

ENGAGEMENT OF ADULT UNDERGRADUATES:
INSIGHTS FROM THE NATIONAL SURVEY OF
STUDENT ENGAGEMENT

by

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A dissertation submitted to the faculty of
The University of Utah
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Educational Leadership and Policy

The University of Utah

August 2010

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The University of Utah Graduate School

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ABSTRACT

Adults are participating in all levels of higher education in increasing numbers due to a variety of societal, cultural, technological, and economic pressures. While many adult students attend 2-year colleges and technical institutions, 4-year colleges and universities are also enrolling substantial percentages of adult students. Nevertheless, adult college students – those who are functionally independent, have substantial work/life experience, and must balance school demands with extra-institutional obligations – experience low persistence and graduation rates comparative to their nonadult peers at these institutions. The literature on student retention points to the importance of academic integration for adult students. In recent years, student engagement – or participation in a variety of effective educational practices linked to successful outcomes – has been presented as an alternative formulation of academic integration. Prior research points to the importance of student engagement as a critical influence on student retention. The National Survey of Student Engagement [NSSE] measures engagement on five different benchmarks whose relevance for adult students is verified by the adult learning theory literature. This study utilizes data from the 2005 NSSE and correlational research methods to create an operationally useful definition of adult students and to compare their engagement on each of the five benchmarks to that of their nonadult peers. The findings are then explored to suggest refinements to current theory and practice and directions for future research regarding adult students.

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ACKNOWLEDGEMENTS

While the accolades typically go to the degree earner, the families of graduate students work and sacrifice as much or more. I wish to express my profound appreciation to my wife, Sarah, who has supported me during the long years, lonely nights, and empty Saturdays. Her willingness to carry the extra burden of caring for a home and family with a frequently absent husband has enabled me to complete my studies and write this dissertation. I am deeply grateful to her and to our children, who have gone without their dad on too many occasions. Thank you from the bottom of my heart and yes, it's finally over.

I also wish to express my appreciation to my doctoral committee members – Drs. Amy Bergerson, Karen Jackson, Mary Skorheim, Donna Ziegenfuss, and Cynthia Bioteau. Each of them has sacrificed time and energy to assist me through my graduate program and dissertation, and I am very thankful. In particular, I wish to thank my chair, Amy Bergerson, for her willingness to support me in this endeavor despite a heavy advising and teaching load.

Finally, I would like to express my appreciation to my employers for their support as I have been in school. Stan Inman of Career Services at the University of Utah, Laura Hunter and Mike Peterson at the Utah Education Network, and Joe Peterson at Salt Lake Community College have encouraged me along the way and made it possible to complete my studies. Thanks again to all of you.

I. INTRODUCTION

The title of a recent report sponsored by the Lumina Foundation says it all:

Returning to Learning: Adults' Success in College is Key to American's Future (Pusser et al., 2007). In the opening lines of the report, Pusser and his colleagues (2007) outline a growing threat to our nation's prosperity in the global marketplace:

In the United States, postsecondary education has long driven individual social mobility and collective economic prosperity. Nonetheless, the nation's labor force includes 54 million adults who lack a college degree; of those, nearly 34 million have no college experience at all. In the 21st century, these numbers cannot sustain us. (p. 1)

Paradoxically, research on adult college students – defined briefly as those who are functionally independent, have substantial work/life experience, and must balance school demands with extrainstitutional obligations – is relatively sparse. This dissertation study employs data from the 2005 National Survey of Student Engagement and correlational research methods to meet two objectives. First, it endeavors to more specifically define "adult students" in a way that is both faithful to the literature on adult students and operationally useful to institutions and those studying adult students' success. Second, it investigates how various characteristics of adult students influence how they engage in educationally effective practices that are linked to successful college outcomes. Findings from this study will be discussed in an effort to shed light on how institutions of higher education can improve retention of the adult students who increasingly populate their campuses.

Background

Adult College Students in the 21st Century

Just as the need to educate more adult students pressing, the number of adults participating in higher education is growing. In 1999, Eric L. Dey and Sylvia Hurtado attempted to encapsulate the changing nature of higher education students in the latter part of the 20th century and project into the 21st by pointing out two major trends: changes in the demographic composition of higher education students and changes in students' educational plans and preferences. In particular, they emphasized that the percentage of entering college students over 19 years of age has been steadily increasing in recent decades along with the ethnic and racial diversity of students (1999, pp. 301-303).

Donaldson and Townsend (2007) indicated in a more recent study that adult students, often referred to as a type of "nontraditional" students, accounted for 43% of all undergraduates in the United States in 2000 as compared to only 27% in 1990 (p. 27). In a similar vein, Carol Kasworm and her colleagues (2000) pointed out that, "In the past fifty years, there has been a dramatic growth of adult learners...in credit and noncredit higher education programs" (p. 450). Philibert, Allen, and Elleven (2008) claim an even higher percentage of enrollees exhibiting adult characteristics. In their study of nontraditional community college students, Philibert and his colleagues cited national statistics indicating that 73% of undergraduate students were considered in some way nontraditional in a 1999-2000 U. S. Department of Education study.

The presence of adult students in higher education is not a new phenomenon, though changes in the way adult students are identified have led to more accurate

reporting (Horn & Carroll, 1996). Adult students began to enroll in large numbers following World War II, and their numbers continue to increase. A number of factors are driving the increasing enrollments of adult learners in higher education. Bean and Metzner (1985) attributed the growth in adult student enrollment to (a) political forces, including the introduction of the GI Bill in 1944 and the creation of conditions more favorable to adult students under the National Defense Education Act of 1958 and the Higher Education Act of 1965 (amended in 1972 to include Basic Educational Opportunity Grants or “Pell Grants”); (b) changes in social norms in American society that included the explosion of women in the workforce following World War II; and (c) economic factors such as the decline in blue-collar jobs. Patricia Cross (1981) similarly summarized these forces into three categories: demographic changes (including increasing life expectancies and lengthening postretirement years), social changes (including changing gender roles, changing career patterns, and so forth), and technological changes (and the accompanying shifts from production to information and service economy jobs). Emphasizing a particular facet of social change, Brown (2002) pointed out that a dramatic increase in divorce rates since 1970 have led to a marked rise in single mothers returning to school.

Recently, instability in the financial sector and a contracting job market have resulted in millions of adults across the United States returning to school to enhance their skills or retrain (Richards, 2008). Higher education enrollments in Utah, for instance, increased approximately 8.5% from fall 2007 to fall 2008 (Stewart, 2008) and another 8.3% from fall 2008 to fall 2009 (Leonard, 2009). Many of these new enrollees were out-of-work adults returning to school.

While many adult students attend 2-year colleges and technical institutions (Philibert, Allen, & Elleven, 2008), 4-year colleges and universities are also enrolling substantial percentages of adult students (Horn & Carroll, 1996). According to the 2007-08 National Postsecondary Student Aid Study (National Center for Education Statistics [NCES], 2008), 22% of students at research and doctoral institutions, 35.4% of students at master's institutions, and 31.5% of students at baccalaureate institutions were 24 years of age or older. Furthermore 15.4%, 25.2% and 24.8% of students at these types of institutions respectively reported a spouse or dependents. Nearly half of the students at these institutions lived off campus, and a small percentage were either active status in the military or were veterans. Because age, dependents, place of residence, and substantial nonschooling life experience are important indicators of adult status, these statistics give an initial indication of the proportion of adult students at these institutions. Adult students have long been considered a key audience of community and technical colleges, but they are rapidly becoming an important group of students even in the 4-year colleges and universities that have traditionally served young students recently out of high school (Bash, 2003).

Retention of Adult Students

In consequence of the growth in adult student enrollments and the driving need for an educated adult workforce, colleges and universities need to be acutely aware of what motivates these students, how they learn, how they interact with institutions to achieve their goals, and what institutions can do to help them succeed. Ironically, the self-concepts and philosophical orientations of many colleges and universities are firmly

rooted in a history of serving traditional students with a liberal arts curriculum (Geiger, 1999). These historical origins can blind colleges and universities to the unique needs of adult students and create a collegiate environment that is marginalizing and foreign to them (Bash, 2003; Kuh & Love, 2000; Sissel, Hansman, & Kasworm, 2001).

A number of authors have written about this tendency of colleges and universities to privilege traditional students both explicitly and implicitly (Brookfield, 2005). Sissel, Hansman, and Kasworm (2001) in particular noted that, “Whether it is policy, program, attitudes, classroom environment, or funding support, adult learners face institutional neglect, prejudice, and denial of opportunities” (p. 18). Even the term “nontraditional student” so often used to describe adult students could be considered deficit-based and indicates that somehow these students are not the normal students that colleges and universities intend to serve (Valencia, 1997).

For adult undergraduate students participating in higher education for the first time, attending any college requires a dramatic role adjustment in which they must adapt to a new environment with new norms and expectations in addition to negotiating the academic requirements of earning a degree (Bash, 2003; Kuh & Whitt, 1988). This adjustment is made more difficult by the fact that many 4-year institutions continue to focus on traditional students in both institutional culture and teaching practices, creating a mismatch for adult students (Hagedorn, 2007; Kuh & Love, 2000; Schlossberg, Lynch, & Chickering, 1989). Furthermore, institutional policies and structures, including when and where classes and student services are offered, can create logistical and scheduling difficulties for students with substantial off-campus work and family obligations (Choy, 2002; Cross, 1981).

The systematic neglect of adult students is reflected in decreased persistence and graduation rates for adult undergraduates (Choy, 2002; Dey & Hurtado, 1999, p. 318; Horn & Carroll, 1996). For example, the 2001 Beginning Postsecondary Students longitudinal survey (NCES, 2001), which followed students who enrolled beginning in the 1995-96 school year, reported dramatically lower persistence and degree attainment rates for adult baccalaureate students as compared to traditional students. While 28.8% of all students who enrolled beginning in 1995 had attained a baccalaureate degree by 2001, only 4.1% of students 24-29 years of age (when first enrolled in 1995), 3.5% of students 30-39 years of age, and 1.1% of students 40 years and older had attained a bachelor's degree compared to 44.1% of students 18 or younger and 13.7% of students 19-23 years old. Degree attainment rates were likewise lower for students with a spouse and/or dependents, working students, and students living off campus, all of which are important characteristics of adult learners.

At the same time, pressure on colleges and universities to retain these students is increasing. In late 2006, the Commission on the Future of Higher Education (also called the Spellings Commission after Secretary of Education Margaret Spellings) published a report entitled, *A test of leadership: Charting the future of U.S. higher education* (U.S. Department of Education, 2006), in which they called upon leaders and policymakers to raise the standard of accountability for postsecondary education outcomes. Among other factors, student retention and persistence rates were mentioned as key indicators of institutional effectiveness. Likewise, regional accrediting bodies use retention rates as a critical indicator of institutional performance (Berger & Lyon, 2005). In today's environment of increasing adult enrollments and relatively low persistence to graduation,

retention of adult students is at once both critical and understudied (Bash, 2003). This dissertation study endeavors to at least partially fill this gap in our understanding of adult student engagement and retention.

Overview of This Study

Adult students participate in postsecondary education in unique ways (Kasworm, 2003b; Pusser et al., 2007). Unfortunately, long-held notions about student retention and persistence – those key accountability measures mentioned in the Spellings Commission’s report – are based largely upon research conducted several decades ago among traditional college students: those who earn a high school diploma, enroll full-time in postsecondary schooling immediately following high school, depend on parents for financial support, and either do not work or work part-time while attending school (Choy, 2002; Tinto, 1993). Furthermore, there is widespread confusion about how to define adult students in a useful way; age is often used as a sole criteria, but doing so masks some important behavioral patterns (exhibited even by some younger students) that distinguish adult and traditional students (see Bash, 2003; Cross, 1981). Other characteristics have been suggested, such as work status and gaps in enrollment, but these are applied inconsistently (Knowles, Holton, & Swanson, 2005). Consequently, our current understanding of adult student retention and persistence is gravely lacking.

Student engagement, defined generally as the degree to which a student is involved in a variety of educationally purposeful activities, is one of the most important predictors of postsecondary student persistence and retention (Astin 1993; Braxton, 2008; Kinzie, Gonyea, Shoup, & Kuh, 2008; Kuh, 2004; Tinto, 1993). For instance,

participation in active and collaborative learning, interacting regularly with other students and faculty, and working hard to accomplish meaningful academic work (all elements of student engagement) have been found to correlate with positive student outcomes (Astin, 1993; Pascarella, 2001a; Pascarella & Terenzini, 1991, 2005). Like the broader constructs of persistence and retention, engagement has been studied extensively in recent years (Kuh, Kinzie, Schuh, & Whitt, 2005). However, adult student engagement at 4-year colleges and universities is a relatively new and scantily explored issue (Donaldson & Townsend, 2007), though it has been studied at the community college level (McClenney, 2007). Understanding adult student engagement is a critical step toward understanding adult student retention and persistence.

Objectives

This study will compare adult and nonadult students' engagement in educationally effective practices known to correlate with student success and retention in an effort to provide direction for institutions seeking to promote the success of adult students. By understanding how adult students engage in effective educational practices, institutions can identify both important areas of success to capitalize upon when working with adult students and areas where adult students are less engaged that can be focused upon as retention strategies.

Potential Significance

The need to attract and retain more adult students is obvious on a number of levels from promoting national economic prosperity to developing an informed citizenry

(Pusser et al., 2007). In addition, as many institutions struggle to adapt to their changing student demographics in order to stay viable in an increasingly competitive higher education sector, the need to produce a positive experience for students becomes critical. Indeed, terms such as “customer service” have become catch phrases for attracting and retaining highly mobile students in an increasingly competitive higher education marketplace (Hadfield, 2003). Some 4-year institutions such as public urban teaching institutions and the proliferating private for-profit institutions have intentionally targeted adult students, while others continue to focus on serving traditional students. When an institution knows how to adjust its practices to accommodate adult students and does so, the cultural distance that must be traversed by these students decreases and the likelihood of their persistence and eventual success increases (Kuh & Love, 2000). In addition to retaining current adult students, the institution that successfully makes such adaptations increases its competitive edge in the higher education industry as its reputation as an institution friendly to adult students spreads and serves as an important recruiting tool. In other words, adult students choose and attend institutions where they feel they will be valued and likely to succeed (Bash, 2003). Finally, students attending such institutions will be more likely to succeed as they encounter institutional practices that validate and support them as learners (Brookfield, 1986; Rendón, 1993, 1994).

Conceptual Framework

This study is anchored in three bodies of literature: the literature on college student retention with a particular focus on Vincent Tinto’s (1975, 1993, 1998) theory regarding the effects of academic and social integration on institutional and goal

commitment and the role of the classroom in adult student retention (Donaldson, 1999; Donaldson, Graham, Kasworm, & Dirks, 1999; Donaldson & Townsend, 2007); the literature on college student engagement, an alternative formulation of academic and social integration (Kuh, 2004; Kuh, Kinzie, Schuh, & Whitt, 2005); and the literature on adult learners (Brookfield, 1986; Cross, 1981; Knowles, Holton, & Swanson, 1998; Lawler, 1991; Lindeman, 1926; Merriam, Caffarella, & Baumgartner, 2007). In addition to informing the creation of an operational definition of adult students, the literature points to key ways in which adult students engage differently than traditional students. These differences and the research questions arising therefrom will be explored in detail in the review of literature below.

Source of Data

One of the primary instruments for measuring and reporting student engagement at 4-year colleges and universities is the National Survey of Student Engagement [NSSE]. Developed initially in 1998 by an expert team of researchers under the direction of Peter Ewell at the National Center for Higher Education Management Systems, the NSSE is now overseen by Indiana University's Center for Postsecondary Research. Each year, the NSSE is administered under contract to first- and fourth-year students at 4-year colleges throughout the United States, and institution-specific results are given to each participating institution while a more general report is issued nationally (National Survey of Student Engagement [NSSE], *About the National Survey of Student Engagement*, n.d.). The Indiana University Center for Postsecondary Research also releases limited subsets

of the NSSE data to researchers interested in studying student engagement. This study will use such a subset of the NSSE data to address the research questions.

Research Questions

The insights gleaned from the research on student retention, student engagement, and adult learners give rise to the following research questions:

1. Do adult students report significantly different levels of engagement than nonadult students on each of the five NSSE engagement benchmarks?
2. How does level of engagement vary with level of adulthood on each of the five NSSE engagement benchmarks?
3. Which indicators of adult status have the largest effect on level of engagement for each of the five NSSE engagement benchmarks?
4. How do the effects of adult status indicators on level of engagement compare with the effects of other important demographic variables, i.e., gender, ethnicity, parent education level, class standing and institutional type?

The origins of these questions will be discussed in detail in Chapter II: Review of Literature, and they will be operationalized in Chapter III: Methods.

Methods and Variables

The NSSE (usually pronounced “nessie”) is constructed around five engagement benchmarks arising from the substantial body of literature on student engagement (Kuh, 2004). An index for each benchmark is created by recoding and averaging a respondent’s scores across all items related to that benchmark. These five engagement indexes will

constitute the dependent variables in this study, while various indicators of adult student status and other demographic and institutional characteristics will serve as independent variables. The benchmarks are described in *The College Student Report 2005 Codebook* (NSSE, 2005a) and consist of:

1. Level of Academic Challenge – a composite measure of the level of academic rigor perceived by students.
2. Active and Collaborative Learning – a composite measure of the degree of active learning and collaborative learning experienced by students.
3. Student-Faculty Interactions – a composite measure of the quantity and quality of student interactions with faculty.
4. Enriching Educational Experiences – a composite measure of students' exposure to certain types of intra- and extra-classroom experiences known to influence engagement.
5. Supportive Campus Environment – a composite measure of students' experience with supporting campus elements that enhance engagement.

The construction, validation, and use of these five benchmarks are discussed in detail in Chapter III: Methods. This study will employ a correlational research design to address the research questions. These methods are also discussed in detail in Chapter III.

Summary

The number of adult students attending 4-year colleges has been increasing in recent years and will likely continue to increase. The literature on student retention, student engagement, and adult learning theory indicate that adult students participate in

higher education differently than traditional students and that increased levels of student engagement will yield increased retention levels. Nevertheless, engagement of adult students at 4-year colleges and universities has not been studied extensively. This study will establish an operational definition of adult students for use by researchers studying engagement and will compare the engagement of adult students to that of traditional students.

II. REVIEW OF LITERATURE

The benefits students reap from participating in higher education are clear from many decades of study, summarized comprehensively by Pascarella and Terenzini (1991, 2005) in their definitive volumes entitled *How College Affects Students: Findings and Insights from Twenty Years of Research* and *How College Affects Students: A Third Decade of Research*. Researchers have thoroughly documented increased verbal, quantitative, and subject-matter competence; development of increased cognitive skills and intellectual growth; positive psychosocial changes; enhanced attitudes and values; moral development; a link to educational attainment and persistence both for the college attender and for his or her children; career and economic benefits; and enhanced quality of life after college (Pascarella & Terenzini, 1991, 2005). Also evident in the research, however, is that not all participants benefit equally, in part because they participate in different ways and to different degrees (Pascarella & Terenzini, 1991, 2005).

What seems to be clear from the research is that individuals who participate more fully, particularly in educational practices known to be effective, benefit to a greater extent than those who participate less fully (Astin, 1993; Chickering & Gamson, 1986; Ewell & Jones, 1996; Kuh, 1994). In addition, those who persist in pursuing higher education until they attain their educational goals, typically defined as graduation, are most likely to benefit (Pascarella & Terenzini, 1991, 2005). Consequently, retaining students is a primary goal of institutions of higher education (Braxton, 2000). This

becomes an increasingly problematic effort, however, as the nature of higher education students and their participation patterns change (Andres & Carpenter, 1997; Bean & Metzner, 1985). In particular, the burgeoning enrollments of adult students and their greater tendency toward noncompletion have placed increasing pressure upon colleges and universities to adjust their institutional efforts to retain students (Bash, 2003; NCES, 2008).

The following review of literature explores three bodies of research in an effort to shed light on how institutions can better retain adult students and, by implication, benefit them more fully. The review begins with a summary and critique of traditional theories of student retention with an emphasis on academic integration as an important predictor of persistence for adult students (Cleveland-Innes, 1994; Tinto, 1997). Next, the literature on quality undergraduate education and student engagement (or the degree to which students are involved in educationally effective practices) is explored as a reformulation of academic integration. In this section, the National Survey of Student Engagement [NSSE], currently the most prominent instrument for measuring college student engagement at 4-year colleges and universities, is described as a means for evaluating the level to which students engage in various educational practices known to be effective (Kuh, 2004). Finally, the literature on adult learners is reviewed. Because adult students learn and engage with institutions somewhat differently than traditional students (Kasworm, 2003a), and because the NSSE has not yet been used to measure these differences, the literature on adult learners helps to define and describe adult students, investigate why and how they participate in higher education, and understand how adult students learn and engage differently than traditional students. The review of literature

concludes with a discussion of how these three bodies of research give rise to the research questions that form the main purpose of this study as set forth previously.

Student Retention Theory

As was pointed out in the introduction to this study, adult students are populating 4-year colleges and universities in ever greater numbers, and their success is critical to students, institutions, and surrounding communities. Student retention has been studied in various forms for nearly a century; however, most recent retention research can be traced back to theoretical frameworks set forth beginning in the 1970s (Berger & Lyon, 2005). Two closely related areas of concentration in the field of student success are research on student retention (how institutions retain students) and student persistence (what factors lead a student to persist to graduation).

Theoretical Perspectives on Retention

There are several groups of theoretical frameworks regarding student retention and persistence that attempt to explain student departure from higher education. They can be loosely categorized into four areas: sociological perspectives, psychological perspectives, organizational perspectives, and economic perspectives (Braxton, 2000; Braxton & Hirschy, 2005).

Sociological perspectives. Sociological theories of student departure focus on the influence of social structures and social forces both inside and outside the institutional setting. This perspective explores the interaction of social factors from the small scale (family encouragement, culture of origin, etc.) to the large scale (cultural capital and

social reproduction). Culture – both the institutional culture and the culture of the student – is an important part of this perspective. The greater the mismatch between a student's culture of origin and the institutional culture (often referred to as the cultural distance that must be traversed by students to fit into the institutional setting), the more likely the student is to withdraw (Braxton, 2000; Braxton & Hirschy, 2005). Important theorists in this perspective include Bean and Metzner (1985), Berger (2000), Bourdieu (1973), Kuh and Love (2000), Tierney (1992), and Tinto (1975, 1993).

Psychological perspectives. Rather than studying interpersonal cultural forces and social factors, psychological theories of student departure focus on individual psychological characteristics and processes that affect student departure. These may include motivation, aptitude and skill, self-perception (including self-efficacy), personality traits, beliefs, locus of control, and psychological development patterns. Psychological theories seek to identify psychological characteristics and processes that lead to persistence and suggest methods for building these in individual students (Braxton, 2000; Braxton & Hirschy, 2005). Prominent theorists writing from a psychological perspective include Astin (1984), Bean and Eaton (2000), Chickering and Reisser (1993), Perry (1981), King and Kitchener (1994), Baxter Magolda (1992), and Milem and Berger (1997).

Organizational perspectives. The influence of organizational characteristics and processes on college student departure is the primary focus of this theoretical framework. Organizational structure (bureaucratization, institutional size, admissions selectivity, institutional control, student-faculty ratios, institutional resources and goals, manifest and latent institutional norms, etc.) and organizational behavior (faculty practices, presidential

and administrative styles, institutional orientation toward students) both influence a student's departure decision (Braxton, 2000; Braxton & Hirschy, 2005). In addition, organizational types – bureaucratic, collegial, political, anarchical (Birnbaum, 1988) – and organizational frameworks – structural/functional, symbolic, political, and human resource (Bolman & Deal, 2003) – also affect students by providing varying degrees of perceived institutional fit and student satisfaction. Birnbaum (1988), Berger and Braxton (1998), Braxton and Brier (1989), and Astin and Scherrei (1980) have all contributed to the organizational perspective on student departure.

Economic perspectives. Economic theories of student departure are based upon cost/benefit analyses. In this perspective, students constantly weigh the relative costs and benefits associated with remaining at a specific institution. From a financial viewpoint, ability to pay, perceptions of financial aid, family resources, tuition, outside income, and individual and cultural perspectives on debt all influence the departure decision. In addition, perceived opportunity costs are weighed against the social, intellectual, and financial benefits of persisting (Braxton, 2000; Braxton & Hirschy, 2005). St. John, Cabrera, and Nora are prominent researchers who employ this perspective (St. John, Cabrera, Nora, & Asker, 2000). Hoxby's (2004) edited volume also contains some excellent research on student participation conducted from an economic perspective.

Summary. Each of the four frameworks described above contributes important insights into the college student departure process. Research from these perspectives has assisted institutions as they work to retain students. For instance, the literature on college climate and culture has led to interventions aimed at creating safe cultural spaces for various groups on campus (Kuh & Whitt, 1988; Tierney, 1992) and the literature on

psychological traits of successful students has led to a variety of counseling interventions and support groups (Hensley & Kinser, 2001b). Seidman (2005) uses a variety of frameworks to assemble a formula for retaining students that includes early identification of students at risk and early, intensive, and continuous intervention.

Two theories, however, have dominated the student retention debate in recent decades: Astin's theory of student involvement (Astin, 1975, 1977, 1993) and Tinto's theory of student departure (Tinto, 1975, 1993). Because Astin's theory is primarily focused on college impact rather than retention (although the "environment" component of Astin's Input-Environment-Outcome model has some important insights about student involvement), Tinto's theory will form the foundation of the following review of important retention factors as it has done with numerous studies over the past three decades (Berger & Lyon, 2005).

Tinto's Theory of Student Departure

Vincent Tinto, an educational sociologist, began his work on student retention in the early 1970s. Prompted in part by the work of Spady (1970), Tinto proposed a theoretical framework of student retention based upon Emile Durkheim's sociological theory of suicide. He proposed that voluntary student withdrawal from higher education institutions, like suicide, results from "insufficient interactions with others in the college and insufficient congruency with the prevailing value patterns of the college collectivity" (1975, p. 92). "Presumably," Tinto continued, "lack of integration into the social system of the college will lead to low commitment to that social system and will increase the probability that individuals will decide to leave college and pursue alternative activities"

(1975, p. 92). Specifying two realms of interaction within colleges and universities, academic and social, Tinto formed a conceptual schema that “argues that it is the individual’s integration into the academic and social systems of the college that most directly relates to his continuance in that college” (p. 96). He used two constructs – goal commitment, or dedication to finishing a program of study, and institutional commitment, or dedication to staying at a particular institution – to explain student retention and proposed that the degree of academic and social integration experienced by a student in the college environment directly influences these two forms of commitment as shown in Figure 1.

Social and academic integration as predictors of retention. Tinto (1975) defined academic integration as the degree to which a student is incorporated into the academic fabric of his or her institution. He argued that academic integration can be measured both in terms of grade performance and the more nebulous construct of intellectual development. While the former refers to how successfully the student meets explicit academic standards, the latter, he asserted, is more closely related to how well the student comes to identify with the norms of the academic system (p. 104). Calling upon the work of Rootman (1972), Tinto (1975) proposed that:

Voluntary withdrawal can be viewed as an individual’s response to the strain produced by the lack of ‘person-role’ fit between himself and the normative climate of the institution that establishes certain roles as appropriate to the institution. (p. 106)

Hence, the retention of students depends heavily upon how successfully the institution can integrate students into the academic realm of the college or university. In a similar vein, social integration “involves notions of both levels of integration and of degrees of congruency between the individual and his social environment” (p. 107). According to

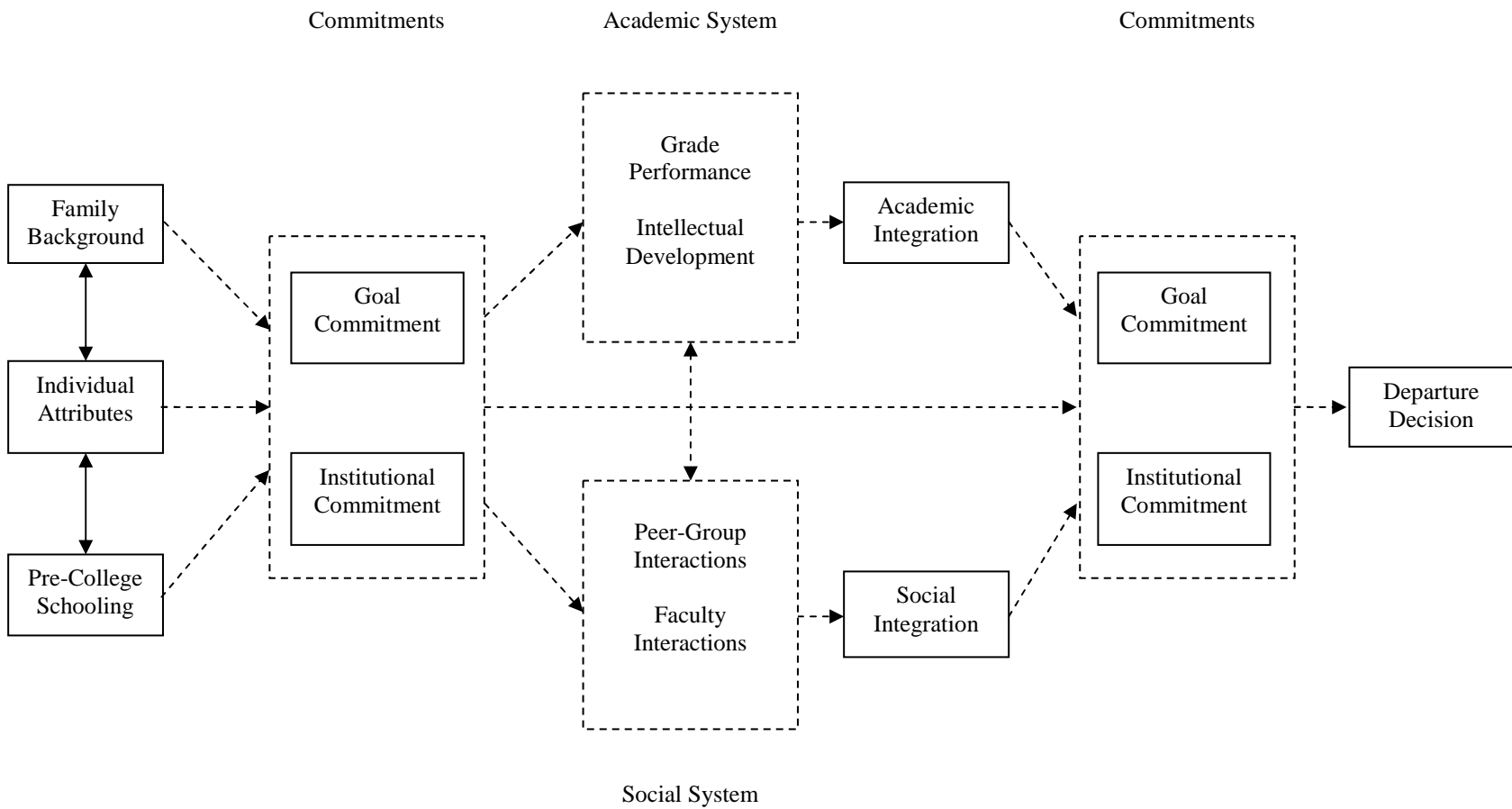


Figure 1. Tinto's conceptual schema for dropout from college (1975, p. 95).

Tinto (1975), academic and social integration have a direct effect on institutional and goal commitment and consequently upon the student departure decision. Higher levels of integration, he claims, lead to lower levels of departure.

Critiques of Tinto's theory. Tinto's theory has been widely criticized for its reliance on research involving traditional students and for its lack of emphasis on other factors critical to student persistence (Braxton, 2000). Predictably, scholars from each of the four main perspectives offer different critiques. Some scholars note Tinto's failure to account for individual psychological factors (Bean & Eaton, 2000), while others point to economic forces such as student finances and financial aid that are missing from Tinto's model (St. John et al., 2000). Still others adopt a more critical viewpoint and question the very purpose of integration. For instance, Tierney (1992) questioned whether integration and conformity are appropriate institutional goals given the negative implications of students abandoning their cultures of origin. Institutional culture and climate are also important considerations missing from Tinto's model, asserts Baird (2000). Weidman (1989) points out that the implicit norms of an institution are just as powerful as explicit expectations in their effect on students. Empirical analysis also brings into question the internal consistency and validity of the causal links between integration and persistence theorized by Tinto, especially when comparing residential and commuter campuses (Braxton, Sullivan, & Johnson, 1997). Operationalizing academic and social integration, however, is not always straightforward, and there is little consensus on their meaning (Braxton, Hirschy, & McClendon, 2004; Braxton & Lien, 2000). As Stage (1989) points out, there is even some amount of overlap in the definitions of academic and social integration.

Another critique more specific to this discussion is that with regard to adult or nontraditional students, factors outside the institution exert a strong pull; adult students tend to experience lower degrees of social integration on campus because of their off-campus obligations (Bean & Metzner, 1985). Consequently, academic integration seems to have a greater influence on the persistence of adult students than social integration by having a direct effect on commitment (Cleveland-Innes, 1994), although Sorey and Duggan (2008) and Asher and Skenes (1993) found that social integration was the more important factor (this, however, seems to be an artifact of how the authors operationalized academic and social integration). Empirical tests of Tinto's theory confirm the association of academic integration and institutional commitment at the commuter campuses that adult students are likely to attend (Braxton, Sullivan, & Johnson, 1997).

Revisions of Tinto's theory. In his more recent work, Tinto (1993, 1997, 1998, 2000, 2005) acknowledged many of these critiques and attempted to fine tune his model by increasing emphasis on the role of intentions and external commitments and their impact on goal and institutional commitment. In addition, he adjusted the definitions of academic and social integration. In the latest edition of his book *Leaving College*, Tinto (1993) set forth a new version of his longitudinal model of institutional departure as shown in Figure 2.

In addition to altering his definition of academic integration to include both academic performance and faculty/staff interactions (previously classified as a social integration factor), Tinto (1993) began investigating the classroom as a key point of student interaction and integration. Since that time, he has focused heavily on the role of

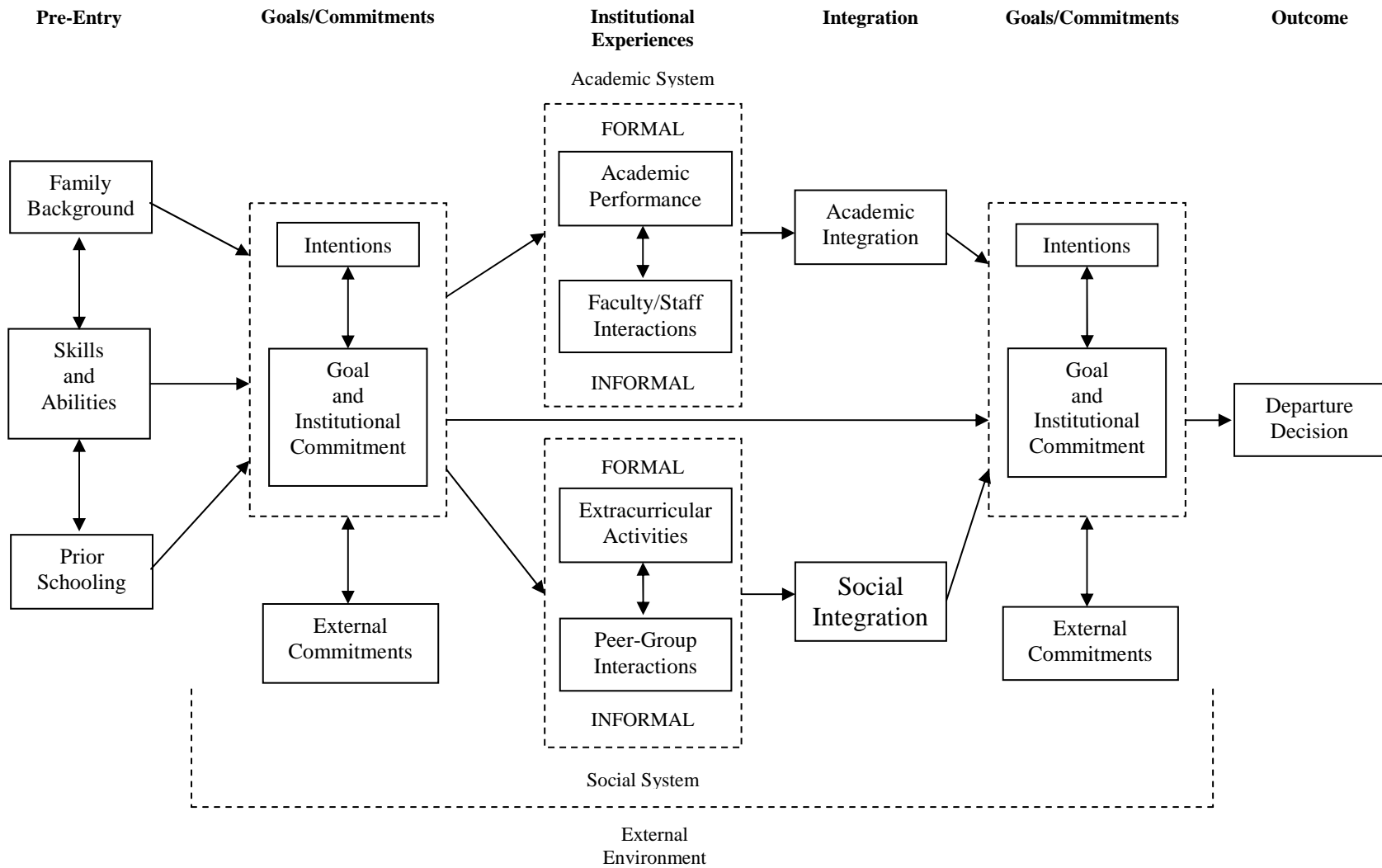


Figure 2. Tinto's 1993 revision of his student departure model (1993, p. 114)

the classroom in his research: “The college classroom lies at the center of the educational activity structure of institutions of higher education; the educational encounters that occur therein are a major feature of student educational experience” (1997, p. 599).

Much of Tinto’s recent work has focused on community colleges. Tinto’s 1997 study of the Coordinated Studies Program at Seattle Central Community College explored at length the impact of learning communities on student persistence and led to further refinement of his longitudinal model (Figure 3). In this iteration of his model of student departure, Tinto began to blend academic and social integration to emphasize that the classroom is a critical site where both forms of integration occur.

Learning communities continued to be a focal point of Tinto’s research for the next several years (1998, 2000). In addition, the term “involvement” began to gradually replace “integration” in his discussions of student persistence:

One thing we know about persistence is that involvement matters. The more academically and socially involved individuals are – that is, the more they interact with other students and faculty – the more likely they are to persist. (1998, p. 168)

It is interesting to note that the term “involvement” was first emphasized by Astin (1977, 1993) and has since been adopted by most retention researchers as one of the critical aspects of student retention despite disagreements over how to define retention and measure it (Bean, 2005; Hagedorn, 2005). Milem and Berger (1997) emphasized this connection in their exploration of the relationships between Astin’s theory of involvement and Tinto’s theory of student departure.

