<td>4e</td>
<td>CLUNPREP</td>
<td>Came to class without completing readings or assignments</td>
</tr>
<tr>
<td>4f</td>
<td>CLASSGRP</td>
<td>Worked with other students on projects during class</td>
</tr>
<tr>
<td>4g</td>
<td>OOCGRP</td>
<td>Worked with classmates outside of class to prepare class assignments</td>
</tr>
<tr>
<td>4h</td>
<td>TUTOR</td>
<td>Tutored or taught other students (paid or voluntary)</td>
</tr>
<tr>
<td>4i</td>
<td>COMMPROJ</td>
<td>Participated in a community-based project as part of a regular course</td>
</tr>
<tr>
<td>4j</td>
<td>INTERNET</td>
<td>Used the Internet or instant messaging to work on an assignment</td>
</tr>
<tr>
<td>4k</td>
<td>EMAIL</td>
<td>Used email to communicate with an instructor</td>
</tr>
<tr>
<td>4l</td>
<td>FACGRADE</td>
<td>Discussed grades or assignments with an instructor</td>
</tr>
<tr>
<td>4m</td>
<td>FACPLANS</td>
<td>Discussed ideas from your readings or classes with instructors outside of class</td>
</tr>
<tr>
<td>4n</td>
<td>FACIDEAS</td>
<td>Discussed ideas from your readings or classes with instructors outside of class</td>
</tr>
<tr>
<td>4o</td>
<td>FACFEED</td>
<td>Received prompt feedback (written or oral) from instructors on your performance</td>
</tr>
<tr>
<td>4p</td>
<td>WORKHARD</td>
<td>Worked harder than you thought you could to meet an instructor's standards or expectations</td>
</tr>
</tbody>
</table>

Used with permission from *The Community College Survey of Student Engagement, 2004*. The University of Texas at Austin.
<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>4q</td>
<td>FACOTH</td>
<td>Worked with instructors on activities other than coursework</td>
</tr>
<tr>
<td>4r</td>
<td>OOCIDEAS</td>
<td>Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)</td>
</tr>
<tr>
<td>4s</td>
<td>DIVRSTUD</td>
<td>Had serious conversations with students of a different race or ethnicity other than your own</td>
</tr>
<tr>
<td>4t</td>
<td>DIFFSTUD</td>
<td>Had serious conversations with students who differ from you in terms of their religious beliefs, political opinions, or personal values</td>
</tr>
<tr>
<td>4u</td>
<td>SKIPCLAS</td>
<td>Skipped class</td>
</tr>
</tbody>
</table>

5) During the current school year, how much has your coursework at this college emphasized the following mental activities?  

**NOTE:** All items below have the following response values:

1=Very little  
2=Some  
3=Quite a bit  
4=Very much

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>5a</td>
<td>MEMORIZE</td>
<td>Memorizing facts, ideas, or methods from your courses and readings so you can repeat them in pretty much the same form</td>
</tr>
<tr>
<td>5b</td>
<td>ANALYZE</td>
<td>Analyzing the basic elements of an idea, experience, or theory</td>
</tr>
<tr>
<td>5c</td>
<td>SYNTHESZ</td>
<td>Synthesizing and organizing ideas, information, or experiences in new ways</td>
</tr>
<tr>
<td>5d</td>
<td>EVALUATE</td>
<td>Making judgments about the value or soundness of information, arguments, or methods</td>
</tr>
<tr>
<td>5e</td>
<td>APPLYING</td>
<td>Applying theories or concepts to practical problems or in new situations</td>
</tr>
<tr>
<td>5f</td>
<td>PERFORM</td>
<td>Using information you have read or heard to perform a new skill</td>
</tr>
</tbody>
</table>
6) During the current school year, about how much reading and writing have you done at this college?

