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An Investigation of the Perceived Development of the Life-Long Learning Skills of Division I Student-Athletes

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An Investigation of the Perceived Development of the Life-Long Learning Skills of Division I Student-Athletes

by

Andrew T. Goodrich

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy
Department of Adult, Career, and Higher Education
with a concentration in Higher Education Administration
College of Education
University of South Florida

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Dedication

In honor of my grandmother, Helen Stiles Goodrich. Thank you for showing me the way to our Lord. Isaiah 40:29-31. He gives strength to the weary and increases the power of the weak. Even youths grow tired and weary, and young men stumble and fall; but those who hope in the LORD will renew their strength. They will soar on wings like eagles; they will run and not grow weary, they will walk and not be faint.
Acknowledgment

I would like to express my sincere appreciation to my classmates and my instructors at the University of South Florida, especially to my dissertation co-chair, Dr. Don Dellow, and the entire committee for their guidance and support throughout each step during this process. Additionally, I would like to acknowledge the support of my friends and family who encouraged me to persevere throughout the process and most importantly, my wife Erika. This learning experience isn't possible without your love and support.
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Abstract

The primary purpose of this investigation was to examine the perceived development of life-long learning skills of Division I student-athletes and their non-athlete general student peers. Using grade point averages and graduation rates, athletics administrators are constantly evaluating the academic performance and growth of student-athletes by comparing their results with those of non-athlete general students. Though these traditional metrics are useful in many ways, there is little research on the self-reported development of life-long learning skills.

Due to a changing global economy, employers are less concerned with the knowledge students possess at graduation and are more interested in a student’s ability to adapt to changes, think critically, and acquire information on their own and apply this new knowledge in an effort to create solutions to existing problems in a team based environment repeatedly over time. Collectively, these skills can be described as life-long learning skills.

The Capacity for Life-Long Learning Index (CLLI), which is comprised of fourteen items from the College Student Experiences Questionnaire (CSEQ), purport to measure students’ perceived gains on academic skills relevant to life-long learning. This study compares scores on the CLLI for several different variables, including student-athletes, non-athlete general students, gender, class, and ethnicity to determine whether there were differences in the perceived gains in life-long learning skills.

On the basis of the results of this study, the following conclusions seem warranted:

1. There were no significant differences in the CLLI score for student-athletes and non-athlete general students.
2. There were significant differences between the CLLI scores for female students, both student-athletes and non-athlete general students, and their male counterparts.

3. There were significant differences between the CLLI scores for senior students, both student-athletes and non-athlete general students, and their freshman student counterparts.

4. There were no significant differences between the CLLI scores among students of different ethnic groups.
Chapter One

Introduction

The American workplace is significantly different now than it was a few generations ago. Today, undergraduate students can no longer expect to graduate from college, find employment with a local company, work for thirty years at the same place, and retire with the same benefits as those obtained in earlier decades without having invested wisely. Due to new business strategies such as open-sourcing, outsourcing, offshoring, and supply-chaining, organizations are swiftly changing the way they conduct their business. As a result of these new business practices, organizations are hiring employees with a different set of skills than were needed during the twentieth century (Friedman, 2005). Due, in large part, to the emergence of information technology and access to meaningful information, companies are less concerned about what knowledge college graduates currently possess and are more concerned with college graduates’ ability to obtain new information and apply it in effective ways (Twigg, 1995). This process, sometimes known as continuous learning or perpetual learning, is most traditionally referred to as life-long learning (Hayek & Kuh, 1998). In today’s data driven labor markets, if employers want facts and figures, they can simply use an internet search engine to acquire them. Because of the ease with which this type of information can be obtained, employers now seek employees who are higher order learners, people who know how to learn, how to think, how to apply knowledge and in doing so, succeed
Due to the changing needs in the labor market, it is important that students develop life-long learning skills during their undergraduate experience.

**Statement of the Problem**

In order to compete in the global work environment of the twenty-first century, college students must develop higher order thinking and life-long learning skills (Friedman, 2005). Achievement test scores, course grades, and graduation rates by themselves are unlikely to provide a basis for understanding the development of higher order thinking and life-long learning skills. There is a need to better understand how undergraduate students perceive their success in acquiring the knowledge and skills that are considered important for the development of higher order thinking and life-long learning. In particular, university and athletic department administrators who are responsible for the academic development of student-athletes are very interested in understanding the role that participation in varsity intercollegiate athletics programs plays in student-athletes’ academic success. Specifically, they are interested in understanding if student-athletes are participating in activities that allow them to develop life-long leaning skills.

**Life-Long Learning Skills Assessment**

One promising approach to the study of life-long learning skills has emerged in a survey utilized in colleges to assess students’ perceptions of their experiences in both academic and social contexts. The survey, the College Students Experiences Questionnaire (CSEQ), was developed by Dr. C. Robert Pace in the 1970’s. The CSEQ is a survey tool designed to assess students’ own perceived quality of effort they have put forth during their educational experiences. Quality of effort is an important component for understanding the effects of attending college, as research has supported the idea that the more students engage in educational activities, the more they benefit in their learning and development (Indiana University-CSEQ, 2014).
In an attempt to study students’ capacity for life-long learning, a number of items from the CESQ, which were judged to be most relevant to life-long learning, were selected to create a Capacity for Life-Long Learning Index (CLLI). Items were selected from each of the CSEQ’s five estimated gains factors: Gains in General Education, Intellectual Skills, Personal Development, Science & Technology, and Vocational Preparation (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003).

The definition of the Capacity for Life-Long Learning Index comes from the College Students Experiences Questionnaire Norms for the Fourth Edition:

“The Capacity for Life-Long Learning Index assesses a student’s capacity for life-long learning – the ability to discover, synthesize, and apply new information to emerging problems; to think about new ways to identify and solve problems (self-reflection); to value learning new ideas and concepts; to apply new knowledge to different situations; and to work collaboratively with people from divergent backgrounds.” (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003, p.10)

In most studies on the subject of student achievement, the GPA is the primary dependent variable used to determine success of a program or experience. This study was conducted to provide an additional perspective from which to measure success by investigating whether student-athletes differ from general students in the self-reported assessment of the quality of their experiences with the learning activities that have been identified as being related to the development of life-long learning skills. Additionally, the study compares the self-reported activities between student-athletes and general students by year in college, gender, and ethnicity.

Theoretical Framework

The theoretical framework for studying the effect of self-reported collegiate experiences, and in particular those activities believed important in developing life-long learning skills, is
based on the interaction and involvement theories of Kurt Lewin (1936), Alexander Astin (1984), and George Kuh (Kuh, 2001). The framework is depicted in Figure 1.1. The figure depicts Lewin’s equation that behavior is a function of a person and his environment. Astin stated that “student learning is proportional to the quality and quantity of their involvement” (Evans, Forney, & Guido-DiBrito, 1998). The creator of the College Student Experiences Questionnaire, C. Robert Pace, conducted research which led him to conclude that student engagement, defined as, the time and energy devoted to educationally purposeful activities, was one of the most powerful variables in student academic development and achievement (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). Professors George Kuh and Shouping Hu (2001) in their research stated that “all of the questions on the CSEQ reflect student behaviors that are highly correlated with desirable learning and personal development outcomes” (p.311). Lead by Dr. Kuh, from the CESQ survey instrument, fourteen specific items were selected from the estimate of gains section to create the Capacity for Life-Long Learning Index. This index is purported to measure those specific experiences that may be most related to the development of life-long learning skills.

This life-long learning theoretical construct is supported by several research studies (Alder & Alder, 1985; Astin, 1984; Chickering & Reisser, 1993; Gayles, 2009; Lewin, 1936; Pace, 1982; Upcraft & Moore, 1990), which have become some of the most influential in the field of student behavior and academic development. Based on the conclusions found in each of these research studies, there is evidence to support the use of student self-reported behaviors and experiences, in measuring the perceived gain in skills that may lead to the development of life-long learning skills.

There have been several studies conducted to better understand the effect that participation in intercollegiate athletics has on student-athlete academic success and these studies have provided mixed results (Maloney & McCormick, 1993, Gayles, 2009). Although
there is some disagreement about what constitutes academic success, one idea that meets near unanimous agreement is that students who participate in certain activities, which include, but are not limited to, using the library and other university tools, developing organization skills, learning to work with others, reflecting on experience, and participating in cultural arts are more likely to have positive academic outcomes (Chickering & Gamson, 1987, Kuh, 2001, Gayles, 2009).

![Figure 1.1 Theoretical Construct for Study on the Capacity to Develop Life-Long Learning Skills](image)

- **Kuh's Life-Long Learning Index**, which assesses a student's capacity for life-long learning.
- **Astin's Involvement Theory**
  - Student learning is proportional to the quality and quantity of their involvement.
- **Lewin's Theory of Student Development**
  - $B = f (P \times E)$
  - Behavior is a function of a person and their environment.

**Figure 1.1** Theoretical Construct for Study on the Capacity to Develop Life-Long Learning Skills, By A.T. Goodrich, University of South Florida College of Education.
Purpose

The purpose of this study was to assess student-athletes’ perceptions of their progress made, also known as an estimate of gains in skills, by engaging in a number of campus experiences (Capacity for Life-Long Learning Index) that have been described as being important for the development of life-long learning skills and to compare their scores with those of non-varsity athlete, undergraduate students, referred to in this study as “general students”. A comparison was also made between the Capacity for Life-Long Learning Index scores for the variables of gender, year in college, and ethnicity of student-athletes and general students alike.

In order to measure and make these comparisons, the researcher used the Capacity for Life-Long Learning Index from the College Student Experiences Questionnaire (CSEQ). The Capacity for Life-Long Learning Index is comprised of fourteen items within the CSEQ that are designed to measure the quality of effort and estimate of gains reported by students in a variety of learning activities that have been previously related to other academic outcomes. Each of the fourteen questions comes from the Estimate of Gains portion of the CSEQ; this section asks students to rate the extent to which they believe they have gained or progressed in certain areas during their collegiate experience (CSEQ Assessment Program Indiana University, 2007).

The College Student Experiences Questionnaire has been used extensively to measure the quality and quantity of participant involvement on campus. “The CSEQ is based upon a simple but powerful premise related to student learning: The more effort students expend, in using the resources and opportunities an institution provides for their learning and development, the more they benefit” (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003, p. 4). Results from the CSEQ survey are measured in terms of “quality of effort.” This term was created by the developer of the CSEQ, Dr. C. Robert Pace, and it describes the interaction between students and their college environment (Pascarella & Terenzini, 2005). Quality of effort is a measure of
the degree to which the student actively participated in his or her learning experiences. Quality of effort scales are a way to measure self-reported student engagement (Pace, 1982). There have been many studies documenting the level of student engagement on college campuses using the CSEQ (Pascarella & Terenzini, 2005, Murphy, 2010, Miller, 2012, Bergeron, 2013). Additionally, a selected group of items from the survey, collectively entitled the Capacity for Life-Long learning Index, have been used to measure students' capacity for life-long learning (Hayek & Kuh, 1998). There has been little research, however, on the perceived development of life-long learning skills by Division I student-athletes. Using the responses from the estimate of gains section on the CSEQ, this study compared a sample of the self-reported, estimate of gain total scores between student-athletes and general students and also compared those scores within the student-athlete and general student sample based on the independent variables, gender, class, and ethnicity at a NCAA Division I institution using the Capacity for Life-Long Learning Index.

1. Acquiring background and specialization for further education in a professional, scientific, or scholarly field.
2. Gaining a broad general education about different fields of knowledge
3. Writing clearly and effectively
4. Developing the ability to get along with different kinds of people
5. Developing the ability to function as a member of a team
6. Understanding new developments in science and technology
7. Thinking analytically and logically
8. Analyzing quantitative problems (understanding probabilities, proportions, etc.)
9. Putting ideas together, seeing relationships, similarities, and differences between ideas.
10. Learning on your own, pursuing ideas, and finding information you need
11. Using computers and other information technologies
12. Understanding yourself, your abilities, interests, and personality
13. Presenting ideas and information effectively when speaking to others
14. Learning to adapt to change (new technologies, different jobs or personal circumstances, etc.)

**Figure 1.2 Capacity for Life-Long Learning Index Questions** (Hayek & Kuh, College Activities and Environmental Factors Associated with the Development of Life-Long Learning Competencies of College Seniors, 1999).
Educational research supports the idea that certain collegiate experiences and activities are correlated with academic development (NSSE, 2000; Kuh, 2001). Less is understood about the extent to which student-athletes are actually engaging in those activities (Gayles, 2009).

**Research Questions**

1. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between the student-athlete population and the general student population at a Division I institution?

2. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male and female student-athletes during their intercollegiate athletic experiences at a large Division I institution?

3. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male general students and female general students during their undergraduate experiences at a large southern Division I institution?

4. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male student-athletes and male general students during their undergraduate experiences at a large southern Division I institution?

5. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between female student-athletes and female general students during their undergraduate experiences at a large southern Division I institution?

6. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among student-athletes in various years in college (freshman, sophomores, juniors, and seniors) during their intercollegiate athletic experiences at a large southern Division I institution?

7. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among general students in various years in college (freshman,
sophomores, juniors, and seniors) during their undergraduate experiences at a large southern Division I institution?

8. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among African-American, Caucasian, and all other minority student-athletes during their intercollegiate experiences at a large southern Division I institution?

9. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among African-American, Caucasian, and all other minority general students during their undergraduate experiences at a large southern Division I institution?