Summary. Although it has undergone several revisions in response to numerous critiques and new research, Tinto’s theory of student departure continues to inform work on student retention (Braxton & Hirschy, 2005). Central to Tinto’s theory are the dual

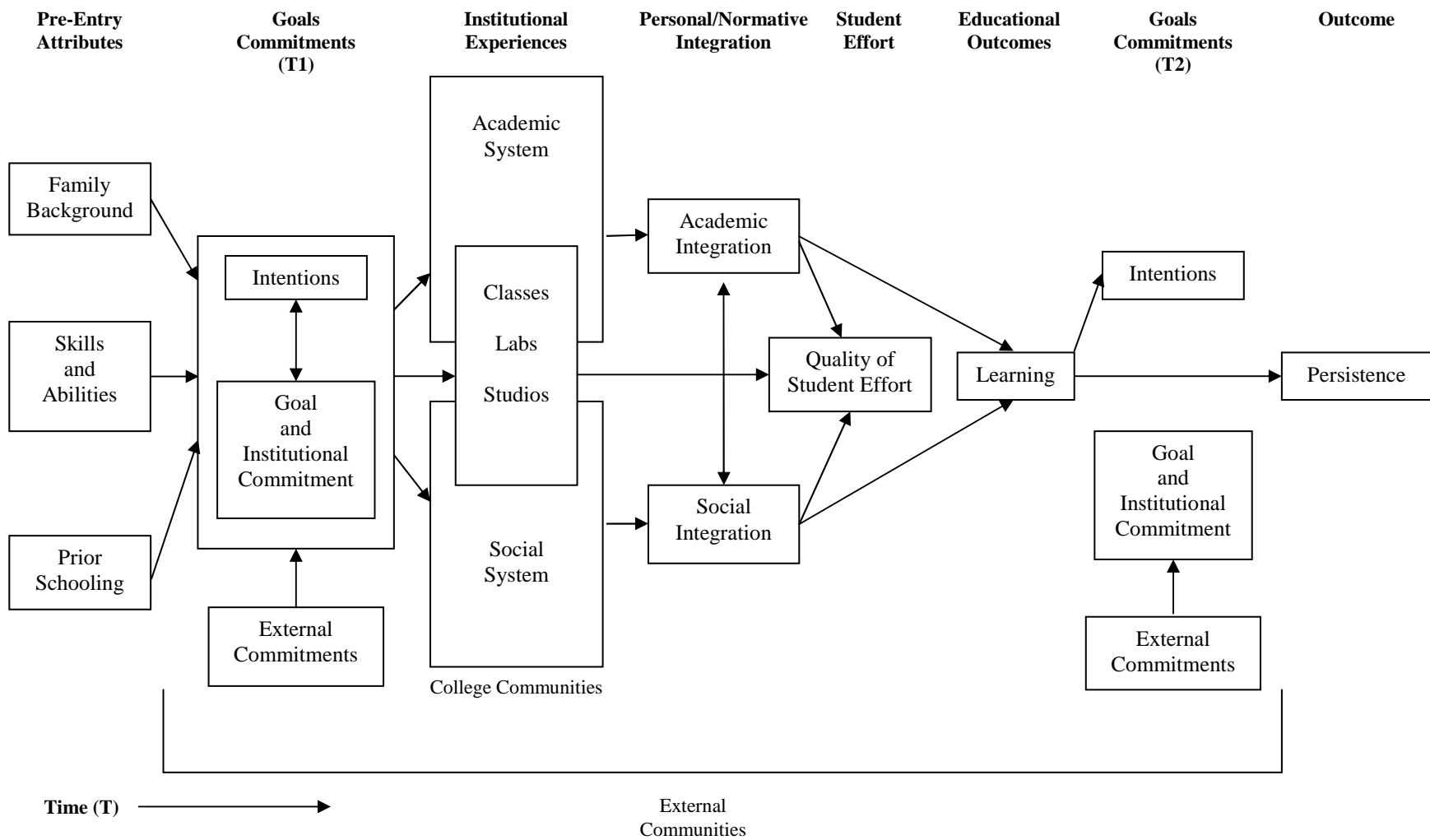


Figure 3. Tinto's 1997 revision of his studentt departure model (1997, p. 615)

constructs of academic and social integration which have gradually blended together to become a continuum of student involvement (Tinto, 1975, 1993, 1997, 1998, 2000, 2005, 2009). As highlighted by the evolution of Tinto's theoretical model of student departure, retention research has begun to focus not only on settings other than traditional 4-year colleges and universities, but also on involvement in educationally effective practices as a measure of academic integration rather than simply grade performance (Kuh, Kinzie, Schuh, & Whitt, 2005). The work on quality undergraduate education and student engagement described later in this review directly addresses the level to which students are involved in effective academic practices at an institution (Chickering & Gamson, 1987; Kuh, 2004). Before proceeding to a discussion of student engagement, however, we will first take a brief look at the research on adult student persistence and the role the classroom plays in adult student retention.

Research on Adult Student Retention and Persistence

Although the study of retention and persistence enjoys a long history (Berger & Lyon, 2005), the development and application of retention theories in the study of adult students is a relatively recent phenomenon launched in earnest in the mid-1980s by Bean and Metzner (1985), Pappas and Loring (1985), and Weidman (1985). Though they employed different definitions of adult students, these studies immediately identified ways in which adult students differ from traditional students that profoundly affect retention and persistence. In addition to increased external obligations, differences in enrollment patterns, residence, and level of personal maturity and psychological development, adult students' motivations for attending are very different from traditional

students (Bean & Metzner, 1985). Bean and Metzner's resulting model focuses heavily on academic and environmental variables and deemphasizes social integration variables (Figure 4).

Since the publication of Bean and Metzner's model in 1985, a number of authors have investigated adult student retention and persistence from a variety of perspectives. Prather and Hand (1986) found that academic integration as measured by GPA was by far the best indicator of persistence for nontraditional students and that the retention patterns were affected by gender and minority status. Cleveland-Innes (1994) likewise found that academic integration was the best predictor of adult student persistence and noted that this concept should be expanded beyond GPA to include involvement of the student in academic life. In a theory elaboration exercise (see Braxton, 2000), Sandler (2002) investigates the relations among variables in Tinto's model and adds additional endogenous and exogenous variables to the analysis. He concludes that the stress/performance and integration/commitment subsystems are important elements negotiated by adult students as is the balance between academic integration and family support (the latter tends to decrease as the former increases). Sandler (2002) concurs with Cleveland-Innes (1994) in her assessment of the importance of academic integration and academic performance. Sorey and Duggan (2008), in contrast, found that the chief predictors of persistence for adult community college students were social integration, institutional commitment, degree utility, encouragement and support, finances, an expressed intent to leave, and (lastly) academic integration. It should be noted, however, that Sorey and Duggan (2008) used an older and more restrictive definition of academic

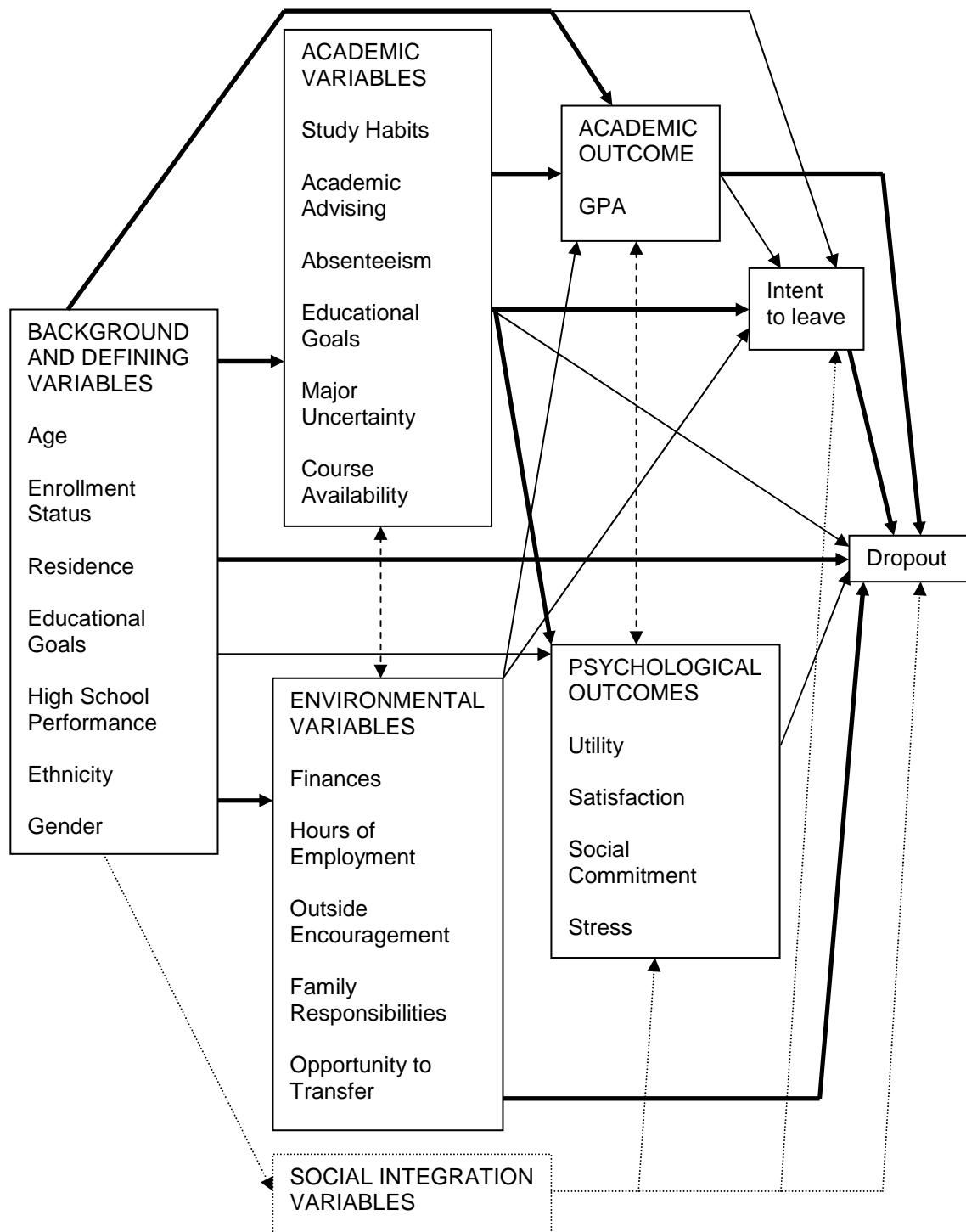


Figure 4. A model of nontraditional student attrition (Bean & Metzner, 1985, p. 491).

integration that only included GPA and a self-reported perception of intellectual and academic development.

In another study, Stolar (1991) surveyed adult students at Cumberland County College and found that nonreturning students were predominately white, female and part-time attendees that most frequently cited financial concerns, job conflicts, and parenthood as the primary reason for dropping out. He also found that continuing students requested campus child care and evening hours for classes and support services. Andres and Carpenter (1997) took a more theoretical approach in preparing a report on nontraditional students in British Columbia that highlighted the inadequacy of traditional retention models when applied to nontraditional students. In addition, they emphasized unique personal characteristics and enrollment patterns of adult students.

Several researchers employing psychological and counseling perspectives have studied adult students' developmental identities and needs to formulate strategies and counseling interventions aimed at retaining adult students (Brown, 2002; Hensley & Kinser, 2001a, 2001b; MacKinnon-Slaney, 1994; Senter & Senter, 1998). These authors focus on identifying and meeting needs unique to adult students such as work-life balance, work-to-school transition, managing multiple identities, and career planning and development. In addition, Hensley and Kinser (2001a, 2001b) introduce the concept of "tenacity" as a substitute for persistence; when studying adult students with cyclical enrollment patterns, pursuing educational goals in the long term despite occasional stop-outs ("tenacity") is more important than year-to-year or semester-to-semester enrollment (the typical definition of "persistence").

Other researchers have studied adult students involved in atypical institutions and delivery modes in an effort to enhance retention. Castles (2004) studied adult students enrolled in the UK's Open University, Park and Choi (2009) investigated factors influencing adults to persist in online learning, and Benseman, Coxon, Anderson, and Anae (2006) outlined lessons learned from Pasifika students in New Zealand. These authors emphasized practices such as active intervention, personal counseling, providing accurate and timely information, and the role played by external and family pressures. Park and Choi (2009) in particular emphasized the importance of organizational support and content relevance in promoting persistence of nontraditional learners.

Yet another set of researchers has focused on the economic aspects of adult persistence. King (2003) asserted that nontraditional students often underestimate the impact of decisions such as whether to drop a course or accept more hours of work and do not understand the cumulative effect that these decisions have on the likelihood of their completing a degree. Kirby, Biever, Martinez, and Gomez (2004) examined the impact of attendance on family, work, and social life and included suggestions to help institutions minimize the impacts of attendance for adult students. Other authors have included financial considerations as well, including Hadfield (2003) in her prescriptive guide for recruiting and retaining adult students.

A final set of adult retention theorists have focused on student involvement and the role of the classroom in adult student retention (Braxton, Jones, Hirschy, & Hartley, 2008; Graham & Gisi, 2000; Kasworm, 2003b). Just as Tinto's (1998, 2000, 2005) later work emphasized the importance of student involvement and the active and involving

classroom, adult retention researchers have recently turned their attention to these issues as described in the following section.

The Role of the Classroom in Adult Student Retention

What happens among adult students and instructors in the learning process has important implications for adult student retention (Barker, Sturdivant, & Smith, 1999; Imel, 2001; Kasworm, 2003b). Just as Knowles, Holton, and Swanson (2005), Brookfield (1986), and Rogers (1983) stated regarding adult students and Rendón (1993, 1994) reiterated in her work on minority students, learners are most likely to persist when their voices, views, and experiences are validated and included in the classroom teaching and learning process (Kasworm, 2003a).

Many other authors have highlighted the critical role of the classroom experience and the role of faculty in fostering student engagement and, by inference, academic integration and goal commitment (Braxton, 2008; Braxton, Jones, Hirschy, & Hartley, 2008; Graham & Gisi, 2000; Sandler, 2002; Sorey & Duggan, 2008; Weidman, 1985). Tinto himself emphasized the critical role of the classroom: “student engagement is, for most institutions, centered in and around the classroom” (1993, p. 132). Braxton (2008) recently edited a volume of *New Directions for Teaching and Learning* that focused exclusively on the role of the classroom in college student persistence. In this volume, a variety of classroom practices, including active and collaborative learning, service learning, and learning communities are demonstrated to be important predictors of persistence.

In creating a model of college outcomes for adult students, Donaldson and colleagues have placed the “connecting classroom” in a prominent position, calling on prior research to highlight its importance (Donaldson, 1999; Donaldson, Graham, Kasworm, & Dirkx, 1999; Graham, Donaldson, Kasworm, & Dirkx, 2000). Donaldson (1999) noted concerning adult students, “their class-related learning and their relationships with faculty and other students become the most powerful influences on their campus experiences” (p. 28). McGivney identifies high-quality course content and presentation together with a supportive learner group as critical success factors for adult students (McGivney, 2004). Kerka (1989) similarly points to a close correspondence needed between instructional and student objectives for adult students. Elsewhere, negative academic experiences are identified as a primary cause for adult student dropout (Hensley & Kinser, 2001a; 2001b). From these sources, it becomes apparent that for the adult student with substantial off-campus obligations and limited social interaction on campus, classroom experiences play a major role in institutional persistence. That is, positive classroom experiences lead to stronger goal and institutional commitment and to a greater likelihood of adult student retention.

Summary

While there are many different perspectives on how to enhance student retention in higher education, Vincent Tinto’s work has demonstrated staying power despite its shortcomings because of its relative parsimony and face validity (Braxton, 2000); students persist when their levels of goal and institutional commitment are high, and this is most likely to happen when they are successfully integrated into the academic and

social systems of the institution. Research on adult student retention affirms this pattern among adult students and emphasizes the role of the classroom as a key point of interaction between adult students and the institutions they attend. However, because of lack of agreement over how to define and operationalize academic and social integration, central constructs in Tinto's model, recent research has focused on student involvement and engagement in educational practices known to be effective (Kuh, Kinzie, Schuh, & Whitt, 2005). In the following section, student engagement is explored as a reformulation of academic integration that has been correlated with student persistence.

Student Engagement – Academic Integration Reformulated

In their work on college impact mentioned earlier, Pascarella and Terenzini (1991, 2005) point to the importance of the time and energy students devote to educationally purposeful activities – an alternative formulation of Tinto's academic integration construct – as a predictor of learning and personal development. In other words, as Kuh (2001) points out:

Those institutions that more fully engage their students in the variety of activities that contribute to valued outcomes of college can claim to be of higher quality in comparison with similar types of colleges and universities. (p. 1)

As stated in the introductory section of this paper, student engagement – defined generally as the degree to which a student is involved in a variety of educationally purposeful activities – is one of the most important predictors of postsecondary student persistence and retention (Braxton, 2008; Kinzie, Gonyea, Shoup, & Kuh, 2008; Kuh, 2004; Tinto, 1993).

Origins of Student Engagement

As a theoretical construct, student engagement has been defined best in the work of George Kuh and his colleagues (Kuh, 2001, 2004; Kuh, Kinzie, Schuh, & Whitt, 2005; Kuh & Love, 2000). However, exploring the origins of this construct in the influential work of Chickering and Gamson (1987, 1999) on high-quality undergraduate education helps us better understand the nuances of student engagement.

Seven principles for good practice in undergraduate education. In the mid 1980s, an undergraduate education reform movement was gaining momentum throughout the United States. Several influential reports were created and circulated by leading scholars, but no unified conclusion had been reached regarding what constituted a high-quality undergraduate education. In 1986, after securing support and funding from the American Association of Higher Education [AAHE], the Johnson Foundation, and the Lily Endowment, Arthur Chickering and Zelda Gamson invited a group of leading scholars to meet at the Wingspread conference center in Racine, Wisconsin, and draft a statement of principles of good practice. Among those participating in the discussion were experts on collegiate quality and undergraduate learning such as Alexander Astin, Patricia Cross, Russell Edgerton, and Joseph Katz. Chickering and Gamson prepared a number of principles of good practice in advance based upon work done by the Council on Adult and Experiential Learning [CAEL] and invited the participants to discuss and refine these in light of their own individual work on the topic. After several days, the group narrowed the list of principles to seven, which Chickering and Gamson presented in their now-classic lead article in the *AAHE Bulletin* in March, 1987 (Chickering & Gamson, 1987, 1999; Kuh, 2001).

According to the group assembled at Wingspread, high-quality undergraduate education:

1. Encourages contacts between students and faculty,
2. Develops reciprocity and cooperation among students,
3. Uses active learning techniques,
4. Gives prompt feedback,
5. Emphasizes time on task,
6. Communicates high expectations, and
7. Respects diverse talents and ways of learning (Chickering & Gamson, 1987).

Response to the “Seven Principles” was immediate and overwhelming. The work quickly expanded into a number of publications and instruments for assessing teaching practices and campus policies. Other applications soon followed, including the Seven Principles for Good Practice in Student Affairs, a joint effort by the American College Personnel Association [ACPA] and the National Association of Student Personnel Administrators [NASPA], and the College Student Experiences Questionnaire, a precursor to the National Survey of Student Engagement (Chickering & Gamson, 1999). In addition, the Seven Principles served as an important springboard for a flurry of discussion surrounding effective educational practices and outcomes-based indicators of quality in undergraduate education as described in the following sections.

Making quality count in undergraduate education. In the early 1990s, work continued on the impact of college on students. Two influential pieces were published during this time: *What Matters in College: Four Critical Years Revisited* by Alexander

Astin (1993), and Ernest Pascarella and Patrick Terenzini's monumental synthesis of research, *How College Impacts Students: Findings and Insights from Twenty Years of Research* (1991). These and other publications formed a foundation for the work of Ewell and Jones (1996) at the National Center for Higher Education Management Systems [NCHEMS] and for an important report issued by the Education Commission of the States, *Making Quality Count in Undergraduate Education* (1995).

Chapter 4 of the *Making Quality Count* report refers to twelve attributes of quality in undergraduate education that are grouped into three categories:

- Quality begins with an *organizational culture* that values:
 - High expectations,
 - Respect for diverse talents and learning styles, and
 - Emphasis on early years of study.
- A quality *curriculum* requires:
 - Coherence in learning,
 - Synthesizing experiences,
 - Ongoing practice of learned skills, and
 - Integrating education and experience.
- Quality *instruction* builds in:
 - Active learning,
 - Assessment and prompt feedback,
 - Collaboration,
 - Adequate time on task, and

- Out-of class contact with faculty (Education Commission of the States, 1995, p. 19; emphasis added).

Peter Ewell and his associates used the quality indicators set forth in this report to produce a handbook for implementing a quality learning experience at the institution level (Chickering & Gamson, 1999; Ewell & Jones, 1996). This work became the direct predecessor to the work on student engagement described below.

Creation of the National Survey of Student Engagement. As a result of his extensive work on defining and measuring quality in undergraduate education and in the face of increasing dissatisfaction with national college ranking schemes such as those employed by *U.S. News and World Report*, Peter Ewell of NCHEMS was asked to lead a team of researchers to create an instrument to measure educational quality at the undergraduate level (Chickering & Gamson, 1999). With funding from the Pew Charitable Trusts, he assembled a design team consisting of Alexander Astin, Gary Barnes, Arthur Chickering, John Gardner, George Kuh, Richard Light, and Ted Marchese (in addition to input from C. Robert Pace) to create a survey instrument. The result of their work was the National Survey of Student Engagement [NSSE], a comprehensive survey that “contains items directly related to institutional contributions to student engagement, important college outcomes, and institutional quality” (NSSE, *Our origins and potential*, n.d.).

Operationalizing Student Engagement – The NSSE

According to George Kuh, longtime director of the Indiana University Center for Postsecondary Research which oversees the NSSE:

[The NSSE is] specifically designed to assess the extent to which students are engaged in empirically derived good educational practices...The main content of the NSSE instrument, *The College Student Report*, represents student behaviors that are highly correlated with many desirable learning and personal development outcomes of college. (Kuh, 2004, p. 2)

Drawing heavily from the earlier work on quality undergraduate education, the NSSE sets forth five areas of effective educational practice, or engagement benchmarks: 1) level of academic challenge, 2) active and collaborative learning, 3) student-faculty interaction, 4) enriching educational experiences, and 5) supportive campus environment. These five benchmarks and their corresponding indicators are described below.

Benchmark 1 – Level of Academic Challenge [LAC].

Challenging intellectual and creative work is central to student learning and collegiate quality. Colleges and universities promote high levels of student achievement by emphasizing the importance of academic effort and setting high expectations for student performance. (NSSE, *Benchmarks of effective educational practice*, n.d.)

Activities and conditions include:

- Time spent preparing for class (studying, reading, writing, rehearsing, and other activities related to your academic program).
- Worked harder than you thought you could to meet an instructor's standards or expectations.
- Number of assigned textbooks, books, or booklength packs of course readings.
- Number of written papers or reports of 20 pages or more.
- Number of written papers or reports between 5 and 19 pages.
- Number of written papers or reports fewer than 5 pages.

- Coursework emphasizes: Analyzing the basic elements of an idea, experience, or theory.
- Coursework emphasizes: Synthesizing and organizing ideas, information, or experiences.
- Coursework emphasizes: Making judgments about the value of information, arguments, or methods.
- Coursework emphasizes: Applying theories or concepts to practical problems or in new situations.
- Campus environment emphasizes spending significant amounts of time studying and on academic work.

Benchmark 2 – Active and Collaborative Learning [ACL].

Students learn more when they are intensely involved in their education and are asked to think about and apply what they are learning in different settings. Collaborating with others in solving problems or mastering difficult material prepares students to deal with the messy, unscripted problems they will encounter daily during and after college. (NSSE, *Benchmarks of effective educational practice*, n.d.)

Activities include:

- Asked questions in class or contributed to class discussions.
- Made a class presentation.
- Worked with other students on projects during class.
- Worked with classmates outside of class to prepare class assignments.
- Tutored or taught other students.
- Participated in a community-based project as part of a regular course.
- Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.).

Benchmark 3 – Student-Faculty Interaction [SFI].

Students see first-hand how experts think about and solve practical problems by interacting with faculty members inside and outside the classroom. As a result, their teachers become role models, mentors, and guides for continuous, life-long learning. (NSSE, *Benchmarks of effective educational practice*, n.d.).

Activities include:

- Discussed grades or assignments with an instructor.
- Talked about career plans with a faculty member or advisor.
- Discussed ideas from your readings or classes with faculty members outside of class.
- Worked with faculty members on activities other than coursework (committees, orientation, studentlife activities, etc.).
- Received prompt written or oral feedback from faculty on your academic performance.
- Worked with a faculty member on a research project.

Benchmark 4: Enriching Educational Experiences [EEE].

Complementary learning opportunities inside and outside the classroom augment the academic program. Experiencing diversity teaches students valuable things about themselves and other cultures. Used appropriately, technology facilitates learning and promotes collaboration between peers and instructors. Internships, community service, and senior capstone courses provide students with opportunities to synthesize, integrate, and apply their knowledge. Such experiences make learning more meaningful and, ultimately, more useful because what students know becomes a part of who they are. (NSSE, *Benchmarks of effective educational practice*, n.d.)

Activities and conditions include:

- Talking with students with different religious beliefs, political opinions, or values.
- Talking with students of a different race or ethnicity.

- An institutional climate that encourages contact among students from different economic, social, and racial or ethnic backgrounds.
- Using electronic technology to discuss or complete assignments.
- Participating in:
 - Internships or field experiences
 - Community service or volunteer work
 - Foreign language coursework
 - Study abroad
 - Independent study or self-assigned major
 - Culminating senior experience
 - Co-curricular activities
 - Learning communities

Benchmark 5: Supportive Campus Environment [SCE].

Students perform better and are more satisfied at colleges that are committed to their success and cultivate positive working and social relations among different groups on campus” (NSSE, *Benchmarks of effective educational practice*, n.d.)

Conditions include:

- Campus environment provides support you need to help you succeed academically.
- Campus environment helps you cope with your nonacademic responsibilities (work, family, etc.).
- Campus environment provides the support you need to thrive socially.
- Quality of relationships with other students.
- Quality of relationships with faculty members.

- Quality of relationships with administrative personnel and offices.

Each of the indicators above is translated into a response item on the NSSE, and scores on each response item are combined to yield an index score for a respondent on each engagement benchmark (NSSE, 2005a). These index scores form the dependent variables for this study as outlined in Chapter III: Methods. In addition, a wide range of demographic information is sought from each respondent that allows researchers to disaggregate the responses along a variety of respondent characteristics such as gender, parental education level, and (in this study) “adulthood.” The index scores for the five benchmarks and the aggregate score totaled across all benchmarks operationalizes the concept of “engagement” in a particular way that is firmly grounded in the research and correlated with other measures of engagement and educational quality. George Kuh’s monograph entitled *The National Survey of Student Engagement: Conceptual framework and overview of psychometric properties* clearly sets forth the justification for the NSSE’s operationalization of student engagement (Kuh, 2004).

How Student Characteristics Affect Levels of Engagement

A great many studies of student engagement have been conducted at both the institutional and national level using results from the National Survey of Student Engagement (see the “Papers and Presentations” section of the NSSE website at <http://nsse.iub.edu> for examples). Each year, the Indiana University Center for Postsecondary Research (home of the NSSE) publishes an analysis of the NSSE survey results from a national perspective. In addition to providing high-level summaries of findings, the annual report compares student responses along a number of dimensions,

including class standing, ethnicity, gender, transfer status, participation in intercollegiate athletics, institutional type, and so forth (NSSE, 2005b). Interaction effects among student characteristics are also analyzed, such as the interaction between class standing (e.g., first-year or fourth-year status) and ethnic classification and between class standing and transfer status (NSSE, 2005b). Other studies published independently cover a broad spectrum of student characteristics from gender, ethnicity, parent education level, academic preparation, field of study, and so forth (Hu & Kuh, 2002) to the influence of information technology on student engagement (Nelson Laird & Kuh, 2005). The NSSE has been used effectively to study the engagement of a wide variety of student groups and the interactions among various student and institutional characteristics.

A similar instrument, the Community College Survey of Student Engagement [CCSSE], was developed in 2001 and administered by the University of Texas at Austin to explore student engagement at 2-year institutions (McClenney, 2007). Just like the NSSE, the CCSSE has been used to study students with a variety of characteristics including several adult characteristics. Some of the CCSSE research will be used in Chapter V to shed light on findings from this study and to develop recommendations for 4-year colleges and universities seeking to more fully engage adult students. It is interesting to note, however, that I was unable to find any studies of adult student engagement using the NSSE aside from a single study of commuter student engagement (Kuh, Gonyea, & Palmer, 2001). This is curious both because of the shift in student demographics and its implications mentioned in the introduction to this paper and because of the wealth of NSSE studies using other student characteristics. A primary purpose of this study is to begin to explore this apparent gap in the literature.

Summary

Promoting student engagement is one of the primary means for enhancing academic integration and, by inference, student retention. The National Survey of Student Engagement is an instrument firmly rooted in the literature on effective educational practices that has served for 10 years as an empirical measuring tool for assessing the degree to which students engage in practices known to be educationally effective at 4-year colleges and universities. Results from the NSSE indicate that individual characteristics influence reported levels of engagement on each of the five NSSE benchmarks, but to date no studies exist comparing the responses of adult and nonadult students to the NSSE benchmarks. In the following section, the literature on adult learners is reviewed and parallels are drawn between sound educational practices for teaching adults and the effective educational practices measured by the NSSE to establish the reasonableness of using the NSSE to study adult student engagement and retention.

Adult Learners in Higher Education

In 1907, adult education pioneer Eduard C. Lindeman enrolled at Michigan State College at the age of 22 after being orphaned and working in a number of odd jobs including ship builder, gravedigger, bricklayer, and grocery deliverer. Lindeman found the transition to postsecondary education very challenging, as it was in that time the realm primarily of the young and wealthy. His experiences formed the basis for his views on adult learning and, together with education pioneer Edward L. Thorndike's book, *Adult Learning* (Thorndike, Bregman, Tilton, & Woodyard, 1928), helped to launch inquiry into the field prior to World War II (Lindeman, 1926). For some 40 years

following the publication of Thorndike's and Lindeman's books, adult learning was studied somewhat quietly. Then, in the 1960s and early 70s, several landmark studies of adult learners were conducted by Johnstone and Rivera at the National Opinion Research Center and the National Center for Education Statistics at the U. S. Department of Education (Merriam, Caffarella, & Baumgartner, 2007) and by Allen Tough (1971). At about the same time, Malcolm S. Knowles introduced the concept of "andragogy," which first originated in Germany and was being used in European literature on adult education, and began anew a rich discussion of how adults learn (Knowles, 1968, 1970, 1973). This discussion continues to the present and seeks to answer five basic questions about adult learners: 1) how to define adult learners relative to nonadult learners, 2) who participates in adult learning, 3) why they participate, 4) what they want to learn, and 5) how they best learn it (Cross, 1981). As volumes have been written on these topics, the following review is a necessarily brief look at some of the more important concepts in the literature.

Defining Adult Students

One of the primary difficulties encountered when embarking upon a discussion of adult participation in higher education is clearly defining what is meant by the term "adult student." Indeed, a brief glance at six sources on adult students yields six different definitions (Bash, 2003; Brookfield, 1986; Cross, 1981; Hensley & Kinser, 2001; Horn & Carroll, 1996; Kasworm, 2003a; Sissel, Hansman, & Kasworm, 2001). Because no standard definition exists, data on adult postsecondary students are not systematically disaggregated in such a way that comparisons between adult and nonadult students can be easily made.

Oftentimes, research on adult or nontraditional students defines them as students who are 25 years of age or older and attending part-time (Bean & Metzner, 1985; Choy, 2002). While this approach makes disaggregating the data on adult students somewhat easier, it masks important features of today's students highlighted by Bash (2003) in his book on adult students entitled *Adults in the Academy*. Bash pointed out that imposing an artificial age limit on the adult population not only excludes younger students who possess significant characteristics of adult students (especially those in the 22- to 25-year age range), it also hides the fact that even younger college students immediately out of high school are beginning to assume characteristics typically ascribed only to adult learners such as financial independence, full-time work, care for dependents, commuter status, and military service. Philibert, Allen, and Elleven (2008) recently reiterated this point in their study of nontraditional students at community colleges, claiming that most students (even younger ones) possess at least one of the so-called nontraditional characteristics.

A particularly insightful definition of adult learners was forwarded by Horn and Carroll (1996) in their report on nontraditional students submitted to the National Center for Education Statistics. Rather than imposing an age criterion, Horn and Carroll characterized adult learners as having a set of characteristics falling into three main categories: enrollment patterns, financial and family status, and high school graduation status. Specifically, Horn and Carroll (1996) used the following characteristics to classify students as minimally nontraditional (possessing only one of these characteristics), moderately nontraditional (possessing two or three of these characteristics), or highly nontraditional (possessing four or more):

- Delays enrollment (does not enter postsecondary education in the same calendar year that he or she finished high school);
- Attends part time for at least part of the academic year;
- Works full time (35 hours or more per week) while enrolled;
- Is considered financially independent for purposes of determining eligibility for financial aid;
- Has dependents other than a spouse (usually children, but sometimes others);
- Is a single parent (either not married or married but separated, and has dependents); or
- Does not have a high school diploma (completed high school with a GED or other high school completion certificate or did not finish high school).

This definition captures three important characteristics of an adult learner: 1) she or he is a functionally independent individual who no longer relies upon parents for financial support and decision making; 2) she or he has substantial work and/or life experience that sets him or her apart from a traditional student; and 3) she or he must balance competing commitments rather than devoting attention fully to school (Choy, 2002). This definition also dramatically expands the scope of those who can be considered “adult students” beyond the typical research in this area, and it captures critical changes in the nature of students both young and old (Philibert, Allen, & Elleven, 2008). Literature on adult learners highlighted in the review below underscores the important implications of these student characteristics.

Adult Learners: Who Participates and Why?

The first comprehensive studies of participation in adult learning shed important light on a phenomenon that turned out to be nearly ubiquitous – learning in adulthood. Early work by adult education pioneer Cyril Houle (1961, 1996) complemented the studies of Johnstone and Rivera (1965) and concluded that adult learners fell into three general categories. First, *goal-oriented* adult learners are pursuing a specific objective that may be anything from learning a new skill to retraining for a new career. Second, *activity-oriented* adult learners participate in education for the social benefits of group membership and the interpersonal relationships arising therefrom. Third, *learning-oriented* adult learners seek knowledge for its own sake and find great fulfillment and satisfaction from doing so (Houle, 1961, 1996; Johnstone & Rivera, 1965; Knowles, Holton, & Swanson, 2005; Merriam, Caffarella, & Baumgartner, 2007).

Allen Tough, another important adult learning theorist, adopted a slightly different perspective as he studied participation rates among adults. Tough categorized adult learners by type of learning activity – *self-directed* learning activities, *organized* learning activities, and *formal* learning for credit. He found that nearly all adults participate in seven to ten self-directed learning activities per year, while only about one-third of adults participate in organized learning activities. By far the smallest portion of adults, only about 10%, participate in formal learning for credit during any given year (Cross, 1981; Tough, 1971).

Following up on Tough's work in 1981, Patricia Cross investigated participation patterns of adult learners in further detail in an attempt to build a theoretical framework for participation in adult learning activities. Cross began her discussion by noting three

areas of rapid change requiring constant learning: demographic changes, social changes (including changing life roles, changing career patterns, increased longevity, and blended life plans), and technological changes involving the shift from a production economy to an information and service economy (Cross, 1981). In a similar vein, Merriam, Caffarella, and Baumgartner (2007) recently posited three social forces driving adults to learn: demographic changes including changes in age distributions and changes in ethnic and racial composition, globalization and its accompanying changes in economic and social structures, and rapidly changing technologies.

Cross (1981) focused not only on what drives adults to participate in learning activities but also on what educational institutions do to attract them into formal and organized learning programs. She stated that pressures to increase the enrollments of adult students come from three sources: traditional colleges and universities seeking to increase their enrollments by recruiting nontraditional learners; mandates from professional, licensing, and consumer advocacy groups for continuing professional education; and public policy efforts to equalize educational opportunities and attainment. Interestingly, all three approaches are external to the learner and controversial in some way: Cross pointed out that there is a difference between serving adults by creating programs tailored to their needs and recruiting adults into pre-existing programs that may be a poor fit. At the center of the controversy is the issue of whose needs are being served – those of the institutions or those of the students (Cross, 1981).

Partly because they participate for different reasons, adults of different socioeconomic and ethnic backgrounds do not participate equally in organized and formal learning activities (Cross, 1981; Merriam, Caffarella, & Baumgartner, 2007). A

common finding across studies, including those of Johnstone and Rivera (1965) and Cross (1981), is that the typical adult learner is a young, well-educated, white-collar worker of moderate income (Brookfield, 1986). To investigate why, Cross identified three categories of barriers to participation. First, *situational barriers* include issues such as time, cost, proximity, transportation, familial support, and so forth. Second, *institutional barriers* such as scheduling problems, institutional mandates for residency or similar constraints, and lack of readily available and accurate information about programs, financial aid, and so on make participating difficult. Third, *dispositional barriers* such as poor self-concept, prior negative educational experiences, and lack of intrinsic motivation can inhibit adult learners (Cross, 1981). Merriam, Caffarella, and Baumgartner (2007) add a sociological lens to the study of participation and draw parallels between work on adult participation in learning activities and research on social participation that problematizes the concept of participation and seeks to understand when it is meaningful.

Brookfield (1986) notes that studies of adults who choose not to participate in formal learning activities are frequently characterized by deficit perspectives because nonparticipants often belong to an ethnic minority group and are either unemployed or employed in low-paying occupations. This view of nonparticipants, he claims, is fundamentally flawed because being disadvantaged is a social product, not an individual phenomenon, and nonparticipation is a function of cultural attitudes that view formal education as irrelevant (Valencia (1997) has since identified this last perspective as deficit thinking as well). Brookfield (1986) further claims that previous educational participation and attainment is the single biggest predictor of future participation in

formal education and that prior successful educational experience is another important factor. These findings echo those by college choice and persistence researchers studying predisposition and participation factors among traditional students; prior educational attainment (and that of parents) and successful educational experiences are major predictors of future involvement (Astin, 1984; Bean & Eaton, 2000; Berger, 2000; Hossler & Gallagher, 1987; Tinto, 1993).