NOTE: All items below have the following response values:

1= None
2 = Between 1 and 4
3 = Between 5 and 10
4 = Between 11 and 20
5 = More than 20

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>6a</td>
<td>READASGN</td>
<td>Number of assigned textbooks, manuals, books, or book-length packets of course readings.</td>
</tr>
<tr>
<td>6b</td>
<td>READOWN</td>
<td>Number of books read on your own (not assigned) for personal enjoyment or academic enrichment.</td>
</tr>
<tr>
<td>6c</td>
<td>WRITEANY</td>
<td>Number of written papers or reports of any length.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
<th>Response Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>EXAMS</td>
<td>Mark the box that best represents the extent to which your examinations during the current school year have challenged you to do your best work at this college.</td>
<td>Responses range from 1 to 7, with scale anchors described: (1) Extremely easy (7) Extremely challenging.</td>
</tr>
</tbody>
</table>

8) Which of the following have you done, are you doing, or do you plan to do while attending this college?

NOTE: All items below have the following response values:

1 = I Have Not Done, Nor Plan To Do
2 = I Plan To Do
3 = I Have Done

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>8a</td>
<td>INTERN</td>
<td>Internship, field experience, co-op experience, or clinical assignment.</td>
</tr>
<tr>
<td>8b</td>
<td>ESL</td>
<td>English as a second language course.</td>
</tr>
<tr>
<td>8c</td>
<td>DEVREAD</td>
<td>Developmental/remedial reading course.</td>
</tr>
<tr>
<td>8d</td>
<td>DEVWRITE</td>
<td>Developmental/remedial writing course.</td>
</tr>
<tr>
<td>8e</td>
<td>DEVMATHT</td>
<td>Developmental/remedial math course.</td>
</tr>
<tr>
<td>8f</td>
<td>STUDSKIL</td>
<td>Study skills course.</td>
</tr>
<tr>
<td>8g</td>
<td>HONORS</td>
<td>Honors course.</td>
</tr>
<tr>
<td>8h</td>
<td>ORIENT</td>
<td>College orientation program or course.</td>
</tr>
<tr>
<td>8i</td>
<td>LRNCOMM</td>
<td>Organized learning communities (linked courses/study groups led by faculty or counselors).</td>
</tr>
</tbody>
</table>
9) How much does this college emphasize each of the following?  
**NOTE:** All items below have the following response values:

<table>
<thead>
<tr>
<th>1 = Very little</th>
<th>2 = Some</th>
<th>3 = Quite a bit</th>
<th>4 = Very much</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>9a</td>
<td>ENVSCHOL</td>
<td>Encouraging you to spend significant amounts of time studying</td>
</tr>
<tr>
<td>9b</td>
<td>ENVSUPRT</td>
<td>Providing the support you need to help you succeed at this college</td>
</tr>
<tr>
<td>9c</td>
<td>ENVDIVRS</td>
<td>Encouraging contact among students from different economic, social, and racial or ethnic backgrounds</td>
</tr>
<tr>
<td>9d</td>
<td>ENVNACAD</td>
<td>Helping you cope with your non-academic responsibilities (work, family, etc.)</td>
</tr>
<tr>
<td>9e</td>
<td>ENVSOCAL</td>
<td>Providing the support you need to thrive socially</td>
</tr>
<tr>
<td>9f</td>
<td>FINSUPP</td>
<td>Providing the financial support you need to afford your education</td>
</tr>
<tr>
<td>9g</td>
<td>ENVCOMP</td>
<td>Using computers in academic work</td>
</tr>
</tbody>
</table>

10) About how many hours do you spend in a typical 7-day week doing each of the following?  
**NOTE:** All items below have the following response values:

<table>
<thead>
<tr>
<th>0 = None</th>
<th>1 = 1-5 hours</th>
<th>2 = 6-10 hours</th>
<th>3 = 11-20 hours</th>
<th>4 = 21-30 hours</th>
<th>5 = More than 30 hours</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>10a</td>
<td>ACDPR01</td>
<td>Preparing for class (studying, reading, writing, rehearsing, doing homework, or other activities related to your program)</td>
</tr>
<tr>
<td>10b</td>
<td>PAYWORK</td>
<td>Working for pay</td>
</tr>
<tr>
<td>10c</td>
<td>COCURR01</td>
<td>Participating in college-sponsored activities (organizations, campus publications, student government, intercollegiate or intramural sports, etc.)</td>
</tr>
<tr>
<td>10d</td>
<td>CAREDE01</td>
<td>Providing care for dependents living with you (parents, children, spouse, etc.)</td>
</tr>
<tr>
<td>10e</td>
<td>COMMUTE</td>
<td>Commuting to and from classes</td>
</tr>
</tbody>
</table>
11) Mark the box that best represents the quality of your relationships with people at this college. Your relationship with:

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
<th>Response Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>11a</td>
<td>ENVSTU</td>
<td>Other students</td>
<td>Responses range from 1 to 7, with scale anchors described as: (1) Unfriendly, unsupportive, sense of alienation (7) Friendly, supportive, sense of belonging</td>
</tr>
<tr>
<td>11b</td>
<td>ENVFAC</td>
<td>Instructors</td>
<td>Responses range from 1 to 7, with scale anchors described as: (1) Unavailable, unhelpful, unsympathetic (7) Available, helpful, sympathetic</td>
</tr>
<tr>
<td>11c</td>
<td>ENVADM</td>
<td>Administrative personnel and offices</td>
<td>Responses range from 1 to 7, with scale anchors described as: (1) Unhelpful, inconsiderate, rigid (7) Helpful, considerate, flexible</td>
</tr>
</tbody>
</table>

12) How much has YOUR EXPERIENCE AT THIS COLLEGE contributed to your knowledge, skills, and personal development in the following areas?

**NOTE:** All items below have the following response values:

1=Very little  
2=Some  
3=Quite a bit  
4=Very much

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>12a</td>
<td>GNGENLED</td>
<td>Acquiring a broad general education</td>
</tr>
<tr>
<td>12b</td>
<td>GNGWORK</td>
<td>Acquiring job or work-related knowledge and skills</td>
</tr>
<tr>
<td>12c</td>
<td>GWRITE</td>
<td>Writing clearly and effectively</td>
</tr>
<tr>
<td>12d</td>
<td>GNSPEAK</td>
<td>Speaking clearly and effectively</td>
</tr>
<tr>
<td>12e</td>
<td>GNANALY</td>
<td>Thinking critically and analytically</td>
</tr>
<tr>
<td>12f</td>
<td>GNISOLVE</td>
<td>Solving numerical problems</td>
</tr>
<tr>
<td>12g</td>
<td>GNCMPTS</td>
<td>Using computing and information technology</td>
</tr>
<tr>
<td>12h</td>
<td>GNOTHERS</td>
<td>Working effectively with others</td>
</tr>
<tr>
<td>12i</td>
<td>GNING</td>
<td>Learning effectively on your own</td>
</tr>
<tr>
<td>12j</td>
<td>GNSELF</td>
<td>Understanding yourself</td>
</tr>
<tr>
<td>12k</td>
<td>GNDIVERS</td>
<td>Understanding people of other racial and ethnic backgrounds</td>
</tr>
<tr>
<td>12l</td>
<td>GNETHICS</td>
<td>Developing a personal code of values and ethics</td>
</tr>
<tr>
<td>12m</td>
<td>GNCOMMUN</td>
<td>Contributing to the welfare of your community</td>
</tr>
<tr>
<td>12n</td>
<td>CARGOAL</td>
<td>Developing clearer career goals</td>
</tr>
<tr>
<td>12o</td>
<td>GAINCAR</td>
<td>Gaining information about career opportunities</td>
</tr>
</tbody>
</table>
13a) Indicate how often you use the following services.