Significance of Study

This study contributes another perspective to enrich the discussion regarding the potential effect that participation in intercollegiate athletics plays in a student’s academic development. Leading management philosophers have concluded that life-long learning skills will be essential in order for current students to be successful in the workforce after they graduate from college (Drucker, 2001; Friedman, 2005). Though there is a considerable body of literature and a number of research studies which examine the effect of intercollegiate athletic participation on student learning outcomes, such as grade point averages and graduation rates, (Maloney & McCormick, 1993; Rishe, 2003), there is little research on the self-reported development of the student-athletes’ life-long learning skills – problem solving, critical thinking, effective communication, and teamwork skills (Gayles, The Student Athlete Experience, 2009).

The role and educational value of intercollegiate athletics on college campuses has been debated since the early 1900’s and continues to this day (Zimmerman & Wickersham, 2013). The findings of this study may be valuable in many ways. It could be used to help leaders within the National Collegiate Athletic Association (NCAA) create policies and procedures to help
support the academic mission of the organization, to help academic advisors at Division I universities gain a better understanding of what classes and experiences would be most beneficial to their student-athletes development of life-long learning skills, and to help provide a better understanding of the role athletic participation plays in the overall educational experience of a Division I student-athlete.

**Operational Definition of Terms**

**Student-athlete:** Any student at an institution who is an official member of one of the varsity intercollegiate athletic programs as recognized by the National Collegiate Athletic Association. This student can either be a scholarship or non-scholarship athletic participant.

**General Student:** Any undergraduate student at the university who does not participate on one of the varsity intercollegiate athletic programs as recognized by the National Collegiate Athletic Association.

**Capacity for Life-Long Learning Index:** A composite score of 14 items from the CSEQ, which measure the self-reported academic activity purported to be important for the development of life-long learning skills.

**College Classification:** The year in which a student is enrolled in college: freshman, sophomore, junior, or senior.

**Student Engagement:** “Student engagement broadly refers to the effort students put into various educational purposeful activities” (Yebei, 2011).

**Quality of Effort:** The measure of the degree to which a student actively participates in his or her learning experiences.

**Delimitations**

Since this study took place on the campus of a Division I institution and due to the fact that Division I athletics institutions are uniquely different from all other levels of college athletics
institutions, the only population in which these study findings are generalizable are to the other NCAA Division I student-athlete populations.

**Limitations**

Though every precaution is made to ensure the validity of this study, there are limitations associated with this research study.

The most significant limitation to this study is the use of self-reported data. There are known liabilities to using self-reported data, and the validity of self-reported data has been examined in great detail by several researchers (Baird, 1976; Pace, 1985; Pike 1995; Turner & Martin, 1984). Of these researchers, Pike (1995) reported “that student reports of their experiences were highly correlated with relevant achievement test scores.” He believed that if the relationship between the content of the criterion variable and the proxy indicator was strong, then self-reports of progress could be used as proxies for achievement test results (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). Additionally, it should be noted that self-reports are often the only economical and effective source of data available due to issues with unobservable and difficult to measure behaviors (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). Gonyea et al (2003) state that student self-reports are valid under five conditions:

1. Respondents should be able and willing to provide accurate information
2. Questions should be about recent behavior
3. Questions should not explore sensitive, potentially embarrassing areas
4. Questions should be phrased clearly and unambiguously
5. Respondents should take the questions seriously and thoughtfully

Gonyea et al (2003) also stated that “experience over two decades indicates that these conditions are met by the CSEQ.”
This study, being a causal comparative design and not a true experiment, does not allow for the manipulation of the independent variable and as such any inferences about causality must be restricted.

The author of this paper is a former student-athlete who has spent over fifteen years coaching, teaching, and leading various levels of athletic organizations ranging from youth leagues, to high-schools, to Division I athletics departments. It is important to note that the experiences and personal viewpoint of the author may include inherent biases and the author worked to recognize and minimize any possible effects.

This research study makes use of secondary data for the quantitative investigation. There are limitations to using secondary data. This data was collected by and stored in the Office of Student Affairs at the University of South Florida.
Chapter Two

Literature Review

Introduction

Several research studies have examined the role that participation in intercollegiate athletics plays in a student's academic development. Additionally, there have been some, though fewer, research studies that have examined the effect that certain academic experiences may have on the development of life-long learning skills. This study, an investigation of the perceived development of life-long learning skills in Division I student-athletes, requires the review of the following conceptual frameworks in student involvement, competence development, and the student-athlete experience. These include the foundational to present student development theories, development of life-long learning philosophies, the College Student Experiences Questionnaire, the Capacity for Life-Long Learning, the current student-athlete experience, competence development and student-athlete experience studies, and student-athletes and life-long learning skills.

Foundational to Present Day Student Development Theories

Student development, the way that it is understood today, was not always addressed on the college campus. It was not until early in the twentieth century that the newly organized disciplines of psychology and sociology were applied to the collegiate environment (Evans, Forney, & Guido-DiBrito, 1998). Until psychological theorists such as Sigmund Freud, Carl Jung, and B.F. Skinner examined human behavior through the lenses of psychology and sociology, students' behavior was examined from the theologian perspective of utilizing Christian moral codes in order to understand and develop students' character (Upcraft &
Moore, 1990). Then in the 1960’s, researchers in the field advanced student development theories that have become widely accepted by student affairs professionals. Some of the most notable include researchers such as Douglas Heath, whose work focused on the concept of maturity; Roy Heath, who introduced a typology theory that focused on how individual differences affect students’ progress toward maturity; Kenneth Feldman and Theodore Newcomb, who together examined the impact college has on students; and Nevitt Sanford, who was one of the first scholars to address the relationship between college environments and students’ transition into adulthood. These researchers asked the fundamental questions about student development, which are still a part of the discussion today (Evans, Forney, & Guido-DiBrito, 1998). Over time these foundational theories have paved the way for the developmental theories of today: cognitive-structural theory, person-environment theory, and psychosocial theory (Evans, Forney, & Guido-DiBrito, 1998). Cognitive-structural theory is derived from the theories of Jean Piaget. His theories stress the importance of heredity and environment in intellectual development and reveal the various ways an individual develops cognitively (Evans, Forney, & Guido-DiBrito, 1998). The person-environment theory examines the student, the college environment, and most importantly, the interaction of the student with the environment (Evans, Forney, & Guido-DiBrito, 1998). Psychosocial theory examines individuals’ personal and interpersonal lives (Evans, 1996). Psychosocial theorists believe that “human development continues throughout the life span and that a basic underlying psychosocial structure guides this development (Rodgers, 1990).

One of the most widely cited psychosocial theorists is Arthur Chickering (Evans, Forney, & Guido-DiBrito, 1998). In his book, Education and Identity, Chickering describes what he believes are the seven vectors that lead to a students’ sense of identity. These seven vectors are: developing competence, managing emotions, moving through autonomy toward interdependence, developing mature interpersonal relationships, establishing identity,
developing purpose, and finally, developing integrity. The first of these vectors, “Developing Competence,” describes the three forms that comprise competence in the developmental setting: intellectual competence, physical and manual competence, and interpersonal competence (1993).

**Intellectual Competence**, according to Chickering and Reisser (1993), is comprised of three broad areas, all of which are centered on the mind: (1) acquisition of subject matter knowledge and academic skills; (2) gains in cultural, aesthetic, and intellectual sophistication, and expanding interests and activities in humanities and performing arts, philosophy, and history; and finally (3) critical thinking, reflective judgment, and communication skills.

**Physical and Manual Competence**, which is centered on the use of the body and requires manual dexterity, covers an entire range of physical experiences, including personal fitness activities such as participation in sport, or working in the physical arts, such as creating ceramic pots, building statues, or carving a canoe.

**Interpersonal Competence** can best be described as learning how to interact effectively with others and to do so from several different perspectives, and when one must take on a variety of roles. This is done best when one learns to master communications skills, such as active listening, asking probing questions, and providing honest and transparent feedback.

These student developmental theories all seek to provide understanding to the core questions of: how can student affairs professionals better understand the students, understand the collegiate environment and its effect on learning outcomes, and ultimately, student cognitive development? A review and synthesis of the theories of Kurt Lewin and Alexander Astin provides support to the Chickering and Reisser (1993) theories on competence development and Pace’s (1982) theories on the role and value of student experiences in college.

Astin (1984) defined involvement as “the amount of physical and psychological energy that the student devotes to the academic experience” (p. 297). He further clarified that
involvement refers to behavior, what the student actually does or experiences (Evans, Forney, & Guido-DiBrito, 1998). Astin’s theory has five postulates:

1. “Involvement refers to the investment of physical and psychological energy in various objects.”
2. “Regardless of the object, involvement occurs along a continuum.”
3. “Involvement has both quantitative and qualitative features.”
4. “The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program.”
5. “The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement” (p. 298).

In regard to Astin’s theory, an object can be anything from the student experience as a whole to a specific activity, such as a public lecture, an athletic event, or a student sponsored outing (Evans, Forney, & Guido-DiBrito, 1998).

Researcher Kurt Lewin developed a formula to help understand the academic value of interaction of students and their environment. This formula since became the cornerstone upon which the understanding of student development is based (Evans, Forney, & Guido-DiBrito, 1998). His interaction equation is $B = f(P \times E)$ and it states that behavior (B) is a function (f) of the interaction (x) of person (P) and environment (E) (Lewin, 1936).

**Life-Long Learning Philosophy**

A life-long learner is in a perpetual state of seeking solutions and can be defined as someone who has developed the ability to analyze a situation, think critically about possible solutions, and apply a solution; or more simply still, to teach oneself to be successful in any given situation via self-directed learning (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003; Hayek & Kuh, 1999; Billett, 2010).
Though the idea of life-long learning has been debated since the days of Plato, it was brought to the forefront of education by Basil Yeaxlee in his book *Lifelong Education* in 1929 (Smith, 1996, 2001). In his book, Professor Yeaxlee proposes that living and education are very much one in the same and that genuine education keeps doing and thinking together (Yeaxlee, 1929). Life-long learning skills are developed through academic and life experiences and are not a function of rote memorization of lower level knowledge. Benjamin Bloom’s Taxonomy (Bloom, Masia, & Krathwohl, 1956) of intellectual behaviors helps define the difference between people who possess only knowledge, and those who also possess the skills and abilities to become a life-long learner. Students who learn only to remember or understand facts and concepts will not become life-long learners as they fail to do the higher order thinking required of life-long learners. Students who wish to develop into life-long learners must develop the ability to analyze, synthesize, apply, and evaluate what they’ve learned beyond just acquiring the knowledge. Life-long learners may develop these higher order learning skills through the typical collegiate academic experience as well as experiential learning opportunities both in and out of the classroom.

**The College Student Experiences Questionnaire**

The College Student Experiences Questionnaire (CSEQ) was developed by Dr. C. Robert Pace during the 1970’s while he was a professor and researcher at the University of California Los Angeles and was first introduced as a multi-institutional survey tool in 1979 (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). Information from the CSEQ database has been cited in over 250 articles, books, dissertations, and many institutional reports (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). The College Student Experiences Questionnaire is a time-tested instrument that is used to measure the quality and quantity of participant involvement on campus. “The CSEQ is based upon a simple but powerful premise related to student learning: the more effort students expend in using the resources and opportunities an
institution provides for their learning and development, the more they benefit” (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003, p. 4). The CSEQ has been revised several times, the most recent being in 1998. Now, in its fourth edition, this instrument is designed to measure the experiences that students have throughout the course of their academic career among several different dimensions. “With over 150 items, the College Student Experience Questionnaire provides colleges and universities with a comprehensive inventory of the self-reported student experience. The survey collects information about the student’s background (e.g. age, sex, year in college, race and ethnicity, residence, major, and parent’s education level), and asks questions about the students experience with the institution in three areas: (a) college activities, (b) the college environment, and (c) estimate of gains” (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). Results from the CSEQ survey are measured in terms of “quality of effort,” a concept developed by Dr. C. Robert Pace, which attempts to measure the interaction between students and their college environment.

**The Capacity for Life-Long Learning Index**

Within the CSEQ, the developers of the fourth edition created an index that helps researchers assess a student’s capacity for life-long learning. Life-long learning is thought to include the ability to discover, to think, to be self-reflective, to solve problems, to value new ideas, to transfer knowledge to new situations, to work in collaboration with others, and to be able to do so with others who are different than oneself (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). The items from the survey that comprise the “Capacity for Life-Long Learning Index” include the following fourteen items from the estimate of gains section (Pace & Kuh, 1998):

1. Acquiring background and specialization for further education in a professional, scientific, or scholarly field

2. Gaining a broad general education about different fields of knowledge.
3. Writing clearly and effectively
4. Developing the ability to get along with different kinds of people
5. Developing the ability to function as a member of a team
6. Understanding new developments in science and technology
7. Thinking analytically and logically
8. Analyzing quantitative problems (understanding probabilities, proportions, ECT)
9. Putting ideas together, seeing relationships, similarities, and differences between ideas
10. Learning on your own, pursuing ideas, and finding information you need
11. Using computers and other information technologies
12. Understanding yourself, your abilities, interests, and personality
13. Presenting ideas and information effectively when speaking to others
14. Learning to adapt to change (new technologies, different jobs, or personal circumstances, etc.)

This study compares the Capacity for Life-Long Learning Index Estimate of Gains scores between student-athletes and general students at an NCAA Division I institution, plus the study compares the Capacity for Life-Long Learning Index Estimate of Gains Scores within the student-athlete and general student groups to gain insight into the possibility of statistically significant differences within each group.

The Current Student-Athlete Experience

If the entire Division I student-athlete experience could be summed up in one word, that word would be “competition.” The competition to earn a roster spot on a Division I team begins long before their freshman season and continues until their final day as a member of their team. An overwhelming majority of students who earn the privilege to become members of Division I athletic teams have spent several years preparing for the opportunity by engaging in special
physical training programs, attending sport specific camps, and all this in addition to playing on several different teams which participate in the sports activity several months out of the year (Razzi, 1998).