To better understand adult participation in formal learning and to form a basis for recommending institutional responses, Cross (1981) proposed a theoretical model that she dubbed the “Chain of Response,” or COR model (see Figure 5).

The seven elements of the COR model lead to six recommendations for those who want to increase the participation of adults in learning activities:

- Raise self-confidence levels,

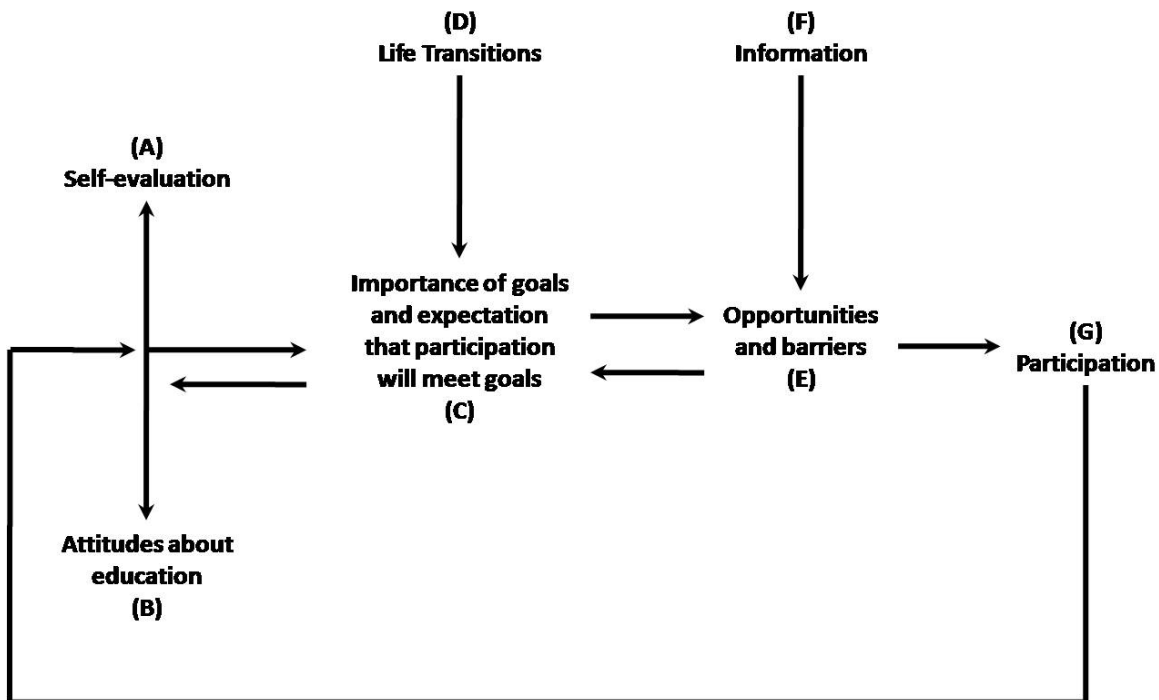


Figure 5. Cross’s Chain of Response (COR) model (1981, p. 124)

- Build positive attitudes toward education,
- Meet goals and expectations of learners,
- Respond to life transitions,
- Create opportunities and remove barriers, and
- Provide accurate information.

Cross included strategies for each of these recommendations and additional information for how to encourage self-directed learning and formal learning by focusing on different factors in the COR model (Cross, 1981).

In summary, nearly all adults participate in some kind of learning on an ongoing basis. However, participation in organized learning activities and formal learning for credit (the focus of this study) is not equitable across social classes, genders, and ethnic groups and is influenced by factors both internal and external to the adult learner.

Institutions offering formal credit-bearing programs for adults have a role in increasing motivation to participate and decreasing barriers for doing so – a stance that echoes that of researchers studying student retention. Institutions must recognize the external factors influencing adult student participation and understand how these affect persistence; in many cases, institutional efforts can counteract negative external pressures and help adult students persist (Bean & Metzner, 1985). Furthermore, institutions must understand and respond to how adults are different from traditional students in what and how they learn in order to more fully engage them in effective educational practices.

What and How Adults Learn

The study of what adults choose to learn and how they learn it comes from a rich tradition of learning theory. While beyond the scope of this study, the voluminous literature on how people of all ages learn (see Knowles, Holton, & Swanson, 2005; Merriam, Caffarella, & Baumgartner, 2007) harks back to the classic Greek thinkers and beyond and includes familiar approaches such as behaviorism (from theorists such as Guthrie, Hull, Pavlov, Watson, Thorndike, Skinner, and others), humanism (influenced heavily by psychologists such as Freud, Maslow, Rogers, and others), cognitivism (Wortheimer, Kohler, Koffka, Lewin, Ausubel, Piaget, Gagne, etc.), social cognitivism (Miller and Dollard, Bandura, Rotter), and constructivism (Dewey, Candy, Lave, Rogoff, von Glaserfeld, and Vygotsky). Newer trends in experiential learning (Kolb, 1984), transformative learning (Cranton, 2006; Mezirow, 1991), brain-based learning (Zull, 2002), organizational learning (Argyris & Schon, 1978; Senge, 2006), and even the study of post-modern, spiritual, and indigenous learning have added to adult learning theory (Merriam, Caffarella, & Baumgartner, 2007). In addition, literature on human development, both physical and cognitive, has informed the formation of adult learning theories (Knowles, Holton, & Swanson, 2005; Merriam, Caffarella, & Baumgartner, 2007). Because of their pivotal importance to the practice of adult learning and their widespread usage, the psychological perspectives of Maslow (1970) and Rogers (1983) and the integrative theory of andragogy forwarded by Malcolm Knowles (Knowles, Holton, & Swanson, 2005) are discussed in greater detail below.

Psychological Perspectives on Adult Learning

Just as the field of education in general borrows heavily from the work of psychologists, adult learning theories have been influenced by a variety of psychological researchers and clinicians from Sigmund Freud and Carl Jung to Erik Erikson and Arthur Chickering (see Knowles, Holton, & Swanson, 2005). The work of humanist psychologists Abraham Maslow (1970) and Carl Rogers (1983) has been especially important to adult learning theorists, including Stephen Brookfield (1986).

Abraham Maslow and the hierarchy of needs. Maslow's work on human motivation has been very influential in the study of adult learners, particularly when trying to understand their motivations. Maslow proposed a pyramid of needs including (beginning at the most basic) physiological needs, safety, love and belonging, self-esteem, and self-actualization (Maslow, 1970; Merriam, Caffarella, & Baumgartner, 2007). While Maslow proposed that self-actualization is the primary purpose of learning and that educators should strive to bring this about, adult education theorists and practitioners readily acknowledge that more basic needs must be met first, and that these more basic needs can also provide strong motivation for adult learners. Furthermore, if the most basic needs – physiological and safety – are not being met, adult learners are likely to drop out of formal education (Cross, 1981). In reviewing Maslow's work, Knowles, Holton, and Swanson (2005) emphasized the special role of safety needs in the creation of Maslow's elements of the growth process. In other words, adult learners must have their physiological needs (food, shelter, care for dependents, etc.) met and must feel physically and psychologically safe to persist and succeed in higher education.

Carl Rogers and person-centered learning. In contrast, Rogers (1983) focused more on the methods that help adults learn. Rogers was a psychotherapist and colleague of Maslow who, in reaction to the techniques of psychoanalysis and behavior modification that had previously dominated the field of psychotherapy, developed an approach called “person-centered therapy,” in which the therapist uses a nondirective approach to help the client come to an understanding of his or her own mental processes.

Rogers’ personal creed was simple:

All individuals have within themselves the ability to guide their own lives in a manner that is both personally satisfying and socially constructive. In a particular type of helping relationship, we free the individuals to find their inner wisdom and confidence, and they will make increasingly healthier and more constructive choices. (Kirschenbaum & Henderson, 1989, p. xiv)

Rogers’ work in psychotherapy proved to be extremely influential in many fields. Therapists, marriage counselors, psychologists, and many others employ a person-centered approach. In addition, as a graduate student at Teacher’s College, Carl Rogers was powerfully influenced by the philosophies of great educators such as John Dewey. Dewey, known among other things as the father of experiential education, believed that education is most effective when learning is situated in real-life settings where investigation and exploration is followed by reflection in a continuous cycle (Brookfield, 1986). Dewey’s ideas, together with his own experiences in the classroom, led Rogers to look closely at the current practice of education and the teacher-student relationship. In order to achieve what he felt was the more productive mode of participatory analysis, Rogers (1983) derived several key elements of a proper educational situation. A productive learning environment consists of:

- A climate of mutual respect and trust,

- A participatory mode of decision making involving both learners and instructors,
- A setting in which students prize themselves and feel self-confident,
- An environment that aims toward uncovering excitement in discovery,
- An instructor whose attitude fosters learner exploration,
- A situation in which the instructor can also learn, and
- A recognition that true satisfaction is found internally, not externally.

In particular, Rogers viewed an educator as a *facilitator* rather than an *instructor*. He asserted that it is the educator's responsibility to provide a climate in which students feel safe to explore and take risks. He further claimed that no one teaching strategy is "right;" however, didactic techniques tend to discourage learner exploration and undermine the teacher-student relationship that must remain a collaboration of equal partners. Drawing upon his theories of psychoanalysis, Rogers promoted active listening, empathy, and shared experience in education (Kirschenbaum & Henderson, 1989; Rogers, 1983).

Brookfield's six principles of effective practice. Though Rogers was primarily addressing teachers of young students, it is interesting to note that teachers of adults have more widely assimilated his suggested practices. In particular, Brookfield (1986) leaned heavily on Carl Rogers's concept of the teacher as facilitator of learning in his work on teaching adult learners. Brookfield (1986) proposed six principles of effective practice for teachers of adults:

1. Participation in learning is voluntary.
2. Effective practice is characterized by a respect among participants for each other's self-worth.

3. Facilitation is collaborative. In other words, teaching and learning is a cooperative process, not a unidirectional transaction.
 4. Praxis – a continual cycle of activity, reflection, and analysis – is at the heart of effective facilitation.
 5. Facilitation aims to foster in adults a spirit of critical reflection whereby they will come to question many aspects of their personal, professional, and political lives.
 6. The aim of facilitation is the nurturing of self-directed, empowered adults.
- (pp. 9-11)

At the heart of Brookfield's six principles is a fundamental respect for and validation of the individual learners and their life experiences and an effort to develop their skill in analytical self-reflection. Furthermore, he emphasizes the collaborative nature of adult learning.

Interestingly, Laura Rendón's work on minority student retention in the mid 1990s asserted that colleges and universities can work to validate the experiences of minority students (including nontraditional students) in both academic and nonacademic settings, inferring that such students are most likely to persist if they feel their life experiences are validated in and out of the classroom (1993, 1994). This concept of learner validation closely parallels Rogers' (1983) person-centered assertions and Brookfield's (1986) six principles of effective practice and has direct application in fostering academic integration for adult students.

Psychological perspectives have influenced other adult learning theorists. Though he builds his work primarily on the earlier writings of Lindeman (1926), Knowles (1968;

Knowles, Holton, & Swanson, 2005) also borrows from the psychological perspectives described above. The following section outlines Knowles's theory of andragogy.

Andragogy – A Theory of Adult Learning

Malcolm S. Knowles, known as the father of andragogy (the science of teaching adults) in the United States, is perhaps more widely cited than any other adult learning theorist. Since his first publication explaining the concept of andragogy (Knowles, 1968), Knowles has been lauded and criticized with equal fervor (see Brookfield, 1986; Cranton, 2006; Cross, 1981; Knowles, Holton, & Swanson, 2005; Lawler, 1991; Merriam, Caffarella, & Baumgartner, 2007).

Knowles noted that, in the classical Greek and Roman periods, all of the examples held up as great teachers were teachers of adults – Socrates, Plato, Jesus Christ, and so forth. Their teaching methods were based upon reflective inquiry in which lived experience was investigated to find meaning. Our classical notions of pedagogy, he argued, originated later in the monastic schools, where the primary goal was different and emphasis was placed upon rote memorization and adoption of dogmatic stances. Knowles asserted that this later concept is what has become embedded in our ideology of teaching and learning and that it is ill suited for adult learners. He therefore sought to draw a distinction between the classical concept of pedagogy and its implicit assumptions and a different set of assumptions to inform educators of adults (Knowles, Holton, & Swanson, 2005).

Knowles himself was heavily influenced by the work of Eduard Lindeman (Knowles, 1973). Lindeman (1926) proposed five key assumptions about adult learners

found in every edition of *The Adult Learner* since the first (Knowles, 1973; Knowles, Holton, & Swanson, 1998, 2005):

1. Adults are motivated to learn as they experience needs and interests that learning will satisfy.
2. Adults' orientation to learning is life-centered.
3. Experience is the richest source for adults' learning.
4. Adults have a deep need to be self-directing.
5. Individual differences among people increase with age. (Knowles, Holton, & Swanson, 1998, p. 40)

In a similar fashion, Knowles proposed and refined a set of six assumptions about how adults learn that can serve as a guide for those working with adult students (Knowles, 1970; Knowles, Holton, & Swanson, 2005). While numerous critiques of and alternatives to andragogy have since been offered, the first four assumptions of andragogy and the additional two assumptions that were later added are still used widely in the discussion about how to approach the teaching of adults (Knowles, Holton, & Swanson, 2006; Merriam, Caffarella, & Baumgartner, 2007). The six assumptions are outlined and compared to pedagogical assumptions below.

First assumption: learner's need to know. Adults need to know *why* they are learning something; they need to understand the practical application of what they are learning to current or anticipated life situations. In some cases, adults come to the learning experience already aware of why they need to know something; in other situations, the learning facilitator will need to help participants become aware of how the learning situation can improve their quality of life. In contrast, pedagogy assumes that

“learners only need to know that they must learn what the teacher teaches if they want to pass and get promoted; they do not need to know how what they learn will apply to their lives” (Knowles, Holton, & Swanson, 1998, p. 62).

Second assumption: self-concept of the learner. Adult students view themselves as being capable of self-direction and want others to see themselves in this way as well. They tend to resist situations in which they are required to assume a position of dependency. In fact, an adult student treated as a dependent learner may choose to drop out or passively (and actively, in some cases) resist learning. Under the pedagogical model, a teacher automatically assumes that the learner is a dependent personality, and learners come to adopt this self-concept (Knowles, Holton, & Swanson, 1998).

Third assumption: prior experience of the learner. Adult students come to the classroom with a greater quantity and quality of life experience than young students, and this lived experience can serve as a great resource for learning. Indeed, adult students expect to be able to bring their lived experience to bear in educational settings because it forms an important part of their identity; any discounting or diminishing their experiences will be perceived as an attack on their identity. In contrast, reflectively analyzing past life experience is viewed as an important instructional method. In a pedagogical framework, the learner’s experience is of little worth compared to that of the teacher, textbook, or other instructional materials. Transmittal techniques form the basis of instructional methods (Knowles, Holton, & Swanson, 1998).

Fourth assumption: readiness to learn. Readiness to learn is critical for adult students; adults become ready to learn when they must cope effectively with real-life situations. A teacher of adults must be skilled in creating a sense of readiness among

students and in capturing moments of readiness incidental to developmental tasks and life transitions. Under the pedagogical viewpoint, learners are expected to be ready to learn when the teacher directs in order for them to pass and get promoted (Knowles, Holton, & Swanson, 1998).

Fifth assumption: orientation to learning. Adult learning is most effective when it is task- or problem-centered and when knowledge and skills are presented in the context of real-world application. Knowles adopts the viewpoint of Eduard Lindeman (1926), who emphasized the artificial nature of subject-based teaching for adults who must deal with complex problems that span multiple subject areas. Adult learners want to be able to immediately apply what they are learning. A pedagogue assumes that learners have a subject-centered orientation and that learning is the process of acquiring subject-matter content (Knowles, Holton, & Swanson, 1998).

Sixth assumption: motivation to learn. Finally, the most important motivator for learning among adult students is an internal desire for self-betterment. However, this is often counteracted by “such barriers as a negative self-concept, inaccessibility of opportunities or resources, time constraints, and programs that violate principles of adult learning” (Knowles, Holton, & Swanson, 1998, p. 68). In the pedagogical model, learners are motivated by external sanctions such as grades and teacher pressure.

Critiques of Andragogy

Andragogy: a theory or set of assumptions? The concept of andragogy has been criticized because it fails to have the descriptive and predicative power typically ascribed to theories (Merriam, Caffarella, & Baumgartner, 2007). However, Knowles (Knowles,

Holton, & Swanson, 1998) clearly stated that andragogy is simply a set of assumptions about learners that are qualitatively different than the typical assumptions related to teaching and learning that arise from the monastic model and research on learning in children and animals. Nevertheless, he asserted that these assumptions produce a dramatically different teaching approach that is better adapted to most adult students. The assumptions of andragogy, he claimed, will lead the teacher of adults to select learning frameworks that place higher emphasis on shared construction of meaning, experiential education, and conversation rather than behavior modification and information delivery (Knowles, Holton, & Swanson, 1998; Merriam, Caffarella, & Baumgartner, 2007). In this regard, his work is similar to that of Brookfield (1986) and Rogers (1983) and includes concepts originally introduced by Dewey (Brookfield, 1986).

Andragogy versus pedagogy. When Knowles first published his work, *The modern practice of adult education* (1970), he viewed andragogy and pedagogy as dichotomous categories. However, with time and in response to repeated criticism, he adjusted this viewpoint to allow for a continuum of approaches. In later works (see Knowles, Holton, & Swanson, 2005), Knowles asserted that an individual's dependency decreases with age under normal circumstances and that as a learner becomes more autonomous, the assumptions of pedagogy become increasingly inappropriate.

Interestingly, some authors have pointed out that adults do not always fit andragogical assumptions – for instance, Cross (1981) finds that many adults prefer directed learning – while others indicate that even younger students are adopting characteristics traditionally ascribed only to adults (Levine & Cureton, 1998).

Summary. In summary, Knowles (1968, 1970, 1973) developed a set of assumptions about how adults learn based upon the fundamental belief that adults learn and function differently than children and adolescents because of their life experiences and relative independence. While thoroughly questioned and critiqued since the early 1970s, many of Malcolm Knowles' ideas and assumptions about adult learners continue to be very influential among teachers of adults, and a number of theorists have continued to both extend his ideas and develop alternatives (Merriam, Caffarella, & Baumgartner, 2007).

Implications for Studying Adult Student Engagement

The work on quality undergraduate education and the ensuing work on student engagement was specifically intended to address the needs of all students (Chickering & Gamson, 1987). The literature on adult learning above highlights a number of adult learning factors found in the NSSE benchmarks that lend credence to the claim that it is an effective tool for measuring the engagement of both traditional and adult students (NSSE, *Benchmarks of effective educational practice*, n.d.). In particular, the following parallels are immediately apparent.

Learner's need to know and orientation to learning. As highlighted above, adult students need to understand the relevance of what they are studying and how it can be applied to everyday situations (Knowles, Holton, & Swanson, 2005). NSSE Benchmark #1, LAC, specifically measures the degree to which coursework emphasizes applying new theories or concepts to practical problems or in new situations in addition to activities lower on Bloom's taxonomy. In addition, Benchmark #4, EEE, includes items

about co-curricular and other applied-learning activities (NSSE, *Benchmarks of effective educational practice*, n.d.).

Self concept and prior experience of learner. Adult students also need to feel like a valued part of the learning process and that their experiences and knowledge are valued (Knowles, Holton, & Swanson, 2005). Active and collaborative learning is especially important because it includes students in the knowledge formation process as active contributors of their own experiences and perspectives (Braxton, 2008). NSSE Benchmark #2, ACL, specifically measures the degree to which active and collaborative learning takes place and includes indicators such as “contributed to class discussions.” In addition, respectful relations between faculty and students is an integral component of Benchmark #3, SFI (NSSE, *Benchmarks of effective educational practice*, n.d.).

Supportive campus environment. Adult learning theorists cited above refer to the importance of campus structures that support and enable adult students (Cross, 1981; Sissel, Hansman, & Kasworm, 2001). NSSE Benchmark #5, SCE, includes indicators such as a “campus environment [that] helps you cope with your nonacademic responsibilities (work, family, etc.)” (NSSE, *Benchmarks of effective educational practice*, n.d.).

Factors on which adult and nonadult students might respond differently. In contrast to the factors listed above that seem to be important for both adult and traditional students, the adult learning literature indicates that adult students may be less likely than their nonadult peers to report high levels of engagement on a number of indicators (Cleveland-Innes, 1994). In particular, work with other students and faculty outside of class may be limited for adult students due to conflicting work and family obligations

(see Benchmarks #1, 2, & 3). A supportive campus environment (Benchmark #5) that provides “the support you need to thrive socially” may not be as important to adult students, either (Cleveland-Innes, 1994; NSSE, *Benchmarks of effective educational practice*, n.d.). In other words, while the five benchmarks seem to be a good aggregate indicator of adult student engagement, there are some individual response items that may differentiate adult and nonadult students. Although a disaggregation of the benchmarks may be a good means of teasing out these differences, it is beyond the scope of this study and may provide a productive direction for future research.

Summary of Adult Learning Factors

Most authors agree that adult learners share several characteristics: they are generally self-directed, have a need to establish the relevance of what they are learning, possess a wealth of experience that can be brought into the learning situation, and want to be respected and included in the construction of knowledge (Brookfield, 1986; Cranton, 2006; Cross, 1981; Knowles, Holton, & Swanson, 2005; Merriam, Caffarella, & Baumgartner, 2007). These characteristics have important implications for how we teach adult students. As noted in the literature on retention and engagement, the classroom is an important site for adult student involvement. It is important to note that the factors found in the literature on quality undergraduate education and student engagement outlined above in many cases parallel what the literature sets forth as key considerations for adult learners and that a primary goal of the adult learning literature is to increase the likelihood of success for adult students. It seems reasonable, then, to infer that engagement in the educationally purposeful activities highlighted above is an important

indicator for adult students just as it is for traditional students and that the National Survey of Student Engagement is an appropriate tool for studying adult student engagement.

Summary

In the foregoing review of literature, I have sought to establish the following line of reasoning. First, participants in higher education benefit in a variety of ways, but not everyone benefits equally. Participants are most likely to benefit when they persist to goal completion, defined in most instances as graduation. However, adult students fall far behind their nonadult counterparts in persistence to graduation. The voluminous literature on student retention points to the importance of academic and social integration as predictors of persistence to graduation, but the definitions of these two predictors are contested. The literature on quality undergraduate education and student engagement provides an alternative formulation of integration that has been correlated with student persistence. However, engagement of adult students in educationally effective practices at 4-year colleges and universities has not been compared to that of nonadult students in a systematic way using tools such as the NSSE, in part because of disagreement over how to define adult students. The literature on adult learners not only helps to define adult students and differentiate them from nonadult students, it also validates the importance of many of the educationally effective practices surveyed on the NSSE for adult students and leads us to the conclusion that the NSSE can be used appropriately to study the engagement of both adult and nonadult students.

With regard to adult students at colleges and universities, gaps in the literature lead us to important questions with implications for adult student retention. First, although the literature hypothesizes that adult students experience different levels of integration and engagement than nonadult students, this has been explored only scantily (Kuh, Gonyea, & Palmer, 2001). Consequently, the first research question of this study seeks to directly measure whether there is in fact a significant overall difference in the levels of engagement reported by adult and nonadult students on each of the five NSSE benchmarks.

This first question begs a second and third: if there is a difference between adult and nonadult students' levels of engagement, how do the levels of engagement vary with degree of student "adulthood," and which characteristics of adult students contribute most to this variation? To date, no attempts have been made to determine which of the adult characteristics has the largest impact on engagement and retention. Unfortunately, the information collected on the 2005 form of the National Survey of Student Engagement does not include all of the characteristics of adult students set forth above (NSSE, 2005c). Consequently, the following items from the 2005 NSSE will be used as indicators of adult student status (or "adulthood"):

- Age category (based on item #15 – year of birth)
- Enrollment status (based on item #22 – full-time or less than full-time)
- Number of hours spent weekly working for pay (sum of items #9b and 9c)
- Number of hours spent weekly providing care for dependents (item #9f)

- Location of residence (item #26) – note: this item is likely to be highly correlated with item #9g (number of hours spent weekly commuting to class), so both will not be used.

Similar to Horn and Carroll's (1996) taxonomy, in this study a student's "adulthood" will fall along a continuum from largely traditional (younger, full-time, no work for pay, no time caring for dependents or commuting to class) to largely adult (older, part-time, 30+ hours weekly working for pay, substantial time spent caring for dependents and residence within driving distance).

The fourth item of interest that arises from the literature is a question about the relative magnitude of the influence of adult characteristics as compared to other important characteristics of students and institutions. In other words, do the various characteristics of adult learners mentioned above have a greater or lesser impact on level of engagement than other factors traditionally explored in the literature and measured on the NSSE, i.e., gender, ethnicity, parental education level, class standing, and institutional type?

By finding the answers to these questions, this study endeavors to provide recommendations for institutions enrolling increasing numbers of adult students regarding how these students engage differently than their nonadult peers, which characteristics seem to make the most difference, and how these characteristics interact with one another to influence student engagement. Appropriate retention strategies can then be developed to address the areas of low engagement as identified by this study.

We now turn to a discussion of the research methods that will be employed to answer these questions. In the following chapter, the construction, validation, and uses of

the National Survey of Student Engagement and its five engagement benchmarks will be outlined, and a description of the sample and statistical techniques to be employed will be given.

III. METHODS

As described in the preceding review of literature, student engagement has been studied for many years, and one of the most prominent instruments used by institutions and researchers is the National Survey of Student Engagement [NSSE] administered by the Indiana University Center for Postsecondary Research [IUCPR]. *The College Student Report*, the core instrument of the NSSE, includes 42 indicators of student engagement grouped into five engagement benchmarks as described in Chapter II (NSSE, 2005c). In addition to addressing each of these indicators, NSSE respondents are asked to complete a number of demographic survey items that allow researchers to disaggregate the data along a variety of dimensions (Kuh, 2004). Since 2000, the NSSE has been administered under contract to first- and fourth-year students at 4-year colleges and universities across the United States.

This study utilized data from the 2005 NSSE administration and a correlational research design to investigate four research questions:

1. Do adult students report significantly different levels of engagement than nonadult students on each of the five NSSE engagement benchmarks?
2. How does level of engagement vary with level of adulthood on each of the five NSSE engagement benchmarks?
3. Which indicators of adult status have the largest effect on level of engagement for each of the five NSSE engagement benchmarks?

4. How do the effects of adult status indicators on level of engagement compare with the effects of other important demographic variables, i.e., gender, ethnicity, parent education level, class standing, and institutional type?

Correlational designs, such as those employed here, are most useful when the purpose of the study is to discover relationships between variables such as adulthood and level of engagement through the use of correlational statistics (Edwards, 1984; Gall, Borg, & Gall, 1996; Hays, 2007; Keppel & Wickens, 2004). Like causal-comparative research designs, correlational designs are intended to lead to inferences about possible causes of various kinds of behavior by comparing the behavior of subjects possessing certain characteristics in varying degrees. Correlational designs are not experimental in nature; in other words, they are intended to study the effects of natural variation in the subjects rather than imposing various treatments and studying the outcomes.

Consequently, causation can only be inferred, not established. In addition, correlational designs are typically applied *ex post facto* – after the causes being studied have presumably exerted their effect on another variable (Gall, Borg, & Gall, 1996).

Correlational research designs have been used commonly when studying the impact of various demographic factors on student engagement as measured by the NSSE benchmarks. For instance, Filkins and Doyle (2002) used data from the 2001 NSSE and correlational methods to study the engagement of TRIO-eligible students to discover that low-income, first-generation students tended to benefit from engagement in collaborative learning to a greater extent than their college peers. Similarly, Harper, Carini, Bridges, and Hayek (2004) used NSEE data and correlational methods to study gender differences among African American undergraduates at historically black colleges and universities

(HBCUs) and found that female students scored significantly higher on academic challenge measures, while male students scored higher on student-faculty interaction measures. In a third example, Zhao, Kuh, and Carini (2005) compared the engagement of international and American students on the NSSE using correlational methods and found that international students were more engaged than their American counterparts particularly in their first year of study. These three studies and many others support the use of correlational methods for this study.

The following sections describe the NSSE in further detail, define the sample of NSSE data that was used and why this sample leads to valid and reliable findings, specify the independent and dependent variables used in the analyses, identify specific statistical analysis procedures and testable hypotheses for each research question, and set forth assumptions and limitations that affect this study and its results.

Instrument – 2005 National Survey of Student Engagement (NSSE)

The literature review above sets forth the origins and general philosophy of the National Survey of Student Engagement. To briefly review, the NSSE survey instrument – *The College Student Report* – was created by a design team headed by Peter Ewell of the National Center for Higher Education Management Systems [NCHEMS] building upon several decades of work by various scholars on effective educational practices for undergraduate students (Chickering & Gamson, 1999; NSSE, *Our origins and potential*, n.d.). First piloted in 1999, the NSSE has been administered annually under contract since 2000 to an ever-increasing number of 4-year colleges and universities. The 2005 NSSE was administered in the spring of that year to first- and fourth-year students at 529

institutions throughout the United States and Canada (NSSE, 2005b, 2005c). In the sections that follow, several key aspects of *The College Student Report* are reviewed.

Structure and Content of The College Student Report.

The structure and content of *The College Student Report* is described in detail by Kuh (2004). In brief, the instrument asks students to indicate using Likert-type scales how frequently they engage in a range of activities representing good educational practice. These include activities related to classwork, cooperation with other students, work with faculty, interaction with others of differing backgrounds and perspectives, higher-order thinking skills, and participation in enriching educational experiences such as learning communities, service learning, study abroad, and so forth. Students are also asked to report their perceptions of features of the college environment that are associated with achievement, satisfaction, and persistence including supportive campus environments and services and the quality of relations among various campus groups, including faculty and students. Finally, students are asked to respond to a number of demographic items that allow institutions and researchers to disaggregate the respondents in various ways (Kuh, 2004, 2009). By disaggregating the respondents by class standing, sex, race, and so forth, researchers and practitioners can gain insight into how various categories of students engage in their educational settings in different ways.

NSSE Sampling and Data Collection Techniques

The NSSE is administered each spring under contract to a random sample of first- and fourth-year students selected from a student population data file provided by

participating institutions in the United States and Canada (NSSE, *Administration*, n.d.). For the purposes of this study, only institutions in the United States were included in the sample to reduce variability resulting from differing institutional structures and practices at the 10 participating Canadian institutions. During the 2005 NSSE administration, a total of 225,544 responses were collected from 519 institutions in the United States (A. D. Lambert, personal communication, December 15, 2009).

The NSSE is administered in both a Web and paper-based format. Participating institutions may choose whether to administer a paper-only survey (respondents are mailed a paper copy of the instrument and asked to return it by mail), a Web-only survey (respondents are contacted by email and asked to fill out the survey online), or a Web-option survey (respondents are mailed a paper copy of the survey and can either fill out the paper survey or the online survey in response). Kuh (2004) conducted an extensive analysis comparing the modes of survey administration and concluded that only very small systematic effects were present across administration modes. It is interesting to note, however, that response rates were higher for the Web-only schools (42%) compared to paper schools (35%) in the 2005 NSSE administration (NSSE, 2005b).

Psychometric Properties of the NSSE.

Validity, reliability, and credibility of self-report data. Because *The College Student Report* is fundamentally a self-report instrument, it is subject to threats to validity and credibility encountered by other self-report tools. These include both the inability of respondents to provide accurate information in response to a question and the unwillingness on the part of respondents to provide what they know to be a truthful

response (Aaker, Kumar, & Day, 1998; Wentland & Smith, 1993). Kuh (2004) addresses these concerns in detail with regard to *The College Student Report* and asserts that the instrument meets the five research-based conditions under which self-reports are likely to be valid: the information requested is known to the respondents, the questions are phrased clearly and unambiguously, the questions refer to recent activities, the respondents think the questions merit a serious and thoughtful response, and “answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways” (p. 4). Pace (1985) confirms these criteria in an earlier study of the validity and reliability of the College Student Experience Questionnaire, another self-report instrument and predecessor of the NSSE. Pascarella (2001b) further explores the issue of self-report reliability in college impact studies and generally supports the practice, though he asserts that pretest – posttest designs are better for capturing effects of specific interventions. Citing a variety of researchers and parallel studies, Kuh (2004) reaffirms that, “it is both reasonable and appropriate that we should pay attention to what college students say about their experiences” (p. 4).

Validity of The College Student Report. According to Kuh (2004), the NSSE design team devoted a considerable amount of time to crafting survey items that were clearly worded, well-defined, and had high face and content validity. The design team included questions with demonstrated validity from previous research programs, including the College Student Experiences Questionnaire [CESQ] and the Cooperative Institutional Research Program [CIRP], as a foundation and added additional items from the literature on quality undergraduate education (Kuh, 2004, 2009). Several pilot tests were conducted before the initial national launch in 2000, and items have continually

been refined since (Kuh, 2009). In addition, Kuh (2004) found that responses to the survey items are normally distributed and that discriminant analysis verified that responses to different clusters of items (including College Activities, Educational and Personal Growth, and Opinions About Your School items) successfully discriminate among students. The design team also used factor analysis to establish the construct validity of the survey items (Kerlinger, 1973; Kuh, 2004). As each successive survey is administered, the responses are again carefully scrutinized to ensure that they continue to be valid (Kuh, 2004, 2009). Finally, nonrespondent studies have been conducted by the Indiana University Center for Postsecondary Research [IUCPR] to verify that respondents are not radically different than nonrespondents. These studies have shown that nonrespondents report slightly higher levels of overall engagement than respondents, though this may be due to the fact that more engaged students have less time to respond to the survey (Kuh, 2004). The differences between nonrespondents and respondents are slight enough though, that there is little reason to question the validity of the engagement measures.

Other efforts to verify the validity of the NSSE have produced mixed results. For instance, a recent study by LaNasa, Cabrera, and Trangsrud (2009) used confirmatory factor analysis to test the current five-benchmark model against several other variations and found that other models produced higher levels of explained variance due to strong intercorrelations between the ACL and SFI benchmarks. However, this study and others by Pike (2006); Carle, Jaffee, Vaughan, and Eder (2009); and Gordon, Ludlom, and Hoey (2008) are intended to explore alternative ways of grouping the NSSE items to increase explained variance and do not cast doubt upon the actual survey items.

Reliability and stability of The College Student Report. As Kuh (2004) outlined, reliability is the extent to which a set of items consistently measure the same thing across respondents and institutional settings, while stability is the degree to which students respond in similar ways at two different points in time. To minimize maturation effects, which negatively affect the stability and comparability of findings, the NSSE is administered at approximately the same time each spring with the assumption that first- and fourth-year students will be at approximately the same level of maturity at a standard time of year.

To further establish the reliability of *The College Student Report*, psychometric analyses are conducted each year following the administration of the NSSE. Kuh (2004) described results from psychometric analyses utilizing responses collected between June 1999 and August 2003. Response items were divided into four categories and tested for reliability (Cronbach's alpha reliability scores): college activities items ($\alpha=.85$), reading and writing items ($\alpha=.70$; $\alpha=.80$ after deleting memorization items), educational and personal growth items ($\alpha=.90$), and opinions about your school items ($\alpha=.84$). Principal component analyses indicated that three or four factors within each group accounted for much of the variance; these principal factors were consistent with the five engagement benchmarks. Kuh (2004) also reported significant intercorrelations that support the groupings of the individual items into engagement categories and noted that measurements of skewness and kurtosis for each item were within acceptable ranges. In addition, IUCPR has conducted test-retest analysis to demonstrate a high level of stability and reliability of responses on the NSSE items (Kuh, 2004). Finally, the five benchmarks were correlated with important academic performance measures, including GPA, GRE

scores, and the measures of academic performance and critical thinking established by the RAND Corporation (Kuh, 2004). Gordon, Ludlom, and Hoey (2008) conducted a similar study linking responses on the NSSE items and benchmarks to important academic indicators such as freshman retention, GPA, pursuit of graduate education, and employment outcome, though their single-institution study questions the predictive power of the NSSE items. Pascarella, Seifert, and Blaich (2010), on the other hand, found that the NSSE benchmarks had a significant positive relationship with liberal arts outcomes, including effective reasoning, moral character, and personal well-being. In summary, the items and benchmarks contained in *The College Student Report* appear to have a reasonable degree of reliability and stability, though alternative groupings of response items have been explored.

Construction and Weighting of Engagement Benchmarks

The five engagement benchmarks used as dependent variables in this study are constructed using five sets of interrelated items from *The College Student Report*. Individual index scores for each benchmark are calculated according to IUCPR's document entitled, *Construction of the 2005 NSSE Benchmarks* (NSSE, n.d.). First, each component of a benchmark is recoded by converting responses to a 0-100 point scale. On a four-option item, for example, a response of "1" = 0, "2" = 33.33, "3" = 66.67, and "4" = 100. For the "enriching" items (items under question #7 on the survey), students who indicate that they have done the enriching activity receive a score of 100 while all other students receive a score of 0. Index scores for each benchmark are then compiled by averaging a respondent's recoded scores on all components of the benchmark.

In *Construction of the 2005 NSSE Benchmarks* (NSSE, n.d.), the authors point out that part-time and full-time students score differently on the Level of Academic Challenge [LAC] benchmark because several of the components ask students to report how much time they spend each week on school-related work. To control for these systematic differences, IUCPR has created an adjusted value for LAC, denoted ACa in the *2005 Codebook* (NSSE, 2005a). This value is calculated by adjusting part-time students' scores on four of the LAC items (readasgn, writemid, writesml, acadpro01). To derive the adjusted value for each item, a ratio is calculated by dividing the national average on the item for full-time students by the national average on the same item for part-time students. Each part-time student's score is then multiplied by the corresponding ratio to yield an adjusted score. Adjusted scores are limited so as not to exceed 100. These adjusted scores are then used instead of the raw scores for the four items to calculate the ACa index score for part-time students (NSSE, *Construction of the 2005 NSSE Benchmarks*, n.d.). This study used the adjusted value ACa to facilitate comparisons between levels of academic challenge reported by part-time and full-time students assuming that all other factors were held constant.

Table 1 outlines the components of the first NSSE benchmark, Level of Academic Challenge (ACa), Table 2 shows the components of Active and Collaborative Learning (ACL), Table 3 gives components of Student-Faculty Interaction (SFI), Table 4 contains components of Enriching Educational Experiences (EEE), and Table 5 lists the components of Supportive Campus Environment (SCE). Additional information for each of these items, including the full variable descriptions and response choices, are included in *The College Student Report 2005 Codebook* (NSSE, 2005a).