**NOTE:** All items below have the following response values:

0=Don't Know/N.A
1=Rarely/never
2=Sometimes
3=Often

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>13a1</td>
<td>USEACAD</td>
<td>Frequency: Academic advising/planning</td>
</tr>
<tr>
<td>13b1</td>
<td>USECACOU</td>
<td>Frequency: Career counseling</td>
</tr>
<tr>
<td>13c1</td>
<td>USEJOBL</td>
<td>Frequency: Job placement assistance</td>
</tr>
<tr>
<td>13d1</td>
<td>USETUTOR</td>
<td>Frequency: Peer or other tutoring</td>
</tr>
<tr>
<td>13e1</td>
<td>USELAB</td>
<td>Frequency: Skill labs (writing, math, etc.)</td>
</tr>
<tr>
<td>13f1</td>
<td>USECHILD</td>
<td>Frequency: Child care</td>
</tr>
<tr>
<td>13g1</td>
<td>USEFAADV</td>
<td>Frequency: Financial aid advising</td>
</tr>
<tr>
<td>13h1</td>
<td>USECOMLB</td>
<td>Frequency: Computer lab</td>
</tr>
<tr>
<td>13i1</td>
<td>USESTORG</td>
<td>Frequency: Student organizations</td>
</tr>
<tr>
<td>13j1</td>
<td>USESTORC</td>
<td>Frequency: Transfer credit assistance</td>
</tr>
<tr>
<td>13k1</td>
<td>USEDISAB</td>
<td>Frequency: Services to students with disabilities</td>
</tr>
</tbody>
</table>

13b) Indicate how satisfied you are with the services at this college.

**NOTE:** All items below have the following response values:

0=N.A.
1=Not at all
2=Somewhat
3=Very

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>13a2</td>
<td>SATACAD</td>
<td>Satisfaction: Academic advising/planning</td>
</tr>
<tr>
<td>13b2</td>
<td>SATCACOU</td>
<td>Satisfaction: Career Counseling</td>
</tr>
<tr>
<td>13c2</td>
<td>SATJOBL</td>
<td>Satisfaction: Job placement assistance</td>
</tr>
<tr>
<td>13d2</td>
<td>SATTUTOR</td>
<td>Satisfaction: Peer or other tutoring</td>
</tr>
<tr>
<td>13e2</td>
<td>SATLAB</td>
<td>Satisfaction: Skill labs (writing, math, etc.)</td>
</tr>
<tr>
<td>13f2</td>
<td>SATCHILD</td>
<td>Satisfaction: Child care</td>
</tr>
<tr>
<td>13g2</td>
<td>SATFAADV</td>
<td>Satisfaction: Financial aid advising</td>
</tr>
<tr>
<td>13h2</td>
<td>SATCOMLB</td>
<td>Satisfaction: Computer lab</td>
</tr>
<tr>
<td>13i2</td>
<td>SATSTORC</td>
<td>Satisfaction: Student organizations</td>
</tr>
<tr>
<td>13j2</td>
<td>SATSTORC</td>
<td>Satisfaction: Transfer credit assistance</td>
</tr>
<tr>
<td>13k2</td>
<td>SATDISAB</td>
<td>Satisfaction: Services to students with disabilities</td>
</tr>
</tbody>
</table>
13c) Indicate how important the services are to you.  
NOTE: All items below have the following response values:

1=Not at all  
2=Somewhat  
3=Very  

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>13a3</td>
<td>IMPACAD</td>
<td>Importance: Academic advising/planning</td>
</tr>
<tr>
<td>13b3</td>
<td>IMPCACC</td>
<td>Importance: Career counseling</td>
</tr>
<tr>
<td>13c3</td>
<td>IMPJOBL</td>
<td>Importance: Job placement assistance</td>
</tr>
<tr>
<td>13d3</td>
<td>IMPTUTOR</td>
<td>Importance: Peer or other tutoring</td>
</tr>
<tr>
<td>13e3</td>
<td>IMFLAB</td>
<td>Importance: Skill labs (writing, math, etc.)</td>
</tr>
<tr>
<td>13f3</td>
<td>IMPCHLD</td>
<td>Importance: Child care</td>
</tr>
<tr>
<td>13g3</td>
<td>IMPFAADV</td>
<td>Importance: Financial aid advising</td>
</tr>
<tr>
<td>13h3</td>
<td>IMPCMLB</td>
<td>Importance: Computer lab</td>
</tr>
<tr>
<td>13i3</td>
<td>IMPSTORG</td>
<td>Importance: Student organizations</td>
</tr>
<tr>
<td>13j3</td>
<td>IMPTRCRD</td>
<td>Importance: Transfer credit assistance</td>
</tr>
<tr>
<td>13k3</td>
<td>IMPDISAB</td>
<td>Importance: Services to students with disabilities</td>
</tr>
</tbody>
</table>