Once on campus, the competitive pressure continues for the student-athletes. The athletic administration and coaching staff members communicate to the student-athletes that they are expected to excel both on the field and in the classroom. Therefore, nearly every Division I school provides a number of academic support personnel, which includes academic advisors, who help select coursework and organize schedules, and academic tutors, who help facilitate student learning, to help the student-athletes meet the university and the NCAA’s measures of academic success (Jolly, 2008; Sievers, 2011). Unlike a vast majority of students in the general population, student-athletes are required to meet certain standards for progress toward degree and academic success rates in order to remain eligible to participate and retain their scholarships (Meyer, 2005). Additionally, it should be noted that student-athletes are oftentimes less qualified and less prepared for the rigors of college academics, based on their incoming standardized test scores and grade point averages, and are very much in need of significant academic support in order to become successful students (Spivey & Jones, 1975; Purdy, Eitzen, & Hufnagel, 1982; Alder & Alder, 1985; Sack, 1987; Shulman & Bowen, 2002).

One of the most often cited research studies of student-athletes regarding their experiences as college students was completed by Josephine Potuto and James O’Hanlon. In their research, they found that participation in Division I athletics is very time demanding and the opportunity cost of participation includes several academic trade-offs (Potuto & O’Hanlon, 2007) as evidenced by the following survey results.

**Time Demands**

- During the season, 82% of student-athletes spend more than 10 hours per week practicing sports.
• During the season, 40% of student-athletes spend more than 10 hours per week playing sports.

• During the off-season, 53% of student-athletes spend more than 10 hours per week practicing sports.

• During the off-season, 21% of student-athletes spend more than 10 hours per week playing sports.

• 36% of student-athletes report that they currently are or have been members of campus-wide organizations.

**Trade-Offs**

• 11% of student-athletes stated that their participation in intercollegiate athletics prevented them from majoring in their desired academic discipline.

• 69% of student-athletes reported that their participation in intercollegiate athletics prevented them from taking a course in which they were interested.
  o 44% of these respondents stated that “the positives of participation have compensated for my inability to take the courses that I really wanted.”

• 53% of student-athletes reported that they do not spend as much time on all aspects of their academic work as they would like.

• 45% of student-athletes state that their participation in intercollegiate athletics is the major reason that prevents them from spending as much time as they would like with other on-campus organizations or attending other campus events.

• 84% of the student-athletes reported that their participation in intercollegiate athletics has prevented them from spending time with non-student-athletes.
60% of these respondents stated that they have no regrets about this issue.
40% of these respondents stated that they do have regrets about this issue.

65% of student athletes reported that they believe that their participation in intercollegiate athletics has had a negative effect on their cumulative grade point average.

11% of student athletes reported that their participation in intercollegiate athletics had a positive effect on their cumulative grade point average.

24% of student athletes reported that their participation in intercollegiate athletics had no effect on their cumulative grade point averages.

Analysis of the years of literature on the topic of the Division I student-athlete experience reveals that student-athletes represent a special population of students with unique challenges and needs, which are different than those of their non-athlete peers (Gayles, 2009). The question related to this research study thus becomes “do athletes report perceiving more or less gains in areas that are correlated to the development of life-long learning skills?”

**Academic and Social Competence Development and Student-Athlete Experience Studies**

Prior to the 1980’s there were very few research articles, surveys, and other literature on the experiences of collegiate student-athletes (Gayles, 2009). Over the past few decades, researchers have been studying the effects of intercollegiate athletics participation on several academic issues, including the development of cognitive skills, intellectual growth, psychosocial change, values, morals, and educational attainment. Many of these research studies have focused on student development outcomes such as grade point average or graduation rate as
opposed to the quality and quantity of student-athlete experiences. There is research that
strongly supports there are certain types of experiences or activities that have positive impacts
on student development throughout a student’s career, there is less research to help determine
whether student-athletes are engaging in those activities (Gayles, 2009) and how those
activities are affecting the student-athletes’ academic and cognitive development.

Economics professors at Clemson University, Dr. Michael Maloney and Dr. Robert
McCormick (1993) conducted an investigation to determine whether intercollegiate athletic
participation affected scholarly success. They defined scholarly success in terms of the
semester grade point average. In their study, they collected the course grades for all the
undergraduate students at Clemson University over a four year period in the late 1980’s. By
controlling for numerous background factors, the researchers found that the student-athletes
had SAT scores that were on average 150 points lower than general students, that their student
rank was 20 percentage points lower than general students, and that student-athletes had a
statistically significant lower grade point average than general students: 2.38 for student-
athletes and 2.68 for general students (Maloney & McCormick, 1993). Furthermore, they found
that student-athletes who participate in revenue generating sports had even lower grade point
averages over this time period; football GPA was 2.12 and men’s basketball GPA was 1.93
(Maloney & McCormick, 1993).

Dr. Patrick Rishe (2003), an economics professor at Webster University, conducted a
research study to compare the graduation rates of Division I student-athletes to all other
undergraduate students. He included sample data from 104 Division I-A schools; these are the
schools that compete at the highest level of athletic competition. His results, which were
derived from paired t-tests, show that graduation rates for student-athletes are statistically
greater than the graduation rates for general student undergraduates: 57.25 percent for general
student undergraduates and 57.34 percent for student-athletes (Rishe, 2003). When graduation
rates for all 252 Division I, Level A, AA, and AAA are compared, the higher rate at which student-athletes graduate is even more pronounced: 58.15 percent for student-athletes verses 54.62 percent for undergraduates.

Dr. Joy Gaston Gayles and Dr. Shouping Hu (2009) conducted research in order to better understand student-athlete engagement and its role in developing the student-athletes’ learning and communication skills as one of the many measures of cognitive development (Gayles & Hu, 2009). They sourced data from the Basic Academic Skills Study (BASS) in order to measure student-athlete experiences. Twenty-one Division I colleges participated in the 1996-97 with a total of 410 freshmen. The research found that “greater participation in academic related activities had a smaller effect on reported gains in learning and communication skills for high profile, revenue generating athletes compared to low profile, non-revenue generating athletes” (Gayles & Hu, 2009). Plus, “Interaction with students other than teammates and participation in academic related activities were positively and significantly related to learning and communications skills reported by student-athletes in low profile sports, but not for student-athletes in high profile sports” (Gayles & Hu, 2009). These results are evidence that there are significant differences between the revenue generating and non-revenue generating student-athletes on a traditional measure of academic success. None of these studies investigated either the self-reported or actual observed involvement on activities that would be helpful in understanding how student athletes are using their time.

**Student Athletes and Life-Long Learning Skills**

Walter F. Mondale, former Vice President of the United States of America, during his campaign in 1976 published an article on Life-Long Learning in which he shared that education should be a process that continues throughout one’s entire life. At the time, many failed to consider that continuing education could be possible outside the bounds of a formal educational setting. Mondale believed that life-long learning was important because people will, throughout
their lives, encounter changing career and social challenges (Mondale, 1976). Mondale’s interest lied mostly with assuring that the government made educational resources available for self-regulated learners to use. But, his article fails to consider whether the citizenry would be prepared to use the learning tools once they were made available to them and begs the question, what experiences must people have to develop the skills necessary to become life-long learners?

A review of the literature on the subject of life-long learning skills development in relation to student-athletes has revealed very few results. Though there have been many articles written about the various components that comprise life-long learning skills, such as metacognition, critical thinking, emotional intelligence, oral and written communication, and team skills, there have been none that combine each of these skills together in an attempt to review them as a whole. McBride and Reed (1998) attempted to measure the critical thinking of skills of student-athletes by administering the New Jersey Test of Reasoning Skills and the California Thinking Depositions Inventory tests on a small sample of student-athletes and non-athletes (Pascarella & Terenzini, 2005). They found that irrespective of gender, “athletes scored significantly lower on both tests than did non-athletes”, but due to the study’s design, it was not clear whether those differences were attributable to participation in intercollegiate athletics or due to traits that they brought with them when they entered college.

The College Students’ Experiences Questionnaire, which contains a section of the survey questions dedicated to the measurement for the capacity of Life-Long Learning, provides an understanding of students’ perceived growth in those activities that have been purported to lead to the development of life-long learning skills. A review of the literature on the subject of student-athletes and their academic achievement and growth reveals that an overwhelming percentage of studies use metrics such as grade point averages and graduation rates to define academic growth and success (Potuto & O’Hanlon, 2007, Gayles, 2009). Grades and
graduation rates are valuable indicators of some measures of academic success, but they provide little information on the breadth and depth of the students’ knowledge and their development of life-long learning skills that will be critically important for their success in our global economy. Student-athletes generally receive considerable academic support, in many cases far greater than the average student. If student-athletes are achieving higher grade point averages and higher graduation rates only because of the tremendous amount of academic support they receive or because they are choosing to select less demanding majors in order to stay eligible to compete in athletics, the question can be asked, are student-athletes participating in those other collegiate experiences that will prepare them to be successful in life after college (Price, 2004)?

It seems reasonable that a student-athlete who spends less time working on his athletic skills and more time interacting with a diverse student body in a variety of activities might develop greater psychosocial skills, such as personality development, critical thinking skills, and emotional intelligence. On the other hand, because of their athletic experiences, working as a member of a diverse team, learning to adapt to change, and thinking strategically, it could be possible that Division I student-athletes report that they are participating in activities that have been identified as being related to the development of life-long learning skills at a greater rate than their undergraduate counterparts.

In summary, NCAA Division I student-athletes are a unique set of students within the undergraduate population. The amount of time and effort that is put into athletic training may come at a price as important academic experiences or opportunities may be missed. Although, the unique experiences that are afforded student-athletes may provide learning opportunities and experiences that they may have no other way of replicating during their academic careers. This study investigates that question by comparing the Capacity for Life-Long Learning estimate of gain scores of undergraduate student-athletes and undergraduate general students to
examine their perceptions of growth in areas that are reported to be highly correlated with life-long skills development with the aim to garner a better understanding of this issue.
Chapter Three
Research Methods

Introduction

The purpose of this study was to compare the self-reported estimate of gains scores on the Capacity for Lifelong Learning Index between groups of student-athletes and the general student population and within the student-athlete population, between gender, year in college, and ethnicity.

This chapter describes the details regarding the research design, population and sample, variables, instrument/measurement, reliability and validity, data collection procedures, and data analysis. Secondary data has been used throughout this study.

Research Design

A causal-comparative research design was used in this study. Causal-comparative research is a type of non-experimental investigation in which researchers seek to identify cause-and-effect relationships by forming groups of individuals in whom the independent variable is present or absent and then determining whether the groups differ on the dependent variable (Gall, Gall, & Borg, 2007). The independent variables in this study are student type (input), gender (input), ethnicity (input), and year in college (input). The dependent variable is the “Capacity for Lifelong Learning Index Estimate of Gain Score” – which is the sum total of the fourteen responses designed to measure a student’s estimated self-assessment of the amount of growth in skills and abilities associated with activities that have been correlated with a number of competencies important for life-long learning (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003).
Population and Sample

The survey took place at a large public metropolitan university consisting of over 40,000 undergraduate students. A number of diverse cultures are represented among the undergraduate population, with a significant population of African American students. Through the collection of secondary data, 752 total students completed the CSEQ, which includes 203 student-athletes and 549 students from the general undergraduate population. Measures have been taken to ensure that the survey results from the two populations are mutually exclusive.

Variables

The independent variables are categorical on a nominal scale for each of the research questions.

Research Question One, the independent variables were student type - student-athlete or general student. The dependent variable was the group mean estimate of gain (EG) score on the capacity for life-long learning index within the College Student Experiences Questionnaire.

Research Question Two, the independent variables were the student-athlete gender; male or female. The dependent variable was the group mean estimate of gain (EG) score on the capacity for life-long learning index within the College Student Experiences Questionnaire.

Research Question Three, the independent variables were the general student gender; male or female. The dependent variable was the group mean estimate of gain (EG) score on the capacity for life-long learning index within the College Student Experiences Questionnaire.

Research Question Four, the independent variables were the male student type, student-athlete or general student. The dependent variable was the group mean estimate of gain (EG) score on the capacity for life-long learning index within the College Student Experiences Questionnaire.
Research Question Five, the independent variables were the female student type, student-athlete or general student. The dependent variable was the group mean estimate of gain (EG) score on the capacity for life-long learning index within the College Student Experiences Questionnaire.

Research Question Six, the independent variables were the student-athlete year in college; freshman, sophomore, junior, or senior. The dependent variable was the group mean estimate of gain (EG) score on the capacity for life-long learning index within the College Student Experiences Questionnaire.

Research Question Seven, the independent variables were the general student year in college; freshman, sophomore, junior, or senior. The dependent variable was the group mean estimate of gain (EG) score on the capacity for life-long learning index within the College Student Experiences Questionnaire.

Research Question Eight, the independent variables were the student-athlete ethnicity; African American, Caucasian, or Other. The dependent variable was the group mean estimate of gain (EG) score on the capacity for life-long learning index within the College Student Experiences Questionnaire.

Research Question Nine, the independent variables were the general student ethnicity; African American, Caucasian, or Other. The dependent variable was the group mean estimate of gain (EG) score on the capacity for life-long learning index within the College Student Experiences Questionnaire.

Instruments/Measures

As this study dealt with the issues of student development and the experiences of students during their academic career the researcher selected the College Student Experiences Questionnaire as the instrument of choice. The College Student Experiences Questionnaire (CSEQ) was developed in the 1970’s by University of California Los Angeles (UCLA) professor,
Dr. C. Robert Pace (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). The CSEQ has been revised several times, the most recent being in 1998. Now, in its fourth edition, the CSEQ Research Program is based out of the Indiana University Center for Postsecondary Research and Planning and is under the direction of Professor George D. Kuh (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003).