Table 1

Components of Engagement Benchmark 1 – Level of Academic Challenge [ACa]

Item #	Variable	Description ^a	Response Values
1r.	workhard	Worked harder than you thought you could	1=Never 2=Sometimes 3=Often 4=Very Often
2b.	analyze	Analyzing the basic elements of an idea	1=Very little 2=Some 3=Quite a bit 4=Very much
2c.	synthesz	Synthesizing and organizing ideas	1=Very little 2=Some 3=Quite a bit 4=Very much
2d.	evaluate	Making judgements about the value of ideas	1=Very little 2=Some 3=Quite a bit 4=Very much
2e.	applying	Applying theories or concepts	1=Very little 2=Some 3=Quite a bit 4=Very much
3a.	readasgn	Number of assigned textbooks, etc.	1=None 2=Between 1 and 4 3=Between 5 and 10 4=Between 11 and 20 5=More than 20
3c.	writemor	Number of written papers 20+ pages	1=None 2=Between 1 and 4 3=Between 5 and 10 4=Between 11 and 20 5=More than 20

Table 1 continued

Item #	Variable	Description ^a	Response Values
3d.	writemid	Number of written papers 5-19 pages	1=None 2=Between 1 and 4 3=Between 5 and 10 4=Between 11 and 20 5=More than 20
3e.	writesml	Number of written papers <5 pages	1=None 2=Between 1 and 4 3=Between 5 and 10 4=Between 11 and 20 5=More than 20
9a.	acadpr01	Time spent preparing for class	1 – 8
10a.	envschol	Institution emphasizes significant amounts of time on academic work	1 – 4

^aFor full item descriptions, refer to *The College Student Report 2005 Codebook* (NSSE, 2005a).

Table 2

Components of Engagement Benchmark 2 – Active and Collaborative Learning [ACL]

Item #	Variable	Description	Response Values
1a.	clquest	Asked questions or contributed in class	1=Never 2=Sometimes 3=Often 4=Very Often
1b.	clpresen	Made a class presentation	1=Never 2=Sometimes 3=Often 4=Very Often
1g.	classgrp	Worked with other students during class	1=Never 2=Sometimes 3=Often 4=Very Often
1h.	occgrp	Worked with classmates outside of class	1=Never 2=Sometimes 3=Often 4=Very Often
1j.	tutor	Tutored or taught other students	1=Never 2=Sometimes 3=Often 4=Very Often
1k.	commproj	Participated in a community-based project	1=Never 2=Sometimes 3=Often 4=Very Often
1t.	oocideas	Discussed ideas from class outside of class	1=Never 2=Sometimes 3=Often 4=Very Often

Table 3

Components of Engagement Benchmark 3 – Student-Faculty Interaction [SFI]

Item #	Variable	Description	Response Values
1n.	facgrade	Discussed grades or assignments with an instructor	1=Never 2=Sometimes 3=Often 4=Very Often
1o.	facplans	Talked about career plans with a faculty member or advisor	1=Never 2=Sometimes 3=Often 4=Very Often
1p.	facideas	Discussed ideas from class with faculty member outside of class	1=Never 2=Sometimes 3=Often 4=Very Often
1q.	facfeed	Received prompt feedback from faculty	1=Never 2=Sometimes 3=Often 4=Very Often
1s.	facother	Worked with faculty members on activities other than coursework	1=Never 2=Sometimes 3=Often 4=Very Often
7d.	resrch04	Work on a research project with a faculty member outside of course requirements	1=Have not decided 2=Do not plan to do 3=Plan to do 4=Done

Table 4

Components of Engagement Benchmark 4 – Enriching Educational Experiences [EEE]

Item #	Variable	Description	Response Values
1l.	itacadem	Used an electronic medium to discuss or complete an assignment	1=Never 2=Sometimes 3=Often 4=Very Often
1u.	divrstud	Had serious conversations with students or a different race or ethnicity	1=Never 2=Sometimes 3=Often 4=Very Often
1v.	diffstu2	Had serious conversations with students who are very different than you	1=Never 2=Sometimes 3=Often 4=Very Often
7a.	intern04	Participate in a practicum, internship, etc.	1=Have not decided 2=Do not plan to do 3=Plan to do 4=Done
7b.	volntr04	Participate in community service or volunteer work	1=Have not decided 2=Do not plan to do 3=Plan to do 4=Done
7c.	lncom04	Participate in a learning community or similar program	1=Have not decided 2=Do not plan to do 3=Plan to do 4=Done
7e.	forlng04	Participate in foreign language coursework	1=Have not decided 2=Do not plan to do 3=Plan to do 4=Done
7f.	stdabr04	Participate in study abroad	1=Have not decided 2=Do not plan to do 3=Plan to do 4=Done

Table 4 continued

Item #	Variable	Description	Response Values
7g.	indstd04	Participate in independent study or self-designed major	1=Have not decided 2=Do not plan to do 3=Plan to do 4=Done
7h.	snrx04	Participate in culminating senior experience	1=Have not decided 2=Do not plan to do 3=Plan to do 4=Done
9d.	cocurr01	Participating in co-curricular activities	1=0 hours 2=1-5 hours 3=6-10 hours 4=11-15 hours 5=16-20 hours 6=21-25 hours 7=26-30 hours 8=More than 30 hours
10c.	envdivrs	Institution encourages contact among students from different backgrounds	1=Very little 2=Some 3=Quite a bit 4=Very much

Table 5

Components of Engagement Benchmark 5 – Supportive Campus Environment [SCE]

Item #	Variable	Description	Response Values
8a.	envstu	Quality of relationships with other students	1=Unfriendly, Unsupportive, Sense of Alienation 2= 3= 4= 5= 6= 7=Friendly, Supportive, Sense of Belonging
8b.	envfac	Quality of relationships with faculty	1=Unfriendly, Unsupportive, Sense of Alienation 2= 3= 4= 5= 6= 7=Friendly, Supportive, Sense of Belonging
8c.	envadm	Quality of relationships with administrative personnel and offices	1=Unfriendly, Unsupportive, Sense of Alienation 2= 3= 4= 5= 6= 7=Friendly, Supportive, Sense of Belonging
10b.	envsuprt	Institution emphasizes providing the support you need to succeed academically	1=Very little 2=Some 3=Quite a bit 4=Very much

Table 5 continued

Item #	Variable	Description	Response Values
10d.	envnacad	Institution emphasizes helping you cope with your nonacademic responsibilities	1=Very little 2=Some 3=Quite a bit 4=Very much
10e.	envsocial	Institution emphasizes providing the support you need to thrive socially	1=Very little 2=Some 3=Quite a bit 4=Very much

Summary of the NSSE.

The National Survey of Student Engagement and *The College Student Report* which forms its core have been carefully crafted and extensively analyzed to ensure that they are valid, reliable measures of college student engagement (Kuh 2004). Five engagement benchmarks arising from the literature on quality undergraduate education are used to draw conclusions and recommendations about how students participate in educationally meaningful activities. Individual index scores on each of these benchmarks will form the dependent variables in the analyses below.

Research Design

As stated previously, this study will use correlational methods to address the four research questions. Correlational research designs have been used commonly when studying the impact of various demographic factors on student engagement as measured by the NSSE benchmarks (Filkins & Doyle, 2002; Harper, Carini, Bridges, & Hayek, 2004; Zhao, Kuh, & Carini, 2005). Disaggregating the NSSE data by adult characteristics, however, is a relatively unexplored area. The only study that does this in detail is a study conducted in 2001 by George D. Kuh, Robert M. Gonyea, and Megan Palmer at NSSE.

In their study, Kuh, Gonyea, and Palmer (2001) investigated whether commuter students differed from residential students in their level of engagement at both the first-year and fourth-year levels. Kuh, Gonyea, and Palmer disaggregated the NSSE data using a single item in the demographic section of the NSSE that asks respondents whether they live on campus (in a dormitory, fraternity, sorority, or other setting), in an off-campus

residence within walking distance, or in an off-campus residence within driving distance. After summarizing the demographic profiles of these three groups, the authors calculated group means on the five NSSE benchmarks for each of the three groups for first-year respondents and for fourth-year respondents. They then tested for statistically significant differences among the resulting group means by “performing separate one-way ANOVAs for both first-year and senior students with the benchmarks and gains factors as dependent variables and commuter status as the grouping variable. Benchmarks [were then] weighted to adjust for differences in sex and fulltime/part-time enrollment status” (Kuh, Gonyea, & Palmer, 2001, footnote 1). To measure the magnitude of the impact of commuter status on the dependent variables, effect sizes were calculated “by dividing the mean difference by the standard deviation of the mean of the group that is being compared (in this instance, on campus students)” (Kuh, Gonyea, & Palemer, 2001, footnote 2). The authors found the largest effect sizes when comparing means across groups for two benchmarks: student-faculty interaction and enriching educational experiences.

Because it uses one of the characteristics of adult students, commuter status, to disaggregate the NSSE results, Kuh, Gonyea, and Palmer’s (2001) study establishes a good stepping-off point for this study. Rather than relying on analysis of variance, however, this study will use correlational methods to investigate the relative contributions of several variables to index scores on the five NSSE benchmarks. This strategy follows the methodological approaches used by Filkins and Doyle (2002), Harper, Carini, Bridges, and Hayek (2004), and Zhao, Kuh, and Carini (2005) as mentioned earlier.

Correlational methods are described in detail by Edwards (1984), Gall, Borg, & Gall (1996), Hays (2007), and Keppel & Wickens (2004).

Sample Selection

To protect institutional anonymity and maintain the integrity of the NSSE data set, including the contractual agreements with participating institutions, the Indiana University Center for Postsecondary Research places certain restrictions on the use of the NSSE data. Acceptable use guidelines include the following (IUCPR, 2006):

1. NSSE data are made available no sooner than three years after institutional reports are mailed to participating institutions, typically the first week of August each year.
2. To protect the integrity of the database and the confidentiality of our users, IUCPR strips all student and institutional identifiers from any data set that they share externally.
3. IUCPR can include institution-level information (e.g. Carnegie types) but not in a way that individual schools can be identified directly or indirectly. This includes data provided by the researchers to be matched with NSSE data before removal of school identifiers. Continuous variables (e.g., enrollment sizes) must be collapsed into categories so that specific values cannot be linked back to school names.
4. Data sets provided will be random samples, in a portion not to exceed 1/5 of the existing data set. Under no circumstance is the entire data set

provided to researchers, nor entire sets of specified subsections of the data (e.g., HBCU's or selective liberal arts institutions).

5. Researchers are required to acknowledge that NSSE data were used by permission of the Indiana University Center for Postsecondary Research, and to provide a copy of all papers and publications utilizing NSSE data to the Center.

In accordance with this policy, data from the spring 2005 administration of the National Survey of Student Engagement were used for this study. During this administration, 519 institutions in the United States participated for a total of 225,544 responses (A. D. Lambert, personal communication, December 15, 2009). To construct the sample for this study, a simple random sample of the 2005 NSSE dataset yielding a total of 45,109 respondents (20% of the dataset) was taken (Gall, Borg, & Gall, 1996). This approach allowed for adequate variety in institutional type, gender, class standing, ethnicity, and other key variables. Although conducting a simple random sample of a dataset composed of a random sample of first- and fourth-year students attending institutions that select themselves to participate in the survey compounds the possibility that the resulting dataset does not mirror the population of first- and fourth-year students at 4-year colleges and universities in the United States (a threat to population validity), this technique maximized the likelihood that the sample would match the overall characteristics of the 2005 NSSE dataset (Gall, Borg, & Gall, 1996). Population validity is considered in the assumptions and limitations section below.

Detailed Methods: Question #1

Q. Do adult students report significantly different levels of engagement than nonadult students on each of the five NSSE engagement benchmarks?

To address the first research question, correlational methods were used to compare respondents from the 2005 NSSE who had been divided into two groups – adult students and nonadult students. Adult students were identified from among NSSE respondents by segmenting those who indicated two or more of the following:

- Age category of 3 or higher (24 years of age and older; based on item #15).
- Residence within driving distance of campus (item #26; note that Kuh, Gonyea, and Palmer (2001) found little difference between students who lived on campus and those who lived within walking distance on most measures).
- Attends school less than full time (item #22).
- Works more than 30 hours per week (sum of items #9b and 9c).
- Spends one or more hours per week providing care for dependents (item #9f).

Unfortunately, no other items on the 2005 NSSE correspond with factors distinguishing adult students such as military service, nonstandard high school completion, or breaks in enrollment (Choy, 2002; Horn & Carroll, 1996). Consequently, the definition of adult students for this study was limited to age, place of residence, enrollment status, work status, and dependents only.

Means on each of the five NSSE benchmarks were calculated for both adult and nonadult respondents, and differences in the means were tested for significance using a two-tailed *t*-test for independent means. Next, the standardized correlation coefficients (*r*) between adulthood and each of the benchmarks were calculated and tested for

significance. Finally, the coefficients of determination (r^2) were calculated for each of the five benchmarks to determine effect size (the amount of variation in engagement explained by adulthood).

Specification of variables and hypotheses. The independent variable in this analysis, adulthood, was a dichotomous variable with two values: adult and nonadult. The dependent variables were the respondent's index scores for each of the five engagement benchmarks and were continuous. For each of the correlations, the null hypothesis was that there is no significant correlation between adulthood and level of engagement in the population ($H_0: \rho=0$). Because of the size of the dataset and the resulting degrees of freedom, the test for significance was set at $\alpha < .001$ to minimize the likelihood of Type I errors. Rejecting the null hypothesis for each of the benchmarks leads to the inference that there is a nonzero correlation (either positive or negative) between adulthood and level of engagement on that benchmark in the broader population.

Anticipated outcome – Benchmark #1 (ACa). Although adult students may spend slightly more time than nonadult students preparing for class (Cross, 1981), the literature above led to no other hypotheses about differences between adult and nonadult student responses on the components of benchmark #1. Consequently, I predicted that there would likely to be little or no correlation between adulthood and Level of Academic Challenge.

Anticipated outcome – Benchmark #2 (ACL). The literature on adult learning states that adult students prefer collaborative learning strategies (Brookfield, 1986; Knowles, Holton, & Swanson, 2007). As a result, I predicted a positive correlation between adulthood and Active and Collaborative Learning.

Anticipated outcome – Benchmark #3 (SFI). Because of their extra-institutional obligations, it is reasonable to infer that adult students are less likely than their nonadult peers to interact with faculty outside of class (see Kuh, Gonyea, & Palmer, 2001). Since several of the components of this benchmark refer to out-of-class interaction with faculty, I predicted that there would be a negative correlation between adulthood and Student-Faculty Interaction.

Anticipated outcome – Benchmark #4 (EEE). Many of the components of this benchmark refer to out-of-class experiences that adult students are less likely to participate in because of their work and dependent care responsibilities (Kuh, Gonyea, & Palmer, 2001). Consequently, as with the previous benchmark, I predicted a negative correlation between adulthood and participation in Enriching Educational Experiences.

Anticipated outcome – Benchmark #5 (SCE). Sissel, Hansman, and Kasworm (2001) described the widespread marginalization and neglect of adult students in higher education, a theme echoed by Bash (2003). While adults are likely to experience more supportive environments at some types of institutions than at others, I predicted that overall there would be a negative correlation between adulthood and SCE.

Comparing adult and nonadult respondents on the five engagement benchmarks can lead to important inferences about how adults experience 4-year institutions differently than nonadults. This was, however, a crude measure of the degree to which the presence of adult characteristics was affecting engagement. The next research questions investigated this further.

Detailed Methods: Question #2

Q. How does level of engagement vary with level of adulthood on each of the five NSSE engagement benchmarks?

Creating an artificial dichotomy between adult and nonadult students can yield broad insights into differences between adult and nonadult students, but it also masks important details such as to what degree characteristics of an adult student affects his or her level of engagement. Horn and Carroll (1996) pointed out that, in reality, individuals fall on a continuum from highly traditional (or nonadult) to highly nontraditional (or adult). While they chose to group students into three categories along this continuum, this study instead arranged respondents into six categories based upon the number of adult characteristics they indicated in their demographic responses (from zero of the characteristics to all five).

As in the first analysis, mean index scores on each NSSE benchmark for each level of adulthood were calculated. In this case, however, these means were graphed to explore the linearity of the relationships, but they were not tested for statistically significant differences. Instead, the standardized correlation coefficients (r) between level of adulthood and level of engagement were calculated for each of the engagement benchmarks and tested for significance. The coefficients of determination (r^2) were then calculated to find the amount of variance in engagement level that was explained by level of adulthood for each benchmark. Because r and r^2 are tests for linear relationships, η and η^2 (statistics based upon the ANOVA analysis that show strength of association for nonlinear relationships; greater nonlinearity reveals itself as greater divergence between r

and η), were calculated and compared to the values of r and r^2 to explore the strength of resulting curvilinear relationships (Garson, 2008).

Specification of variables and hypotheses. As in the analysis for the first research question, the dependent variables were the respondent's index scores for each of the five engagement benchmarks and were continuous. The independent variable in this analysis was level of adulthood and was created by adding the responses for the five adult characteristics used in the previous question (Table 6). A sum of 0 indicated a classification of nonadult on all five characteristics (minimally adult), while a sum of 5 indicated a classification of adult on all five characteristics (maximally adult).

Again, the null hypothesis for each of the five correlations was that there is no significant correlation between level of adulthood and level of engagement in the population ($H_0: \rho=0$). The test for significance was again set at $\alpha<.001$ to minimize the likelihood of Type I errors. Unlike the first test, this analysis gave a more precise estimate of the magnitude and directionality of the relationship between level of adulthood and level of engagement on each of the five benchmarks. However, it did not help to identify which of the characteristics of adult students were most influential in reported level of engagement. The following research question addressed this issue.

Anticipated outcomes. Since this research question merely extended the previous question to a greater level of precision, I predicted that the correlations between level of adulthood and each engagement benchmark would be as the same as described above in the anticipated outcomes for the first research question.

Table 6

Independent Variables for Question #2

Item #	Variable	Description	Response Values
	SumAdult*	SumAdult = Age \geq 24 + ResCateg + EnrlCateg + SumWork + carede01	0 (minimally adult) – 5 (maximally adult)
15.	Age \geq 24*	Age category	0 = age < 24 yrs 1 = age \geq 24 yrs
26.	ResCateg*	Place of residence	0 = on campus, within walking distance, or fraternity/sorority 1 = within driving distance
22.	EnrlCateg*	Thinking about this current academic term, how would you characterize your enrollment?	0 = Full-time 1 = Part-time
9b. + 9c.	SumWork*	SumWork = workon01 + workof01 (Hours each week spent working for pay on campus + off campus)	0 = SumWork \leq 30 hrs/wk 1 = SumWork > 30 hrs/wk
9f.	DepCateg*	Hours each week spent providing care for dependents living with you (parents, children, spouse, etc.)	0 = 0 hrs/wk 1 = 1 or more hrs/wk

*Indicates a derived variable based upon the NSSE item indicated.

Detailed Methods: Question #3

Q. Which indicators of adult status have the largest effect on level of engagement for each of the five NSSE engagement benchmarks?

As in the previous analysis, each of the characteristics of adult students was used in a correlational analysis to determine its effect on level of engagement for each of the five NSSE benchmarks. Unlike the previous analysis, the adult characteristics in this

analysis were not summed to create a single independent variable. Instead, each characteristic in Table 7 served as a separate independent variable to allow comparisons of how much each variable contributed to the variance in index scores on each of the NSSE benchmarks.

For each of the five engagement benchmarks, the independent variables were analyzed to determine which contributed significantly to reported level of engagement. First, means for each level of the independent variables were calculated for each of the five NSSE benchmarks and graphed to explore obvious patterns. Standardized correlation coefficients (r) between each characteristic and benchmark were then calculated and tested for significance. As before, the test for significance was set at $\alpha < .001$ to minimize the likelihood of Type I errors. Next, coefficients of determination (r^2) were calculated to test effect sizes and η and η^2 statistics were calculated to explore nonlinearity as in second research question.

A multiple regression analysis was then performed for each benchmark to determine which adult characteristics most strongly contributed to variations in each benchmark. As age is commonly used as a sole distinguishing characteristic of adult students, this analysis employed a hierarchical multiple regression analysis by performing an OLS regression where only age was included as an independent variable followed by an OLS regression in which all adult characteristics were included simultaneously to compare the explained variances in the NSSE benchmarks resulting from the two approaches. In each step, the standardized regression coefficients for each independent variable (indicating the semipartial correlations between that independent variable and the benchmark being studied) were examined to determine its relative importance in

Table 7

Independent Variables for Question #3

Item #	Variable	Description	Response Values
15.	age	Age category	1 = 19 or younger 2 = 20-23 3 = 24-29 4 = 30-39 5 = 40-55 6 = Over 55
26.	*Residence	Place of residence (livenow)	1 = Dormitory or other campus housing (including fraternity/sorority) 2 = Residence within walking distance 3 = Residence within driving distance
22.	enrlmnt	Thinking about this current academic term, how would you characterize your enrollment?	1 = Less than full-time 2 = Full-time
9b.	workon01	Hours each week spent working for pay on campus	1 = 0 hours / week 2 = 1-5 hours / week 3 = 6-10 hours / week 4 = 11-15 hours / week 5 = 16-20 hours / week 6 = 21-25 hours / week 7 = 26-30 hours / week 8 = more than 30 hours / week
9c.	workof01	Hours each week spent working for pay off campus	1 = 0 hours / week 2 = 1-5 hours / week 3 = 6-10 hours / week 4 = 11-15 hours / week 5 = 16-20 hours / week 6 = 21-25 hours / week 7 = 26-30 hours / week 8 = more than 30 hours / week

Table 7 continued

Item #	Variable	Description	Response Values
9f.	carede01	Hours each week spent providing care for dependents living with you (parents, children, spouse, etc.)	1 = 0 hours / week 2 = 1-5 hours / week 3 = 6-10 hours / week 4 = 11-15 hours / week 5 = 16-20 hours / week 6 = 21-25 hours / week 7 = 26-30 hours / week 8 = more than 30 hours / week

*Indicates a derived variable based upon the NSSE item indicated.

explaining variance in the engagement benchmark. In addition, the tolerances for each variable and its bivariate correlations with the other independent variables were explored to determine its level of independence from the other variables in the analysis (Cohen & Cohen, 1983; Garson, 2010).

Specification of variables and hypotheses. In contrast to the previous analysis, the actual response categories for age (age), enrollment status (enrlment), work for pay (workon01 and workof01), and care of dependents (carede01) were used rather than the derived dichotomous variables used in the second research question in order to gain a more nuanced understanding of how these variables affect engagement. This was possible because these variables are ordinal in nature and can be used in a multiple regression analysis in their raw form. The variable livenow, on the other hand, is a categorical variable and cannot be used in a multiple regression in its raw form. Consequently, a new variable was created (Residence) in which living in a fraternity/sorority house was combined with living on campus to yield a roughly ordinal variable which could be used in the regression analysis (see Kuh, Gonyea, & Palmer, 2001).

Anticipated outcome – Benchmark #1 (ACa). The weighted values for level of academic challenge used in this analysis equalize part-time and full-time students' scores on this benchmark to adjust for time spent weekly on academic work. Aside from this obvious correlation that is controlled for when the ACa index is used as the dependent variable, no other correlations between adult characteristics and Level of Academic Challenge were predicted.

Anticipated outcome – Benchmark #2 (ACL). Knowles, Holton, and Swanson (2007) used age as the primary distinguishing characteristic of adult learners.

Consequently, age was expected to have the largest correlation coefficient in this analysis. It was also anticipated that hours worked, part-time attendance, and time spent caring for dependents would have small negative coefficients that mitigated the effect of age on the overall portion of variance explained by the regression equation.

Anticipated outcome – Benchmark #3 (SFI). I anticipated that age was less likely to be a strong factor in this analysis. Instead, I expected hours worked, part-time attendance, and time spent caring for dependents each week to correlate negatively with Student-Faculty Interaction. Cotten and Wilson (2006), for instance, reported that students identified time constraints related to off-campus obligations as a significant deterrent to student-faculty interaction. Nelson Laird and Cruce (2009) also reported that part-time students lower levels of engagement in student-faculty interaction on the NSSE than full-time students.

Anticipated outcome – Benchmark #4 (EEE). As in the previous benchmark, I predicted that hours spent in activities not related to academic work would correlate negatively with Enriching Educational Experiences because of the constraining nature of off-campus obligations and part-time attendance (Cotton & Wilson, 2006; Nelson Laird & Cruce, 2009).

Anticipated outcome – Benchmark #5 (SCE). While Sissel, Hansman, and Kasworm (2001) indicated that adult students were marginalized, they did not point to any specific adult characteristics that led to this marginalization, and I could find no other research specifically related to this issue. Consequently, the interactions between adult characteristics and perception of a supportive campus environment were unclear at this point, and I predicted that if any correlations existed, they were likely to be small.

Detailed Methods: Question #4

Q. How do the effects of adult status indicators on level of engagement compare with the effects of other important demographic variables, i.e., gender, ethnicity, parent education level, class standing and institutional type?

In the analysis accompanying the previous research question, each adult characteristic was analyzed to determine how it was correlated with each of the five NSSE benchmarks. While the effect of adult characteristics on engagement have not been studied extensively using the NSSE, the effects of other demographic variables have (Filkins & Doyle, 2002; Harper, Carini, Bridges, & Hayek, 2004; Hu & Kuh, 2002; Zhao, Kuh, & Carini, 2005). In this research question, these additional factors are included in the analysis to determine their effects relative to the adult characteristics previously studied.

The same analytical methods and tests for significance employed in the previous analysis were used. In this analysis, the hierarchical regression analysis included the other demographic variables commonly employed in studying the NSSE data in the first regression model and added the six adult characteristics in the second model to compare the variance in the NSSE benchmarks explained by the adult characteristics to the variance explained by the other commonly used demographic variables. The relative magnitudes of the standardized regression coefficients and resulting coefficients of determination were compared to determine whether characteristics of adulthood or other individual characteristics have a larger influence on reported levels of engagement for each of the five benchmarks, and tolerance and bivariate correlations among independent variables were once again examined to explore multicollinearity.

Specification of variables and hypotheses. In addition to the six adult characteristics used as independent variables in the previous analysis, this analysis included gender, ethnicity, parent education level, class standing, and institutional type as independent variables (Table 8). Hu and Kuh (2002) indicated that these additional variables are correlated with engagement in predictable ways, though their study gives no mention of adult characteristics. As in the previous research question, categorical variables had to be recoded to make them either dichotomous (race was grouped into white/Asian and nonwhite/non-Asian; see Huh and Kuh (2002)) or ordinal (Carnegie classification was recoded into baccalaureate, masters, and doctoral institutions) in order to use them in the multiple regression analysis.

Anticipated outcomes. Hu and Kuh (2002) explored a number of relationships between engagement and individual / institutional characteristics. In their study, they found that engagement was positively related to parental education and that women were more likely to be engaged than men. They also found important relationships between engagement and race (White and Asian students were more likely to be disengaged than others) and between engagement and class standing (freshmen tended to be less engaged than upperclassmen). In addition, they explored the relationship between engagement and institutional type and found that students regularly reported higher levels of engagement at some types of institutions and lower levels at others, such as research universities. In light of these findings, I predicted that Level of Academic Challenge (ACa) should remain relatively stable across all demographic characteristics except institutional type because I assumed that all students would be asked to complete similar levels of academically challenging work at similar types of institutions. I also predicted that ACL,

Table 8

Additional Independent Variables for Question #4

Item #	Variable	Description	Response Values
16.	sex	Your sex	1 = Male 2 = Female
18.	WhiteAsian*	What is your racial or ethnic identification? (Mark only one.)	1 = White/Asian-Pacific Islander 2 = Nonwhite/non-Asian-Pacific Islander
27a.	fathredu	Father's educational attainment	1 = Did not finish high school 2 = Graduated from high school 3 = Attended college but did not complete a degree 4 = Completed an associate's degree (A.A., A.S., etc.) 5 = Completed a bachelor's degree (B.A., B.S., etc.) 6 = Completed a master's degree (M.A., M.S., etc.) 7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)
27b.	mothredu	Mother's educational attainment	1 = Did not finish high school 2 = Graduated from high school 3 = Attended college but did not complete a degree 4 = Completed an associate's degree (A.A., A.S., etc.) 5 = Completed a bachelor's degree (B.A., B.S., etc.) 6 = Completed a master's degree (M.A., M.S., etc.) 7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)

Table 8 continued

Item #	Variable	Description	Response Values
19.	ClassStdng*	What is your current classification in college?	1 = Freshman (1st year) 2 = Sophomore (2nd year) 3 = Junior (3rd year) 4 = Senior (4th year)
	Categ05*	Institutional type (2005 basic Carnegie classification)	1 = Baccalaureate 2 = Master's 3 = Doctoral

*Indicates a derived variable based upon the NSSE item indicated.

SFI, EEE, and SCE were likely to be significantly correlated with institutional type. In addition, I expected that participation in enriching educational experiences (EEE) was likely to be correlated strongly with both class standing (seniors have engaged in more enriching experiences than freshman because they have been in higher education longer) and parental education level. No basis existed for predicting the magnitude of these semipartial correlations relative to the semipartial correlations between the adult characteristics and the engagement benchmarks, so no prediction was made.

Summary

The research methods described above utilize a variety of correlational strategies and a random sample of data from the 2005 National Survey of Student Engagement to address the four research questions. The correlational strategies (including bivariate correlation and hierarchical multiple regression) were supplemented by an investigation of group means and eta (η) statistics to assist in understanding the affects of adult and other individual and institutional characteristics on engagement in educationally effective practices. The following section discusses assumptions and limitations inherent in this approach.

Assumptions and Limitations

This study makes two fundamental assumptions, and there are limitations associated with each. First, the study assumes that adult students and nonadult students will benefit equally from institutional engagement and that one of the benefits of higher levels of engagement is increased persistence levels. While this argument is substantiated

in the review of literature above, this study does not directly measure student persistence. Consequently, the assertion that knowing how adult students engage has important implications for their persistence cannot be backed with data from this study. Future studies can address possible correlations or causal patterns between engagement and persistence of adult students.

Second, this study assumes that the NSSE is a valid and reliable measure of student engagement for both adult and traditional students. The NSSE has been evaluated extensively to ensure reliability and internal validity, and Kuh (2004) indicates that the results of this evaluation indicate that the NSSE is both valid and reliable for all undergraduate students. For this study, the primary threats to internal validity are error variance and extraneous variance. The sampling strategy outlined above attempts to limit extraneous variance by drawing a random sample whose characteristics mirror the entire 2005 NSSE data set.

Of greater concern in this instance are population and ecological validity. The fact that NSSE institutions choose to participate and must pay to do so introduces a selection bias that can affect the population validity of the overall data set and, consequently, the sample used for this study (particularly in lean budget years where less wealthy institutions may choose not to participate). IUCPR has published a profile of NSSE participating institutions and compared this to the national profile in an attempt to justify the population validity of the data (NSSE, 2005b). However, changing economic conditions and other nonrandom factors affect institutional participation in the NSSE survey and bring population validity into question. Consequently, generalizations arising

from this study may be biased toward wealthier institutions who can devote the fiscal resources to participating in the NSSE.

Furthermore, the NSSE is only administered to 4-year institutions. Any inferences from the total data set and the sample in this study cannot be legitimately generalized to all institutional types. Nevertheless, the results of this study may be informative to institutions outside of the NSSE profile.

In addition to the limitations imposed by the data source, this study is somewhat sensitive to extraneous variance because student respondents are nested within specific institutions. The lowest level of aggregation in this study is the institutional type, but students within specific institutions may vary in systematic ways that introduce extraneous variance into the statistical models employed by this study. For future studies, a hierarchical linear modeling strategy may provide additional insight into systematic within-institution variances (Keppel & Wickens, 2007).

Summary

This study will employ a correlational research design to investigate four research questions regarding the engagement of adult students using data selected from the 2005 National Survey of Student Engagement. Beginning with a relatively crude measure of whether there is a statistically significant difference in the engagement of adult and nonadult students on each of the five NSSE engagement benchmarks, the study will disaggregate and compare the effects of the various indicators of adult student status and other demographic and institutional variables to draw inferences about the engagement of adult students. Although limited in its ability to resolve concerns about population and

ecological validity, the study will employ random sampling techniques in an effort to maximize the likelihood of drawing valid inferences about the adult student population.

IV. RESULTS

The increasing numbers of adult undergraduate students at 4-year colleges and universities and their relative lack of persistence compared to their nonadult peers leads practitioners and researchers to ask searching questions about how to retain these students more effectively (Bash, 2003; Donaldson & Townsend, 2007). The literature on student retention, student engagement, and adult learning theory above suggests that the National Survey of Student Engagement is an important tool for studying adult student engagement (and by inference retention) and leads to four research questions:

1. Do adult students report significantly different levels of engagement than nonadult students on each of the five NSSE engagement benchmarks?
2. How does level of engagement vary with level of adulthood on each of the five NSSE engagement benchmarks?
3. Which indicators of adult status have the largest effect on level of engagement for each of the five NSSE engagement benchmarks?
4. How do the effects of adult status indicators on level of engagement compare with the effects of other important demographic variables, i.e., gender, ethnicity, parent education level, class standing, and institutional type?

During the Spring 2005 administration of the NSSE, a total of 225,544 responses were collected from 519 institutions in the United States (A. D. Lambert, personal communication, December 15, 2009). Using standard techniques, a simple random

sample consisting of 45,109 responses (20% of the total) from the Spring 2005 NSSE was taken and used to conduct this study. In the following sections, summary statistics describing the sample of NSSE data used to address each research question will be presented followed by the results of the analyses described in the previous chapter.

Question #1: Influence of Adult Status on Engagement

In this analysis, mean index scores of adult and nonadult respondents on each of the five NSSE benchmarks were compared, and correlations between adulthood and these index scores were calculated and tested for significance. A respondent was considered an adult if he or she possessed two or more characteristics of adult learners: age over 24, residence within driving distance of campus, part-time attendance, over 30 hours of work for pay each week, and one or more hours each week spent caring for dependents (Choy, 2002; Horn & Carroll, 1996). Any respondents missing values on one or more of the characteristics of adult learners were excluded as invalid (missing).

Table 9 indicates the numbers of adult and nonadult respondents within the sample. Of the 40,415 valid respondents, 28.2% were classified as adults (possessed two or more of the adult characteristics mentioned above).

Means for adult and nonadult respondents on each of the five NSSE benchmarks are set forth in Table 10. Only three of the mean differences were statistically significant (ACL, EEE, and SCE); adult respondents averaged just over 2 points higher than nonadult respondents on Active and Collaborative Learning, almost 2 points lower on Enriching Educational Experiences, and nearly 3 points lower on Supportive Campus Environment.

Table 9

Frequencies: Adult and Nonadult Respondents

Variable	Response Values	<i>N</i>	Raw %	% of Valid
All Cases		45,109	100.0%	100.0%
Adult	1 = nonadult	29,012	64.3%	71.8%
	2 = adult	11,403	25.3%	28.2%
	Missing	4,694	10.4%	

Table 10

Mean Responses on NSSE Benchmarks: Adult and Nonadult Respondents

		<i>M</i>	<i>SD</i>	<i>N</i>
ACa	Nonadult	54.749	13.592	29,008
	Adult	54.927	14.471	11,397
	Difference in <i>M</i>	0.178		
ACL	Nonadult	46.430	16.388	29,011
	Adult	48.501	17.508	11,401
	Difference in <i>M</i>	2.071 ^{***}		
SFI	Nonadult	39.077	19.964	29,004
	Adult	38.858	20.054	11,395
	Difference in <i>M</i>	0.219		
EEE	Nonadult	35.856	17.025	28,988
	Adult	34.078	17.717	11,386
	Difference in <i>M</i>	1.778 ^{***}		
SCE	Nonadult	59.741	17.822	28,983
	Adult	56.971	19.294	11,377
	Difference in <i>M</i>	2.769 ^{***}		

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

Table 11

Correlations Between Adult Status and NSSE Benchmarks

		ACa	ACL	SFI	EEE	SCE
Adult	<i>N</i>	40,405	40,412	40,399	40,374	40,360
	<i>r</i>	.006	.056***	-.005	-.046***	-.068***
	<i>r</i> ²	.000	.003	.000	.002	.005

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

Finally, bivariate correlations were calculated to test the size and significance of the effect of adult status on each of the benchmarks. Results of the correlational analysis are presented in Table 11. Similar to the pattern in Table 10, there was a statistically significant positive correlation between adulthood and ACL and statistically significant negative correlations between adulthood and two other NSSE benchmarks (EEE and SCE). Effect sizes, indicated by the r^2 statistic, are very small in all three cases: 0.3% of the variance in ACL explained by adulthood, 0.2% of the variance in EEE explained by adulthood, and 0.5% of the variance in SCE explained by adulthood.

Question #2: Correlation of Adulthood and Engagement

In this analysis, adulthood was considered as a quasi-continuous variable instead of being dichotomized as in the first research question. Mean index scores on each of the five NSSE benchmarks and correlations between adulthood and index scores were again calculated and tested for significance. As before, characteristics of adult learners included age over 24, residence within driving distance of campus, part-time attendance, over 30

hours of work for pay each week, and one or more hours each week spent caring for dependents (Choy; Horn & Carroll, 1996). A value of “1” was assigned for each adult characteristic of a respondent, and a value of “0” was assigned for the other characteristics that fell below the adult threshold. The five values were then summed to yield a derived variable, “SumAdult,” which ranged in value from 0 to 5 (minimally adult to maximally adult). As before, any respondents missing values on one or more of the characteristics of adult learners were excluded as invalid (missing).

Frequencies of adult characteristics in the sample are outlined in Table 12. Just over 50% of valid respondents possessed no adult characteristics (they would be considered minimally adult), while another 22% possessed only one adult characteristic. Of the 28% of respondents possessing two or more adult characteristics, nearly half (13%) possessed only two; the remaining 15% possessed three or more adult characteristics. Table 12 also indicates how many respondents qualified as adults on each of the five characteristics. Only 17% of valid respondents were 24 years or older, 39% lived within driving distance of campus, 9% were enrolled part-time, 12% worked more than 30 hours per week, and 26% cared for dependents.

Next, mean responses for each category of SumAdult were calculated for each of the five benchmarks as shown in Table 13. Figure 6 graphically portrays the variations in mean scores for each of the five NSSE benchmarks by level of SumAdult and serves to highlight the curvilinear nature of the relationships. The overall mean for ACa (Level of Academic Challenge) was 54.8, and most categories of respondents scored close to the mean. However, respondents who scored 3 on SumAdult averaged 56.2, while respondents who scored 5 on SumAdult only averaged 52.2 on ACa.