14) How likely is it that the following issues would cause you to withdraw from class or from this college?  
NOTE: All items below have the following response values:  

1=Not Likely  
2=Somewhat Likely  
3=Likely  
4=Very Likely  

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>14a</td>
<td>WRFKFULL</td>
<td>Working full-time</td>
</tr>
<tr>
<td>14b</td>
<td>CAREDEP</td>
<td>Caring for dependents</td>
</tr>
<tr>
<td>14c</td>
<td>ACADUNP</td>
<td>Academically unprepared</td>
</tr>
<tr>
<td>14d</td>
<td>LACKFIN</td>
<td>Lack of finances</td>
</tr>
<tr>
<td>14e</td>
<td>TRANSFER</td>
<td>Transfer to a 4-year college or university</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
<th>Response Value</th>
</tr>
</thead>
</table>
| 15     | FRNDSUPP      | How supportive are your friends of your attending this college? | 1=Not very  
|        |               |                                | 2=Somewhat  
|        |               |                                | 3=Quite a bit  
|        |               |                                | 4=Extremely  |
| 16     | FAMSUPP       | How supportive is your immediate family of your attending this college? | 1=Not very  
|        |               |                                | 2=Somewhat  
|        |               |                                | 3=Quite a bit  
|        |               |                                | 4=Extremely  |
17) Indicate which of the following are your reasons/goals for attending **this college**.

**NOTE:** All items below have the following response values:

1 = Not a goal
2 = Secondary goal
3 = Primary goal

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>17a</td>
<td>CERT/PRGM</td>
<td>Complete a certificate program</td>
</tr>
<tr>
<td>17b</td>
<td>ASSOC/DEG</td>
<td>Obtain an associate degree</td>
</tr>
<tr>
<td>17c</td>
<td>TRY/WR</td>
<td>Transfer to a 4-year college or university</td>
</tr>
<tr>
<td>17d</td>
<td>OBJSKIL</td>
<td>Obtain or update job-related skills</td>
</tr>
<tr>
<td>17e</td>
<td>SLK/FMP</td>
<td>Self-improvement/personal enjoyment</td>
</tr>
<tr>
<td>17f</td>
<td>CARCHNG</td>
<td>Change careers</td>
</tr>
</tbody>
</table>

18) Indicate which of the following are **sources** you use to pay your tuition at this college.

*Please respond to each item.*

**NOTE:** All items below have the following response values:

1 = Not a source
2 = Minor source
3 = Major source

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>18a</td>
<td>OWNINC</td>
<td>My own income/savings</td>
</tr>
<tr>
<td>18b</td>
<td>PARSPINC</td>
<td>Parent or spouse/significant other’s income/savings</td>
</tr>
<tr>
<td>18c</td>
<td>EMPLOYER</td>
<td>Employer contributions</td>
</tr>
<tr>
<td>18d</td>
<td>GRANTS</td>
<td>Grants and scholarships</td>
</tr>
<tr>
<td>18e</td>
<td>STULOANS</td>
<td>Student loans (bank, etc.)</td>
</tr>
<tr>
<td>18f</td>
<td>PUBASSIT</td>
<td>Public assistance</td>
</tr>
</tbody>
</table>

19) Since high school, which of the following types of schools have you attended other than the one you are now attending?

*This question asks students to select all options that apply. To permit multiple responses, the question is represented in the codebook by five separate items the student either checks or does not check.*