The instrument was designed to measure the experiences that students have throughout the course of their academic career among several different dimensions. In the CSEQ Norms for the Fourth Edition, authored by Dr. Kuh, et al. (2003), he explains:

“With over 150 items, the College Student Experience Questionnaire provides colleges and universities with a comprehensive inventory of the student experience. The survey collects information about the student’s background (e.g. age, sex, class, race and ethnicity, residence, major, and parent’s education level), and asks questions about the students experience with the institution in three areas: (a) college activities, (b) the college environment, and (c) estimate of gains.”

The segment regarding background information has eighteen questions that collect important characteristics about the respondent. These include the respondents, age, gender, marital status, year of school, transfer information, housing situation, computer access, average academic letter grade, major, parents educational background, expectation to continue onto graduate education, number of credit hours taken this term, hours spent on academic study, hours spent in employment, opinion of the effect employment has on school work, meeting college expenses, and racial and ethnic background.

On each segment of the instrument, college activities, the college environment, and estimate of gains, participants responded on a Likert-type scale.
The Capacity for Life-Long Learning Index was scored by taking the cumulative score of each of the 14 index questions from within the Estimate of Gains section. Each of the questions in the index requires a response on a four point Likert-type scale, with each response getting between one and four points depending on the response. The range of possible Estimate of Gain (EG) scores is 14, equating to the least amount of gain in these skills, to 56, equating to the greatest amount of gain in these skills.

- Very Little = 1 point
- Some = 2 points
- Quiet a Bit = 3 points
- Very Much = 4 points

The CSEQ instrument may be administered in one of two ways, via a paper version or the online version, which was developed and introduced in the spring of 2000 (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). The two versions of the survey, paper and electronic, are identical and it is up to the researcher’s discretion to use the option that best fits the parameters of the study. The paper version of the fourth edition questionnaire is eight pages and contains over 150 questions, including an area for twenty additional multiple choice questions to be created by the survey administrator, and an identification number box for those studies which require respondent identification. In spite of the number of questions, most people complete the survey in about 30 minutes or less (Pace & Kuh, CSEQ: Fourth Edition, 1998). The paper version of the survey requires the respondent to use a number two pencil and the questionnaire will be scored using an electronic scanning device. Due to the nature of the questionnaire and its purpose of gathering information on how students spend their time at college, the survey is normally administered in the late spring or early summer in order to ensure that each student who takes the survey has had at least one full year of collegiate experience.
Reliability and Validity

Several research articles have supported the CSEQ’s psychometric properties because it has shown to be reliable in measuring educational practices that affect student outcomes (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003).

“In a 1994 report produced by the National Center for higher Education Management Systems (NCHEMS), Peter Ewell and associates concluded that the CSEQ had “excellent psychometric properties” (Indicators of "good practice" in undergraduate education: A handbook for development and implementation., p. 31) was easy to administer, and had high to moderate potential for assessing student behavior and aspects of the college environment associated with desired outcomes.

All the items on the CSEQ scales are understandable, distinct, well-defined, and have high face validity (College Student Experiences Questionnaire: Norms for the Fourth Edition., 2003). This statement is supported by factor analysis and reviews published by J.V. Mitchell (1983) and by Brown (1985), DeCoste (1989), and McCammon (1989) in the Buros Mental Measurements Yearbooks.

A good survey discriminates well between students of varying strengths and experiences on the constructs that it aims to measure. Using a normal curve distribution as a guide, the standard deviations of each scale within the CSEQ survey point to considerable differences in students’ quality of effort and the obtained scores utilize a majority of each scale which is a good indicator of discrimination and variance (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003).

Reliability is the amount of measurement error in the scores yielded by a test (Gall, Gall, & Borg, 2007). In order to estimate the reliability of an instrument researchers analyze the correlation patterns among items within measurement scales and the correlations within the Quality of Effort, College Environment, and Estimate of Gains are in the .3 to.4 range and in many cases even higher (Gall, Gall, & Borg, 2007). These statistics indicate that the questions
are reliable. In order to measure the internal consistency of items in an index, one may use the Cronbach’s alpha. The range for a Cronbach’s alpha is 0.0 to 1.0. A score greater than .70 would be considered good for ensuring that the items in the index are measuring the same thing (Hair, Anderson, Tatham, & Black, 1998). The Quality of Effort scale alphas range between .74 and .92, the College Environment range between .70 and .75, and the Estimate of Gains range between .78 and .87 (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). These scores are all acceptable in terms of reliability.

Validity is the appropriateness, meaningfulness, and usefulness of specific inferences made from test scores (Gall, Gall, & Borg, 2007). The two forms of validity that are meaningful to the CSEQ are content validity and construct validity. Content validity is the extent to which the items in a test represent the domain of content that the test is designed to measure (Gall, Gall, & Borg, 2007). Content validity is usually established by content experts and the CSEQ has been shown to be a reliable instrument by several assessment professionals (Ewell & Jones, 1996, Brown, 1985, Mccammon, 1989, Mitchell, 1983). Using factor analysis, all of the quality of effort scales meet the criteria of content validity for one factor for each scale, with the exception of one scale, Campus Facilities, which retains an acceptable reliability (alpha = .74) (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). Construct validity is the extent to which a measure used in a case study correctly operationalizes the concepts being studied (Gall, Gall, & Borg, 2007). CSEQ results show that intellectual effort is highly correlated with grade point average and desired academic outcomes, (Pike G. R., 1995) though this is more common within the classification of senior than with freshman and those who have the expectation of enrolling in graduate studies. Using blocked hierarchical regression analysis, Gonyea, et al, (2003) explained a large portion of the variance in each of the five gains factors (dependent variables) using sets of student background variables, institutional and environmental characteristics, and quality of effort scales as independent variables. Of the CSEQ’s major strengths, its multiple
examinations of its reliability and validity is the reason why it has been cited in more than 250 journal articles (Miller & Miller, 2005).

The CSEQ is an instrument that relies on self-reported data. There are known liabilities to using self-reported data and the validity of self-reported data have been examined in great detail by several researchers (Baird, 1976; Pace, 1985; Pike 1995; Turner & Martin, 1984). Of these researchers, Pike (1995) reported “that student reports of their experiences were highly correlated with relevant achievement test scores”. He believed that if the relationship between the content of the criterion variable and the proxy indicator was strong, then self-reports of progress could be used as proxies for achievement test results (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). Additionally, it should be noted that self-reports are often the only economical and effective source of data available due to issues with unobservable and difficult to measure behaviors (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). Gonyea, et al. (2003) state that student self-reports are valid under five conditions:

1. Respondents should be able and willing to provide accurate information
2. Questions should be about recent behavior
3. Questions should not explore sensitive, potentially embarrassing areas
4. Questions should be phrased clearly and unambiguously
5. Respondents should take the questions seriously and thoughtfully

Gonyea, et al. (2003) also stated that “experience over two decades indicates that these conditions are met by the CSEQ.”

Data Collection Procedures

The data used for this research are secondary in nature and have been acquired from the USF Office of Student Affairs. Measures were taken to ensure that research samples could be taken from two mutually exclusive populations; student-athletes and general students. The data collection effort was led by the USF Office of Student Affairs and was assisted by the USF
College of Education and USF Department of Athletics to improve the response rate and to ensure the mutual exclusivity of the surveys. In the case of the student-athletes, the survey was administered by the academic enrichment team within the athletics department in order to help improve the response rate among a very small population within the general student body, the student-athletes. To collect data from the general population, the office of the Vice-President of Student Affairs sent an email to students inviting them to participate in the study. Students who met with a representative of the College of Education at the assigned time and location were provided with the survey after confirming that they were current students, but not student-athletes. An opportunity to be entered into a raffle for a $100 gift card was used to incentivize students to complete and return the surveys. The collection of all data was done in accordance with IRB principles.

Upon completion, the surveys were collected and submitted to the Director of Student Affairs Planning, Evaluation and Assessment. The surveys were then sent to the College Student Experiences Questionnaire Research Program headquarters at the Center for Postsecondary Research, Policy, and Planning at Indiana University in Bloomington, Indiana. Here the surveys were processed by the CSEQ staff and the report was returned to the USF College of Education (CSEQ Research Program Center for Postsecondary Research, Policy, and Planning, 2007).

**Data Analysis**

The researcher conducted a series of statistical analyses and provided descriptive statistics including the mean, standard deviation, and frequency on each variable. The data were analyzed using SPSS software. Descriptive statistics, such as applicable measures of standard deviation, central tendency, skewness, and kurtosis were calculated and reported for all variables in this study. Inferential statistics were used to test the relationship among all
variables. Analysis of Variance (ANOVA), T-Tests, and Cohen’s d were used to understand the relationship among all variables.

1. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between the student-athlete population and the general student population at a large southern Division I institution?

The goal of the first research question was to understand if there was an important difference between student-athletes and general students in their mean scores on questions from the Capacity for Life Long Learning Index on the CSEQ. Independent T-tests were conducted to assess if the mean of each group is statistically different from the other.

2. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male and female student-athletes during their intercollegiate experiences at a large southern Division I institution?

The goal of the second research question was to understand if there was a difference between male and female student-athletes in their mean scores on questions from the Capacity for Life Long Learning Index on the CSEQ. Independent T-tests were conducted to assess if the mean of each group is statistically different from the other.

3. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male general students and female general students during their undergraduate experiences at a large southern Division I institution?

The goal of the third research question was to understand if there was a difference between male general students and female general students in their mean scores on questions from the Capacity for Life Long Learning Index on the CSEQ. Independent T-tests were conducted to assess if the mean of each group is statistically different from the other.
4. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male student-athletes and male general students during their undergraduate experiences at a large southern Division I institution?

The goal of the fourth research question was to understand if there was a difference between male student-athletes and male general students in their mean scores on questions from the Capacity for Life Long Learning Index on the CSEQ. Independent T-tests were conducted to assess if the mean of each group was statistically different from the other.

5. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between female student-athletes and female general students during their undergraduate experiences at a large southern Division I institution?

The goal of the fifth research question was to understand if there was a difference between female student-athletes and female general students in their mean scores on questions from the Capacity for Life Long Learning Index on the CSEQ. Independent T-tests were conducted to assess if the mean of each group was statistically different from the other.

6. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among student-athletes in various years in college (freshman, sophomores, juniors, and seniors) during their intercollegiate experiences at a large southern Division I institution?

The goal of the sixth research question was to understand if there was a difference among student-athletes from various years in college in their mean scores on questions from the Capacity for Life Long Learning Index on the CSEQ. A one-way ANOVA was conducted to assess if the mean of each group was statistically different from the other.
7. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among general students in various years in college (freshman, sophomores, juniors, and seniors) during their undergraduate experiences at a large southern Division I institution?

The goal of the seventh research question was to understand if there was a difference among general students from various years in college in their mean scores on questions from the Capacity for Life Long Learning Index on the CSEQ. A one-way ANOVA was conducted to assess if the mean of each group was statistically different from the other.

8. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among African-American, Caucasian, and all other minority student-athletes during their intercollegiate experiences at a large southern Division I institution?

The goal of the eighth research question was to understand if there was a difference among African-American, Caucasian, and other minority student-athletes in their mean scores on questions from the Capacity for Life Long Learning Index on the CSEQ. A one way ANOVA was conducted to assess if the mean of each group was statistically different from the other.

9. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among African-American, Caucasian, and all other minority general students during their undergraduate experiences at a large southern Division I institution?

The goal of the ninth research question was to understand if there was a difference among African-American, Caucasian, and other minority student-athletes in their mean scores on questions from the Capacity for Life Long Learning Index on the CSEQ. A one way ANOVA was conducted to assess if the mean of each group was statistically different from the other. All statistical testing was completed via SPSS.
Chapter Four

Results

Introduction

This chapter reports the demographics of the research sample, the results from the analyses of the research questions, and a summary of the results.

Research Sample

In the spring of 2010 the University of South Florida (USF) Office of Student Affairs conducted a survey of students using the College Students Experiences Questionnaire (CSEQ). The data from the survey included a total of 799 participants. The survey population contained 578 participants classified as general students who were not members of a varsity athletics program and 221 participants classified as student-athletes. Participants with missing responses or who were not undergraduate students were removed from the sample. After removing the data of the participants who failed to meet the study’s criteria, the sample size for the study was reduced to a total of 752 participants, 549 of whom were classified as non-athlete general students, and 203 who were classified as student-athletes.

Descriptive Statistics

The following descriptive statistics in Table 1 describe the data set in order to provide a general understanding of the sample population of the students who participated in the CSEQ survey. A total of 752 students were included in the sample, of which 203 were student-athletes (27%) and 549 were general students (73%). Within the sample data, 341 (45.3%) were male, 411 (54.7%) were female, 223 (29.7%) were African American, 307 (40.8%) were Caucasian,
and 222 (29.5%) were classified as Other. Of the 752 respondents, 331 were freshmen (44.0%), 108 were sophomores (14.4%), 153 were juniors (20.3%), and 160 were seniors (21.3%).