Table 12

Frequencies: Number of Adult Characteristics

Variable	Response Values	<i>N</i>	Raw %	% of Valid
All Cases		45,109	100.0%	100.0%
SumAdult	0	20,329	45.1%	50.3%
	1	8,683	19.2%	21.5%
	2	5,262	11.7%	13.0%
	3	3,289	7.3%	8.1%
	4	1,802	4.0%	4.5%
	5	1,050	2.3%	2.6%
	Missing	4,694	10.4%	
Age \geq 24	0 = age < 24	33,812	75.0%	82.8%
	1 = age 24 and over	7,023	15.5%	17.2%
	Missing	4,274	9.5%	
ResCateg	0 = on campus, within walking distance, or fraternity/sorority	24,779	54.9%	60.9%
	1 = within driving distance	15,880	35.2%	39.1%
	Missing	4,450	9.9%	
EnrlCateg	0 = full-time	37,145	82.3%	91.1%
	1 = part-time	3,627	8.0%	8.9%
	Missing	4,337	9.6%	
Work>30	0 = 30 hours / week or less	36,568	81.1%	88.1%
	1 = more than 30 hours / week	4,938	10.9%	11.9%
	Missing	3,603	8.0%	
DepCateg	0 = less than 1 hour / week	30,510	67.6%	73.3%
	1 = 1 or more hours / week	10,955	24.3%	26.4%
	Missing	3,644	8.1%	

Table 13

Mean Responses on NSSE Benchmark by Number of Adult Characteristics

	SumAdult	<i>M</i>	<i>SD</i>	<i>N</i>
ACa	0	54.963	13.438	20,326
	1	54.248	13.932	8,682
	2	54.914	14.239	5,261
	3	56.163	14.594	3,287
	4	54.327	14.724	1,800
	5	52.151	14.366	1,049
	Overall	54.800	13.845	40,405
ACL	0	45.700	16.132	20,328
	1	48.140	16.849	8,683
	2	48.624	17.535	5,262
	3	50.499	17.679	3,288
	4	47.278	17.352	1,801
	5	43.723	15.967	1,050
	Overall	47.014	16.734	40,412
SFI	0	38.396	19.769	20,323
	1	40.672	20.326	8,681
	2	40.259	20.742	5,258
	3	40.288	20.056	3,287
	4	36.382	18.619	1,801
	5	31.606	16.669	1,049
	Overall	39.016	19.990	40,399
EEE	0	35.467	16.679	20,310
	1	36.766	17.777	8,678
	2	35.336	17.977	5,258
	3	35.461	17.784	3,281
	4	31.600	16.839	1,801
	5	27.684	15.735	1,046
	Overall	35.355	17.242	40,374

Table 13 continued

	SumAdult	<i>M</i>	<i>SD</i>	<i>N</i>
SCE	0	60.670	17.530	20,307
	1	57.565	18.304	8,676
	2	57.065	19.108	5,253
	3	57.031	19.689	3,278
	4	56.790	19.207	1,802
	5	56.627	19.138	1,044
	Overall	58.960	18.291	40,360

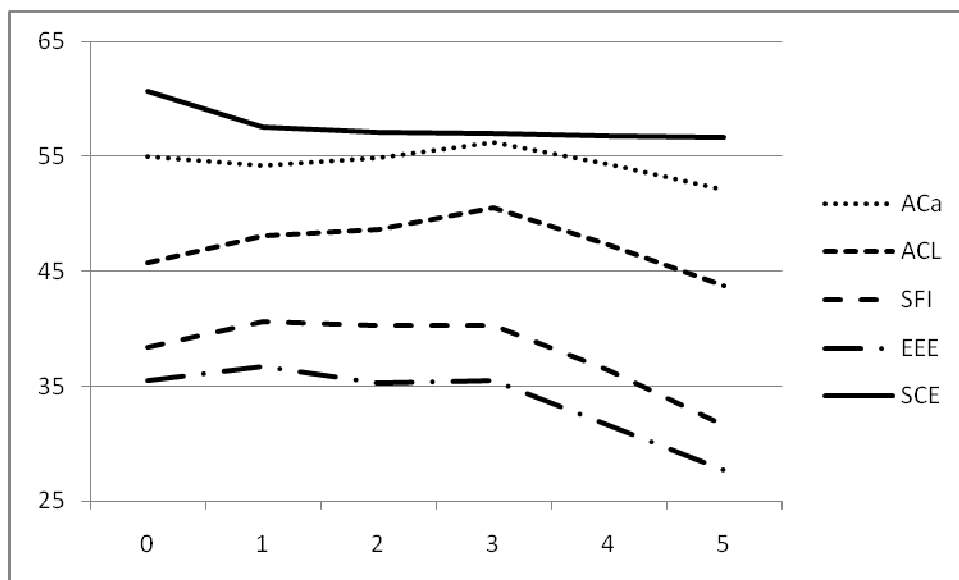


Figure 6. Means on NSSE benchmarks by value of *SumAdult*

For the ACL benchmark (Active and Collaborative Learning), the overall mean was 47.0. On this benchmark, the means for each group followed an inverted curve with those scoring 0 and 5 on SumAdult averaging the lowest scores on ACL while those scoring 3 averaged the highest. SFI (Student-Faculty Interaction) also followed a curve with those scoring 0 and 5 on SumAdult averaging the lowest on SFI while those scoring 1, 2, or 3 averaged just above the overall mean of 39.0.

Average scores on the EEE benchmark (Enriching Educational Experiences) similarly followed a curvilinear pattern with those scoring 1 on SumAdult averaging above the overall mean of 35.4. Respondents scoring 0 on SumAdult averaged lower on EEE, and those scoring 2 and above also averaged progressively lower scores with increasing levels of adulthood.

The relationship between SumAdult and the last benchmark, Supportive Campus Environment (SCE), was more linear. The overall mean score for SCE was just under 59; respondents who scored 0 on SumAdult averaged 60.7 on SCE, and the scores fell off to an average of 56.6 for respondents scoring a 5 on SumAdult.

Finally, the variable SumAdult was correlated with each of the five NSSE benchmarks. Results of the correlational analysis are presented in Table 14. In contrast to Table 11, all five correlations are statistically significant, though ACL, EEE, and SCE still show the strongest relationships (slightly stronger than in Table 10). Table 14 also gives values for η and η^2 , statistics that demonstrate association between variables that are nonlinearly related (Garson, 2008). Notice that the values for η and η^2 are significantly larger than the values of r and r^2 . This indicates that a curvilinear relationship is indeed present, and that fitting the data to a curve yields more explanatory

Table 14

Measures of Association Between SumAdult and NSSE Benchmarks

		ACa	ACL	SFI	EEE	SCE
SumAdult	<i>N</i>	40,405	40,412	40,399	40,374	40,360
	<i>r</i>	-.010*	.051***	-.017**	-.058***	-.080***
	<i>r</i> ²	.000	.003	.000	.003	.006
	<i>η</i>	.047***	.099***	.084***	.093***	.095***
	<i>η</i> ²	.002	.010	.007	.009	.009

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

power than fitting them to a straight line. Indeed, the amount of variance explained in each of the five NSSE benchmarks increases markedly, though the total explained variance still only ranges from 0.2% to 1.0%.

Question #3: Effects of Individual Adult Characteristics

In this question, each of the indicators of adult status was considered separately as a variable in a hierarchical linear regression for each of the five NSSE benchmarks. The ordinal variables age, workon01, workof01, and carede01 were used instead of their dichotomous counterparts used previously (Age \geq 24, Work $>$ 30, and DepCateg), and the source variable enrlnm was used instead of its derived counterpart, EnrlCateg. The derived ordinal variable Residence (created by combining the values for living on campus and living in a fraternity/sorority) was used instead of its categorical source variable, livenow, or the dichotomous variable ResCateg used in the previous question. This allowed for a more nuanced correlation between these variables and the NSSE benchmarks.

Table 15 contains frequencies for each response on the adult characteristic items. Note that working on and off campus were considered separately rather than combining them to yield total number of hours worked for pay as was done in the first two research questions in order to understand their individual impact. In this sample, 44% of the valid respondents were 19 or younger, and another 39% were 20-23 years of age. Of those who qualified as adults (24 or older), nearly half were 24-29 years old; the remainder were evenly split between the 30-39 category and the 40-55 category.

Nearly half of respondents lived on campus and 14% lived within walking distance of campus. 39% of respondents lived within driving distance. As noted before, just under 9% of respondents were enrolled less than full-time.

Approximately 72% of respondents did not work on campus; the largest portion of the remainder (almost 10%) worked 6-10 hours each week on campus, and nearly everyone else worked 20 hours per week or less. In contrast, 42.5% of respondents reported working off campus with the largest portions working half-time (16-20 hours per week; 7.3%) or full-time (more than 30 hours per week; 9.7%). Almost three-quarters of respondents reported no dependent care; the largest portions of the remaining respondents reported caring for dependents 1-6 hours each week (9.6%) or more than 30 hours per week (6.1%).

Tables 16 – 20 contain group means on the five NSSE benchmarks for each level of the independent variables. A detailed analysis of each set of group means is superfluous to this research question, but an overview of these means can serve to highlight nonlinear trends that are not captured well by linear regression analyses and

Table 15

Frequencies: Adult Learner Characteristics

Variable	Response Values	N	Raw %	% of Valid
All Cases		45,109	100.0%	100.0%
age	1 (19 or younger)	17,915	39.7%	43.9%
	2 (20 – 23)	15,897	35.2%	38.9%
	3 (24 – 29)	3,345	7.4%	8.2%
	4 (30 – 39)	1,914	4.2%	4.7%
	5 (40 – 55)	1,626	3.6%	4.0%
	6 (over 55)	138	0.3%	0.3%
	Missing	4,274	9.5%	
Residence	1 = dormitory or other campus housing (not fraternity/sorority)	19,172	42.5%	47.2%
	2 = residence within walking distance	5,607	12.4%	13.8%
	3 = residence within driving distance	15,884	35.2%	39.1%
	Missing	4,446	9.9%	
enrlment	1 = less than full-time	3,627	8.0%	8.9%
	2 = full-time	37,145	82.3%	91.1%
	Missing	4,337	9.6%	
workon01	1 = 0 hours / week	29,689	65.8%	71.6%
	2 = 1-5 hours / week	2,380	5.3%	5.7%
	3 = 6-10 hours / week	4,057	9%	9.8%
	4 = 11-15 hours / week	2,356	5.2%	5.7%
	5 = 16-20 hours / week	1,743	3.9%	4.2%
	6 = 21-25 hours / week	467	1.0%	1.1%
	7 = 26-30 hours / week	194	0.4%	0.5%
	8 = more than 30 hours / week	582	1.3%	1.4%
	Missing	3,641	8.1%	

Table 15 continued

Variable	Response Values	<i>N</i>	Raw %	% of Valid
workof01	1 = 0 hours / week	23,840	52.8%	57.5%
	2 = 1-5 hours / week	2,200	4.9%	5.3%
	3 = 6-10 hours / week	2,310	5.1%	5.6%
	4 = 11-15 hours / week	2,445	5.4%	5.9%
	5 = 16-20 hours / week	3,012	6.7%	7.3%
	6 = 21-25 hours / week	2,140	4.7%	5.2%
	7 = 26-30 hours / week	1,487	3.3%	3.6%
	8 = more than 30 hours / week	4,017	8.9%	9.7%
	Missing	3,658	8.1%	
carede01	1 = 0 hours / week	30,510	67.6%	73.6%
	2 = 1-5 hours / week	3,972	8.8%	9.6%
	3 = 6-10 hours / week	1,843	4.1%	4.4%
	4 = 11-15 hours / week	1,064	2.4%	2.6%
	5 = 16-20 hours / week	762	1.7%	1.8%
	6 = 21-25 hours / week	452	1.0%	1.1%
	7 = 26-30 hours / week	312	0.7%	0.8%
	8 = more than 30 hours / week	2,550	5.7%	6.1%
	Missing	3,644	8.1%	

Table 16

Mean Responses on ACa by Adult Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
age	1 (19 or younger)	53.134	13.226	17,890
	2 (20 – 23)	56.457	14.024	15,878
	3 (24 – 29)	55.205	14.639	3,338
	4 (30 – 39)	55.579	14.442	1,911
	5 (40 – 55)	55.320	14.473	1,621
	6 (over 55)	52.980	13.320	138
	Total	54.799	13.853	40,776
Residence	1 = dormitory or other campus housing (including fraternity/sorority)	54.643	13.444	19,157
	2 = residence within walking distance	56.015	13.934	5,599
	3 = residence within driving distance	54.569	14.277	15,860
	Total	54.803	13.850	40,616
enrlment	1 = less than full-time	51.416	14.534	3,619
	2 = full-time	55.140	13.744	37,110
	Total	54.809	13.856	40,729
workon01	1 = 0 hours / week	54.212	13.922	29,679
	2 = 1-5 hours / week	55.958	13.511	2,380
	3 = 6-10 hours / week	56.048	13.129	4,056
	4 = 11-15 hours / week	55.735	13.651	2,356
	5 = 16-20 hours / week	56.239	13.941	1,742
	6 = 21-25 hours / week	56.916	13.713	467
	7 = 26-30 hours / week	56.756	14.183	194
	8 = more than 30 hours / week	57.953	15.498	582
	Total	54.759	13.860	41,456

Table 16 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
workof01	1 = 0 hours / week	54.780	13.669	23,837
	2 = 1-5 hours / week	54.765	13.966	2,198
	3 = 6-10 hours / week	55.065	13.787	2,310
	4 = 11-15 hours / week	55.282	13.593	2,444
	5 = 16-20 hours / week	54.555	13.870	3,008
	6 = 21-25 hours / week	54.454	14.134	2,139
	7 = 26-30 hours / week	55.201	14.147	1,487
	8 = more than 30 hours / week	54.208	14.839	4,013
	Total	54.751	13.862	41,436
carede01	1 = 0 hours / week	54.571	13.711	30,504
	2 = 1-5 hours / week	54.092	14.067	3,969
	3 = 6-10 hours / week	55.007	13.896	1,843
	4 = 11-15 hours / week	55.813	13.564	1,062
	5 = 16-20 hours / week	55.185	13.881	761
	6 = 21-25 hours / week	55.337	14.761	452
	7 = 26-30 hours / week	57.564	14.434	312
	8 = more than 30 hours / week	56.786	14.937	2,548
	Total	54.755	13.863	41,451

Table 17

Mean Responses on ACL by Adult Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
age	1 (19 or younger)	42.265	15.337	17,912
	2 (20 – 23)	51.532	16.623	15,893
	3 (24 – 29)	49.403	17.347	3,344
	4 (30 – 39)	48.218	17.252	1,912
	5 (40 – 55)	48.243	17.295	1,626
	6 (over 55)	44.617	17.184	138
	Total	46.982	16.754	40,825
Residence	1 = dormitory or other campus housing (including fraternity/sorority)	45.244	16.181	19,170
	2 = residence within walking distance	50.215	16.548	5,607
	3 = residence within driving distance	48.006	17.213	15,876
	Total	47.008	16.739	40,653
enrlment	1 = less than full-time	44.108	16.693	3,625
	2 = full-time	47.268	16.739	37,140
	Total	46.987	16.759	40,765
workon01	1 = 0 hours / week	45.664	16.580	29,689
	2 = 1-5 hours / week	50.065	16.326	2,380
	3 = 6-10 hours / week	49.235	16.146	4,056
	4 = 11-15 hours / week	49.550	16.861	2,356
	5 = 16-20 hours / week	51.795	17.348	1,742
	6 = 21-25 hours / week	52.286	17.497	467
	7 = 26-30 hours / week	52.651	18.313	194
	8 = more than 30 hours / week	52.383	18.677	582
	Total	46.946	16.757	41,466

Table 17 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
workof01	1 = 0 hours / week	45.789	16.386	23,840
	2 = 1-5 hours / week	49.531	17.140	2,200
	3 = 6-10 hours / week	49.455	16.893	2,310
	4 = 11-15 hours / week	48.854	16.727	2,444
	5 = 16-20 hours / week	48.256	17.014	3,010
	6 = 21-25 hours / week	48.064	17.076	2,140
	7 = 26-30 hours / week	49.205	16.993	1,487
	8 = more than 30 hours / week	47.268	17.619	4,016
	Total	46.935	16.762	41,447
carede01	1 = 0 hours / week	46.283	16.434	30,509
	2 = 1-5 hours / week	47.319	16.886	3,972
	3 = 6-10 hours / week	49.112	17.306	1,843
	4 = 11-15 hours / week	49.583	17.838	1,064
	5 = 16-20 hours / week	49.527	17.712	761
	6 = 21-25 hours / week	49.788	17.580	452
	7 = 26-30 hours / week	49.757	18.080	311
	8 = more than 30 hours / week	49.932	18.213	2,548
	Total	46.940	16.763	41,460

Table 18

Mean Responses on SFI by Adult Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
age	1 (19 or younger)	33.728	17.321	17,890
	2 (20 – 23)	45.201	21.139	15,882
	3 (24 – 29)	39.981	20.775	3,342
	4 (30 – 39)	37.810	19.068	1,912
	5 (40 – 55)	36.420	17.694	1,624
	6 (over 55)	34.340	18.525	138
	Total	39.008	19.980	40,788
Residence	1 = dormitory or other campus housing (including fraternity/sorority)	37.872	19.531	19,157
	2 = residence within walking distance	43.729	21.210	5,601
	3 = residence within driving distance	38.712	19.836	15,870
	Total	39.007	19.981	40,628
enrlment	1 = less than full-time	34.656	18.566	3,618
	2 = full-time	39.431	20.063	37,119
	Total	39.007	19.981	40,737
workon01	1 = 0 hours / week	36.636	18.969	29,675
	2 = 1-5 hours / week	44.629	20.753	2,377
	3 = 6-10 hours / week	43.779	21.004	4,053
	4 = 11-15 hours / week	44.410	21.033	2,355
	5 = 16-20 hours / week	46.311	21.763	1,742
	6 = 21-25 hours / week	47.982	21.688	467
	7 = 26-30 hours / week	48.018	21.776	194
	8 = more than 30 hours / week	46.787	21.887	581
	Total	38.965	19.970	41,444

Table 18 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
workof01	1 = 0 hours / week	38.415	19.863	23,829
	2 = 1-5 hours / week	42.124	20.315	2,198
	3 = 6-10 hours / week	42.093	20.461	2,307
	4 = 11-15 hours / week	41.586	20.263	2,443
	5 = 16-20 hours / week	39.284	19.618	3,010
	6 = 21-25 hours / week	39.697	20.067	2,139
	7 = 26-30 hours / week	39.504	20.155	1,486
	8 = more than 30 hours / week	36.160	19.406	4,014
	Total	38.954	19.965	41,426
carede01	1 = 0 hours / week	38.668	19.898	30,494
	2 = 1-5 hours / week	39.415	20.095	3,969
	3 = 6-10 hours / week	40.645	20.751	1,841
	4 = 11-15 hours / week	40.728	20.089	1,064
	5 = 16-20 hours / week	40.738	20.375	760
	6 = 21-25 hours / week	39.985	20.524	452
	7 = 26-30 hours / week	40.921	20.594	309
	8 = more than 30 hours / week	38.888	19.590	2,548
	Total	38.963	19.971	41,437

Table 19

Mean Responses on EEE by Adult Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
age	1 (19 or younger)	28.127	12.471	17,857
	2 (20 – 23)	44.181	17.778	15,858
	3 (24 – 29)	35.670	17.585	3,335
	4 (30 – 39)	31.991	16.963	1,907
	5 (40 – 55)	31.684	17.207	1,617
	6 (over 55)	31.796	18.000	134
	Total	35.334	17.243	40,708
Residence	1 = dormitory or other campus housing (including fraternity/sorority)	33.924	16.161	19,125
	2 = residence within walking distance	42.224	18.102	5,589
	3 = residence within driving distance	34.651	17.638	15,845
	Total	35.351	17.248	40,559
enrlment	1 = less than full-time	31.347	17.541	3,608
	2 = full-time	35.731	17.166	37,063
	Total	35.342	17.244	40,671
workon01	1 = 0 hours / week	33.368	16.538	29,643
	2 = 1-5 hours / week	39.826	18.003	2,376
	3 = 6-10 hours / week	39.441	17.520	4,054
	4 = 11-15 hours / week	39.738	18.116	2,356
	5 = 16-20 hours / week	41.469	18.313	1,743
	6 = 21-25 hours / week	43.015	18.091	467
	7 = 26-30 hours / week	42.712	18.052	193
	8 = more than 30 hours / week	40.262	19.327	582
	Total	35.286	17.237	41,414

Table 19 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
workof01	1 = 0 hours / week	34.812	16.779	23,809
	2 = 1-5 hours / week	36.968	17.854	2,196
	3 = 6-10 hours / week	37.766	17.755	2,308
	4 = 11-15 hours / week	37.504	17.847	2,441
	5 = 16-20 hours / week	36.438	17.552	3,007
	6 = 21-25 hours / week	36.028	17.708	2,137
	7 = 26-30 hours / week	36.255	17.455	1,487
	8 = more than 30 hours / week	32.650	17.810	4,009
	Total	35.273	17.237	41,394
carede01	1 = 0 hours / week	35.665	17.098	30,475
	2 = 1-5 hours / week	33.887	17.433	3,968
	3 = 6-10 hours / week	34.687	17.393	1,839
	4 = 11-15 hours / week	34.685	17.773	1,062
	5 = 16-20 hours / week	35.353	17.796	757
	6 = 21-25 hours / week	34.169	18.010	452
	7 = 26-30 hours / week	34.481	18.596	310
	8 = more than 30 hours / week	33.793	17.629	2,547
	Total	35.280	17.241	41,410

Table 20

Mean Responses on SCE by Adult Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
age	1 (19 or younger)	60.597	17.838	17,825
	2 (20 – 23)	57.976	18.229	15,847
	3 (24 – 29)	55.643	19.205	3,332
	4 (30 – 39)	57.421	19.233	1,901
	5 (40 – 55)	59.016	18.843	1,611
	6 (over 55)	60.675	18.241	133
	Total	58.958	18.284	40,649
Residence	1 = dormitory or other campus housing (including fraternity/sorority)	60.987	17.607	19,102
	2 = residence within walking distance	58.599	18.033	5,583
	3 = residence within driving distance	56.638	18.915	15,826
	Total	58.958	18.297	40,511
enrlment	1 = less than full-time	55.582	19.075	3,597
	2 = full-time	59.279	18.184	37,021
	Total	58.952	18.295	40,618
workon01	1 = 0 hours / week	58.045	18.350	29,529
	2 = 1-5 hours / week	61.784	17.509	2,369
	3 = 6-10 hours / week	61.922	17.455	4,045
	4 = 11-15 hours / week	60.490	17.840	2,344
	5 = 16-20 hours / week	59.752	18.799	1,737
	6 = 21-25 hours / week	59.969	18.412	466
	7 = 26-30 hours / week	59.027	19.499	193
	8 = more than 30 hours / week	61.938	19.390	578
	Total	58.931	18.287	41,261

Table 20 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
workof01	1 = 0 hours / week	60.072	17.885	23,719
	2 = 1-5 hours / week	60.175	18.045	2,187
	3 = 6-10 hours / week	59.029	18.002	2,299
	4 = 11-15 hours / week	58.108	18.261	2,430
	5 = 16-20 hours / week	56.871	18.238	2,998
	6 = 21-25 hours / week	56.048	18.538	2,127
	7 = 26-30 hours / week	56.061	19.212	1,482
	8 = more than 30 hours / week	56.047	19.695	3,998
	Total	58.929	18.286	41,240
carede01	1 = 0 hours / week	59.167	18.009	30,368
	2 = 1-5 hours / week	58.259	18.655	3,949
	3 = 6-10 hours / week	58.466	18.853	1,831
	4 = 11-15 hours / week	57.645	18.587	1,056
	5 = 16-20 hours / week	56.711	18.797	752
	6 = 21-25 hours / week	58.063	19.327	450
	7 = 26-30 hours / week	59.250	20.169	310
	8 = more than 30 hours / week	58.708	19.849	2,540
	Total	58.926	18.294	41,256

differences in how the means trend for each benchmark. These trends are best displayed graphically in Figures 7 – 12.

Figure 7 shows means on each of the five NSSE benchmarks for different values of the variable “age.” Note that mean level of engagement on four of the five benchmarks follows a curvilinear pattern which peaks for a response value of 2 (20-23 years old), while mean level on SCE follows an inverted curve which bottoms out for respondents with an age value of 3 (24-29 years old).

Figure 8 shows means on the five benchmarks for the three values of the variable “Residence.” While not linear in nature, the patterns on four of the five benchmarks are once again quite similar: higher levels of engagement for students living off campus within walking distance (a response value of 2) and lower levels of engagement for those living on campus (Residence=1) or within driving distance (Residence=3). As before, the only exception is for the SCE benchmark; students living on campus show a higher level of engagement than any other students.

Figure 9 shows means on the five NSSE benchmarks for students enrolled less than full-time (enrlment=1) and full-time (enrlment=2). On every benchmark, full-time students average higher levels of engagement.

Figure 10 shows engagement levels for respondents working various numbers of hours on campus. For all five of the benchmarks, there is a peak at a response value of $workon01 = 2$; students working on campus 1-6 hours per week seem to be more engaged than those who do not work on campus. As hours of work increase, engagement levels increase slightly on every benchmark except SCE; mean scores on SCE fall as number of hours worked on campus increase with the exception of a sharp upswing for full-time

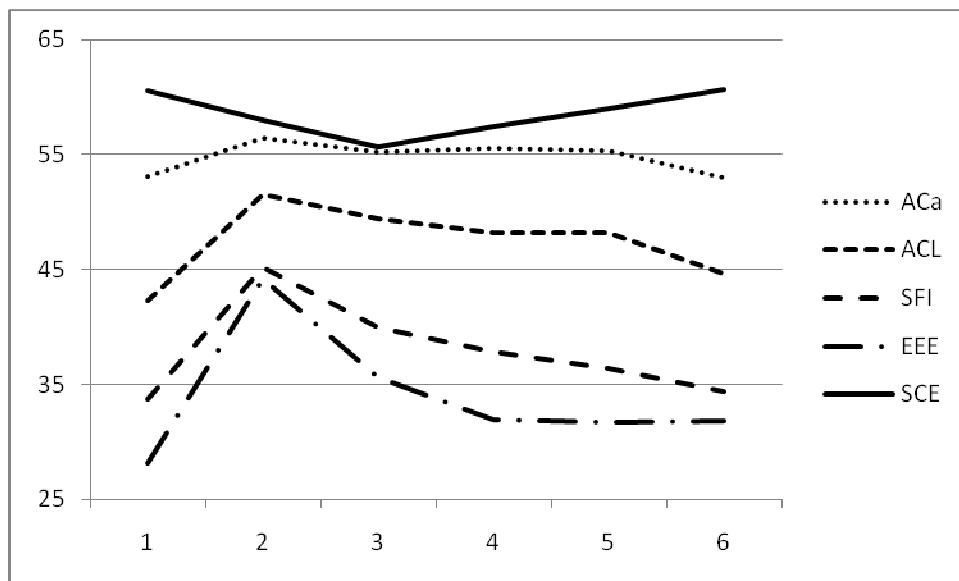


Figure 7. Means on NSSE benchmarks by value of *age*

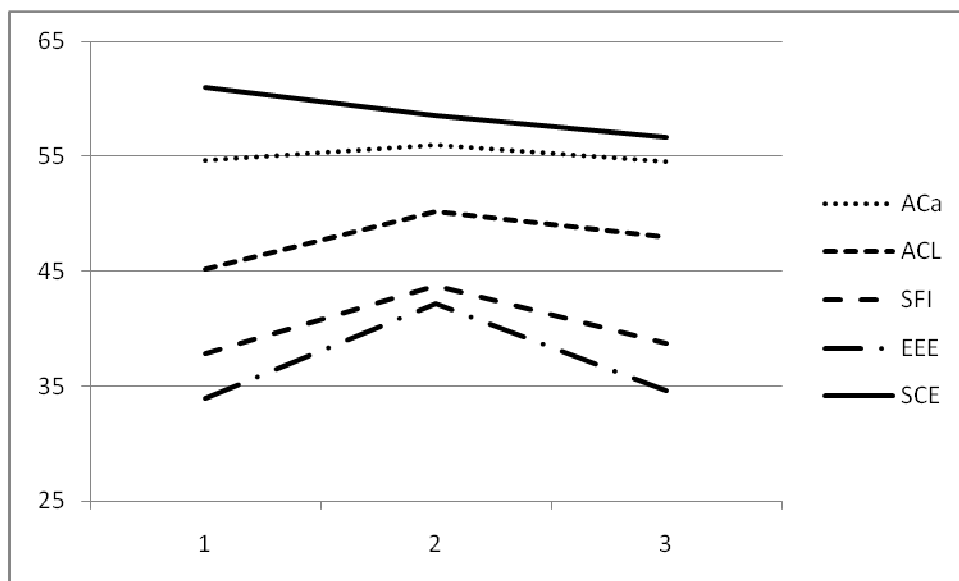


Figure 8. Means on NSSE benchmarks by value of *Residence*

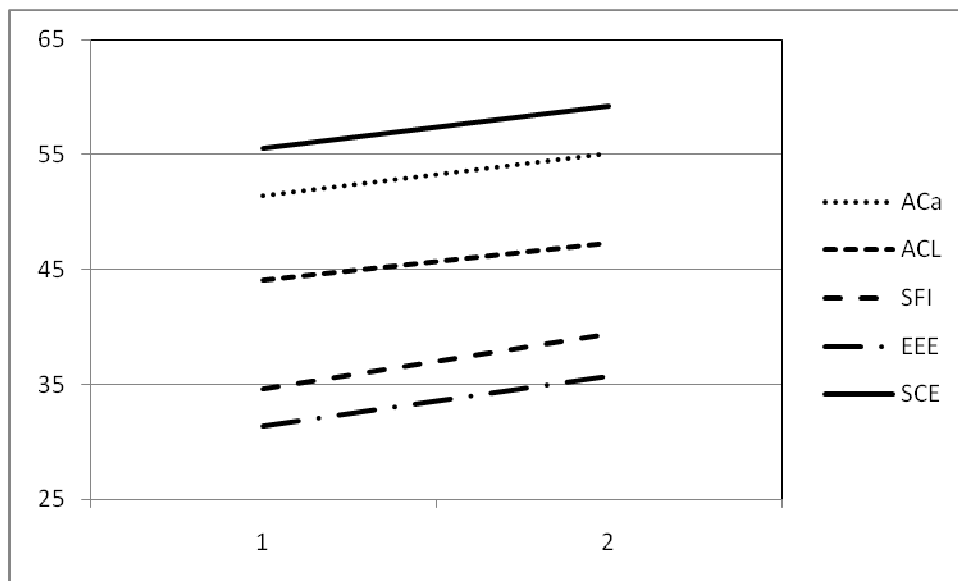


Figure 9. Means on NSSE benchmarks by value of *enrlnmt*

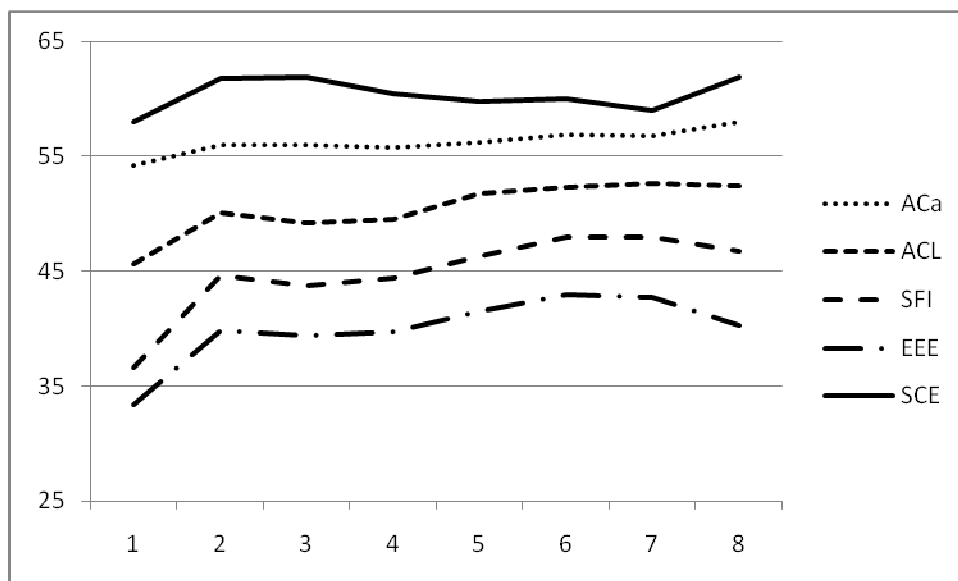


Figure 10. Means on NSSE benchmarks by value of *workon01*

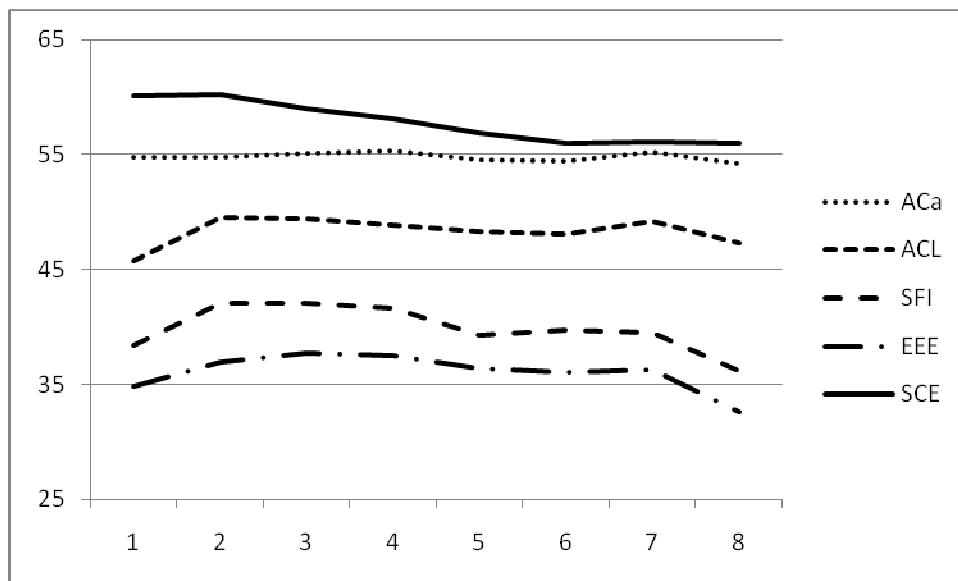


Figure 11. Means on NSSE benchmarks by value of *workof01*

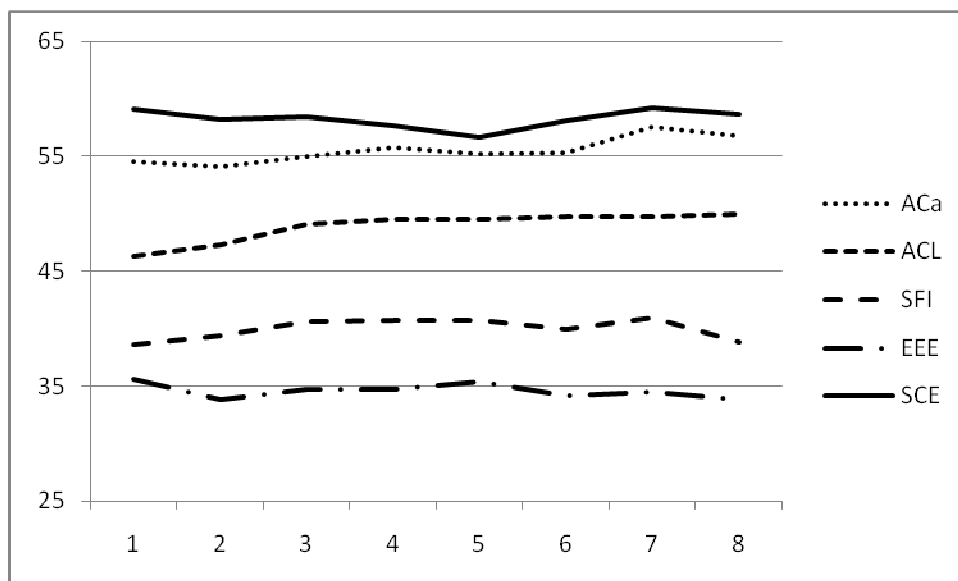


Figure 12. Means on NSSE benchmarks by value of *carede01*

employees (workon01 = 8). In contrast, Figure 11 shows that engagement levels generally fall off as number of hours worked off campus increases. As before, mean responses on SCE show a slightly different pattern than those on the other four benchmarks.

Finally, Figure 12 shows means on the five NSSE benchmarks for students reporting successively higher numbers of hours spent each week caring for dependents. For the most part, these trends are fairly flat with a slight upward tendency.

Tables 21 - 25 contains the bivariate correlations between each of the five NSSE benchmarks and the characteristics of adult learners. As in the previous question, η and η^2 were also calculated to test for the magnitude and significance of nonlinear patterns displayed in Figures 7 – 12. In each table the values of r and η for the variable enrollment are identical because enrollment is a dichotomous variable and the relationships are exactly linear in nature.

Table 21 shows that, for the benchmark ACa, age, enrollment status, work on campus, and care for dependents all exhibit a slight positive correlation with level of academic challenge. The values of η and η^2 , however, indicate that the relationships between ACa and the variables age and Residence are better explained using a curve; explained variance for these two variables rises from 0.4% to 1.2% for age and from 0 to 0.1% for Residence when the data are fit to a curve rather than a straight line.

Table 22 similarly investigates both the straight line and curvilinear associations between the benchmark ACL and the adult characteristics. In this case, age and work on campus show the strongest relationships to ACL, though the other four variables also demonstrate a significant positive correlation with ACL. The values of η and η^2 again

Table 21

Measures of Association Between ACa and Adult Characteristics

	age	Residence	enrlment	workon01	workof01	carede01
<i>N</i>	40,776	40,616	40,729	41,456	41,436	41,451
<i>r</i>	.060 ^{***}	-.001	.076 ^{***}	.060 ^{***}	-.008	.042 ^{***}
<i>r</i> ²	.004	.000	.006	.004	.000	.002
η	.111 ^{***}	.035 ^{***}	.076 ^{***}	.065 ^{***}	.019 ^{**}	.047 ^{***}
η^2	.012	.001	.006	.004	.000	.002

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

Table 22

Measures of Association Between ACL and Adult Characteristics

	age	Residence	enrlment	workon01	workof01	carede01
<i>N</i>	40,825	40,653	40,765	41,466	41,447	41,460
<i>r</i>	.142 ^{***}	.079 ^{***}	.054 ^{***}	.117 ^{***}	.052 ^{***}	.069 ^{***}
<i>r</i> ²	.020	.006	.003	.014	.003	.005
η	.256 ^{***}	.108 ^{***}	.054 ^{***}	.127 ^{***}	.086 ^{***}	.074 ^{***}
η^2	.066	.012	.003	.016	.007	.005

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

Table 23

Measures of Association Between SFI and Adult Characteristics

	age	Residence	enrlment	workon01	workof01	carede01
<i>N</i>	40,788	40,628	40,737	41,444	41,426	41,437
<i>r</i>	.091 ^{***}	.023 ^{***}	.068 ^{***}	.169 ^{***}	-.010 ^{**}	.015 ^{**}
<i>r</i> ²	.008	.001	.005	.028	.000	.000
η	.263 ^{***}	.096 ^{***}	.068 ^{***}	.188 ^{***}	.079 ^{***}	.031 ^{***}
η^2	.069	.009	.005	.035	.006	.001

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

Table 24

Measures of Association Between EEE and Adult Characteristics

	age	Residence	enrlment	workon01	workof01	carede01
<i>N</i>	40,708	40,559	40,671	41,414	41,394	41,410
<i>r</i>	.132 ^{***}	.025 ^{***}	.072 ^{***}	.158 ^{***}	-.006	-.029 ^{***}
<i>r</i> ²	.018	.001	.005	.025	.000	.001
<i>η</i>	.428 ^{***}	.160 ^{***}	.072 ^{***}	.179 ^{***}	.077 ^{***}	.040 ^{***}
<i>η</i> ²	.183	.026	.005	.032	.006	.002

* *p* < .05. ** *p* < .01. *** *p* < .001.