**NOTE:** All items below have the following response values:

0 = No response
1 = Response

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>19a</td>
<td>PROPSCH</td>
<td>Proprietary (private) school or training program</td>
</tr>
<tr>
<td>19b</td>
<td>VOCTECH</td>
<td>Public vocational/technical school</td>
</tr>
<tr>
<td>19c</td>
<td>COMM/COL</td>
<td>Another community or technical college</td>
</tr>
<tr>
<td>19d</td>
<td>FOUYEAR</td>
<td>4-year college or university</td>
</tr>
<tr>
<td>19e</td>
<td>NONESC</td>
<td>None</td>
</tr>
</tbody>
</table>
### Item # | Variable Name | Item Description/Variable Label | Response Value
---|---|---|---
20 | TAKAGAIN | When do you plan to take classes at this college again? | 1=I will accomplish my goal(s) this term and will not be returning 2=I have no current plans to return 3=Within the next 12 months 4=Uncertain
21 | GPA | At this college, in what range is your overall college grade average? | 1=Pass/fail classes only 2=Do not have a GPA at this school 3=C- or lower 4=C 5=B- to C+ 6=B 7=A- to B+ 8=A
22 | TIMCLASS | When do you most frequently take classes at this college? | 1=Day classes (morning or afternoon) 2=Evening classes 3=Weekend classes
23 | TOTCHRS | How many TOTAL credit hours have you earned at this college, not counting the courses you are currently taking this term? | 0=None 1=1 - 14 credits 2=15 - 29 credits 3=30 - 44 credits 4=45 - 60 credits 5=over 60 credits

24) At what other types of institutions are you taking classes this term? This question asks students to select all options that apply. To permit multiple responses, the question is represented in the codebook by six separate items the student either checks or does not check.

**NOTE:** All items below have the following response values:

0=No response 1=Response

<table>
<thead>
<tr>
<th>Item #</th>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>24a</td>
<td>OTCLSNON</td>
<td>None</td>
</tr>
<tr>
<td>24b</td>
<td>OTCLSHS</td>
<td>High school</td>
</tr>
<tr>
<td>24c</td>
<td>OTCLSVT</td>
<td>Vocational/technical school</td>
</tr>
<tr>
<td>24d</td>
<td>OTCLSCC</td>
<td>Another community or technical college</td>
</tr>
<tr>
<td>24e</td>
<td>OTCLS4Y</td>
<td>4-year college/university</td>
</tr>
<tr>
<td>24f</td>
<td>OTCLASS</td>
<td>Other</td>
</tr>
<tr>
<td>Item #</td>
<td>Variable Name</td>
<td>Item Description/Variable Label</td>
</tr>
<tr>
<td>--------</td>
<td>---------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>25</td>
<td>OTHINST</td>
<td>How many classes are you presently taking at OTHER institutions?</td>
</tr>
<tr>
<td>26</td>
<td>RECOMMEN</td>
<td>Would you recommend this college to a friend or family member?</td>
</tr>
<tr>
<td>27</td>
<td>ENTIREXP</td>
<td>How would you evaluate your entire educational experience at this college?</td>
</tr>
<tr>
<td>28</td>
<td>HAVKID</td>
<td>Do you have children who live with you?</td>
</tr>
<tr>
<td>29</td>
<td>AGENew</td>
<td>Mark your age group</td>
</tr>
<tr>
<td>30</td>
<td>SEX</td>
<td>Your sex</td>
</tr>
<tr>
<td>31</td>
<td>MARRY</td>
<td>Are you married?</td>
</tr>
<tr>
<td>32</td>
<td>ENGFIRST</td>
<td>Is English your native (first) language?</td>
</tr>
<tr>
<td>33</td>
<td>INTERNAT</td>
<td>Are you an international student or foreign national?</td>
</tr>
<tr>
<td>Item #</td>
<td>Variable Name</td>
<td>Item Description/Variable Label</td>
</tr>
<tr>
<td>-------</td>
<td>---------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>34</td>
<td>RERACE</td>
<td>What is your racial identification? (Mark only one)</td>
</tr>
<tr>
<td>35</td>
<td>HIACCRED</td>
<td>What is the highest academic credential you have earned?</td>
</tr>
<tr>
<td>36m</td>
<td>MOTHED</td>
<td>Highest level of education: mother</td>
</tr>
<tr>
<td>36f</td>
<td>FATHED</td>
<td>Highest level of education: father</td>
</tr>
<tr>
<td>37</td>
<td>MAJOR</td>
<td>Using the list provided, please write the code indicating your major</td>
</tr>
<tr>
<td>38</td>
<td>STID</td>
<td>Student Identification Number</td>
</tr>
</tbody>
</table>