TABLE 1

*Descriptive Statistics of All Participants in the Sample*

<table>
<thead>
<tr>
<th>Demographic Category</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Athlete</td>
<td>203</td>
<td>27.00%</td>
</tr>
<tr>
<td>Male</td>
<td>131</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>General Student</td>
<td>549</td>
<td>73.00%</td>
</tr>
<tr>
<td>Male</td>
<td>210</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>339</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>341</td>
<td>45.30%</td>
</tr>
<tr>
<td>Female</td>
<td>411</td>
<td>54.70%</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>223</td>
<td>29.70%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>307</td>
<td>40.80%</td>
</tr>
<tr>
<td>Other</td>
<td>222</td>
<td>29.50%</td>
</tr>
<tr>
<td><strong>Class</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>331</td>
<td>44.00%</td>
</tr>
<tr>
<td>Sophomore</td>
<td>108</td>
<td>14.40%</td>
</tr>
<tr>
<td>Junior</td>
<td>153</td>
<td>20.30%</td>
</tr>
<tr>
<td>Senior</td>
<td>160</td>
<td>21.30%</td>
</tr>
</tbody>
</table>

N = 752
### TABLE 2

*Student-Athlete Percentage Responses on Capacity of Life-long Learning Estimate of Gains Items Spreadsheet Form*

#### Acquiring Background and Specialization for Further Professional Education

<table>
<thead>
<tr>
<th>Response Percentage</th>
<th>Very Little</th>
<th>Some</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-Athletes</td>
<td>4.4%</td>
<td>38.9%</td>
<td>46.8%</td>
<td>9.9%</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
<td>6.4%</td>
<td>29.7%</td>
<td>40.4%</td>
<td>23.5%</td>
</tr>
</tbody>
</table>

#### Gaining a Broad General Education About Different Fields of Knowledge

<table>
<thead>
<tr>
<th>Response Percentage</th>
<th>Very Little</th>
<th>Some</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-Athletes</td>
<td>0.1%</td>
<td>37.4%</td>
<td>48.8%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
<td>5.1%</td>
<td>29.7%</td>
<td>39.5%</td>
<td>25.7%</td>
</tr>
</tbody>
</table>

#### Writing Clearly and Effectively

<table>
<thead>
<tr>
<th>Response Percentage</th>
<th>Very Little</th>
<th>Some</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-Athletes</td>
<td>5.4%</td>
<td>26.1%</td>
<td>48.8%</td>
<td>19.7%</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
<td>5.6%</td>
<td>28.1%</td>
<td>37.7%</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

#### Presenting Ideas and Information Effectively When Speaking to Others

<table>
<thead>
<tr>
<th>Response Percentage</th>
<th>Very Little</th>
<th>Some</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-Athletes</td>
<td>3.0%</td>
<td>30.0%</td>
<td>53.2%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
<td>4.2%</td>
<td>26.6%</td>
<td>40.6%</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

#### Using Computers and Other Information Technologies

<table>
<thead>
<tr>
<th>Response Percentage</th>
<th>Very Little</th>
<th>Some</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-Athletes</td>
<td>2.5%</td>
<td>27.1%</td>
<td>45.3%</td>
<td>25.1%</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
<td>4.7%</td>
<td>26.2%</td>
<td>33.7%</td>
<td>35.3%</td>
</tr>
</tbody>
</table>

#### Understanding Yourself, Your Abilities, Interests, and Personality

<table>
<thead>
<tr>
<th>Response Percentage</th>
<th>Very Little</th>
<th>Some</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-Athletes</td>
<td>0.0%</td>
<td>16.7%</td>
<td>52.7%</td>
<td>30.5%</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
<td>4.9%</td>
<td>19.1%</td>
<td>27.9%</td>
<td>48.1%</td>
</tr>
</tbody>
</table>
Table 2 (continued)

<table>
<thead>
<tr>
<th>Developing the Ability to Get Along with Different Kinds of People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Percentage</td>
</tr>
<tr>
<td>Student-Athletes</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Developing the Ability to Function as a Member of a Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Percentage</td>
</tr>
<tr>
<td>Student-Athletes</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding New Developments in Science and Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Percentage</td>
</tr>
<tr>
<td>Student-Athletes</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thinking Analytically and Logically</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Percentage</td>
</tr>
<tr>
<td>Student-Athletes</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analyzing Quantitative Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Percentage</td>
</tr>
<tr>
<td>Student-Athletes</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Synthesis: Recognizing Relationships, Similarities, and Differences Between Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Percentage</td>
</tr>
<tr>
<td>Student-Athletes</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learning on Your Own, Pursuing Ideas, and Finding Information You Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Percentage</td>
</tr>
<tr>
<td>Student-Athletes</td>
</tr>
<tr>
<td>Non-Athlete Students</td>
</tr>
</tbody>
</table>
A review of the responses on the fourteen Capacity for Life-Long Learning Index questions reveals that on each of the estimate of gain questions general students responded with “Very Much” at a higher percentage rate than the student-athletes. The three questions with the greatest discrepancy in their “Very Much” responses were 1) Developing the Ability to Get Along with Different Kinds of People, (18.3% difference); 2) Learning on Your Own, Pursuing Ideas, and Finding Information You Need, (18% difference); and 3) Synthesis: Recognizing Relationships, Similarities, and Differences Between Ideas, (17.7% difference). Conversely, the three estimate of gain questions that had the most similar “Very Much” responses were 1) Developing the Ability to Function as a Member of a Team, (5.6% difference); 2) Analyzing Quantitative Problems, (7.2% difference); 3) Understanding New Developments in Science and Technology, (8.2% difference).

Results of Analysis

Research Question One. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between the student-athlete population and the non-athlete student population at a large southern Division I institution?

An independent t-test was conducted to determine the level of significance between the two group means. The student-athlete sample \(N = 203\) was associated with a total estimate of gain score of \(M = 40.00\ (SD = 7.10)\). By comparison, the general student sample \(N = 549\) was associated with a numerically larger total estimate of gain score of \(M = 41.14\ (SD = 9.42)\) (Table 3).
TABLE 3

*Group Statistics of Sample of all Self-Reported Data*

<table>
<thead>
<tr>
<th>Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-Athlete</td>
<td>203</td>
<td>40.0049</td>
<td>7.10146</td>
<td>-0.205</td>
<td>-0.267</td>
</tr>
<tr>
<td>General Student</td>
<td>549</td>
<td>41.1439</td>
<td>9.42446</td>
<td>-0.463</td>
<td>-0.274</td>
</tr>
<tr>
<td>Total</td>
<td>752</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To determine if there is a significant difference between the student-athletes and the general students on their mean estimate of gain scores, an independent *t*-test was performed. The student-athlete and general student distributions were sufficiently normal for the purposes of conducting a *t*-test (i.e., skew < |2.0| and kurtosis < |9.0|; (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010).

As can be seen in Table 4, there was no statistically significant difference between the estimate of gain scores of student-athletes and general students, *t*(476.31) = -1.78, *p* = .076.

TABLE 4

*Levene’s Test for Equality of Variances & T-Test for the Equality of Means from all Self-Reported Data*

<table>
<thead>
<tr>
<th>Levene’s Test</th>
<th>F</th>
<th>Sig.</th>
<th>T</th>
<th>Df</th>
<th>Significance (2-Tailed)</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal Variances Assumed</td>
<td>20.52</td>
<td>0.000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Lower</td>
</tr>
<tr>
<td>Equal Variances Not Assumed</td>
<td>-</td>
<td>-</td>
<td>1.565</td>
<td>750</td>
<td>0.118</td>
<td>-2.56756</td>
</tr>
<tr>
<td>Equal Variances Assumed</td>
<td>-</td>
<td>-</td>
<td>1.778</td>
<td>476.309</td>
<td>0.076</td>
<td>-2.39748</td>
</tr>
</tbody>
</table>

45
Research Question Two. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male and female student-athletes during their intercollegiate experiences at a large southern Division I institution?

Independent t-tests were conducted to assess if the mean of each group is statistically different from the other.

The male student-athlete sample (N = 131) was associated with an estimate of gain score of $M = 38.94$ ($SD = 7.03$). By comparison, the female student-athlete sample (N = 72) was associated with a numerically larger total estimate of gain score of $M = 41.94$ ($SD = 6.86$). To determine if the male student-athletes and the female student-athletes were associated with a statistically significant different mean estimate of gain scores, an independent $t$-test was performed. As can be seen in Table 5, the male student-athlete and female student-athlete distributions were sufficiently normal for the purposes of conducting a $t$-test (i.e., skew $< 1$ 2.0 1 and kurtosis $< 1$ 9.0 1; (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010). As can be seen in Table 6, there was a statistically significant difference between the estimate of gain scores of male student-athletes and female student-athletes, $t(201) = -2.939, p = .004$. In an effort to understand the magnitude of the differences found, a Cohen’s $d$ test was performed to compute the effect size with the result $d = -0.43$, which is considered to be a medium effect (Cohen, 1988). The 95% confidence interval was -5.02 to -0.99. Based on the results of these tests the researcher determined that there was a statistically significant difference in estimate of gain scores between male and female student-athletes.

TABLE 5

<table>
<thead>
<tr>
<th>Student-Athlete Type</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>131</td>
<td>38.9389</td>
<td>7.02934</td>
<td>-0.23</td>
<td>-0.311</td>
</tr>
<tr>
<td>Female</td>
<td>72</td>
<td>41.9444</td>
<td>6.86261</td>
<td>-0.168</td>
<td>-0.268</td>
</tr>
<tr>
<td>Total</td>
<td>203</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 6

Levene’s Test for Equality of Variances & T-Test for the Equality of Means from all Student-Athlete Self-Reported Data

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>Sig.</th>
<th>T</th>
<th>Df</th>
<th>Significance (2-Tailed)</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levene’s Test</td>
<td>0.145</td>
<td>0.704</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Lower</td>
</tr>
<tr>
<td>Equal Variances Assumed</td>
<td>-</td>
<td>-</td>
<td>-2.939</td>
<td>201</td>
<td>0.004</td>
<td>-5.02205</td>
</tr>
<tr>
<td>Equal Variances Not Assumed</td>
<td>-</td>
<td>-</td>
<td>-2.96</td>
<td>149.367</td>
<td>0.004</td>
<td>-5.01216</td>
</tr>
</tbody>
</table>

**Research Question Three.** Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male general students and female general students during their undergraduate experiences at a large southern Division I institution?

Independent *t*-tests were conducted to assess if the mean of each group is statistically different from the other.

The male general student sample (*N* = 210) was associated with an estimate of gain score of *M* = 39.50 (*SD* = 9.88). By comparison, the female general student sample (*N* = 339) was associated with a numerically larger total estimate of gain score of *M* = 42.16 (*SD* = 9.00). To determine if the male general students and the female general students were associated with statistically significant different mean estimate of gain scores, an independent *t*-test was performed. As can be seen in Table 7, the male and female general student distributions were sufficiently normal for the purposes of conducting a *t*-test with skew less than the absolute value.
of 2.0 and kurtosis less than the absolute value of 9.0 (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010). Additionally, the assumption of homogeneity of variances was tested and satisfied via Levene’s $F$ test, $F(547) = 2.70, p = .101$.

As can be seen in Table 8, there was a statistically significant difference between the estimate of gain scores of male general students and female general students, $t(547) = -3.24, p = .001$. In an effort to understand the magnitude of the differences found, a Cohen’s $d$ test was performed to compute the effect size with the result $d = -0.28$, which is considered to be a medium effect (Cohen, 1988). The 95% confidence interval was -4.27 to -1.04. Based on the results of these tests the researcher determined that there was a statistically significant difference between the male and female students in the non-athlete, general student population.

### TABLE 7

<table>
<thead>
<tr>
<th>General Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>210</td>
<td>39.5048</td>
<td>9.8822</td>
<td>-0.35</td>
<td>-0.411</td>
</tr>
<tr>
<td>Female</td>
<td>339</td>
<td>42.1593</td>
<td>8.9953</td>
<td>-0.507</td>
<td>-0.187</td>
</tr>
<tr>
<td>Total</td>
<td>549</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Research Question Four.** Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male student-athletes and male general students during their undergraduate experiences at a large southern Division I institution?

Independent $t$-tests were conducted to assess if the mean of each group is statistically different from the other.
The male student-athletes sample ($N = 131$) was associated with a total estimate of gain score of $M = 38.94$ ($SD = 7.03$). By comparison, the male general student sample ($N = 210$) was associated with a numerically larger total estimate of gain score of $M = 39.50$ ($SD = 9.88$). To determine if the male student-athletes and the male general students were associated with a statistically significant different mean estimate of gain scores, an independent $t$-test was performed. As can be seen in Table 9, the male student-athletes and male general student distributions were sufficiently normal for the purposes of conducting a $t$-test with skew less than the absolute value of 2.0 and kurtosis less than the absolute value of 9.0 (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010).

As can be seen in Table 10, there was no statistically significant difference between the estimate of gain scores of male student-athletes and male general students, $t (333.16) = -.62$, $p = .538$. 

---

**TABLE 8**

*Levene’s Test for Equality of Variances & T-Test for the Equality of Means from All General Student Self-Reported Data*

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>Sig.</th>
<th>T</th>
<th>df</th>
<th>Sig. (2-Tailed)</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levene's Test</td>
<td>2.702</td>
<td>0.101</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Lower – Upper</td>
</tr>
<tr>
<td>Equal Variances</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assumed</td>
<td>-</td>
<td>-</td>
<td>-3.235</td>
<td>547</td>
<td>0.001</td>
<td>-4.26638 – 1.04268</td>
</tr>
<tr>
<td>Equal Variances</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Assumed</td>
<td>-</td>
<td>-</td>
<td>-3.164</td>
<td>411.562</td>
<td>0.002</td>
<td>-4.30356 – -1.0055</td>
</tr>
</tbody>
</table>

The male student-athletes sample ($N = 131$) was associated with a total estimate of gain score of $M = 38.94$ ($SD = 7.03$). By comparison, the male general student sample ($N = 210$) was associated with a numerically larger total estimate of gain score of $M = 39.50$ ($SD = 9.88$). To determine if the male student-athletes and the male general students were associated with a statistically significant different mean estimate of gain scores, an independent $t$-test was performed. As can be seen in Table 9, the male student-athletes and male general student distributions were sufficiently normal for the purposes of conducting a $t$-test with skew less than the absolute value of 2.0 and kurtosis less than the absolute value of 9.0 (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010).