Table 25

Measures of Association Between SCE and Adult Characteristics

	age	Residence	enrlment	workon01	workof01	carede01
<i>N</i>	40,649	40,511	40,618	41,261	41,240	41,256
<i>r</i>	-.058 ^{***}	-.110 ^{***}	.057 ^{***}	.056 ^{***}	-.088 ^{***}	-.014 ^{**}
<i>r</i> ²	.003	.012	.003	.003	.008	.000
<i>η</i>	.088 ^{***}	.110 ^{***}	.057 ^{***}	.081 ^{***}	.090 ^{***}	.027 ^{***}
<i>η</i> ²	.008	.012	.003	.007	.008	.001

* *p* < .05. ** *p* < .01. *** *p* < .001.

show that fitting the data to curves is helpful for five of the six independent variables (and the sixth, enrlnmt, is fundamentally linear by virtue of the fact that it is dichotomous). The largest improvement is for the variable age, where explained variance rises from 2.0% to 6.6%. Residence, workon01, and workof01 also demonstrate more explanatory power when fitted to a curve instead of a straight line. Explained variance for these three variables is 1.2%, 1.6%, and 0.7% respectively when a curvilinear relationship is employed.

Table 23 likewise shows gains in explanatory power for five of the six variables compared to the benchmark SFI. Linear correlation coefficients for the six variables range from -.010 for workof01 to .169 for workon01. When fitted to a curve, however, age has the strongest explanatory power and explains 6.9% of the variance in SFI. The variable workon01 follows closely and explains 3.5% of the variance in SFI. The other four variables, while related significantly to SFI, explain less than 1% of the variance.

The largest explained variance for the adult characteristics is found in Table 24, where the associations between the six adult characteristic variables and the benchmark EEE are set forth. For this benchmark, workon01 and age show the strongest linear correlations with EEE. However, comparing the values for η and η^2 with the values for r and r^2 in this table shows once again that there is clearly a nonlinear pattern. In this analysis, age accounts for 18.3% of the variance in EEE when fitting it to a curve, while workon01 accounts for 3.2% of the variance and Residence accounts for 2.6% of the variance. The remaining associations, while statistically significant, again explain less than 1% of the variance in EEE.

Finally, Table 25 displays the calculated associations between the six adult characteristic variables and the SCE benchmark. In this instance, four of the six correlation coefficients are negative, indicating that scores on SCE decrease as values of the variables increase (respondents were less likely to perceive a supportive campus environment if they were older, lived off campus, worked more hours off campus, or cared for dependents). These relationships were more nearly linear as evidenced by the smaller differences between the values of r and η . For SCE, the variable Residence explained 1.2% of the variance when fitted to a curve, while the remaining variables explained less than 1% of the variance.

Tables 26-30 contain the hierarchical regression model summaries for each of the NSSE benchmarks when the six adult characteristic variables are used as predictors. For each of the five benchmarks, Model 1 shows the regression model resulting when only age is used as to distinguish students. Model 2 shows the expanded regression model that employs all six adult characteristics.

Table 26 shows that the regression model for ACa has five times more explanatory power when all six adult characteristics are included as opposed to when just age is considered ($R^2=.021$ instead of $R^2=.004$). The standardized regression coefficients indicate that age has the most explanatory power ($\beta=.124$) followed by enrollment status. Table 27 shows a similar pattern: the expanded model has more than twice the explanatory power of the model with just age, and once again age and enrollment status are the strongest predictors of ACL (though work on campus is not far behind). Unlike in the model for ACa, place of residence and care for dependents do not have a significant effect on ACL.

Table 26

Regression Model Summary for ACa (Adult Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	53.166	.148		40.072	.663	
age	.898	.070	.067***	1.669	.094	.124***
Residence				-.609	.100	-.041***
enrlment				6.015	.295	.118***
workon01				.506	.050	.054***
workof01				.003	.035	.001
carede01				.208	.045	.028***
R^2		.004***			.021***	

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

Table 27

Regression Model Summary for ACL (Adult Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	42.140	.177		2.804	.788	
age	2.611	.084	.161***	3.300	.112	.203***
Residence				.126	.118	.007
enrlment				8.663	.351	.141***
workon01				1.402	.059	.123***
workof01				.283	.042	.041***
carede01				-.037	.054	-.004
R^2		.026***			.056***	

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

Table 28

Regression Model Summary for SFI (Adult Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	35.188	.213		11.975	.942	
age	2.087	.101	.107***	3.451	.133	.178***
Residence				-.181	.141	-.008
enrlment				9.068	.419	.123***
workon01				2.276	.071	.168***
workof01				.087	.05	.011*
carede01				-.349	.064	-.033***
R^2		.012***			.054***	

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

Table 29

Regression Model Summary for EEE (Adult Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	3.728	.183		8.769	.802	
age	2.501	.087	.149***	4.716	.114	.281***
Residence				-.439	.121	-.024***
enrlment				9.114	.357	.144***
workon01				1.75	.06	.149***
workof01				.053	.043	.008
carede01				-1.107	.055	-.120***
R^2		.022***			.077***	

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

Table 30

Regression Model Summary for SCE (Adult Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	61.026	.195		58.462	.873	
age	-.907	.093	-.051***	.110	.124	.006
Residence				-1.867	.131	-.095***
enrlment				1.791	.389	.027***
workon01				.512	.066	.041***
workof01				-.312	.046	-.042***
carede01				.413	.060	.043***
R^2		.003***			.017***	

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

Age once again shows the strongest association with SFI in Table 28 ($\beta=.178$), though work on campus is second in order of magnitude followed by enrollment status. Place of residence does not have a significant effect on SFI, and the association between SFI and work off campus is only significant at the $p<.05$ level. The expanded regression model for SFI explains 5.4% of the variance compared to only 1.2% when only age is included in the model.

The expanded regression model for EEE in Table 29 explains the most variance of the five benchmarks: 7.7% of the variance in EEE is accounted for by the full range of adult characteristics as opposed to only 2.2% when age alone is included. As with SFI, age, work on campus, and enrollment status are the strongest predictors, though care for dependents takes on a negative value of similar magnitude. Work off campus once again is not significantly associated with EEE.

In contrast to the other benchmarks, the regression model for SCE shows lower explanatory power (Table 30). Even when the full set of adult characteristics is included in the regression model, only 1.7% of the variance in SCE is explained. When only age is included as a variable, the explained variance drops to 0.3%. In fact, age is not even significantly associated with SCE in the expanded model; place of residence, care for dependants, and work both on and off campus show the largest (though still tiny) associations.

Two issues account for the relatively small explained variances (R^2 ranging from .003 to .077) resulting from the five regression models. First, Tables 21-25 noted the presence of nonlinearity, which tends to decrease the explanatory power of a linear analysis like hierarchical linear regression (Cohen & Cohen, 1983). One possible way to

correct for nonlinear relationships in a multiple regression is to apply a quadratic transformation to the independent variable(s). The simplest forms of quadratic transformations involve squaring the independent variable, taking the square root of the independent variable, or taking the natural logarithm of the independent variable (Abrams, 2010). However, these are only rough tools; a polynomial transformation of the independent variable will often yield better results (Keppel & Wickens, 2004). The goal in these transformations is to normalize the independent variable(s), thus yielding linear relationships between the independent variables and dependent variables that increase the explanatory power of the multiple regression models. Selecting the best transformation is often a lengthy process of trial and error, and interpreting the results can be tricky (Abrams, 2010). Consequently, a full exploration of appropriate transformations will not be undertaken in the present study. A brief test of squared and square-root transformations was, however, conducted with the adult characteristics and indicated that a square-root transformation of the adult characteristics increased the explained variance in each of the five NSSE benchmarks slightly ($\Delta R^2 = .003$ for ACa, $\Delta R^2 = .007$ for ACL, $\Delta R^2 = .009$ for SFI, $\Delta R^2 = .023$ for EEE, and $\Delta R^2 = .000$ for SCE). This leads to the inference that finding an appropriate transformation for the adult characteristics will indeed yield a higher level of explained variance in the NSSE benchmarks.

Second, shared variance among the independent variables (referred to as multicollinearity) decreases the amount of explained variance resulting when all variables are included (Edwards, 1984). Tables 31 and 32 display the bivariate correlations and tolerances among the six adult characteristic variables in the above regression models.

Table 31

Bivariate Correlations (r) Between Adult Characteristics

	age	Residence	enrlment	workon01	workof01	carede01
1. age	---	.540	-.421	-.015	.388	.506
2. Residence		---	-.279	-.098	.495	.392
3. enrlment			---	.030	-.308	-.267
4. workon01				---	-.194	-.033
5. workof01					---	.295
6. carede01						---

Note. All values $p < .001$.

Table 32

Tolerances of Adult Characteristic Variables in the Regression Models

	age	Residence	enrlment	workon01	workof01	carede01
<i>Tolerance</i>	.550	.604	.800	.956	.690	.716

These intercorrelations are divided below into three categories based upon Cohen's (1988, 1992) classification of effect size.

Large effect-size intercorrelations ($r \geq 0.37$). Several of the intercorrelations between adult characteristics are of particular note. First, note the strong positive correlation between age and place of residence ($r = .540$). It should come as no surprise that older students tend to live off campus, while younger students live on campus (with the exception of a portion that live at home with parents). This is consistent with Kuh, Gonyea, and Palmer's (2001) findings. Second, there is an almost equally strong correlation ($r = .506$) between age and number of hours spent caring for dependents. Older students are more likely to be caring for dependents living with them.

Four other intercorrelations fall within this range: place of residence and work off campus ($r = .495$), age and enrollment status ($r = -.421$), place of residence and care for dependents ($r = .392$), and age and work off campus ($r = .388$). These correlations indicate that those who reside off campus are more likely to work off campus, older students are more likely to be enrolled part-time, those who live off campus are more likely to spend time each week caring for dependents, and older students are more likely to work off campus.

Moderate effect-size intercorrelations ($r = 0.24$ to 0.36). In the moderate effect size range, enrollment status is negatively correlated with work off campus ($r = -.308$), place of residence ($r = -.279$), and care for dependents ($r = -.267$). In contrast, work off campus is positively correlated with care for dependents ($r = .295$). These correlations indicate that those who are enrolled full-time are less likely to work off campus, live off

campus, or care for dependents. In contrast, those who work off campus are more likely to care for dependents.

Small effect-size intercorrelations ($r=0.10$ to 0.23). In this category, work off campus is negatively correlated with work on campus ($R=-.194$); in other words, students who work more off campus are likely to work less on campus. In addition, four items are only slightly correlated: work on campus and place of residence ($r=-.098$), work on campus and care for dependents ($r=-.033$), work on campus and enrollment status ($r=.030$), and work on campus and age ($r=-.015$). These last four associations would be considered negligible by Cohen (1988, 1992).

These correlations were expected; the characteristics were chosen because they are all characteristics of adult students, and the possession of one is likely to coincide with the possession of another. Nevertheless, the correlations between these variables decreases the overall explanatory power of a model in which they are all included. This is further highlighted in Table 32, which displays the tolerances of the six independent variables. Tolerance is related to multicollinearity and is a measure of how much unique contribution each variable makes to the regression model. Notice in particular that age has a relatively low tolerance; that is, it is related to the other variables and makes less of a unique contribution. Work on campus, in contrast, has a very high tolerance (a tolerance of 1.000 is the maximum), which means it is relatively independent of the other variables. This is born out by the low correlation coefficients between `workon01` and the other variables in Table 31.

Question #4: Effects of Additional Characteristics

This portion of the study added six additional characteristics to the hierarchical linear regression analyses conducted in the previous section. In addition to the characteristics of adult learners, sex, race, father's education level, mother's education level, self-reported class in school, and institutional Carnegie classification (based on the 2005 basic categories) were added to the regression models to compare their effects on each of the engagement benchmarks to the effects of the adult characteristics already studied. In Model 1 for each of the benchmarks, the additional characteristics were entered simultaneously into the regression model. In Model 2, the adult characteristics were added to determine how much they contributed to the overall explained variance in the benchmarks.

As stated previously, variables used in a regression model cannot be categorical (unless they are dichotomous), so the variable "race" was recoded into a derived variable (WhiteAsian) that grouped respondents into two groups suggested by Huh and Kuh (2002). Another derived variable (ClassStdng) was created by treating those responding with a value of 5 (other) to the variable "class" as missing cases, thus yielding an ordinal variable instead of a categorical one. Finally, a variable for 2005 Carnegie Classification (Categ05) was created by grouping values into three categories: baccalaureate institutions, masters institutions, and doctoral institutions. All other categories were treated as missing cases.

Table 33 contains frequencies for each response on the additional items. Of the valid respondents, 35% were male and 65% were female. White or Asian/Pacific Islander students accounted for 82% of valid respondents, while non-Whites and non-Asian/

Table 33

Frequencies: Additional Individual and Institutional Characteristics

Variable	Level	N	Raw %	% of Valid
All Cases		45,109	100.0%	100.0%
sex	1 = Male	14,481	32.1%	35.4%
	2 = Female	26,404	58.5%	64.6%
	Missing	4,224	9.4%	
WhiteAsian	1 = White or Asian/Pacific Islander	31,315	69.4%	82.0%
	2 = Nonwhite or Non-Asian/Pacific Islander	6,895	15.3%	18.0%
	Missing	6,899	15.3%	
fathredu	1 = Did not finish high school	3,030	6.7%	7.5%
	2 = Graduated from high school	9,219	20.4%	22.8%
	3 = Attended college but did not complete a degree	5,702	12.6%	14.1%
	4 = Completed an associate's degree (A.A., A.S., etc.)	3,106	6.9%	7.7%
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	10,438	23.1%	25.9%
	6 = Completed a master's degree (M.A., M.S., etc.)	5,910	13.1%	14.6%
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	2,952	6.5%	7.3%
	Missing	4,752	10.5%	

Table 33 continued

Variable	Level	N	Raw %	% of Valid
mothredu	1 = Did not finish high school	2,411	5.3%	6.0%
	2 = Graduated from high school	9,497	21.1%	23.4%
	3 = Attended college but did not complete a degree	6,288	13.9%	15.5%
	4 = Completed an associate's degree (A.A., A.S., etc.)	4,824	10.7%	11.9%
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	10,794	23.9%	26.6%
	6 = Completed a master's degree (M.A., M.S., etc.)	5,732	12.7%	14.1%
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	972	2.2%	2.4%
	Missing	4,591	10.2%	
ClassStdng	1 = Freshman (1 st year)	17,316	38.4%	43.1%
	2 = Sophomore (2 nd year)	2,497	5.5%	6.2%
	3 = Junior (3 rd year)	1,101	2.4%	2.7%
	4 = Senior (4 th year)	19,240	42.7%	47.9%
	Missing	4,955	11.0%	
Categ05	1 = Baccalaureate Institutions	11,301	25.1%	25.4%
	2 = Masters Institutions	18,391	40.8%	41.3%
	3 = Doctoral Institutions	14,887	33.0%	33.4%
	Missing/Special Classifications	530	1.2%	

Pacific Islanders constituted the remaining 18% of the sample. Fathers' and mothers' education levels followed similar patterns with 23% having graduated from high school, 26-27% with a bachelor's degree, and 14-15% with a master's degree. The primary point of difference was that 7.3% of respondents' fathers had completed a doctoral degree, while only 2.4% of mothers had done so. The respondents were primarily divided between freshman and senior class standing with a small percentage reporting other categories. Finally, the majority of respondents attended research and doctoral universities (33%), master's colleges (41%), and baccalaureate colleges (25%).

Tables 34 – 38 display group means for each level of each additional demographic variable for each of the five NSSE benchmarks. In the interest of brevity, these means will not be discussed at length. However, Figures 13 – 18 graphically summarize the information contained in these tables by displaying means on each benchmark by level of the six additional demographic variables. As the analyses for third research question demonstrated, some of the variables show nonlinear patterns of means that called for further exploration.

Tables 39 – 43 show the calculated associations between the expanded set of independent variables (now including a total of 12 characteristics) and each of the five NSSE benchmarks, including values for the linear correlation coefficients r and r^2 as well as the coefficients η and η^2 used to show nonlinear associations (except for the dichotomous variables enrollment, sex, and WhiteAsian, which are inherently linear). Because they were discussed under the previous question, the associations involving the six adult characteristics will not be described in detail again here, though they are

Table 34

Mean Responses on ACa: Additional Individual and Institutional Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
sex	1 = Male	53.418	13.878	14,454
	2 = Female	55.558	13.784	26,374
	Total	54.800	13.855	40,828
WhiteAsian	1 = White or Asian/Pacific Islander	54.766	13.714	31,289
	2 = Nonwhite or Non-Asian/Pacific Islander	54.898	14.329	6,876
	Total	54.790	13.826	38,165
fathredu	1 = Did not finish high school	54.394	14.454	3,024
	2 = Graduated from high school	54.016	13.765	9,211
	3 = Attended college but did not complete a degree	54.332	13.997	5,697
	4 = Completed an associate's degree (A.A., A.S., etc.)	54.488	13.874	3,103
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	54.791	13.590	10,432
	6 = Completed a master's degree (M.A., M.S., etc.)	55.868	13.771	5,904
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	57.065	13.817	2,951
	Total	54.820	13.844	40,322

Table 34 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
mothredu	1 = Did not finish high school	54.404	14.717	2,407
	2 = Graduated from high school	54.060	13.661	9,490
	3 = Attended college but did not complete a degree	54.162	14.011	6,281
	4 = Completed an associate's degree (A.A., A.S., etc.)	54.925	13.884	4,823
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	54.955	13.598	10,787
	6 = Completed a master's degree (M.A., M.S., etc.)	56.161	13.851	5,725
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	57.438	14.210	971
	Total	54.816	13.853	40,484
class	1 = Freshman (1 st year)	53.116	13.248	17,294
	2 = Sophomore (2 nd year)	51.718	13.934	2,491
	3 = Junior (3 rd year)	55.138	14.470	1,101
	4 = Senior (4 th year)	56.756	14.030	19,221
	Total	54.829	13.836	40,107
basic2005	1 = Baccalaureate Institutions	57.192	13.748	10,807
	2 = Masters Institutions	54.175	13.877	17,407
	3 = Doctoral Institutions	53.355	13.816	13,909
	Total	54.679	13.907	42,123

Table 35

Mean Responses on ACL: Additional Individual and Institutional Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
sex	1 = Male	46.605	16.663	14,478
	2 = Female	47.188	16.807	26,397
	Total	46.981	16.759	40,875
WhiteAsian	1 = White or Asian/Pacific Islander	46.699	16.558	31,310
	2 = Nonwhite or Non-Asian/Pacific Islander	47.956	17.570	6,890
	Total	46.925	16.751	38,200
fathredu	1 = Did not finish high school	47.515	17.595	3,028
	2 = Graduated from high school	46.517	16.837	9,217
	3 = Attended college but did not complete a degree	46.782	16.752	5,700
	4 = Completed an associate's degree (A.A., A.S., etc.)	46.743	16.739	3,106
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	46.685	16.456	10,437
	6 = Completed a master's degree (M.A., M.S., etc.)	47.889	16.658	5,910
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	47.902	16.586	2,952
	Total	46.992	16.741	40,350

Table 35 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
mothredu	1 = Did not finish high school	47.162	17.611	2,411
	2 = Graduated from high school	46.276	16.723	9,497
	3 = Attended college but did not complete a degree	46.618	16.764	6,286
	4 = Completed an associate's degree (A.A., A.S., etc.)	47.267	16.969	4,824
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	46.962	16.481	10,793
	6 = Completed a master's degree (M.A., M.S., etc.)	48.072	16.664	5,730
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	48.803	16.437	972
	Total	46.997	16.745	40,513
class	1 = Freshman (1 st year)	42.124	15.310	17,313
	2 = Sophomore (2 nd year)	43.193	16.083	2,496
	3 = Junior (3 rd year)	47.969	17.515	1,101
	4 = Senior (4 th year)	51.811	16.602	19,236
	Total	46.992	16.730	40,146
basic2005	1 = Baccalaureate Institutions	49.112	16.538	11,268
	2 = Masters Institutions	47.258	16.920	18,347
	3 = Doctoral Institutions	44.733	16.974	14,853
	Total	46.886	16.927	44,468

Table 36

Mean Responses on SFI: Additional Individual and Institutional Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
sex	1 = Male	39.075	20.251	14,453
	2 = Female	38.965	19.830	26,385
	Total	39.004	19.980	40,838
WhiteAsian	1 = White or Asian/Pacific Islander	38.842	19.797	31,293
	2 = Nonwhite or Non-Asian/Pacific Islander	39.353	20.414	6,884
	Total	38.934	19.910	38,177
fathredu	1 = Did not finish high school	38.049	19.861	3,026
	2 = Graduated from high school	38.452	19.847	9,213
	3 = Attended college but did not complete a degree	38.786	19.976	5,697
	4 = Completed an associate's degree (A.A., A.S., etc.)	38.063	19.829	3,102
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	38.790	19.675	10,431
	6 = Completed a master's degree (M.A., M.S., etc.)	40.182	20.207	5,905
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	41.905	21.082	2,951
	Total	39.032	19.991	40,325

Table 36 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
mothredu	1 = Did not finish high school	37.434	19.504	2,410
	2 = Graduated from high school	37.897	19.608	9,490
	3 = Attended college but did not complete a degree	38.317	19.610	6,284
	4 = Completed an associate's degree (A.A., A.S., etc.)	39.070	20.014	4,824
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	39.409	19.920	10,785
	6 = Completed a master's degree (M.A., M.S., etc.)	41.090	20.820	5,724
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	41.912	21.385	972
	Total	39.025	19.986	40,489
class	1 = Freshman (1 st year)	33.617	17.194	17,292
	2 = Sophomore (2 nd year)	34.785	18.196	2,493
	3 = Junior (3 rd year)	38.415	19.349	1,101
	4 = Senior (4 th year)	44.528	21.065	19,230
	Total	39.052	19.981	40,116
basic2005	1 = Baccalaureate Institutions	42.721	20.606	10,881
	2 = Masters Institutions	38.842	19.717	17,565
	3 = Doctoral Institutions	36.529	19.503	14,030
	Total	39.071	20.018	42,476

Table 37

Mean Responses on EEE: Additional Individual and Institutional Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
sex	1 = Male	34.123	17.138	14,414
	2 = Female	35.986	17.271	26,345
	Total	35.327	17.247	40,759
WhiteAsian	1 = White or Asian/Pacific Islander	35.208	17.067	31,245
	2 = Nonwhite or Non-Asian/Pacific Islander	35.356	17.779	6,866
	Total	35.235	17.198	38,111
fathredu	1 = Did not finish high school	33.055	17.466	3,020
	2 = Graduated from high school	33.313	16.785	9,202
	3 = Attended college but did not complete a degree	35.115	17.134	5,686
	4 = Completed an associate's degree (A.A., A.S., etc.)	34.411	16.915	3,102
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	35.791	17.013	10,420
	6 = Completed a master's degree (M.A., M.S., etc.)	37.587	17.399	5,896
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	39.855	18.171	2,947
	Total	35.378	17.255	40,273

Table 37 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
mothredu	1 = Did not finish high school	32.958	17.956	2,401
	2 = Graduated from high school	33.213	16.609	9,479
	3 = Attended college but did not complete a degree	34.477	17.005	6,272
	4 = Completed an associate's degree (A.A., A.S., etc.)	35.305	17.070	4,819
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	36.182	17.147	10,777
	6 = Completed a master's degree (M.A., M.S., etc.)	38.631	17.551	5,717
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	40.144	18.835	970
	Total	35.367	17.250	40,435
class	1 = Freshman (1 st year)	27.788	12.431	17,265
	2 = Sophomore (2 nd year)	28.203	13.528	2,482
	3 = Junior (3 rd year)	33.450	16.024	1,100
	4 = Senior (4 th year)	43.195	17.939	19,199
	Total	35.355	17.225	40,046
basic2005	1 = Baccalaureate Institutions	38.010	18.032	10,645
	2 = Masters Institutions	34.019	17.032	17,084
	3 = Doctoral Institutions	34.708	16.754	13,613
	Total	35.273	17.283	41,342

Table 38

Mean Responses on SCE: Additional Individual and Institutional Characteristics

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
sex	1 = Male	57.963	18.370	14,393
	2 = Female	59.505	18.224	26,307
	Total	58.960	18.291	40,700
WhiteAsian	1 = White or Asian/Pacific Islander	59.297	17.914	31,203
	2 = Nonwhite or Non-Asian/Pacific Islander	59.393	19.286	6,859
	Total	59.314	18.169	38,062
fathredu	1 = Did not finish high school	58.847	19.259	3,016
	2 = Graduated from high school	58.765	18.372	9,187
	3 = Attended college but did not complete a degree	58.567	18.374	5,685
	4 = Completed an associate's degree (A.A., A.S., etc.)	58.674	18.370	3,101
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	59.062	17.747	10,411
	6 = Completed a master's degree (M.A., M.S., etc.)	59.318	18.181	5,888
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	59.971	18.696	2,944
	Total	58.982	18.279	40,232

Table 38 continued

Variable	Level	<i>M</i>	<i>SD</i>	<i>N</i>
mothredu	1 = Did not finish high school	58.513	19.800	2,397
	2 = Graduated from high school	58.597	18.271	9,465
	3 = Attended college but did not complete a degree	58.484	18.258	6,266
	4 = Completed an associate's degree (A.A., A.S., etc.)	58.845	18.089	4,813
	5 = Completed a bachelor's degree (B.A., B.S., etc.)	59.548	17.858	10,771
	6 = Completed a master's degree (M.A., M.S., etc.)	59.098	18.496	5,716
	7 = Completed a doctoral degree (Ph.D., J. D., M.D., etc.)	59.968	19.114	965
	Total	58.961	18.290	40,393
class	1 = Freshman (1 st year)	60.932	17.767	17,238
	2 = Sophomore (2 nd year)	56.794	19.184	2,476
	3 = Junior (3 rd year)	57.397	19.313	1,095
	4 = Senior (4 th year)	57.652	18.377	19,178
	Total	59.006	18.272	39,987
basic2005	1 = Baccalaureate Institutions	62.519	17.679	10,526
	2 = Masters Institutions	59.219	18.192	16,886
	3 = Doctoral Institutions	55.701	18.265	13,394
	Total	58.916	18.271	40,806

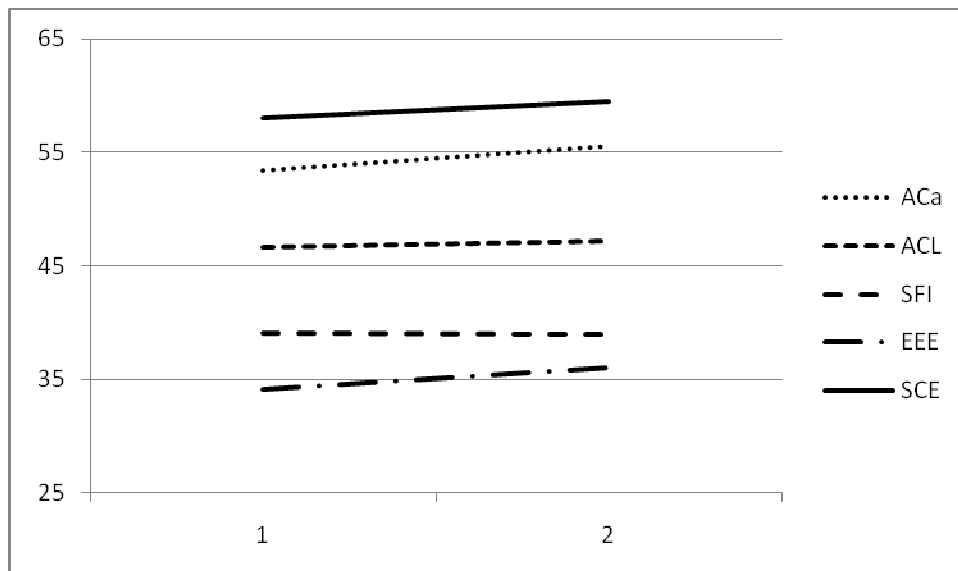


Figure 13. Means on NSSE benchmarks by value of sex

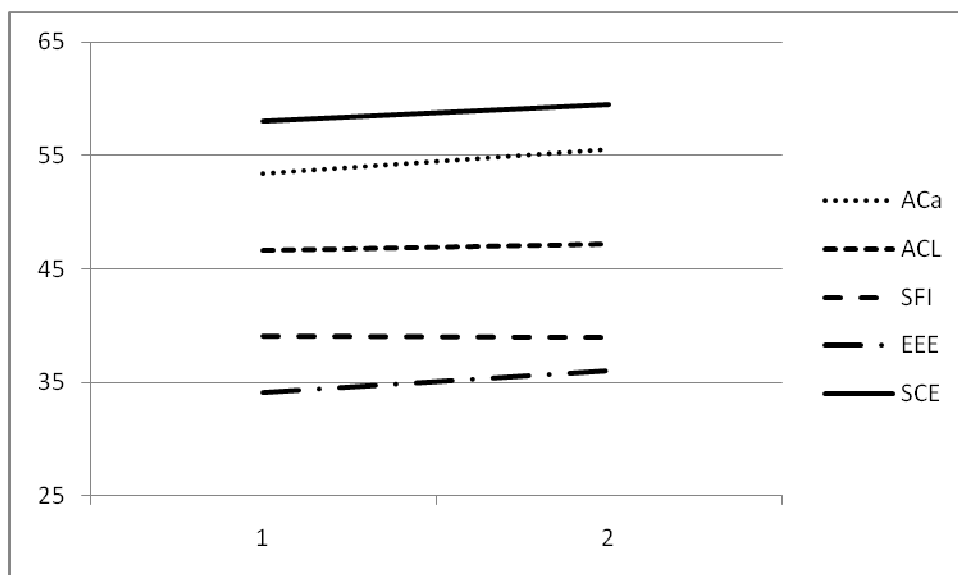


Figure 14. Means on NSSE benchmarks by value of WhiteAsian

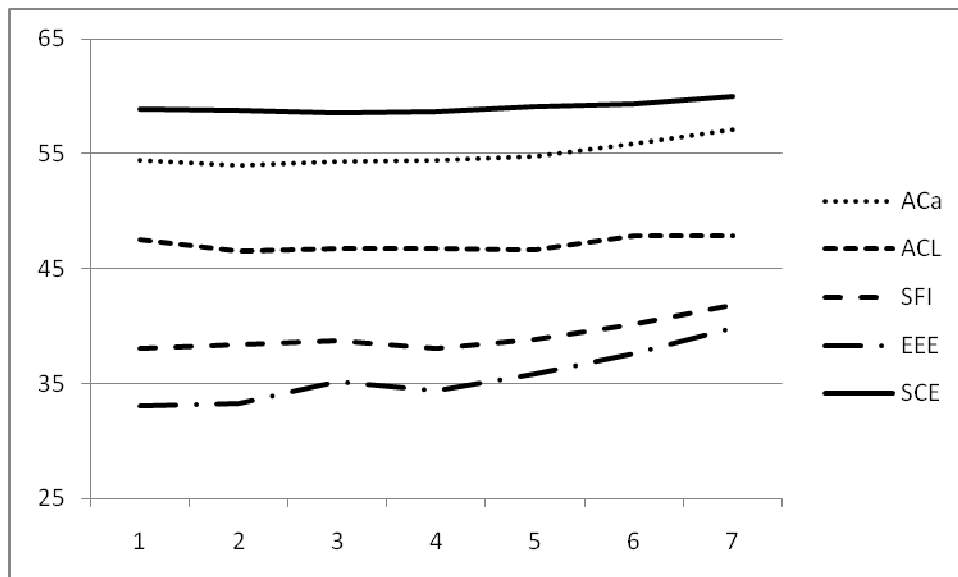


Figure 15. Means on NSSE benchmarks by value of *fathredu*

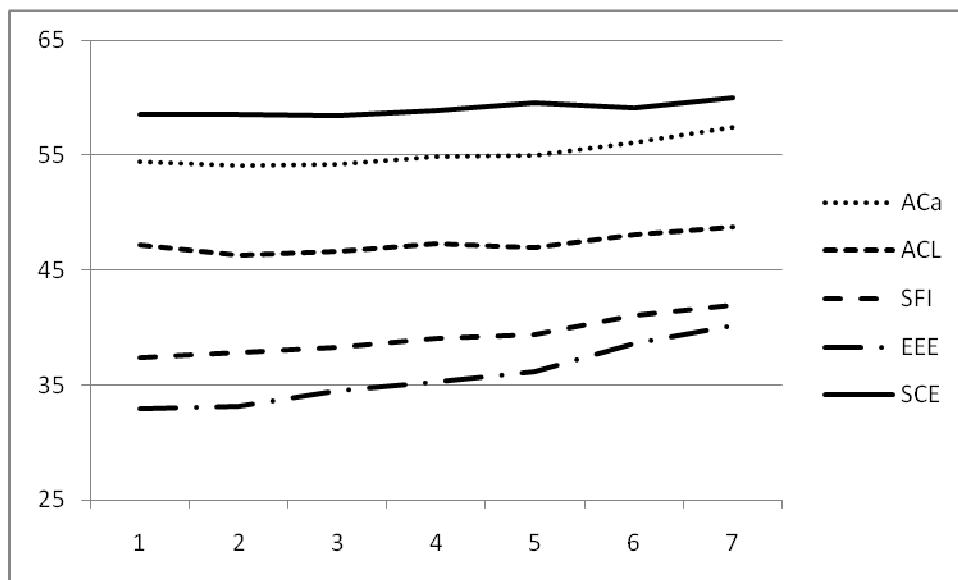


Figure 16. Means on NSSE benchmarks by value of *mothredu*

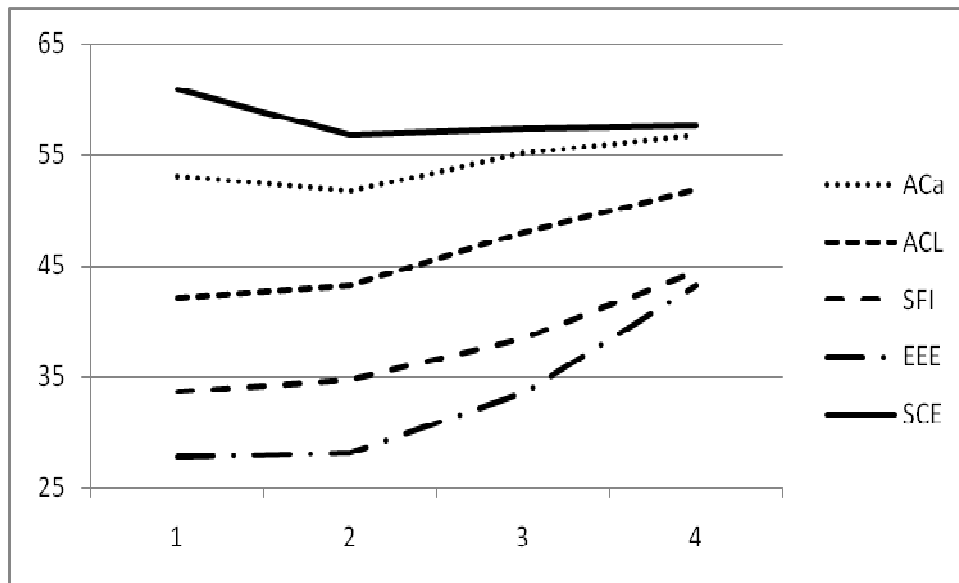


Figure 17. Means on NSSE benchmarks by value of *ClassStdng*

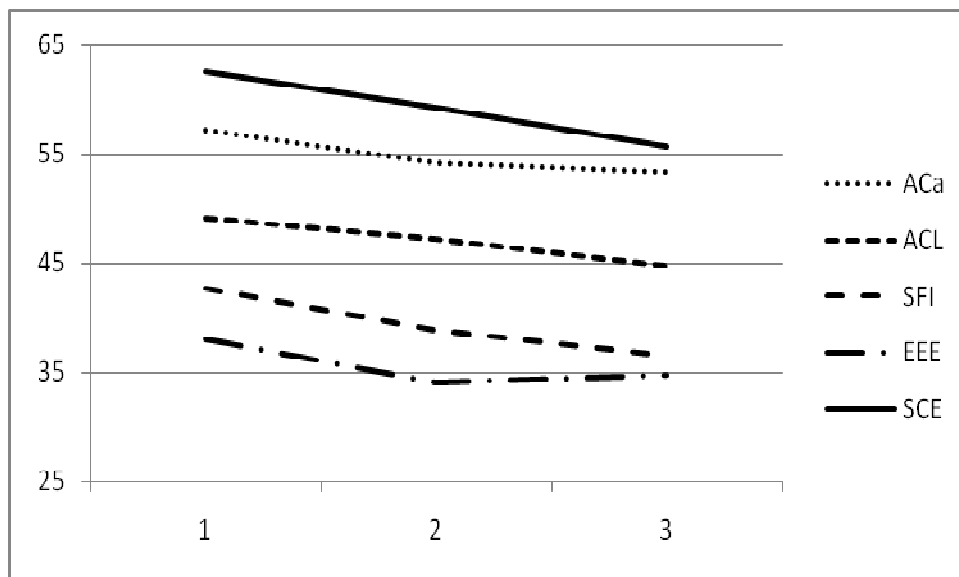


Figure 18. Means on NSSE benchmarks by value of *Categ05*

Table 39

Measures of Association Between ACa and Expanded Characteristics

	age	Residence	enrlment	workon01	workof01	carede01	sex	WhiteAsian	fathr edu	mothr edu	ClassSt dng	Categ05
<i>N</i>	40,776	40,616	40,729	41,456	41,436	41,451	40,828	38,165	40,322	40,484	40,107	42,123
<i>r</i>	.060***	-.001	.076***	.060***	-.008	.042***	.074***	.004	.053***	.050***	.130***	-.102***
<i>r</i> ²	.004	.000	.006	.004	.000	.002	.005	.000	.003	.003	.017	.010
<i>η</i>	.111***	.035***	.076***	.065***	.019**	.047***	.074***	.004	.062***	.058***	.138***	.109***
<i>η</i> ²	.012	.001	.006	.004	.000	.002	.005	.000	.004	.003	.019	.012

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

Table 40

Measures of Association Between ACL and Expanded Characteristics

	age	Residence	enrlment	workon01	workof01	carede01	sex	WhiteAsian	fathr edu	mothr edu	ClassSt dng	Categ05
<i>N</i>	40,825	40,653	40,765	41,466	41,447	41,460	40,875	38,200	40,350	40,513	40,146	44,468
<i>r</i>	.142***	.079***	.054***	.117***	.052***	.069***	.017**	.029***	.017**	.029***	.280***	-.100***
<i>r</i> ²	.020	.006	.003	.014	.003	.005	.000	.001	.000	.001	.079	.010
<i>η</i>	.256***	.108***	.054***	.127***	.086***	.074***	.017**	.029***	.032***	.038***	.282***	.100***
<i>η</i> ²	.066	.012	.003	.016	.007	.005	.000	.001	.001	.001	.080	.010

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

Table 41

Measures of Association Between SFI and Expanded Characteristics

	age	Residence	enrlment	workon01	workof01	carede01	sex	WhiteAsian	fathr edu	mothr edu	ClassSt dng	Categ05
<i>N</i>	40,788	40,628	40,737	41,444	41,426	41,437	40,838	38,177	40,325	40,489	40,116	42,476
<i>r</i>	.091***	.023***	.068***	.169***	-.010*	.015**	.003	.010*	.040***	.056***	.264***	-.116***
<i>r</i> ²	.008	.001	.005	.028	.000	.000	.000	.000	.002	.003	.070	.014
<i>η</i>	.263***	.096***	.068***	.188***	.079***	.031***	.003	.010*	.051***	.059***	.266***	.118***
<i>η</i> ²	.069	.009	.005	.035	.006	.001	.000	.000	.003	.003	.071	.014

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

Table 42

Measures of Association Between EEE and Expanded Characteristics

	age	Residence	enrlment	workon01	workof01	carede01	sex	WhiteAsian	fathr edu	mothr edu	ClassSt dng	Categ05
<i>N</i>	40,708	40,559	40,671	41,414	41,394	41,410	40,759	38,111	40,273	40,435	40,046	41,342
<i>r</i>	.132***	.025***	.072***	.158***	-.006	-.029***	.052***	.003	.104***	.109***	.433***	-.068***
<i>r</i> ²	.018	.001	.005	.025	.000	.001	.003	.000	.011	.012	.188	.005
<i>η</i>	.428***	.160***	.072***	.179***	.077***	.040***	.052***	.003	.111***	.113***	.440***	.095***
<i>η</i> ²	.183	.026	.005	.032	.006	.002	.003	.000	.012	.013	.194	.009

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

Table 43

Measures of Association Between SCE and Expanded Characteristics

	age	Residence	enrollment	workon01	workof01	carede01	sex	WhiteAsian	fathr edu	mothr edu	ClassStdng	Categ05
<i>N</i>	40,649	40,511	40,618	41,261	41,240	41,256	40,700	38,062	40,232	40,393	39,987	40,806
<i>r</i>	-.058***	-.110***	.057***	.056***	-.088***	-.014**	.040***	.002	.016**	.020***	-.083***	-.142***
<i>r</i> ²	.003	.012	.003	.003	.008	.000	.002	.000	.000	.000	.007	.020
<i>η</i>	.088***	.110***	.057***	.081***	.090***	.027***	.040***	.002	.020***	.024***	.092***	.143***
<i>η</i> ²	.008	.012	.003	.007	.008	.001	.002	.000	.000	.001	.009	.020

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

presented in Tables 35 – 39 to allow for easy comparison with the expanded individual and institutional characteristics.