The items below contain course level data from the Course Master Data File:

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
<th>Response Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>timegrp</td>
<td>Administration Time Group</td>
<td>1=Morning (Before Noon), 2=Afternoon (Noon to 4:59), 3=Evening (5:00 or later)</td>
</tr>
<tr>
<td>camploc</td>
<td>Campus location</td>
<td></td>
</tr>
<tr>
<td>seco</td>
<td>Section number</td>
<td></td>
</tr>
<tr>
<td>coursesno</td>
<td>Course number</td>
<td></td>
</tr>
<tr>
<td>courname</td>
<td>Course full name</td>
<td></td>
</tr>
<tr>
<td>bldg</td>
<td>Building</td>
<td></td>
</tr>
<tr>
<td>room</td>
<td>Room</td>
<td></td>
</tr>
<tr>
<td>meetdays</td>
<td>Class meeting days</td>
<td></td>
</tr>
</tbody>
</table>
Course level data from the Course Master Data File (cont.):

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
<th>Response Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>instrnam</td>
<td>Instructor name</td>
<td></td>
</tr>
<tr>
<td>depart</td>
<td>Department</td>
<td></td>
</tr>
<tr>
<td>actenrol</td>
<td>Actual enrollment</td>
<td></td>
</tr>
<tr>
<td>stime</td>
<td>Class start time</td>
<td></td>
</tr>
<tr>
<td>etime</td>
<td>Class end time</td>
<td></td>
</tr>
<tr>
<td>sdate</td>
<td>Course start date</td>
<td></td>
</tr>
<tr>
<td>edate</td>
<td>Course end date</td>
<td></td>
</tr>
<tr>
<td>primary</td>
<td>Record in primary sample</td>
<td>0=False 1=True</td>
</tr>
<tr>
<td>in</td>
<td>Survey number in range for packet</td>
<td>0=False 1=True</td>
</tr>
</tbody>
</table>

The items below are calculated weights and benchmarks:

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
<th>Response Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td>Institutional weight based on part-time/full-time enrollment</td>
<td></td>
</tr>
<tr>
<td>actcoll</td>
<td>Active and collaborative learning benchmark score (rescaled from 0 to 1)</td>
<td></td>
</tr>
<tr>
<td>steff</td>
<td>Student effort benchmark score (rescaled from 0 to 1)</td>
<td></td>
</tr>
<tr>
<td>accchall</td>
<td>Academic challenge benchmark score (rescaled from 0 to 1)</td>
<td></td>
</tr>
<tr>
<td>sfac</td>
<td>Student faculty interaction benchmark score (rescaled from 0 to 1)</td>
<td></td>
</tr>
<tr>
<td>support</td>
<td>Support for learners (rescaled from 0 to 1)</td>
<td></td>
</tr>
</tbody>
</table>

The items below contain course level data from the class information sheet:

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Item Description/Variable Label</th>
<th>Response Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRVADMIN</td>
<td>Survey administered by</td>
<td>1=Faculty 2=Survey Administrator</td>
</tr>
<tr>
<td>FACPTPT</td>
<td>Faculty member's status</td>
<td>1=Full-time 2=Part-time</td>
</tr>
<tr>
<td>NUMSTU</td>
<td>Number of students in attendance</td>
<td></td>
</tr>
<tr>
<td>ADMNTIME</td>
<td>Total administration time in minutes</td>
<td></td>
</tr>
<tr>
<td>ADMNDATE</td>
<td>Administration date</td>
<td></td>
</tr>
<tr>
<td>SPNEEDS</td>
<td>How many students in this class have special needs</td>
<td></td>
</tr>
<tr>
<td>SEMHRS</td>
<td>Number of credit hours taught this semester by faculty member teaching this class</td>
<td></td>
</tr>
<tr>
<td>QRTTHRS</td>
<td>Number of credit hours taught this semester by faculty member teaching this class</td>
<td></td>
</tr>
</tbody>
</table>

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LIST OF REFERENCES


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