As can be seen in Table 10, there was no statistically significant difference between the estimate of gain scores of male student-athletes and male general students, $t (333.16) = -.62$, $p = .538$. 

49
TABLE 9

*Group Statistics of All Male Self-Reported Data from the General Student and Student-Athlete Sample*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-Athletes</td>
<td>131</td>
<td>38.9389</td>
<td>7.02934</td>
<td>-0.23</td>
<td>-0.311</td>
</tr>
<tr>
<td>General Students</td>
<td>210</td>
<td>39.5048</td>
<td>9.8822</td>
<td>-0.35</td>
<td>-0.411</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>341</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE 10

*Levene’s Test for Equality of Variances & T-Test for the Equality of Means from All Male Student Self-Reported Data*

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>Sig.</th>
<th>T</th>
<th>Df</th>
<th>Significance (2-Tailed)</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levene's Test</td>
<td>16.462</td>
<td>0.000</td>
<td>-</td>
<td>-</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Equal Variances Assumed</td>
<td>-</td>
<td>-</td>
<td>-0.571</td>
<td>339</td>
<td>0.568</td>
<td>-2.51422 1.38256</td>
</tr>
<tr>
<td>Equal Variances Not Assumed</td>
<td>-</td>
<td>-</td>
<td>-0.617</td>
<td>333.162</td>
<td>0.538</td>
<td>-2.3711 1.23944</td>
</tr>
</tbody>
</table>

**Research Question Five.** Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between female student-athletes and female general students during their undergraduate experiences at a large southern Division I institution?
Independent *t*-tests were conducted to assess if the mean of each group is statistically different from the other.

The female student-athletes sample (*N* = 72) was associated with a total estimate of gain score of *M* = 41.94 (*SD* = 6.86). By comparison, the female general student sample (*N* = 339) was associated with a numerically larger total estimate of gain score of *M* = 42.16 (*SD* = 9.00). To determine if the female student-athletes and the female general students were associated with a statistically significant different mean total estimate of gain scores, an independent *t*-test was performed. As can be seen in Table 11, the female student-athletes and female general student distributions were sufficiently normal for the purposes of conducting a *t*-test with skew less than the absolute value of 2.0 and kurtosis less than the absolute value of 9.0 (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010).

As can be seen in Table 12, there was no statistically significant difference between the estimate of gain scores of female student-athletes and female general students, *t* (128.67) = - .23, *p* = .820, *d* = -0.03. Based on the results of these tests the researcher failed to find a statistically significant difference between the two groups.

### TABLE 11

**Group Statistics of All Female Self-Reported Data from the General Student and Student-Athlete Sample**

<table>
<thead>
<tr>
<th>All Female Students</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-Athletes</td>
<td>72</td>
<td>41.9444</td>
<td>6.86261</td>
<td>-0.168</td>
<td>-0.268</td>
</tr>
<tr>
<td>General Students</td>
<td>339</td>
<td>42.1593</td>
<td>8.9953</td>
<td>-0.507</td>
<td>-0.187</td>
</tr>
<tr>
<td>Total</td>
<td>411</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 12

Levene’s Test for Equality of Variances & T-Test for the Equality of Means from All Female Student Self-Reported Data

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>Sig.</th>
<th>t</th>
<th>df</th>
<th>Significance (2-Tailed)</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levene’s Test</td>
<td>7.075</td>
<td>0.008</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Lower  Upper</td>
</tr>
<tr>
<td>Equal Variances Assumed</td>
<td>-</td>
<td>-</td>
<td>-0.191</td>
<td>409</td>
<td>0.849</td>
<td>-2.42463 1.99493</td>
</tr>
<tr>
<td>Equal Variances Not Assumed</td>
<td>-</td>
<td>-</td>
<td>-0.227</td>
<td>128.672</td>
<td>0.82</td>
<td>-2.08435 1.65466</td>
</tr>
</tbody>
</table>

Research Question Six. Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among student-athletes in various years in college (freshmen, sophomore, junior, and senior) during their intercollegiate experiences at a large southern Division I institution?

The descriptive statistics associated with the mean estimate of gain scores across the four classes are reported in Table 13. It can be observed that the freshman class had the numerically smallest mean level of estimate of gain scores ($M = 38.900$, $SD = 8.18$) and the senior class had the numerically highest mean level of estimate of gain scores ($M = 43.22$, $SD = 6.30$).
TABLE 13

Descriptive Statistics for Perceived Student-Athlete Estimate of Gain Scores by Class

<table>
<thead>
<tr>
<th>CLASS</th>
<th>M</th>
<th>N</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>38.9074</td>
<td>54</td>
<td>8.18482</td>
<td>0</td>
<td>-0.502</td>
</tr>
<tr>
<td>Sophomore</td>
<td>39.5962</td>
<td>52</td>
<td>5.79811</td>
<td>-0.493</td>
<td>0.548</td>
</tr>
<tr>
<td>Junior</td>
<td>39.3667</td>
<td>60</td>
<td>7.14728</td>
<td>-0.207</td>
<td>-0.8</td>
</tr>
<tr>
<td>Senior</td>
<td>43.2162</td>
<td>37</td>
<td>6.29874</td>
<td>0.388</td>
<td>0.172</td>
</tr>
<tr>
<td>Total</td>
<td>40.0049</td>
<td>203</td>
<td>7.10146</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to determine if class had a statistically significant effect on mean estimate of gain scores, a one-way analysis of variance was performed. Prior to conducting the ANOVA, the assumption of normality was evaluated using histograms of each class (Figure 3) and determined to be satisfied as the four groups’ distributions were each associated with skewness and kurtosis less than the absolute value of 2.0 and 9.0, respectively (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010). The one-way analysis of variance was conducted to determine if there was a statistically significant difference among the estimate of gain scores based on their year in school \((N = 203)\). The independent variable, year in school, labeled as class, included four groups: freshman \((M = 38.91, SD = 8.18, n = 54)\), sophomore \((M = 39.60, SD = 5.80, n = 52)\), junior \((M = 39.37, SD = 7.15, n = 60)\), and senior \((M = 43.22, SD = 6.30, n = 37)\).

The assumption of homogeneity of variances was tested and found to be statistically significant using Levene’s Test, \(F(3, 199) = 2.78, p = .042\) (Table 14). Therefore, rather than use the \(p\) value from the ANOVA, the researcher referred to the Brown-Forsythe (1974) test of equality of means to assess a \(p\) value (Table 15).
FIGURE 3. Histogram of mean estimate of gain scores by class of student-athlete

TABLE 14

Test of Homogeneity of Variances

<table>
<thead>
<tr>
<th>Levene’s Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.778</td>
<td>3</td>
<td>199</td>
<td>0.042</td>
</tr>
</tbody>
</table>
**TABLE 15**

Robust Test of Equality of Means

<table>
<thead>
<tr>
<th>Statistic (a)</th>
<th>df1</th>
<th>df2</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown-Forsythe</td>
<td>3.364</td>
<td>3</td>
<td>186.46</td>
</tr>
</tbody>
</table>

a. Asymptotically F distributed

The Brown-Forsythe test provided a statistically significant effect $F(3, 186.46) = 3.36, p = .020, \eta^2 = .047$. Thus, the ANOVA and Brown-Forsythe test indicates that there is a statistically significant difference among the groups. To evaluate the nature of the differences of the four means a Scheffe post-hoc test was performed (Scheffe, 1947).

The difference between the freshman class and the senior class was statistically significant, $p = .042, d = -.59$ (Table 16). No other comparison between classes was found to be statistically significant. The effect size associated with the statistically significant effect are considered to be moderate to large based on Cohen’s (1988) guidelines.

**Research Question Seven.** Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among general students in various years in college (freshmen, sophomore, junior, and senior) during their undergraduates experiences at a large southern Division I institution?

The descriptive statistics associated with the mean estimate of gain scores across the four classes are reported in Table 17. It can be observed that the freshman class had the numerically smallest mean level of estimate of gain scores ($M = 39.08, SD = 10.49$) and the sophomore class had the numerically highest mean level of estimate of gain scores ($M = 43.73, SD = 7.38$).
**TABLE 16**

*Schefe Multiple Comparisons Post-Hoc Test*

<table>
<thead>
<tr>
<th>Class (I)</th>
<th>Class (J)</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Significance (2-Tailed)</th>
<th>95% Confidence Interval Lower</th>
<th>95% Confidence Interval Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>Sophomore</td>
<td>-0.6887</td>
<td>1.35699</td>
<td>0.968</td>
<td>-4.5149</td>
<td>3.1374</td>
</tr>
<tr>
<td></td>
<td>Junior</td>
<td>-0.4593</td>
<td>1.31009</td>
<td>0.989</td>
<td>-4.1531</td>
<td>3.2346</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>-4.3088*</td>
<td>1.49054</td>
<td>0.042</td>
<td>-8.5115</td>
<td>-0.1061</td>
</tr>
<tr>
<td>Sophomore</td>
<td>Freshman</td>
<td>0.6887</td>
<td>1.35699</td>
<td>0.968</td>
<td>-3.1374</td>
<td>4.5149</td>
</tr>
<tr>
<td></td>
<td>Junior</td>
<td>0.2295</td>
<td>1.32329</td>
<td>0.999</td>
<td>-3.5016</td>
<td>3.9606</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>-3.6201</td>
<td>1.50215</td>
<td>0.125</td>
<td>-7.8555</td>
<td>0.6154</td>
</tr>
<tr>
<td>Junior</td>
<td>Freshman</td>
<td>0.4593</td>
<td>1.31009</td>
<td>0.989</td>
<td>-3.2346</td>
<td>4.1531</td>
</tr>
<tr>
<td></td>
<td>Sophomore</td>
<td>-0.2295</td>
<td>1.32329</td>
<td>0.999</td>
<td>-3.9606</td>
<td>3.5016</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>-3.8495</td>
<td>1.45993</td>
<td>0.077</td>
<td>-7.9659</td>
<td>0.2668</td>
</tr>
<tr>
<td>Senior</td>
<td>Freshman</td>
<td>4.3088*</td>
<td>1.49054</td>
<td>0.042</td>
<td>0.1061</td>
<td>8.5115</td>
</tr>
<tr>
<td></td>
<td>Sophomore</td>
<td>3.6201</td>
<td>1.50215</td>
<td>0.125</td>
<td>-0.6154</td>
<td>7.8555</td>
</tr>
<tr>
<td></td>
<td>Junior</td>
<td>3.8495</td>
<td>1.45993</td>
<td>0.077</td>
<td>-0.2668</td>
<td>7.9659</td>
</tr>
</tbody>
</table>

Based on observed means. The error term is Mean Square (Error) = 48.780.

* The mean difference is significant at the .05 level.
TABLE 17

Descriptive Statistics for Perceived General Student Estimate of Gain Scores

<table>
<thead>
<tr>
<th>CLASS</th>
<th>M</th>
<th>N</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>39.0758</td>
<td>277</td>
<td>10.49386</td>
<td>-0.225</td>
<td>-0.742</td>
</tr>
<tr>
<td>Sophomore</td>
<td>43.7321</td>
<td>56</td>
<td>7.37931</td>
<td>-0.373</td>
<td>-0.048</td>
</tr>
<tr>
<td>Junior</td>
<td>42.3656</td>
<td>93</td>
<td>7.51489</td>
<td>-0.110</td>
<td>-0.613</td>
</tr>
<tr>
<td>Senior</td>
<td>43.6992</td>
<td>123</td>
<td>7.88642</td>
<td>-0.691</td>
<td>0.835</td>
</tr>
<tr>
<td>Total</td>
<td>41.1439</td>
<td>549</td>
<td>9.42446</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to determine if class had a statistically significant effect on mean estimate of gain scores, a one-way analysis of variance was performed. Prior to conducting the ANOVA, the assumption of normality was evaluated using histograms of each class (Figures 4-7) and determined to be normal as the four groups’ distributions were each associated with skewness and kurtosis less than the absolute value of 2.0 and 9.0, respectively (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010). The one-way analysis of variance was conducted to determine if there was a statistically significant difference among the estimate of gain scores based on their year in school ($N = 549$). The independent variable, year in school, labeled as class, included four groups: freshman ($M = 39.08$, $SD = 10.49$, $n = 277$), sophomore ($M = 43.73$, $SD = 7.38$, $n = 56$), junior ($M = 42.37$, $SD = 7.51$, $n = 93$), and senior ($M = 43.70$, $SD = 7.89$, $n = 123$).

The assumption of homogeneity of variances was tested and found to be statistically significant using Levene’s Test, $F (3, 545) = 10.72$, $p = .000$ (Table 18). Therefore, rather than the $p$ value from the ANOVA, the researcher referred to the Brown-Forsythe (1974) test of equality of means to assess a $p$ value (Table 19).
TABLE 18

Test of Homogeneity of Variances

<table>
<thead>
<tr>
<th>Levene’s Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.72</td>
<td>3</td>
<td>545</td>
<td>0.000</td>
</tr>
</tbody>
</table>

FIGURE 4. Histogram of mean estimate of gain scores by freshman class of general students
FIGURE 5. Histogram of mean estimate of gain scores by sophomore class of general students
FIGURE 6. Histogram of mean estimate of gain scores by junior class of general students
FIGURE 7. Histogram of mean estimate of gain scores by senior class of general students

TABLE 19

Robust Test of Equality of Means

<table>
<thead>
<tr>
<th></th>
<th>Statistic (a)</th>
<th>df1</th>
<th>df2</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown-Forsythe</td>
<td>12.595</td>
<td>3</td>
<td>405.606</td>
<td>0.000</td>
</tr>
</tbody>
</table>

a. Asymptotically F distributed
The Brown-Forsythe test provided a statically significant effect $F (3, 405.61) = 12.595, p = .000$. Thus, the ANOVA and Brown-Forsythe test indicates that there is a statistically significant difference among the groups. To evaluate the nature of the differences of the four means a Scheffe post-hoc test was performed (Scheffe, 1947).