The associations set forth in Table 39 indicate that ClassStdg and Categ05 have greater explanatory power than any of the adult characteristics explored previously. Slight differences between the magnitudes of r and η for fathredu, mothredu, ClassStdng, and Categ05 indicate a small degree of nonlinearity. When using the values for η^2 , ClassStdng accounts for the most variance in ACa (1.9%) followed by age (1.2%) and Carnegie classification (1.2%). The remaining variables each explain less than 1% of the variance in ACa. It is worth noting that work off campus and race classification both have a negligible net impact on ACa.

The linear correlation coefficients in Table 36 indicate that class standing is most strongly correlated with ACL followed by age. All of the correlation coefficients are positive except the coefficient for Categ05. Comparison of the values for r and η show slight nonlinearity in fathredu, mothredu, and ClassStdng. The coefficients of determination η^2 indicate that class standing accounts for 8.0% of the variance in ACL and that age, work on campus, place of residence, and Carnegie classification explain 6.6%, 1.6%, 1.2%, and 1.0% of the variance in ACL respectively. The remaining variables each explain less than 1% of the variance in ACL.

Table 37 shows the calculated associations between the twelve independent variables and the SFI benchmark. The linear correlation coefficients are all positive except the coefficient for workof01 (which is negligible) and Categ05. Class standing shows the largest correlation followed in descending order of magnitude by workon01, Categ05, and age. The slight differences between the values of r and η show small levels

of nonlinearity in the relationships between fathredu, mothredu, ClassStdng, and Categ05 and the benchmark SFI. The coefficients of determination η^2 show that class standing accounts for 7.1% of the variance in SFI followed by age, workon01, and Categ05, which explain 6.9%, 3.5%, and 1.4% of the variance in SFI respectively while the remaining variables account for less than 1% of the variance in SFI each. The variables sex and WhiteAsian account for none of the variance in SFI.

In Table 38, the correlation coefficient for class standing indicates that this clearly has a stronger relationship to the benchmark EEE than any of the adult characteristics and that father's and mother's level of education are important variables as well. The differences between r and η for the additional variables is slight and shows a small degree of nonlinearity compared to the adult characteristics on the left side of the table. The coefficients of determination η^2 indicate that class standing explains the most variance in EEE (19.4%) followed by age (18.3%), workon01 (3.2%), Residence (2.6%), mothredu (1.3%), and fathredu (1.2%). The remaining variables account for less than 1% of the variance in EEE each, and race category (WhiteAsian) accounts for none of the variance in EEE.

Lastly, Table 39 shows the associations between the independent variables and the benchmark SCE. Unlike with the other four benchmarks, the linear correlation coefficients here are mostly negative. Carnegie classification has a larger correlation coefficient than any of the adult characteristics and is followed in descending order of magnitude by Residence, workof01, and ClassStdng. Small differences between r and η for the additional characteristics indicate only slight nonlinearity. The coefficients of determination η^2 indicate that Carnegie classification explains the most variance in SCE

(2.0%) followed by place of residence (1.2%). The remaining independent variables explain less than 1% of the variance in SCE each, and WhiteAsian and fathredu explain none of the variance in SCE.

Tables 44 – 48 contain the regression model summaries for each of the five NSSE benchmarks. As stated previously, the first model contains just the commonly used demographic variables (sex, race, parent education level, class standing, and Carnegie classification), while the second model adds the adult characteristics to determine how much additional explanatory power they add to the regression models.

Table 44 indicates that for ACa, the adult characteristics add an additional 1.3% of explained variance ($R^2=.053$ with these variables included and $R^2=.040$ with only the standard demographic variables). The regression coefficients in this analysis indicate that class standing is the biggest predictor of ACa followed by Carnegie classification and enrollment status (equal in magnitude but opposite in direction). Sex is next in order of impact followed by care for dependents, father's education level, and place of residence. Work off campus has no significant association with ACa.

The pattern in Table 45 is slightly different. While the adult characteristics add an additional 1.9% of explained variance ($R^2=.119$ as opposed to $R^2=.100$), class standing is by far the most important predictor of ACL, followed by Carnegie classification and enrollment status (once again nearly equal in magnitude but opposite in direction). All of the remaining adult characteristics had larger regression coefficients than the standard demographic variables with the exception of age, which is not significantly associated with ACL.

Table 44

Regression Model Summary for ACa (Expanded Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	48.412	.471		37.874	.802	
sex	2.338	.149	.081***	2.274	.148	.079***
WhiteAsian	.590	.189	.016**	.502	.189	.014**
fathredu	.400	.048	.052***	.391	.048	.051***
mothredu	.269	.053	.032***	.231	.053	.027***
ClassStdng	1.330	.049	.139***	1.422	.070	.149***
Categ05	-2.001	.093	-.111***	-1.793	.094	-.099***
age				.328	.115	.024**
Residence				-.726	.103	-.049***
enrlment				5.019	.293	.099***
workon01				.322	.050	.034***
workof01				.010	.035	.002
carede01				.438	.047	.059***
R^2		.040***			.053***	

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

Table 45

Regression Model Summary for ACL (Expanded Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	38.578	.552		24.133	.936	
sex	.666	.175	.019***	.544	.173	.016**
WhiteAsian	1.596	.222	.036***	1.418	.221	.032***
fathredu	.111	.056	.012*	.128	.056	.014*
mothredu	.404	.062	.039***	.349	.062	.034***
ClassStdng	3.441	.058	.297***	3.614	.082	.312***
Categ05	-2.590	.109	-.119***	-2.345	.109	-.107***
age				-.232	.135	-.014
Residence				-.634	.120	-.035***
enrlment				6.395	.342	.104***
workon01				.950	.058	.083***
workof01				.238	.041	.035***
carede01				.582	.054	.065***
R^2		.100***			.119***	

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

Table 46

Regression Model Summary for SFI (Expanded Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	31.000	.661		17.906	1.114	
sex	.091	.209	.002	.065	.206	.002
WhiteAsian	1.312	.266	.025***	1.249	.263	.024***
fathredu	.222	.067	.020**	.105	.067	.009
mothredu	.730	.074	.059***	.511	.074	.042***
ClassStdng	3.867	.069	.279***	4.584	.097	.331***
Categ05	-3.469	.130	-.133***	-3.050	.130	-.117***
age				-1.047	.160	-.054***
Residence				-1.107	.143	-.051***
enrlment				6.189	.407	.084***
workon01				1.707	.069	.126***
workof01				.033	.048	.004
carede01				.462	.065	.043***
R^2		.095***			.126***	

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

Table 47

Regression Model Summary for EEE (Expanded Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	13.515	.528		6.981	.877	
sex	2.217	.167	.062***	2.326	.162	.065***
WhiteAsian	1.438	.212	.032***	1.839	.207	.041***
fathredu	.757	.054	.079***	.477	.053	.050***
mothredu	1.016	.059	.096***	.625	.058	.059***
ClassStdng	5.377	.055	.450***	6.956	.077	.583***
Categ05	-1.983	.104	-.088***	-1.475	.103	-.066***
age				-1.885	.126	-.112***
Residence				-2.426	.112	-.130***
enrlment				4.925	.321	.078***
workon01				.968	.054	.083***
workof01				.011	.038	.002
carede01				.155	.051	.017**
R^2		.225***			.271***	

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

Table 48

Regression Model Summary for SCE (Expanded Characteristics)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
(Constant)	64.588	.623		6.622	1.063	
sex	1.545	.197	.041 ^{***}	1.616	.197	.043 ^{***}
WhiteAsian	.346	.251	.007	.294	.251	.006
fathredu	.100	.063	.010	.019	.064	.002
mothredu	.154	.070	.014 ^{**}	.081	.070	.007
ClassStdng	-.890	.065	-.071 ^{***}	-.821	.093	-.065 ^{***}
Categ05	-3.334	.123	-.141 ^{***}	-3.025	.124	-.128 ^{***}
age				.793	.153	.045 ^{***}
Residence				-1.073	.136	-.055 ^{***}
enrlment				2.032	.389	.030 ^{***}
workon01				.531	.066	.043
workof01				-.325	.046	-.044 ^{***}
carede01				.175	.062	.018 ^{**}
R^2		.028 ^{***}			.036 ^{***}	

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

In Table 46, the adult characteristics explain an additional 3.1% of the variance in SFI ($R^2=.126$ instead of $R^2=.095$). Once again, class standing is by far the most important predictor of SFI, followed by work on campus and Carnegie classification. Enrollment status, age, and place of residence all have larger regression coefficients than the remaining standard demographic variables. Work off campus, father's education level, and sex have no significant association with SFI in this analysis.

The regression models for EEE in Table 47 show more explanatory power than any of the others. With the adult characteristics included, the regression model explains 27.1% of the variance in EEE, 5.4% more than when the standard variables are considered alone ($R^2=.271$ instead of $R^2=.225$). Class standing is again the strongest predictor followed by place of residence, age, and work on campus. The other standard demographic variables show weaker associations with EEE, and work off campus is not significantly associated with EEE.

In contrast, the regression models for SCE explain little of the overall variance. Table 48 shows that only 3.6% of the variance in SCE is explained when the adult characteristics are included in the regression model, while 2.8% of the variance is explained by the standard demographic variables alone. In this analysis, Carnegie classification is most strongly associated with SCE. The remaining regression coefficients all fall below $\beta=.100$, the threshold for what Cohen (1988, 1992) considers a small effect size. Work on campus, father and mother education level, and race are not significantly associated with this benchmark.

As in the regression analyses for the third research question, multicollinearity plays a strong role in these hierarchical regression models. Tables 49 and 50 set forth the

Table 49

Bivariate Correlations (r) Between Individual and Institutional Characteristics

	age	Residence	enrollment	workon01	workof01	carede01	sex	WhiteAsian	fathrededu	mothrededu	ClassStdg	Categ05
1. age	---	.538	-.417	-.012*	.386	.507	.015**	.080	-.207	-.232	.647	.022
2. Residence		---	-.271	-.098	.495	.393	.051	.086	-.217	-.222	.465	.158
3. enrollment			---	.031	-.305	-.270	-.006 [†]	-.051	.113	.133	-.177	-.033
4. workon01				---	-.195	-.034	-.008 [†]	.032	.007 [†]	.015**	.089	-.058
5. workof01					---	.299	.039	.058	-.220	-.206	.272	.055
6. carede01						---	.081	.125	-.218	-.218	.172	.005 [†]
7. sex							---	.027	-.085	-.050	.003 [†]	.000 [†]
8. WhiteAsian								---	-.168	-.137	-.003 [†]	.027
9. fathrededu									---	.556	-.040	-.013**
10. mothrededu										---	-.058	-.020
11. ClassStdg											---	.047
12. Categ05												---

Note. All values $p < .001$ except where stated. [†]Not significant. * $p < .05$. ** $p < .01$.

Table 50

Tolerances Among Individual and Institutional Characteristics

	age	Residence	enrlment	workon01	workof01	carede01	sex	White Asian	fathr edu	mothr edu	ClassSt dng	Categ05
<i>Tolerance</i>	.352	.549	.784	.927	.679	.653	.986	.957	.660	.668	.485	.965

bivariate correlations and tolerances among the adult variables and other individual and institutional characteristics used in these analyses.

The intercorrelations among the six adult characteristics (age, place of residence, enrollment status, work on campus, work off campus, and care for dependents) are the same as they were in the analysis for the third research question, so they will not be reviewed again in this section. Instead, the intercorrelations involving the additional individual and institutional characteristics will be discussed in three categories: large effects, moderate effects, and small effects (Cohen, 1988, 1992).

Large effect-size intercorrelations ($r \geq 0.34$). The largest of the correlations (including those reviewed earlier in the third research question) is the correlation between age and class standing ($r = .647$). This is an obvious relationship: upperclassmen tend to be older than underclassmen. This intercorrelation dramatically affects the regression models above, since neither age nor class standing are likely to contribute much in the way of unique variance once the other is included in the regression model. Next in order of magnitude is the correlation between father's level of education and mother's level of education ($r = .556$). This correlation seems to indicate that more highly educated females marry more highly educated males and vice versa. The last intercorrelation in the large effect-size category is the correlation between class standing and place of residence ($r = .465$). Upperclassmen tend to live off campus, while underclassmen tend to live on campus. This relationship validates Kuh, Gonyea, and Palmer's (2001) findings that older students are more likely to commute. As with age and class standing, this intercorrelation helps to explain why class standing and place of residence are rarely included together in order of entry into the regression models above.

Moderate effect-size intercorrelations ($r=0.24$ to 0.36). Only one of the intercorrelations fell into the moderate range. Class standing and working off campus are moderately correlated ($r=.272$), that is upperclassmen are more likely to work off campus than underclassmen.

Small effect-size intercorrelations ($r=0.10$ to 0.23). Fourteen of the intercorrelations fell into the small effect-size range. These intercorrelations are listed below in descending order of magnitude with a brief explanatory note for each.

- mothredu & age ($r=-.232$) – Students whose mothers are more highly educated are more likely to attend college at a young age.
- mothredu & Residence ($r=-.222$) – Students whose mothers are more highly educated are less likely to live off campus.
- mothredu & carede01 ($r=-.218$) – Students whose mothers are more highly educated are less likely to care for dependents while attending school.
- fathredu & carede01 ($r=-.218$) – Students whose fathers are more highly educated are less likely to care for dependents while attending school.
- fathredu & Residence ($r=-.217$) – Students whose fathers are more highly educated are less likely to live off campus.
- fathredu & age ($r=-.207$) – Students whose fathers are more highly educated are more likely to attend college at a young age.
- mothredu & workof01 ($r=-.206$) – Students whose mothers are more highly educated are less likely to work off campus.
- ClassStdng & enrlnent ($r=-.177$) – Upperclassmen are less likely to attend full-time than underclassmen.

- ClassStdng & carede01 ($r=.172$) – Upperclassmen are more likely to spend time each week caring for dependents than underclassmen.
- WhiteAsian & fathredu ($r=-.168$) – Fathers of white or Asian / Pacific Islander students were more likely to have higher levels of education.
- Categ05 & Residence ($r=.158$) – Students attending doctoral institutions were more likely to live off campus than those attending baccalaureate or masters institutions.
- WhiteAsian & mothredu ($r=-.137$) – Mothers of white or Asian / Pacific Islander students were more likely to have higher levels of education.
- WhiteAsian & carede01 ($r=.125$) – White or Asian / Pacific Islander students were less likely to spend many hours caring for dependents each week.
- fathredu & enrment ($r=.113$) – Students whose fathers were more highly educated were more likely to be enrolled full-time.

As stated before, these intercorrelations affect the explanatory power of each variable as it is added to the regression models above. Variables that are highly correlated with other variables already included in the regression model are less likely to add additional explanatory power to the model. The tolerances of the 12 variables in the regression models for the fourth research question highlight the patterns discussed above (Table 50). Because it is strongly correlated with other variables in the analyses, age has the lowest tolerance of the 12 variables. Class standing also has a relatively low tolerance, indicating that it shares variance with many of the other variables. In contrast, work on campus, sex, race, and Carnegie classification have very high tolerances; this indicates (as did the bivariate correlations in Table 49) that these variables are relatively

independent of the other variables in the analyses. The relatedness of the 12 variables, particularly the adult characteristics, has important implications that will be discussed in Chapter V.

Summary

To address each of the four research questions, a sample of responses from the 2005 National Survey of Student Engagement consisting of 45,109 respondents was analyzed using correlational methods. When adulthood was considered as a dichotomous variable, it had little explanatory power. Recoding adulthood as a quasi-continuous variable added to its explanatory power slightly. However, its nonlinear relationship to the five NSSE benchmarks affected the correlation analyses, and additional explanatory power was gained by associating adulthood with the benchmarks using a nonlinear analysis. Breaking out adulthood into its six constituent characteristics added additional explanatory power and revealed important nonlinear associations and intercorrelations among adult characteristics that affected the explained variance in each of the hierarchical linear regression models. Finally, including commonly used demographic variables to the hierarchical linear regression models for each of the five NSSE benchmarks greatly increased the explained variance in each of the benchmarks, though the adult characteristics continued to contribute to the explained variance in important ways. In the following chapter, these findings will be discussed in greater detail along with implications for practice and further research.

V. DISCUSSION

In the previous chapter, results of the correlational analyses conducted for this study were set forth. Following a brief review of the research topic, theoretical background, and research questions, this final chapter will begin by exploring the results as they pertain to each of the five research questions. Next, theoretical implications of the findings will be discussed followed by an exploration of how these findings impact the practice of adult student engagement and retention. Finally, implications for future research will be presented.

Review of Topic, Theoretical Background, and Research Questions

Adults are participating in all levels of higher education in increasing numbers due to a variety of societal, cultural, technological, and economic pressures (Cross, 1981; Merriam, Caffarella, & Baumgartner, 2007). Nevertheless, research on adult college students – those who are functionally independent, have substantial work/life experience, and must balance school demands with extra-institutional obligations – at 4-year institutions is relatively sparse. While many adult students attend 2-year colleges and technical institutions (Philibert, Allen, & Elleven, 2008), 4-year colleges and universities are also enrolling substantial percentages of adult students (Choy, 2002; Horn & Carroll, 1996). However, colleges and universities show a tendency to privilege “traditional,” or nonadult, students both explicitly and implicitly in part due to their historical origins

(Sissel, Hansman, & Kasworm, 2001). The resulting marginalization of adult students is evident in their low persistence and graduation rates when compared to their nonadult peers (Choy, 2002; Dey & Hurtado, 1999; Horn & Carroll, 1996). At the same time, colleges and universities are facing increasing pressure to retain all students, including adults. One way to do this is to study how adult students interact with their institutions and identify key areas where institutions can improve the adult student experience. This study references three bodies of literature regarding student retention, student engagement, and adult learning to develop a working definition of “adult student” and to formulate research questions that can shed light on the issue of adult student retention.

The literature on student retention has evolved over time to increasingly focus on the integration of students into the social and academic environments of a college or university (Tinto, 1993). For adult students with substantial off-campus obligations, the more important form of integration appears to be academic integration (Cleveland-Innes, 1994). In recent years, extensive work on quality undergraduate education has led to the identification of effective educational practices, participation in which has been linked to student persistence and success (Chickering & Gamson, 1987; Ewell & Jones, 1995; Pascarella & Terenzini, 1991). Involvement in effective educational practices, referred to as “student engagement,” has become an important measure of academic integration (Kuh, Kinzie, Schuh, & Whitt, 2005). The National Survey of Student Engagement [NSSE] was developed in the late 1990s to measure student engagement and includes five engagement benchmarks that measure different aspects of student involvement in effective educational practices in addition to demographic indicators that allow responses to be disaggregated along a variety of individual and institutional characteristics (Kuh,

2004). The rich tradition of adult learning theory validates many of the effective educational practices measured on the NSSE as being relevant and important to adult students (Brookfield, 1986; Knowles, Holton, & Swanson, 2005; Merriam, Caffarella, & Baumgartner, 2007). In addition, the adult learning theory literature helps to define adult students as those who possess some or all of the following characteristics: delayed enrollment, part-time attendance, full-time work, financial independence, dependent care, and nontraditional high-school completion (Choy, 2002; Horn & Carroll, 1996).

These bodies of literature give rise to four research questions that were studied using data from the 2005 National Survey of Student Engagement. The research questions reflect successive efforts to deconstruct adult student engagement patterns in an effort to inform both theory and practice. Correlational research methods (Edwards, 1984; Gall, Borg, & Gall, 1996; Keppel & Wickens, 2004) were employed to address the following research questions:

1. Do adult students report significantly different levels of engagement than nonadult students on each of the five NSSE engagement benchmarks?
2. How does level of engagement vary with level of adulthood on each of the five NSSE engagement benchmarks?
3. Which indicators of adult status have the largest effect on level of engagement for each of the five NSSE engagement benchmarks?
4. How do the effects of adult status indicators on level of engagement compare with the effects of other important demographic variables, i.e., gender, ethnicity, parent education level, class standing, and institutional type?

Chapters III and IV above describe in detail the NSSE instrument and research methods used and present the results of the various analyses. In the following section, the results presented earlier are analyzed and discussed in depth.

Analysis and Discussion of Findings

Question #1: Influence of Adult Status on Engagement

Q. Do adult students report significantly different levels of engagement than nonadult students on each of the five NSSE engagement benchmarks?

Percentage of adult students. The first item of note in this analysis is that adult students, defined as those possessing two or more of the adult characteristics described previously, comprise approximately 28% of the valid sample as shown in Table 9. This is in line with findings from the 2007-08 National Postsecondary Student Aid Study (NCES, 2008) mentioned early in this paper and indicates that both the sample used and the criteria for selecting adult students from the respondents has reasonable ecological validity. It should also be noted, however, that this is a much lower percentage than the estimates given by Donaldson and Townsend (2007) and Pilibert, Allen, and Elleven (2008), who included all postsecondary institutions in their estimates, not just 4-year colleges and universities. It is reasonable to infer that 4-year institutions, which tend to attract higher numbers of traditional students directly out of high school, have a lower proportion of adult students than other types of institutions. Nevertheless, a more careful analysis of the definition of adult student used in this study will be presented later in this section.

Mean differences and correlations. On two of the five NSSE benchmarks, ACa (Level of Academic Challenge - adjusted) and SFI (Student-Faculty Interaction), there was only a slight difference in the mean scores for adult and nonadult students. Upon further analysis, these differences were not statistically significant. The first result is what was expected and outlined in Chapter III; that is, it was anticipated that there would be little or no correlation between adulthood and level of academic challenge. On the other hand, the second finding is not what was anticipated. The hypothesis for student-faculty interaction was that adults would be less likely to interact with faculty (producing a significantly lower mean on that benchmark) than their nonadult peers due to their off-campus obligations. According to Table 11, there is no significant correlation between adulthood and student-faculty interaction.

In contrast, Tables 10 and 11 show a statistically significant difference in the means of adult and nonadult students on the other three benchmarks – ACL (Active and Collaborative Learning), EEE (Enriching Educational Experiences), and SCE (Supportive Campus Environment). As was hypothesized in Chapter III, adult students engage in active and collaborative learning at a slightly higher level than their nonadult counterparts. This may result from the preference adult students show toward these types of learning activities (see Brookfield, 1986; Knowles, Holton, & Swanson, 2007). The effect size, however, is quite small with adulthood accounting for only about 0.3% of the variation in active and collaborative learning. This hardly seems to support the assertion by these authors that a preference for active and collaborative learning is a primary distinction between adult and nonadult students.

Mean scores between adult and nonadult students on Enriching Educational Experiences (EEE) likewise exhibited a statistically significant difference, with adult students scoring slightly lower overall on this benchmark than nonadult students. As was hypothesized, the correlation between adulthood and participation in enriching educational activities was negative (see Kuh, Gonyea, & Palmer, 2001), though again the effect size was very small (0.2% of the variance accounted for).

Scores for adult and nonadult students on the Supportive Campus Environment (SCE) benchmark were slightly more divergent, with nonadult students scoring higher than adult students. This led to a negative correlation between level of adulthood and the supportive campus environment benchmark with 0.5% of the variance in the benchmark being explained by variations in level of adulthood. Interestingly, this was the strongest correlation of the five, though the hypothesized relationship was that there would be no correlation. This seems to indicate that adult students, with their off-campus focus and obligations, do not feel as well supported by the campus environment as their nonadult peers. Sissel, Hansman, and Kasworm (2001) pointed out the marginalization expressed by adult students in their study, though the weak correlation found in this study does little to confirm their findings.

Discussion. The first key point highlighted by this analysis is that simply dividing the student population into adult and nonadult students does little to explain differences in levels of engagement. While there is some statistically significant variation in mean scores on ACL, EEE, and SCE when respondents are divided into adults and nonadults, the amount of explained variance is very small. This finding reinforces Horn and Carroll's (1996) contention that adulthood should fall on a continuum rather than being

dichotomized. Interestingly, it also calls into question much of the research that has been based upon an overly-simplified definition of adult students (Cross, 1981; Donaldson & Townsend, 2007; Philibert, Allen, & Elleven, 2008). Without a more nuanced definition of adult students, other analyses may find like this one did that there is little or no relationship between adulthood and important student behaviors or interactions. These results also call into question the work of important adult learning theorists, such as Malcolm Knowles and Patricia Cross, who base their recommendations in large part on a simple grouping of students into adult and nonadult (Cross, 1981; Knowles, Holton, & Swanson, 2005; Merriam, Caffarella, & Baumgartner, 2007). If the lines between adult and nonadult students are blurring to the extent that they do not explain variations in engagement well, perhaps there are other phenomenon such as adult learning that could be better explained by a more nuanced definition of adult students. Finally, institutions seeking to better engage students need to look beyond simple distinctions between adult and nonadult students when creating solutions. The theoretical and practical implications of these findings are discussed in more detail in the latter part of this chapter.

Question #2: Correlation of Adulthood and Engagement

Q. How does level of engagement vary with level of adulthood on each of the five NSSE engagement benchmarks?

Frequencies of adult characteristics. As was described in Chapter III, level of adulthood was determined by summing the number of adult characteristics a respondent possessed (Choy, 2002; Horn & Carroll, 1996). A respondent indicating no adult characteristics scored 0 on level of adulthood (a level of 0, or nonadult, on each of the five

indicators), while a respondent indicating all adult characteristics scored 5 on level of adulthood (a level of 1 on each of the five indicators). By way of review, just over 50% of the valid cases scored 0 (no adult indicators present) and another 21.5% scored 1 (only one adult indicator present). In the previous analysis, these two groups constituted the “nonadult” portion of the sample. The fact that over half of respondents did not indicate the presence of a single adult characteristic surprised me somewhat, because it means that this entire group is younger than 24 years of age, lives on campus, attends full-time, works less than 30 hours per week, and does not care for dependents. Even at 4-year institutions, I expected a majority of students to possess at least one indicator of adult student status because of the literature cited previously (Donaldson & Townsend, 2007; Horn & Carroll, 1996; NCES, 2008; Philibert, Allen, & Elleven, 2008).

This led me to look more carefully at the individual components of level of adulthood. In this sample, only 17.2% of respondents were 24 years of age or older. In contrast, the 2008 NCES study found that 22% of students at research and doctoral universities, 35.4% of students at master’s institutions, and 31.5% of students at baccalaureate institutions were 24 years of age or older. This sample does not seem to match that profile, even though nearly all respondents belonged to one of these three institutional categories. The incongruence of this sample calls into question the population validity of this study. Also surprising was that only 8.9% of the valid respondents were part-time students. On the other hand, 26.4% of this sample reported caring for a spouse or dependents and 39.1% reported living off campus (just about half if those within walking distance are included). These last two percentages are in line with those found by the NCES (2008).

Analysis of group means. When adulthood is treated as a variable with six levels, some interesting patterns in mean scores on the benchmarks appear. Table 13 indicates mean responses on each of the five NSSE benchmarks disaggregated by level of adulthood. Note that respondents in the “3” category (possessing three of the five adult characteristics) indicated the highest average levels of engagement on both ACa (Level of Academic Challenge) and ACL (Active and Collaborative Learning). On two of the benchmarks, Student-Faculty Interaction (SFI) and Enriching Educational Experiences (EEE), respondents possessing one adult characteristic (reflected by a score of “1” on SumAdult) indicated the highest average level of engagement. Respondents exhibiting no adult characteristics showed the highest average level of engagement on only one of the benchmarks, Supportive Campus Environment (SCE). Figure 6 further highlights the nonlinear patterns of means by level of adulthood. These findings indicate that adulthood affects different types of engagement differently, which has important implications for both research and practice.

Correlations between level of adulthood and NSSE benchmarks. As shown in Table 14, converting level of adulthood to a multilevel variable instead of treating it as a dichotomous variable strengthened all of the correlations between adulthood and the NSSE benchmarks except one: Active and Collaborative Learning (and this correlation was weakened only very slightly). In contrast to the previous analysis, the correlation between adulthood and Level of Academic Challenge took on a negative value in this analysis, though still barely sufficient to be statistically significant. Explained variance in Enriching Educational Experiences and Supportive Campus Environment increased by

0.1% respectively, while the explained variance did not change for the other three benchmarks.

The lack of a substantial change in explained variance resulting from considering multiple levels of adulthood was disappointing. From a closer look at the mean scores in Table 13, however, it becomes apparent that there is a nonlinear relationship between adulthood and level of engagement, and nonlinear relationships are not captured well by simple linear correlations which seek to create a straight line of best fit. The eta statistics in Table 14 highlight this nonlinearity and show that using curvilinear analysis strengthens the amount of explained variance for all five of the benchmarks. Using the eta statistics, the association between adulthood and ACL rises to the level of what Cohen (1988, 1992) would consider a small effect, while the other four associations are still negligible. The assertion by Choy (2002) and Horn and Carroll (1996) that adulthood should be considered on a continuum seems to have some utility, but not as much as I had hoped.

Discussion. Residence off campus and care for dependents were the adult characteristics most likely to lead to classifying a respondent as an adult in this analysis, followed by age. This supports Horn and Carroll's (1996) contention that age may not be the most important indicator of adult status. On four of the five engagement benchmarks (ACa, SFI, EEE, SCE) level of engagement decreased slightly as level of adulthood increased. On the remaining benchmark, ACL, level of engagement increased slightly with level of adulthood. However, the relationships appeared to be nonlinear in nature, with students possessing three adult characteristics scoring highest on ACa and ACL, students possessing one adult characteristic scoring highest on SFI and EEE, and students

with no adult characteristics scoring highest on SCE. Placing level of adulthood on a continuum seemed to most affect the relationship between adulthood and ACL, a finding in keeping with assertions by adult learning theorists that adults prefer active and collaborative learning to passive learning strategies (Brooksfield, 1986; Knowles, Holton, & Swanson, 2005). However, the association was not as clear as these authors asserted. The continuing lack of explanatory power of adulthood, even when it was operationalized along a continuum, calls into question the utility of using adulthood as a distinguishing characteristic of students. The analyses for the next research question broke down adulthood into its constituent components to investigate the relative influence of each characteristic.

Question #3: Effects of Individual Adult Characteristics

Q. Which indicators of adult status have the largest effect on level of engagement for each of the five NSSE engagement benchmarks?

Frequencies of adult characteristics. The sample employed in this study consisted largely of younger students living on campus or within driving distance. Most did not work on campus, but nearly half worked off campus. Only a quarter of respondents reported caring for dependents. The prevalence of students working off campus may be an important topic for future study.

Analysis of means. While Tables 15-20 contain important granular data, Figures 7-12 are more helpful in analyzing the patterns of means for each variable on the five NSSE benchmarks. As in the analysis for the second research question, most of the relationships are nonlinear. For the variable age, those in the 20-23 range exhibited the

highest levels of engagement on all of the benchmarks except SCE (where those in the 24-29 age category scored lowest). Residence off campus within walking distance produced the highest means on all of the benchmarks except SCE, and full-time enrollment yielded higher levels of engagement on every benchmark. The patterns for workon01, workof01, and carede01 were not as clear, though engagement generally increased as number of hours worked on campus increased, decreased with rising number of hours worked off campus, and stayed fairly flat for those caring for dependents.

Correlations between adult characteristics and NSSE benchmarks. The relatively small bivariate correlations between the adult characteristics and each of the NSSE benchmarks reflected nonlinear relationships as well. When using a linear correlation, only six of the associations rose to the level of Cohen's (1988, 1992) small effect size. However, calculating the nonlinear associations (eta statistics) proved to have greater utility and revealed that three of the associations fell into the moderate effect size range (age vs. ACL, age vs. SFI, and age vs. EEE). Another seven associations rose to the level of small effect size. This suggests that age may indeed be a helpful predictor of engagement if used alone, though further analyses of the fourth research question cast doubt on this.

Regression model: level of academic challenge (ACa). Age alone proved to have very little explanatory power in this regression model unless it was combined with the other adult characteristics. Of the six adult characteristics in the expanded regression model, age and enrollment status (part- or full-time) exerted small effects on ACa, though the total variance explained by the model is only 2.1% (just above the threshold for a small effect size according to Cohen (1988, 1992)). These results agree with the

hypothesis that there would be little or no correlation between the various adult characteristics and level of academic challenge.

Regression model: active and collaborative learning (ACL). As hypothesized, age correlated most strongly with ACL. When used alone in the regression model, age explained 2.6% of the variance in ACL (a small effect size). In the expanded regression model, enrollment status and work on campus also contributed meaningfully to variance in ACL to yield a total explained variance of 5.6% (just above the threshold for a moderate effect size (Cohen, 1998, 1992).

Interestingly, the regression coefficients for place of residence and care for dependents were not significant, and the coefficients for the other factors were all positive; just the opposite of what was hypothesized (with the exception of enrollment status). It appears that hours worked (especially on campus), residence off campus, and care for dependents are positively correlated with active and collaborative learning, perhaps because they are likewise indicators of adulthood. On the other hand, full-time enrollment (not typically an adult characteristic) was also positively associated with active and collaborative learning.

Regression model: student-faculty interaction (SFI). Age alone served again as only a marginal predictor of SFI, yielding a total explained variance of only 1.2%. However, the expanded regression model explained 5.4% of the variance in SFI (a moderate effect size), and age, work on campus, and enrollment status all contributed meaningfully as indicated by their regression coefficients. Hours worked was hypothesized to have the greatest impact on student-faculty interaction. The analysis shows that work on campus does indeed exhibit the strongest correlation with student-

faculty interaction, though work off campus had only a marginal impact on SFI. The group means in Table 18 clearly show that students who worked any number of hours on campus score substantially higher on this benchmark than those who did not work on campus. Those who worked off campus showed lower levels of engagement in student-faculty interaction.

In contrast to the hypothesis, age had the strongest impact on SFI and care for dependents and place of residence had little or no effect. Table 18 shows that students in the 20-23 year range averaged much higher levels of student-faculty interaction than any others. The youngest category of students averaged the lowest level of student-faculty interaction, perhaps because they are participating in large introductory classes with little faculty contact.

Regression model: enriching educational experiences (EEE). Age alone explained 2.2% of the total variance in EEE and had the strongest impact on EEE when combined with the other adult characteristics in the expanded regression model. Enrollment status, work on campus, and care for dependents also influenced EEE, and the expanded model explained a total of 7.7% of the variance in EEE. Place of residence in and work off campus contributed little or not at all to this model, which is contrary to my hypothesis that time spent off campus would negatively impact engagement in enriching educational activities. As with Student-Faculty Interaction, the group means for age and working on campus shown in Table 19 exhibit a nonlinear trend. Those 20-23 years of age scored most highly on Enriching Educational Experiences. The youngest age group of students scored the lowest on this benchmark, presumably because they have had fewer opportunities for participating in these experiences. Similarly, students who do not work

on campus averaged a much lower score on this benchmark than those who do; in fact, students who work 20-25 hours each week on campus scored highest on level of engagement in enriching educational activities. Finally, as expected, full-time students were more likely to have been involved in enriching educational experiences. Of the five benchmarks, EEE was best predicted by the adult characteristics used in this study.