The difference between the freshman class and all other classes was statistically significant, sophomore $p = .008, d = -.51$, junior $p = .032, d = -.36$, senior $p = .000, d = -.50$ (Table 20). The effect sizes associated with the statistically significant effects are considered to be moderate to medium based on Cohen’s (1988) guidelines.

**TABLE 20**

*Schefte Multiple Comparisons Post-Hoc Test on General Students by Class*

<table>
<thead>
<tr>
<th>Class (I)</th>
<th>Class (J)</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Significance (2-Tailed)</th>
<th>95% Confidence Interval Lower</th>
<th>95% Confidence Interval Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>Sophomore</td>
<td>-4.65633*</td>
<td>1.34859</td>
<td>0.008</td>
<td>-8.4381</td>
<td>-.8746</td>
</tr>
<tr>
<td></td>
<td>Junior</td>
<td>-3.28978*</td>
<td>1.10309</td>
<td>0.032</td>
<td>-6.3831</td>
<td>-.1965</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>-4.62337*</td>
<td>.99730</td>
<td>0.000</td>
<td>-7.4201</td>
<td>-1.8267</td>
</tr>
<tr>
<td>Sophomore</td>
<td>Freshman</td>
<td>-4.65633*</td>
<td>1.34859</td>
<td>0.008</td>
<td>.8746</td>
<td>8.4381</td>
</tr>
<tr>
<td></td>
<td>Junior</td>
<td>1.36655</td>
<td>1.55685</td>
<td>0.856</td>
<td>-2.9992</td>
<td>5.7323</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>.03296</td>
<td>1.48378</td>
<td>1.000</td>
<td>-4.1279</td>
<td>4.1938</td>
</tr>
<tr>
<td>Junior</td>
<td>Freshman</td>
<td>-3.28978*</td>
<td>1.10309</td>
<td>0.032</td>
<td>.1965</td>
<td>-6.3831</td>
</tr>
<tr>
<td></td>
<td>Sophomore</td>
<td>1.36655</td>
<td>1.55685</td>
<td>0.856</td>
<td>-5.7323</td>
<td>2.9992</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>-1.33360</td>
<td>1.26480</td>
<td>.774</td>
<td>-4.8804</td>
<td>2.2132</td>
</tr>
<tr>
<td>Senior</td>
<td>Freshman</td>
<td>-4.62337*</td>
<td>.99730</td>
<td>0.000</td>
<td>1.8267</td>
<td>7.4201</td>
</tr>
<tr>
<td></td>
<td>Sophomore</td>
<td>.03296</td>
<td>1.48378</td>
<td>1.000</td>
<td>-4.1938</td>
<td>4.1279</td>
</tr>
<tr>
<td></td>
<td>Junior</td>
<td>-1.33360</td>
<td>1.26480</td>
<td>.774</td>
<td>-2.2132</td>
<td>4.8804</td>
</tr>
</tbody>
</table>

* The mean difference is significant at the .05 level.
**Research Question Eight.** Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ between African-American, Caucasian, and all Other minority student-athletes during their intercollegiate experiences at a large southern Division I institution?

A one way ANOVA will be conducted to assess if the mean of each group is statistically different from the others.

The descriptive statistics associated with the mean estimate of gain scores across the three classes are reported in Table 21. It can be observed that the African-American sample \((N = 58)\) was associated with a total estimate of gain score of \(M = 40.05 (SD = 7.43)\). The Caucasian sample \((N = 92)\) was associated with a numerically larger total estimate of gain score of \(M = 40.33 (SD = 7.16)\). The Other minority sample \((N = 53)\) was associated with a total estimate of gain score of \(M = 39.40 (SD = 6.73)\).

In order to determine if student ethnicity had an effect on their mean estimate of gain scores, a one-way analysis of variance was performed. Prior to conducting the ANOVA, the assumption of normality was evaluated using histograms of each class (Figure 8) and determined to be satisfied as the three groups’ distributions were each associated with skewness and kurtosis less than the absolute value of 2.0 and 9.0, respectively (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010). The one-way analysis of variance was conducted to determine whether there was a statistically significant difference in student-athletes estimate of gain scores based on their ethnicity \((N = 203)\). The independent variable, labeled as ethnicity, included three groups: African-American \((M = 40.05, SD = 7.43, n = 58)\), Caucasian \((M = 40.33, SD = 7.16, n = 92)\), and the Other minority \((M = 39.40, SD = 6.73, n = 53)\).
TABLE 21

Descriptive Statistics for Perceived Student-Athlete Estimate of Gain Scores by Ethnicity

<table>
<thead>
<tr>
<th>General Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>58</td>
<td>40.0517</td>
<td>7.42547</td>
<td>-0.078</td>
<td>-0.821</td>
</tr>
<tr>
<td>Caucasian</td>
<td>92</td>
<td>40.3261</td>
<td>7.1562</td>
<td>-0.55</td>
<td>0.059</td>
</tr>
<tr>
<td>Other</td>
<td>53</td>
<td>39.3962</td>
<td>6.72921</td>
<td>0.29</td>
<td>0.397</td>
</tr>
<tr>
<td>Total</td>
<td>203</td>
<td>40.0049</td>
<td>7.10146</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FIGURE 8. Histogram of mean estimate of gain scores by ethnicity of student-athlete
The assumption of homogeneity of variances was tested and satisfied based on Levene’s Test, $F(2, 200) = .788, p = .456$ (Table 22).

**TABLE 22**

*Test of Homogeneity of Variances: Perceived Student-Athlete Estimate of Gain Score by Ethnicity*

<table>
<thead>
<tr>
<th>Levene's Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.788</td>
<td>2</td>
<td>200</td>
<td>0.456</td>
</tr>
</tbody>
</table>

The independent ANOVA did not yield a statistically significant effect, $F(2, 200) = .288, p = .750, \eta^2 = .003$ (Table 23), indicating there was no statistically significant differences among the groups.

**TABLE 23**

*ANOVA: Perceived Student-Athlete Estimate of Gain Score by Ethnicity*

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>29.254</td>
<td>2</td>
<td>14.627</td>
<td>0.288</td>
<td>0.75</td>
</tr>
<tr>
<td>Within Groups</td>
<td>10157.741</td>
<td>200</td>
<td>50.789</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10186.995</td>
<td>202</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Research Question Nine.** Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ between African-American, Caucasian, and all other minority general students during their undergraduate experiences at a large southern Division I institution?
A one way ANOVA was conducted to assess if the mean of each group is statistically different from the others.

The descriptive statistics associated with the mean estimate of gain scores across the three classes are reported in Table 24. It can be observed that the African-American sample \((N = 165)\) was associated with a total estimate of gain score of \(M = 40.45\) \((SD = 10.07)\). The Caucasian sample \((N = 215)\) was associated with a numerically larger total estimate of gain score of \(M = 41.30\) \((SD = 9.28)\). The Other minority sample \((N = 169)\) was associated with the largest total estimate of gain score of \(M = 41.62\) \((SD = 8.96)\).

**TABLE 24**

*Descriptive Statistics for Perceived General Student Estimate of Gain Scores by Ethnicity*

<table>
<thead>
<tr>
<th>General Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>165</td>
<td>40.4545</td>
<td>10.06652</td>
<td>-0.490</td>
<td>-0.352</td>
</tr>
<tr>
<td>Caucasian</td>
<td>215</td>
<td>41.3023</td>
<td>9.28202</td>
<td>-0.556</td>
<td>-0.181</td>
</tr>
<tr>
<td>Other</td>
<td>169</td>
<td>41.6154</td>
<td>8.96289</td>
<td>-0.248</td>
<td>-0.433</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>549</td>
<td>41.1439</td>
<td>9.42446</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to determine if student ethnicity had an effect on their mean estimate of gain scores, a one-way analysis of variance was performed. Prior to conducting the ANOVA, the assumption of normality was evaluated using histograms of each class (Figure 9, 10, and 11) and determined to be satisfied as the three groups’ distributions were each associated with skewness and kurtosis less than the absolute value of 2.0 and 9.0, respectively (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010). The one-way analysis of variance was conducted to determine whether there was a statistically significant difference in general student’s estimate of gain scores based on their ethnicity \((N = 549)\). The independent variable, labeled as ethnicity,
included three groups: African-American ($M = 40.45$, $SD = 10.07$, $n = 165$), Caucasian ($M = 41.30$, $SD = 9.28$, $n = 215$), and the Other minority ($M = 41.62$, $SD = 8.96$, $n = 169$).

![Histogram](image)

**FIGURE 9.** Histogram of mean estimate of gain scores of African-American General Students
FIGURE 10. *Histogram of mean estimate of gain scores of Caucasian General Students*
The assumption of homogeneity of variances was tested and satisfied based on Levene’s Test, $F (2, 546) = 1.133, p = .323$ (Table 25).

**TABLE 25**

Test of Homogeneity of Variances: Perceived General Student Estimate of Gain Score by Ethnicity

<table>
<thead>
<tr>
<th>Levene's Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.133</td>
<td>2</td>
<td>546</td>
<td>.323</td>
</tr>
</tbody>
</table>
The independent ANOVA did not yield a statistically significant effect, $F(2, 546) = .682$, $p = .506$, $\eta^2 = .002$ (Table 26), indicating there was no statistically significant differences among the groups.

**Table 26**

**ANOVA: Perceived General Student Estimate of Gain Score by Ethnicity**

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>121.374</td>
<td>2</td>
<td>60.687</td>
<td>0.682</td>
<td>0.506</td>
</tr>
<tr>
<td>Within Groups</td>
<td>48552.258</td>
<td>546</td>
<td>88.924</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>48673.632</td>
<td>548</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Summary of Results**

In summation, the researcher first conducted a series of statistical analyses on the responses of fourteen questions from the College Student Experiences Questionnaire called the Capacity for Life Long Learning Index. These analyses compared the mean Capacity for Life Long Learning Index Estimate of Gains scores between several distinct groups, 1) general students verses student-athletes, 2) male student-athletes versus female student-athletes, 3) male general students versus female general students, 4) male student-athletes versus male general students, and finally, 5) female student-athletes versus female general students. Next, the researcher then conducted a series of statistical analysis on those same responses sorted by, 6) student-athlete class/year in school, 7) general student class/year in school, 8) student-athlete ethnicity, and 9) general student ethnicity.
Using an independent t-test, question one revealed that there was not a statistically significant difference in the perceived estimate of gain score between the general students and the student-athletes.

Using an independent t-test, question two revealed that there was a statistically significant difference in the perceived estimate of gain scores of the male and female student-athletes with a medium effect size.

Using an independent t-test, question three revealed that there was a statistically significant difference in the perceived estimate of gain scores of the male and female general students with a small effect size.

Using an independent t-test, question four revealed that there was not a statistically significant difference in the perceived estimate of gain score between the male general students and the male student-athletes.

Using an independent t-test, question five revealed that there was not a statistically significant difference in the perceived estimate of gain score between the female general students and the female student-athletes.

Using a one way ANOVA, question six revealed that there was a statistically significant difference among two classes in the perceived estimate of gain scores. A Scheffe post-hoc test result determined that there was a significant difference between the freshman student-athletes and the senior student-athletes with a moderate to large effect size.

Using a one way ANOVA and the Brown-Forsythe test, question seven revealed that there was a statistically significant difference among two classes in the perceived estimate of gain scores. A Scheffe post-hoc test determined that there was a significant difference between the freshman student-athletes and each of the three other classes, sophomores, juniors, and seniors. Each effect size was considered moderate to medium.
### TABLE 27

**Independent T-Test Summary Results**

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Group One</th>
<th>Group Two</th>
<th>Statistically Significant Difference</th>
<th>P</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Students</td>
<td>Student-Athletes</td>
<td>No</td>
<td>0.076</td>
<td>-0.14</td>
</tr>
<tr>
<td></td>
<td>Male Student-Athletes</td>
<td>Female Student-Athletes</td>
<td>Yes</td>
<td>0.004</td>
<td>-0.43</td>
</tr>
<tr>
<td>2</td>
<td>General Students</td>
<td>Female</td>
<td>Yes</td>
<td>0.001</td>
<td>-0.28</td>
</tr>
<tr>
<td></td>
<td>Male General Students</td>
<td>Male Student-Athletes</td>
<td>No</td>
<td>0.538</td>
<td>-0.07</td>
</tr>
<tr>
<td>5</td>
<td>General Students</td>
<td>Female</td>
<td>No</td>
<td>0.82</td>
<td>-0.03</td>
</tr>
</tbody>
</table>

Using a one way ANOV and the Brown-Forsythe test, question seven revealed that there was a statistically significant difference among two classes in the perceived estimate of gain scores. A Scheffe post-hoc test determined that there was a significant difference between the freshman student-athletes and each of the three other classes, sophomores, juniors, and seniors. Each effect size was considered moderate to medium.

Using a one way ANOVA, question eight revealed that there was no statistically significant difference in the perceived estimate of gain scores among student-athletes of varying ethnicities.