Regression model: supportive campus environment (SCE). The regression models for supportive campus environment yielded the smallest predictive value of the five sets of models. When used alone, age explained less than 1% of the variance in SCE. Combined with the other adult characteristics in the expanded model, age does not have a significant impact. Place of residence, work on campus, and work off campus combined to explain approximately 1.7% of the variance in SCE – on the low end of the range for small effect size set forth by Cohen (1988). This affirmed my hypothesis that any correlations between the adult characteristics and the SCE benchmark were likely to be small.

Discussion. Several general trends are worth noting. First, respondents in the 20-23 year age category reported the highest levels of engagement and those in the 19 or younger category reported the lowest levels of engagement on every benchmark except Supportive Campus Environment. The analysis of the fourth research question below points out that there is a strong correlation between age and class standing; that is, older students are more likely to be upperclassmen than younger students (a rather obvious conclusion). It seems reasonable to infer that many respondents in the 20-23 year age range are upperclassmen who began their college career at the age of 19 or younger. If this inference is correct, it is likewise reasonable to infer that the higher levels of

engagement reported by these students reflect a growing level of engagement as students progress through the institution (or it could reflect that those who were less engaged dropped out before they entered the 20-23 year age range). In direct contrast, the youngest and oldest students reported the highest average scores on Supportive Campus Environment, perhaps indicating that new students and older adult students experience the most support while those in the middle age ranges (presumably those nearing graduation) experience the least.

A second general trend worth noting is that full-time students reported higher levels of engagement on every benchmark, even when this effect was controlled for in Level of Academic Challenge (ACa). It seems obvious that full-time students are more engaged in educationally effective practices than part-time students (see Kuh, Kinzie, Schuh, & Whitt, 2005).

A third important trend is the beneficial impact of working on campus. Those who worked at least some amount on campus averaged higher levels of engagement on every benchmark than those who did not work on campus. On three of the benchmarks – ACL, SFI, and EEE – the difference in scores between those who do not work on campus and those who do was substantial (see Perna, 2010).

Finally, those who lived within walking distance of campus averaged higher scores than those who lived on campus or within driving distance on every benchmark except Supportive Campus Environment (on-campus respondents scored highest on this benchmark). Kuh, Gonyea, and Palmer's (2001) study of commuter students indicated that younger students are more likely to live on campus while older students are more

likely to live within walking distance, so this general trend may simply mirror the age-related trends discussed above.

Implications for defining adult students. In addition to highlighting the interconnectedness of the adult characteristics, the above analyses reveal an interesting finding: work on campus is negatively correlated with all of the other characteristics of adult students. According to Table 31, those who worked on campus were likely to be younger, live on campus, work less off campus, and spend less time caring for dependents. To explore this in a little bit more detail, each of the adult characteristics was correlated with the two derived adulthood variables, Adult and SumAdult, to determine if working for pay on campus was perhaps included in the definition of “adult student” erroneously. Table 51 shows that, of all the variables included in the definitions of Adult and SumAdult, workon01 is the only variable that correlates negatively with these derived variables. This would suggest that either work on campus does not fit in a useful definition of adult students, or adult students simply are not working on campus to the

Table 51

Correlation Coefficients (β) Between Adult Derived Variables and Adult Characteristics

	Age> 24	age	Res Categ	Enrl Categ	Work >30	Sum Work	work on01	work of01	Dep Categ	cared e01
Adult	.658	.537	.699	.420	.489	.392	-.127	.465	.675	.689
Sum Adult	.648	.590	.838	.454	.514	.467	-.118	.540	.702	.710

same extent as nonadult students. Implications of these findings for both research and practice will be discussed in a later section.

Summary. This section has summarized the findings with respect to which indicators of adult status have the largest effect on level of engagement for each of the five NSSE benchmarks. For four of the five benchmarks (ACa, ACL, SFI, and EEE), enrollment status, age, and number of hours worked on campus had the largest effect. In contrast, place of residence, work on campus, work off campus, and care for dependents had the largest influence on SCE. This section also discussed the nonlinear nature of the relationships between the adult characteristics and the five benchmarks and ended with a discussion of whether work on campus is an appropriate component of adult status.

Question #4: Effects of Additional Characteristics

Q. How do the effects of adult status indicators on level of engagement compare with the effects of other important demographic variables, i.e., gender, ethnicity, parent education level, class standing and institutional type?

Frequencies of demographic and institutional characteristics. The first finding of note in this analysis is that female respondents constituted nearly 65% of the valid responses. According to Peter and Horn (2005), 56% of all undergraduates in 2001 were female, and the percentage of female undergraduates was increasing over time. However, this still does not account for the even higher proportion of female respondents in this sample. Perhaps response rates were higher among female students invited to participate in the 2005 NSSE; regardless, this gender disparity in respondents again calls into question the population validity of the sample.

The racial composition of respondents seemed to be more in keeping with national data. For instance, Writ, Choy, Rooney, Hussar, Provasnik, and Hampden-Thompson (2005) reported that approximately 29% of all undergraduates were ethnic minorities in 2002. In this sample, approximately 72% of valid respondents were white, with percentages of various minority groups similar in magnitude to those reported by Writ et al. (2005).

Highest level of education completed by respondents' mothers and fathers were very similar. 22.8% and 25.9% of fathers completed high school and a bachelor's degree, respectively, while 23.4% and 26.6% of mothers completed high school and a bachelor's degree. Nearly three times as many fathers completed doctoral degrees as mothers. As expected (due to the fact that NSSE sampled first- and fourth-year students), respondents were split between freshman and senior class status with small residuals claiming to be sophomores, juniors, or unclassified. The largest percentage (40.8%) of respondents attended Master's colleges. Doctoral/research universities combined for another 33.1% of respondents, with baccalaureate colleges contributing 24.3%.

Analysis of means. The group means on each of the NSSE benchmarks for different levels of gender, ethnicity, parent education level, class standing, and institutional type followed essentially linear patterns, unlike the means for the adult characteristics. Just as Huh and Kuh (2002) found, females reported higher levels of engagement on all benchmarks, as did students whose parents had completed higher levels of education. White and Asian / Pacific Islander students reported lower levels of engagement on all five benchmarks, and students at doctoral institutions reported lower levels of engagement than students at baccalaureate institutions. Seniors reported higher

levels of engagement than underclassmen on every benchmark except SCE. Tables 39-43 show that there is little if any difference between the linear correlation coefficients r and the nonlinear eta statistics η . This suggests that linear analytical methods are more appropriate for these variables than for the adult characteristics studied previously. The following sections describe the amount of variance in each of the NSSE benchmarks explained by just these the standard demographic variables, then by these variables in combination with the adult characteristics previously studied.

Regression models. When both the standard variables and the adult characteristics were included in the five regression models, the amount of explained variance increased dramatically, ranging from an explained variance of 3.6% for SCE (a small effect size according to Cohen (1988, 1992)) to 22.7% for EEE (a large effect size). The adult characteristics contributed 0.8% to 4.6% additional explained variance above and beyond that explained by the standard characteristics alone. The regression models were especially useful in explaining variance in ACL, SFI, and EEE as evidenced by the large coefficients of determination for these models.

Class standing had the largest regression coefficient in every model except the model for SCE, where institutional type had the largest coefficient. I had predicted that class standing would especially impact EEE, which indeed it did (the regression coefficient for class standing on the EEE benchmark was $\beta=.583$, by far the largest coefficient in any of the regression models).

Institutional type also had a large regression coefficient in the models for ACa, ACL, and SFI, indicating that baccalaureate institutions foster student engagement more than masters or doctoral institutions. These results agreed with my hypothesis that

institutional type would have a strong impact on engagement. Aside from these two characteristics, however, the adult characteristics in the models had better explanatory power than the standard demographic characteristics, as evidenced by their regression coefficients. The main exception was that work off campus seemed to have little or no explanatory power in the regression models.

Discussion. In every case, the inclusion of the additional individual and institutional characteristics doubled (and for EEE, tripled) the predictive power of the regression models. Class standing was the strongest predictor for all benchmarks except SCE. The regression model for SCE contrasted sharply with the other four models; Carnegie classification was the strongest predictor in this model. The intercorrelations discussed above between class standing and several of the other variables, especially the relationships between class standing and age and between class standing and place of residence, help to explain why class standing displaces these two adult status indicators. Enrollment status again emerged as an important predictor variable, as did work on campus. These findings point toward a need to better understand the interactions among the individual and institutional characteristics used in this study. However, they also indicate that adult characteristics add to the explained variance in level of engagement on each of the five NSSE benchmarks, even though their utility may be limited when used alone.

Implications for Theory

The findings from this study have a number of important implications for theory, and these implications touch on all three bodies of theoretical literature reviewed in

Chapter II. In the following sections, implications for how to define “adult student” are discussed first, followed by implications for adult learning theory regarding active and collaborative learning. Implications regarding a supportive campus environment, an important element of prominent retention theories, will then be discussed. Finally, implications for how engagement is measured and studied will be presented.

Defining Adult Students

Components of adulthood. Adult students have been defined differently by different authors (Bash, 2003; Bean & Metzner, 1985; Brookfield, 1986; Choy, 2002; Cross, 1981; Hensley & Kinser, 2001; Horn & Carroll, 1996; Kasworm, 2003a; Sissel, Hansman, & Kasworm, 2001). Often age and enrollment status are used as the primary indicators of adult student status (Bean & Metzner, 1985). One of the primary purposes of this study was to arrive at a definition of “adult student” that is operationally useful for research and for institutions seeking to better understand and meet the needs of their adult students. Horn and Carroll’s (1996) definition of adult students formed the basis for the definition employed in this study, but the demographic information collected on the NSSE limited this definition to five elements: age, enrollment status, place of residence, hours worked for pay, and care for dependents. The analysis reflected in Table 51 indicates that each of these factors contributes in a meaningful way to adulthood with the exception of work on campus, which is negatively correlated with all of the other adult indicators. A more appropriate definition of adult student using the demographic characteristics on the NSSE would exclude work on campus as a component. The remaining characteristics (age, enrollment status, place of residence, hours worked off-

campus, and care for dependents) are all positively correlated, indicating that they are appropriate components of a definition for “adult student.”

Age versus other adult characteristics. Because it is easy to measure and report, age is frequently used as the sole means for determining which students are adults (Choy, 2002; Horn & Carroll, 1996). However, Bash (2003) pointed out that this masks two important trends: first, younger students are exhibiting adult behavior patterns, and second, other characteristics are having an increasing impact on the success of students. This study supports Bash’s position; in many instances, enrollment status, place of residence, work off campus, and care for dependents had a larger effect on engagement than age. If age were to be used as the sole criteria for identifying adult students, many important effects on engagement and retention would be missed. Hence, it is important to include these other dimensions of adult status in a study of adult students. Furthermore, age correlates strongly with class standing (this is discussed further below) and would lead to inappropriate conclusions about adult student engagement if considered alone.

Necessary versus sufficient characteristics. The use of a single characteristic such as age to define a population assumes that the characteristic is both necessary and sufficient by itself to define that population, and many authors of research on adults have fallen into this error (Kasworm, 2003a; Sissel, Hansman, & Kasworm, 2001). In contrast, this study found that age was neither a sufficient nor even a necessary component of adulthood; many students qualified as adult students because of their place of residence, work off campus, and care for dependents – even though they were young. In fact, none of the characteristics of adult students seemed to be sufficient on its own. The analysis of the second research question indicated that for the benchmarks ACa and ACL,

respondents possessing three of the adult characteristics scored highest. For the benchmarks SFI and EEE, respondents with one adult characteristic scored highest, though work on campus seemed to be the biggest contributing factor rather than age. Again, none of the adult characteristics seemed to be both necessary and sufficient to distinguish adult students from nonadult students in their level of engagement. Using only one factor, such as age, to differentiate adults from nonadults would lead to erroneous conclusions about the engagement of adult students.

Dichotomizing versus scaling adulthood. In contrast to many other authors of studies regarding adult students who treat adulthood as a dichotomous variable, Horn and Carroll (1996) chose to arrange students on a scale from minimally adult to maximally adult. Unlike Horn and Carroll, who used a scale with only three levels of adulthood, this study used a six-level scale based upon the number of adult characteristics possessed by a student (from zero to five). If only the correlation coefficients for each of the benchmarks had been considered, this approach would have only a slight advantage over using a dichotomous measure of adulthood (as was used in the first research question). However, when the mean engagement scores were considered for each level of adulthood, some important nonlinear patterns emerged. Consequently, using a scale of adulthood rather than simply classifying students as adult or nonadult has greater utility when studying engagement and, by inference, other phenomena involving adult students.

Percentage of adult students at 4-year colleges and universities. Even when using multiple characteristics to capture adulthood, however, a surprising number of students in this sample were still classified as nonadults. Philibert, Allen, and Elleven (2008) estimated that as much as 73% of postsecondary students were adults in some facet.

However, their analysis included all institutional types, including 2-year colleges and technical institutions. Nevertheless, even the 2007-08 National Postsecondary Aid Survey (NCES, 2008) indicated higher percentages of adult students at 4-year colleges and universities when age, place of residence, and other factors were combined. Perhaps the lack of additional characteristics in the demographic section of the NSSE that are typically used to measure adulthood led to undercounting adult students in this sample. Alternately, it is possible that the sampling strategy for the 2005 NSSE administration somehow oversampled nonadult students. Generalizations drawn from this study should consequently be applied with caution.

Adult characteristics missing from the NSSE demographic variables. A few additional demographic items could be included in future iterations of the NSSE that would help to identify adult respondents. In particular, Horn and Carroll (1996) included parenthood (a more specific measure than care for dependents), marital status, veteran status, gaps in enrollment, and nontraditional high school completion (GED, adult high school diploma, etc.) as key indicators of adult status. If included on the NSSE, these items could further help to distinguish adult from nonadult students. A full set of adult characteristics can help in other studies of phenomena involving adult students as well.

Summary. With the exception of work for pay on campus, the adult characteristics set forth by Horn and Carroll (1996) and later used by Choy (2002) seem to adequately capture the adult segment of the sample. Based upon the results of this study, the inclusion of a full set of adult characteristics together with an adulthood scale consisting of multiple levels has the most utility in studies where adult students are compared to

nonadult students. In contrast, using a dichotomous characterization of adulthood and nonadulthood masks important effects and outcomes.

Adult Engagement in Active and Collaborative Learning

A second important theoretical implication arising from this study relates to the assertion by Knowles, Holton, and Swanson (1998, 2005) that participation in active and collaborative learning increases with age. While this study did indeed find a correlation between age and active and collaborative learning (the second NSSE benchmark), this correlation upon further study turned out to be more closely tied to class standing than to age. In fact, the analysis of the third research question indicates that engagement in active and collaborative learning actually decreases with age in the 24 and over age group. This result is opposite that predicted by Knowles, Holton, and Swanson (2005). Other adult learning theorists likewise emphasize the role of collaborative learning in adulthood (Brookfield, 1986; Lawler, 1991; Merriam, Cafarella, & Baumgartner, 2007). Despite questions about population and ecological validity raised in this study, the results presented above call into question the assertion that older adults are more likely to learn collaboratively. This finding warrants further inquiry.

Supportive Campus Environment

Tinto's (1998, 2009) later work on student persistence began to increasingly emphasize creating a supportive campus environment, much like Bean and Metzner's (1985) model from more than a decade before. Likewise, Kuh, Kinzie, Schuh, and Whitt (2005) highlighted the importance of a supportive campus environment, as did Hensley

and Kinser (2001b). Sissel, Hansman, and Kasworm (2001) pointed out that traditional college campuses typically marginalize adult students, a phenomenon that should show up in the measurement of SCE. This did indeed turn out to be the case in the initial analysis; age and SCE were negatively correlated. On closer investigation of the group means, however, it became apparent that this relationship was not linear. In fact, older adults indicated a higher level of supportive campus environment than those in the 24-29 year age range. More importantly, it appeared that those scoring lowest on this benchmark were those who attended part-time and those who worked more hours off campus. Perhaps Sissel, Hansman, and Kasworm's (2001) statement needs to be amended slightly to say that colleges and universities tend to marginalize students who attend part-time and work off campus, although they may have been observing generational differences in student-institutions interactions that were not captured well by this study.

Studying Engagement of Adult Students

In addition to the implications of this study for defining adult students, refining theories of adult learning, and studying adult student retention, this study suggests several key items relevant to the study of student engagement, particularly for adult students.

Four items are discussed below.

Relatively low engagement scores for all students. To arrive at index scores for each respondent on the five NSSE benchmarks, individual responses are recoded on a scale of 0 – 100 and averaged across all components of the benchmark (NSSE, 2005a). It seems reasonable that if the scales are constructed well, students who are highly engaged should have index scores well above 50, while those who are marginally engaged should

have index scores well below 50. Table 13 indicates that the average index scores vary widely by benchmark, but they are all relatively low. In particular, mean scores for all respondents are just over 35 on the Enriching Educational Experiences benchmark and 39 for Student-Faculty Interaction. Scores on the remaining three benchmarks – Active and Collaborative Learning, Level of Academic Challenge, and Supportive Campus Environment – average 47, 55, and 59 respectively. These low average scores beg the question of whether the response items are biased toward the low end or the respondents are in fact engaged at a relatively low level. Furthermore, the disparity among the average scores on the five benchmarks calls into question the comparability of the five measures; it is unclear whether some of the benchmarks yield lower average scores because they are inherently skewed or because students do indeed engage in some practices at a lower level than others. The relatively low average engagement scores of all respondents has implications for the study of adult engagement, since the average scores of adult respondents did not vary dramatically from those of nonadult respondents. The relative skewness of the various engagement benchmarks needs to be better understood.

Small effect sizes. Correlational and ANOVA analyses seek to segment variation within and between different groups of respondents (Edwards, 1984; Keppel & Wickens, 2004). Large effect sizes can result from a combination of two different patterns: large variations in responses between groups, and small variations within groups. When effect sizes are small, a reasonable inference is that the variation has not been segmented in a particularly meaningful way. In some situations, particularly when respondents are nested within categories (such as class standing or institutional type), a hierarchical linear

modeling approach can help to segment the variance in a way that leads to larger effect sizes and more explanatory power (Edwards, 1984; Keppel & Wickens, 2004).

In this study, the coefficients of determination were relatively small when only adult characteristics were included. This could mean two things: the variation between adult engagement scores and nonadult engagement scores was relatively small compared to the within-group variations, or nesting effects introduced nonrandom variations that affected the outcomes of the statistical procedures. Hierarchical linear modeling may be an important methodological strategy for studying engagement in the future, but its utility would need to be studied and compared to the present method.

Nonlinear variations in engagement patterns. As noted previously, correlational research methods also do not capture nonlinear relationships well because they seek to match the data to a straight line of best fit (Edwards, 1984). Nonlinear relationships recurred repeatedly throughout this study, and it is likely that they would appear in other studies of engagement as well. Consequently, other statistical methods might be more appropriate for studying engagement. Kuh, Gonyea, and Palmer (2001), for instance, used ANOVA methods. Other methods might also include nonlinear regression analyses. A brief exploration of different curves of best fit revealed that quadratic and cubic functions fit the data in this study better than linear functions.

Optimal level of adulthood. Adulthood has frequently been viewed from a deficit perspective; that is, adult students are viewed as being at a disadvantage in 4-year colleges and universities (Sissel, Hansman, & Kasworm, 2001; Valencia, 1997). In contrast, the results of this study indicate that minimally adult students are actually less engaged in a variety of educationally purposeful activities than students who have one to

three adult characteristics. In other words, some level of adulthood seems actually to be beneficial rather than detrimental. While the influence of class standing discussed below introduces some additional complexity into this finding, the fact that moderately adult students, particularly those who live off campus within walking distance and those who work a limited number of hours each week, are more engaged than the youngest students who live on campus and do not work has important theoretical implications. The deficit perspective regarding adult students prominent in the literature needs to be revisited.

Confounding relationships between class standing, age, and place of residence.

As a final note, the multicollinearity among various factors in the analyses introduced ambiguity into the results. In particular, the intercorrelations between age, class standing, and place of residence made it unclear which of the variables was most responsible for the observed effects. In future engagement studies, holding one or more of these intercorrelated factors constant (such as only studying seniors or those who live off campus) may be useful in understanding the effects of the others.

Summary

The findings from this study have important implications for theory and research. In particular, the definition of adult student used in the study included five components that were highly correlated and useful for distinguishing adult from nonadult students: age, place of residence, enrollment status, work off campus, and care for dependents. The inclusion of additional adult indicators on the NSSE instrument would be helpful for future researchers studying adult student engagement.

In addition, the findings from this study suggest that, in contrast to prominent theories in the field of adult education (Brookfield, 1986; Knowles, Holton, & Swanson, 2005; Merriam, Cafferella, & Baumgartner, 2007), older individuals do not necessarily engage in higher levels of active and collaborative learning. In fact, those 24 years and older steadily declined in their level of active and collaborative learning. Also interesting is the finding that the oldest and youngest students find the campus environment to be the most supportive. This seemingly contradicts research on adult retention that asserts a declining level of campus support for older adults (Kasworm, 2003a; Sissel, Hansman, & Kasworm, 2001).

Finally, the findings from this study suggest that the skewness of the engagement benchmarks needs to be investigated and understood more thoroughly. In addition, correlational methods may not be the most appropriate analytical tools for studying engagement; nonlinear patterns and relatively small effect sizes suggest that other methods, including hierarchical linear modeling, may be more useful.

Implications for Practice

One of the purposes of this study was to shed light on what 4-year colleges and universities can do to retain the adult students increasingly populating their campuses. In this section, the implications of this study's findings for retaining adult students will be discussed. In addition, several implications for retaining nonadult students will also be set forth.

Implications for Retaining Adult Students

As stated in Chapter I, understanding how adult students engage differently from their nonadult peers in educationally effective practices linked to retention is a critical precursor to designing effective retention strategies for adult students. In the following sections, several key findings from this study are reviewed and suggestions for possible interventions are presented.

The impact of age versus other adult characteristics. In the previous section regarding theoretical implications of this study, age was neither a sufficient nor even necessary defining characteristic of adult students. The definition of “adult student” validated by this study included possessing two or more adult characteristics (age > 24, part-time enrollment, residence off campus, full-time work, and care for dependents), and the previous section noted that many of the respondents thereby classified as adults were actually younger than 24 years of age. The regression analyses and comparison of group means clearly highlighted that, while age was an important predictor of engagement on four of the five NSSE benchmarks (in part because it correlated with class standing), enrollment status, place of residence, and care for dependents were also important predictors of engagement. An institution desiring to create targeted retention strategies may choose a student subpopulation defined not by age but by enrollment status (interventions targeted toward part-time students), care for dependents (interventions targeted toward students with children), or commuter status (interventions aimed toward commuter students). Many institutions, for instance, have designed retention programs specifically for commuter students (Jacoby & Garland, 2004). Because of the confounding effects of age and class standing, another strategy might include a focus on

first-year students who are 24 years of age or older. Retention programs targeted toward these students at community colleges can serve as a valuable model for 4-year colleges and universities (Gardenhire-Crooks, Collado, & Ray, 2006; Kefallinou, 2009).

The importance of working on campus. A second important finding from this study was the impact of on-campus work on student engagement. In particular, work on campus was found to be correlated more strongly with student-faculty interaction and participation in enriching educational experiences than any of the adult status indicators (see Table 23). If adult students who are financially independent must work to pay for schooling and other expenses, providing expanded opportunities for these students to work on campus for pay can both enhance their levels of engagement and provide them with the necessary income to meet their needs. The federal work-study program recognizes this connection and has provided opportunities for many students to work on campus (Cheng & Alcantara, 2007), but institutions can offer adult students additional opportunities for on-campus work to enhance their engagement (Perna, 2010).

Living close to campus. This study reaffirmed the findings of Kuh, Gonyea, and Palmer (2001) that living within walking distance of campus is associated with higher levels of engagement in effective educational practices. Those institutions with limited housing near campus may focus on creating more student housing within walking distance as a means for enhancing student engagement and retention.

The impact of full-time attendance. That part-time attendance is negatively related to both student engagement and student persistence was hardly a surprising finding (Chen, 2007; Marti, 2008). Nevertheless, this finding once again highlights the relationship between full-time attendance and persistence. To encourage adult students to

attend full-time, institutions can create funding and scheduling mechanisms that include appropriate financial aid advising, on-campus work, scholarships and fellowships, and so forth (Marti, 2008). On-campus childcare can also help students who have young children (Keyes & Boulton, 2007). Helping adult students meet their financial and family obligations is an important precondition for their enrolling full-time.

Promoting a supportive campus environment. Overall, students possessing more adult characteristics perceived the campus environment as less supportive. In particular, those who commute, attend part-time, and work full-time off campus perceived the campus environment as less supportive than their peers. According to the retention research, a supportive campus environment is critical to the success of adult students who often need this support to counteract conflicting off-campus pressures (Bean & Metzner, 1985; Cross, 1981; Tinto, 1998). In addition to the quality of relationships with other students, faculty, and administrative personnel and offices, the components of a supportive campus environment include the institution providing the support needed to succeed academically and cope with nonacademic responsibilities (see Table 5). Interventions aimed at enhancing a supportive campus environment might include facilitating interactions with other students and with faculty in addition to providing academic and nonacademic support (advising, counseling, financial aid, and so forth) at times and in places accessible to working students who commute to campus, often after traditional support offices have closed for the evening (Jacoby & Garland, 2004).

Education levels of adult students' parents. A growing body of research indicates that reaching out to potential college students and their parents in high school and even middle school is critical to both college choice and persistence (Bloom, 2007). The

intercorrelations explored in Table 49 and discussed in the findings for the fourth research question indicate that students whose parents complete higher levels of education are more likely to attend college at a younger age, attend full-time, live on campus, and work on campus and are less likely to work off campus or have dependents while in school. In other words, middle and high school students with less highly educated parents are more likely to enroll in college as adults than their peers.

Consequently, an important intervention for institutions seeking to promote student persistence is to focus recruiting and educating efforts on these students and their parents during the middle school and high school years. The successful federal TRIO programs have demonstrated the effectiveness of this approach (Cowan Pitre & Pitre, 2009). Four-year colleges and universities can positively impact an even greater body of potential students and influence them to attend college soon after high school, thereby avoiding some of the persistence difficulties encountered by adult students with substantial off-campus obligations.

At-risk upperclassmen. While upperclassmen averaged higher scores on four of the five engagement benchmarks (most notably they reported a significantly higher level of participation in enriching educational activities), they actually reported a lower level of engagement on the Supportive Campus Environment benchmark than their freshman peers. While the majority of students who drop out of higher education do so in the earlier years of college (Tinto, 1993), there is still a risk of upperclassmen failing to finish their studies. Because they are more likely to live off campus, work off campus, attend part time, and care for dependents (see Table 30), upperclassmen are at risk of

dropping out. Consequently, focusing on enhancing a supportive campus environment for upperclassmen is a critical retention strategy for 4-year colleges and universities.

Matching adult students with appropriate institutions. Institutional type was the strongest predictor of scores on the Supportive Campus Environment benchmark (see Table 29). This finding has important implications for adult students; those who attend campuses more supportive of adult students are more likely to persist to graduation (Kuh & Whitt, 1988). Those advising adult students as they choose an institution may do well to note that master's and baccalaureate institutions are perceived as having more supportive campus environments than research and doctoral institutions and may be a better fit for adult students.

Implications for Retaining Traditional Students

Interestingly, this study also suggests some important implications for the retention of nonadult students. While these will not be explored in detail, Tables 16-20 indicate that the youngest category of students (ages 19 and younger) and those students who live in campus housing are less engaged than their older, off-campus peers on four of the five benchmarks. In particular, they report much lower levels of engagement in active and collaborative learning, student-faculty interaction, and enriching educational experiences than their older peers. These findings seem to point to the need for focused efforts to engage young students in these effective educational practices from the very beginning of their college experience. It is possible that higher average levels of engagement reported by older upperclassmen are due in part to the attrition of the young

underclassmen who report low levels of engagement in their beginning college years or that there are some generational differences affecting engagement.

Summary

Understanding how adult students engage differently from their nonadult peers in effective educational practices can lead to important retention strategies aimed at promoting persistence among these students. These can include retention strategies aimed at part-time and commuter students, students with children, and older underclassmen. In addition, providing increased opportunities for adult students to work on campus together with supplemental financial and family guidance and support can enhance engagement and provide the necessary conditions for full-time attendance. Finally, early intervention (even at the middle school and high school level for those whose parents lack advanced education), appropriate guidance during the college choice process, and a focus on creating a campus environment that is supportive for adult students are all important retention strategies.

These findings have important implications for retaining nonadult students as well. In particular, efforts aimed at engaging young students in active and collaborative learning, student-faculty interaction, and enriching educational experiences are important for the success and persistence of young students. This is just one area of additional investigation suggested by the findings of this study; others are described in the following section.

Implications for Future Research

The findings from this study suggest a number of areas worthy of further exploration. Four general areas of future research are discussed below: redefining adult students, additional adult engagement research, comparing results from the National Survey of Student Engagement (NSSE) and the Community College Survey of Student Engagement (CCSSE), and linking adult student engagement with adult student retention.

Redefining Adult Students

In this study, a working definition of “adult student” was derived and validated using data from the 2005 NSSE. However, the review of literature in Chapter II included a number of different definitions of adult student that might be equally valid in different settings. One important area for further research is additional validation of the five adult student characteristics derived from this study and the appropriateness of their application in different research settings. In particular, a study of which adult characteristics are necessary and which are both necessary and sufficient in different settings could inform both future research and practice. Future research might also include additional adult characteristics, such as military service, delayed enrollment, or a nonstandard route to high school graduation to distinguish adult and nonadult students when studying engagement.

Refining the NSSE

The absence of key indicators of adult status, including military service, delayed enrollment, and nonstandard high school completion, impacted the investigation of adult

student engagement in this study. The inclusion of these variables in the demographic section of the NSSE is an important modification that will allow additional analysis of the effects of adult characteristics on engagement in the future. In addition, the ability to compare the responses of an individual student who completes the NSSE as a freshman and again as a senior could help to unmask the effects of class standing and maturation.

Additional Adult Engagement Research Arising From This Study

The findings in this study regarding adult student engagement also need to be extended and refined. Below are four suggestions for ways to do this.

Hold class standing constant. The ambiguous interactions between age, class standing, and place of residence were noted several times previously. One important way to refine this study is to hold one or more of these characteristics constant and study the effects of varying the other characteristics. For instance, a study of adult freshman student engagement or adult senior student engagement would remove the maturation and experiential effects incident to differences in class standing.

Investigate optimal levels of adulthood. As mentioned previously, the results of this study indicate that there is an optimal level of adulthood that yields the highest levels of engagement on four of the five NSSE benchmarks. Once the confounding effects of class standing are removed by controlling for this variable, the effects of age, place of residence, work and care for dependents can be investigated more carefully in an effort to determine the optimal profile of a highly engaged student.

Investigate interaction effects. The analysis of the fourth research question offered a brief introduction to the study of interaction effects on various types of student

engagement. These interaction effects can give important insights regarding student engagement behavior. For instance, Kuh, Gonyea, and Palmer (2001) studied the interaction effects between class standing and commuter status. There are another 329 two-way interaction effects among variables identified by the bivariate correlations in this study. Three-way interaction effects (there are a total of 1,100 three-way interactions with 12 factors and five dependent variables) can also be important. For instance, an older, part-time student who lives on campus may engage very differently than a younger, full-time student who lives on campus or an older, full-time student who lives off campus. Identifying and exploring interaction effects can be an important means for segmenting the student population and creating targeted retention strategies aimed at enhancing the engagement of specific student subgroups.

Transform the adult characteristic variables. The nonlinear relationships between the adult characteristic variables and the NSSE benchmarks in the third research question led to a brief discussion about how these variables might be transformed to normalize them and yield more linear relationships (Abrams, 2010). In the presentation of the results for this research question in Chapter IV, several quadratic transformations were discussed and the slight increase in explained variance in the regression models when using a square-root transformation was presented. However, a full exploration of which transformations to apply to the adult characteristics is beyond the scope of this study. Additional research can identify appropriate polynomial transformations to apply to the adult characteristics to yield linear relationships between these characteristics and the NSSE benchmarks that can then be used to increase the amount of explained variance in the regression models for the NSSE benchmarks (Keppel & Wickens, 2005).

Deconstruct the dependent variables. While this study progressively deconstructed the adulthood of respondents, it did nothing to deconstruct the dependent variables (the five NSSE benchmarks). The index scores used as dependent variables in this analysis are averages based upon a number of individual components. Just as averaging mean scores across components of adulthood masks important variations in engagement, averaging across various components of a benchmark masks important points of difference between adult and nonadult respondents. In response to this challenge, Pike (2006) created 12 “scalelets” consisting of smaller groups of response items on the NSSE. Like the engagement benchmarks, each scalelet represents an important facet of student engagement and can be used to investigate student engagement patterns. Doing so increases the level of specificity in the results and could potentially yield important insights into how adult and nonadult students engage differently. To take this concept one step further, adult and nonadult student responses could be compared on individual NSSE response items. The review of the adult learning theory literature in Chapter III suggested several individual response items on which adult students might score differently from nonadult students. Findings from such a study could yield even more specific insight about how to target interventions aimed at increasing adult student engagement and, by inference, adult student retention.

Use alternative research methods. Nearly every study can be enriched by using alternative research methods, and this study is no different. In the section describing the theoretical implications of this study, the importance of using statistical methods that are sensitive to nonlinear variations was discussed. For some of these methods, such as hierarchical linear modeling, excellent analytical tools exist. For others, such as nonlinear

regression analysis using quadratic and cubic functions, tools have yet to be developed extensively. Investigation into student engagement using these methods could be both important theory- and method-building exercises. In addition, cross-sectional statistical analyses such as this study have several inherent shortcomings including lack of control for random variations across individuals (Keppel & Wickens, 2004). Using a longitudinal study design could help to control for some of these variations and reduce the statistical “noise” in the study. Finally, quantitative studies can be useful for identifying phenomena and relationships, but they are not particularly useful for understanding why a particular phenomenon is occurring. A qualitative study of adult student engagement could provide critical insight for both theoreticians and practitioners interested in understanding why adult students engage in the ways they do.

Comparing Results From the NSSE and the CCSSE

Community colleges and other 2-year and technical schools have typically been viewed as important postsecondary education providers for adult students, and research on adult students in these settings is much more abundant than research on adult students in 4-year colleges and universities. As has been stated previously, retention studies and strategies in community colleges and other 2-year schools can be an important source of information for 4-year colleges and universities seeking to enhance the engagement and retention of adult students. In 2001, the Community College Survey of Student Engagement [CCSSE], an instrument analogous to the NSSE, was launched by the same design team that created the NSSE (McClenney, 2007). Data from students at hundreds of 2-year institutions has now been collected and analyzed. While the two instruments are

not identical, an important extension of this study would be to compare the engagement of adult and nonadult students measured on the CCSSE to that measured on the NSSE to compare and contrast patterns in the different institutional types. In addition, findings from studies using the CCSSE to study adult student engagement could be validated for 4-year institutions using data from the NSSE.

Linking Adult Student Engagement to Adult Student Retention

Finally, this study assumes a strong link between adult student engagement and adult student retention based upon research by Pascarella and Ternezini (1991, 2005) and others. However, this research, like the student retention research discussed in Chapter II, is founded largely upon a traditional notion of college students. A recent study by Gordon, Ludlom, and Hoey (2008) calls this link into question by exploring successful outcomes for students who have taken the NSSE. Determining the nature and strength of the link between engagement and retention for adult students is an important direction for future research.

Summary

The findings from this study leave a number of important questions unanswered. This section has suggested additional research to validate the definition of “adult student” derived by this study and the application of the revised definition to other settings involving research on adult students. In addition, four suggestions regarding how to refine this study have been offered including holding class standing constant, investigating interaction effects, deconstructing the dependent variables, and using

alternate research methods. Finally, a comparison of adult student engagement measured by the NSSE and the CCSSE could yield insights into how institutional type and mission affect the engagement of adult students.

Conclusion

Since the introduction of the GI Bill in 1944, adults have been participating in postsecondary education in ever-increasing numbers (Bean & Metzner, 1985; Cross, 1981; Donaldson & Townsend, 2007). In the past several years, adult enrollments have skyrocketed due to an economic downturn and other economic, social, technological, and demographic changes (Cross, 1981; Leonard, 2009). While many of these adult students attend 2-year colleges and technical institutions, the number of adult students attending 4-year colleges and universities has also increased dramatically (NCES, 2008). Yet despite their increased participation, adult students still lag far behind their traditional-aged college peers in persistence and degree attainment (Choy, 2002; NCES, 2001).

While the literature on student retention, student engagement, and adult learning gives some important insights into how 4-year colleges and universities can increase the retention of adult students, it leads to lingering questions about how to accurately define “adult students” in a way that is operationally useful and how these adult students engage differently from their nonadult college peers in effective educational practices linked to higher retention rates. At the beginning of this chapter, the five research questions derived from the literature in Chapter II were reiterated. The remainder of the chapter has been devoted to exploring the results of the analyses conducted in Chapter IV to address the research questions.

In summary, adult students do indeed engage differently in effective educational practices than their nonadult peers. However, these differences are not linear in nature; some characteristics of adult students have a larger effect on engagement than others, and few of the mean scores on the engagement benchmarks follow a linear pattern across levels of adulthood.

These findings contribute to theory and practice in important ways. First, they lead toward a more useful definition of adult students that moves beyond simply using age as a distinguishing criterion as is so often done. The findings of this study indicate that age is neither a necessary nor sufficient characteristic of adult students and that other characteristics such as work status, place of residence, and care for dependents may indeed be more important than age. When studying adult students and creating interventions to help them succeed, using a more nuanced set of criteria will lead to more accurate conclusions. Second, these findings indicate that adulthood, rather than negatively impacting student engagement, may actually enhance it. The deficit perspective regarding adult students at 4-year colleges and universities may indeed be unfounded or even entirely mistaken. Third, nonlinear relationships between adulthood and engagement indicate the need for better statistical tools than linear regression analysis when studying adult student engagement. Finally, additional adult characteristics, such as military service, gaps in enrollment, and nonstandard high school completion, need to be included in research on adult students and in tools such as the NSSE. Doing so will allow researchers to better understand the impacts of a wider range of adult characteristics.

While this chapter has explored some of the implications of these findings, colleges and universities need to study how the differences between adult and nonadult student engagement play out at the institutional level. By better understanding how older, off-campus, part-time students who work off campus and care for dependents engage in various educational practices, 4-year colleges and universities can design effective interventions that will help adult students to persist. Doing so will benefit students, institutions, and the nation relying upon a highly trained workforce for its continued economic and social prosperity.

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