Using a one way ANOVA, question nine revealed that there was no statistically significant difference in the perceived estimate of gain scores among general students of varying ethnicities.
### TABLE 28

**ANOVA Summary Results**

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Groups</th>
<th>Statistically Significant Difference</th>
<th>Between Which Groups</th>
<th>P</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>SA Class</td>
<td>Yes</td>
<td>Freshman &amp; Seniors</td>
<td>0.042</td>
<td>-0.59</td>
</tr>
<tr>
<td>7</td>
<td>GS Class</td>
<td>Yes</td>
<td>Freshman &amp; Sophomores</td>
<td>0.008</td>
<td>-0.51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Freshman &amp; Juniors</td>
<td>0.032</td>
<td>-0.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Freshman &amp; Seniors</td>
<td>0.000</td>
<td>-0.50</td>
</tr>
<tr>
<td>8</td>
<td>SA Ethnicity</td>
<td>No</td>
<td>None</td>
<td>0.750</td>
<td>NA</td>
</tr>
<tr>
<td>9</td>
<td>GS Ethnicity</td>
<td>No</td>
<td>None</td>
<td>0.682</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Chapter Summary**

Chapter Four contains the current data analysis for this research study. Chapter Five will provide the principle findings of the research questions, discussion of results, recommendations for practice, future research, and the conclusions of this study.
Chapter Five
Discussion and Conclusion

Introduction

This chapter includes the principle findings of the research questions, a discussion of results, recommendations for practice, and suggestions for future research.

The purpose for this study was to better understand how undergraduate students perceive their success in acquiring the knowledge and skills that are considered important for the development of life-long learning capacity. Specifically, the survey questions asked how much students felt they “gained or made progress” in fourteen academic areas that comprise the Life-Long Learning Index, and to determine if there were differences between a sample of students who were athletes and students who were not athletes. The study compared the results of these survey questions between the responses of general student body and responses of student-athletes, as well as between groups of student-athletes by gender, class, and ethnicity.

Many studies documenting the level of student engagement on college campuses have used results from the CSEQ (Pascarella & Terenzini, 2005, Miller, 2012, Bergeron, 2013). This study used a selected group of items from the survey, collectively entitled the Capacity for Life-Long learning Index to measure students’ capacity for life-long learning (Hayek & Kuh, 1998). There has been little research, however, on the development of life-long learning skills by Division I student-athletes.
Principle Findings

This research study posed nine questions to measure student responses on a series of questions within the College Student Experiences Questionnaire known as the Capacity for Life-Long Learning Index. Students were asked to indicate how much they felt they had “gained or made progress” (Very Much, Quite a Bit, Some, or Very Little) in fourteen academic experiences that are correlated with the development of skills required for life-long learning. The responses were analyzed to help gain a better understanding about the relationship between the independent variables of student type (athlete or general, non-athlete), gender (male or female), class (freshman, sophomore, junior, senior), and ethnicity (African-American, Caucasian, or Other) and the dependent variable, mean total estimate of gain score for fourteen items on the CSEQ.

Findings for Research Question One

Question one was designed to determine if student-athletes and non-athletes, referred to as general students, had statistically significant different perceived estimate of gain mean scores for the Capacity for Life-Long Learning Index questions. The question was stated as follows: Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between the student-athlete population and the general student population at a large southern Division I institution?

The statistical analysis indicate that the mean scores on the Life-Long Learning Index for student-athletes and general students, at this large southern Division I university, were not significantly different.

Overall, student-athletes do not report lower perceived capacity to develop life-long learning skills than their general student peers.
Findings for Research Question Two

Question two was designed to determine if male student-athletes and female student-athletes had statistically significant different perceived estimate of gain mean scores on the Capacity for Life-Long Learning Index questions. The question was stated as follows: Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between male and female student-athletes at a large southern Division I University during their undergraduate experiences?

The findings of research question two indicate that female student-athletes had a mean score that is statistically significantly higher than their male student-athlete counterparts with a Cohen’s d test for effect size, $d = -.43$, was moderate in size.

Within the student-athlete sample, female student-athletes report greater perceived capacity to develop life-long learning skills than their male student-athlete peers.

Findings for Research Question Three

Question three was designed to determine if male general students and female general students reported statistically significant different perceived estimate of gain mean scores on the Capacity for Life-Long Learning Index questions. The question was stated as follows: Is there a statistically significant difference in the Capacity for Life-Long Learning Index, on the CSEQ, between male general students and female general students at a large southern Division I University during their undergraduate experiences?

The findings of research question three indicate that female general students’ mean scores on the Capacity for Life-Long Learning Index were significantly higher than their male general student counterpart’s mean scores, with a Cohen’s d test for effect size, $d = -.28$, which was small to moderate in size.

Within the general student sample, female general students report greater perceived capacity to develop life-long learning skills than their male general student peers.
Findings for Research Question Four

Question four was designed to determine if male general students and male student-athletes reported statistically significant different perceived estimate of gain mean scores on the Capacity for Life-Long Learning Index questions. The question was stated as follows: Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between the male general students and male student-athletes at a large southern Division I University during their undergraduate experiences?

The findings of research question four indicate that the means scores on the Capacity for Life-Long Learning Index of male student-athletes and male general students, at this large southern Division I university, were not significantly different.

Overall, male student-athletes do not report lower perceived capacity to develop life-long learning skills than their male general student peers.

Findings for Research Question Five

Question five was designed to determine if female general students and female student-athletes reported statistically significant different perceived estimate of gain mean scores on the Capacity for Life-Long Learning Index questions. The question was stated as follows: Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores, on the CSEQ, between the female general students and female student-athletes at a large southern Division I University during their undergraduate experiences?

The findings of research question four indicate that the means scores on the Capacity for Life-Long Learning Index of female student-athletes and female general students, at this large southern Division I university, were not significantly different.

Overall, female student-athletes do not report lower perceived capacity to develop life-long learning skills than their female general student peers.
Findings for Research Question Six

Question six was designed to determine if student-athletes in different years in school, freshman, sophomore, junior, and senior, referred to as class, reported statistically significant different perceived estimate of gain mean scores on the Capacity for Life-Long Learning Index questions. The question was stated as follows: Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among student-athletes in various years in college (freshman, sophomore, junior, and senior) during their intercollegiate experiences?

An ANOVA was used to compare the perceived estimate of gain scores of the student-athletes in the freshman, sophomore, junior, and senior class. Results from the Brown-Forsythe test of equality provided a statistically significant effect \( p = .020 \) meaning that there was a possibility that there were significant differences between two or more groups. A Scheffe post-hoc test was performed and demonstrated that the freshman class and senior class reported statistically significant different perceived estimate of gain scores, \( p = .042 \) and a moderate to large effect size, \( d = -.59 \).

The findings of research question six indicate that the means scores on the Capacity for Life-Long Learning of senior student-athletes were statistically significantly higher than the freshman student-athletes.

Overall, freshman student-athletes reported lower perceived capacity to develop life-long learning skills than their senior student-athlete peers.

Findings for Research Question Seven

Question seven was designed to determine if general students in different years in school, freshman, sophomore, junior, and senior, referred to as class, reported statistically significant different perceived estimate of gain mean scores on the Capacity for Life-Long Learning Index questions. The question was stated as follows: Is there a statistically significant
difference in the Capacity for Life-Long Learning Index scores on the CSEQ among general students in various years in college (freshman, sophomore, junior, and senior) during their undergraduate experiences?

An ANOVA was used to compare the perceived estimate of gain scores of the general students in the freshman, sophomore, junior, and senior class. The freshman general students reported a mean score of 39.08, the sophomores reported a mean score of 43.73, the juniors reported a mean score of 42.37, and the seniors reported a mean score of 43.70. Using Levene’s test of homogeneity of variances, it was determined that the variances among the groups were statistically significant, \( p = .000 \) and therefore the researcher had to use the Brown-Forsythe test of equality to assess a level of significance value. Results from the Brown-Forsythe test of equality provided a statistically significant effect \( p = .000 \) meaning that there was a possibility that there were significant differences between two or more groups. A Scheffe post-hoc test was performed and demonstrated that the freshman class had statistically significant different perceived estimate of gain scores with sophomores, \( p = .008 \) and a moderate to medium effect size, \( d = -.51 \), with juniors, \( p = .032 \) and a moderate to medium effect size, \( d = -.36 \), and with seniors \( p = .000 \) and a moderate to medium effect size, \( d = -.50 \).

The findings of research question seven indicate that the means scores on the Capacity for Life-Long Learning of freshman general students were statistically significantly lower than all the other classes of general students.

Overall, freshman general students reported lower perceived capacity to develop life-long learning skills than their sophomore, junior, and senior general student peers.
Findings for Research Question Eight

Question eight was designed to determine if student-athletes of differing ethnicity, African-American, Caucasian, and Other report statistically significant different perceived estimate of gain scores on the Capacity for Life-Long Learning Index questions. The question was stated as follows: Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among African-American, Caucasian, and Other minority student-athletes during their intercollegiate experiences?

An ANOVA was used to measure the perceived estimate of gain scores of the African-American, Caucasian, and Other student-athletes. The African-American student-athletes reported a mean score of 40.05. The Caucasian student-athletes reported a mean score of 40.33. The Other minority student-athletes reported a mean score of 39.40. Levene’s test of homogeneity was satisfied, the ANOVA did not yield a statistically significant effect, $p = .750$, and the effect size was very small, $\eta^2 = .003$. The test indicates that there is not a statistically significant difference between the Life-Long Learning Index scores of the different ethnic groups.

Overall, no one student-athlete ethnic group reported greater perceived capacity to develop life-long learning skills than another student-athlete group.

Findings for Research Question Nine

Question nine was designed to determine if general students of differing ethnicity, African-American, Caucasian, and Other report statistically significant different perceived estimate of gain scores on the Capacity for Life-Long Learning Index questions. The question was stated as follows: Is there a statistically significant difference in the Capacity for Life-Long Learning Index scores on the CSEQ among African-American, Caucasian, and Other minority general students during their undergraduate experiences?
An ANOVA was used to measure the perceived estimate of gain scores of the African-American, Caucasian, and Other general students. The African-American general students reported a mean score of 40.45. The Caucasian general students reported a mean score of 41.30. The Other minority general students reported a mean score of 41.62. Levene’s test of homogeneity was satisfied, the ANOVA did not yield a statistically significant effect, \( p = .506 \), and the effect size was very small, \( \eta^2 = .002 \). The test indicates that there is not a statistically significant difference between the Life-Long Learning Index scores of the different ethnic groups.

Overall, no one general student ethnic group reported greater perceived capacity to develop life-long learning skills than another general student group.

**Discussion of Results**

The purpose of the study was to determine whether the perceived academic gains in the development of life-long learning skills of those who participated in intercollegiate athletics would be similar to a group of non-athletes. Since these life-long learning skills are deemed essential for post-graduate success, it is important to know if participation in campus activities, especially varsity athletic teams, is detrimental to academic gains (Drucker, 2001; Friedman, 2005). Questions 1, 4, and 5 compared the mean estimate of gain scores on the fourteen Capacity for Life-Long Learning Index questions between general students and student-athletes, male general students and male student-athletes, and female general students and female student-athletes, respectfully. In each of these three research questions there was no statistical difference in the composite Life-Long Learning Index Scores, which indicate that among the members of these groups there was no difference in the perceived capacity to develop life-long learning skills. Some have predicted that the amount of time that student-athletes dedicate to their sports prevents growth in areas correlated with the development of life-long learning skills (Gayles, The Student Athlete Experience, 2009). The results of the
current research found that both groups perceived their gains similarly. On the basis of the Life-Long Learning Index, the results are encouraging in that student-athletes did perceive they had gained academically in several key dimensions that are considered important for life-long learning.

Questions 2 and 3 compare mean estimate of gain scores on the Capacity for Life-Long Learning Index questions between female students to male students in both the general student group and student-athlete group. In each case there were statistically significant higher gains scores for females compared to males in both the general student group and student-athlete group. The results of this study support other recent research studies that support evidence of females closing the gap on academic performance measures and in some cases outperforming males in various areas throughout college (Bailey & Dynarski, 2011; Voyer & Voyer, 2014)

Questions 6 and 7 compared mean estimate of gain scores on the Capacity for Life-Long Learning Index questions among the year in school or class the students were in at the time of the survey. The research results from the student-athlete group revealed a statistical difference between the freshman class and senior class, with seniors reporting greater perceived gains in these areas correlated with the development of life-long learning skills. It is reasonable to believe that seniors, with more academic experience during the undergraduate years would report greater perceived growth in these areas. These results would seem to confirm the expectation that more time in college does increase students’ perception that they have gained from that experience.

The research from the general student group revealed a statistical difference between the freshman class and each of the other classes of students in areas correlated with the development of life-long learning skills. These findings, indicating an increase of perceived gains for those students who completed a year of school beyond their freshman year, support
the idea that the more time invested in collegiate academic experiences will return an increased sense of academic achievement among student participants.

One would expect the perceived development of life-long learning skills to increase over time as is seen from the freshman class to the senior class within both samples, yet for each sample the junior class reported numerically lower Capacity for Life-Long Learning Index scores than the sophomore class. There are a number of possible explanations that should be included in future research, including, but not limited to, the role of changing majors during the junior year, reaching the legal drinking age, changing marital status, and transferring from two year or four year colleges.

Questions 8 and 9 compare mean estimate of gain scores on the Capacity for Life-Long Learning Index questions among the student’s reported ethnicity. The research results from both the student-athlete and general student group revealed no statistically significant difference among the three reported ethnicities, African-American, Caucasian, and Other, in these areas correlated with the development of life-long learning skills. Apparently, based on these results, ethnicity was not a significant factor in how students perceived their academic gains in those areas assessed.

The role and educational value of intercollegiate athletics on college campuses has been debated since the early 1900’s and continues to this day (Zimmerman & Wickersham, 2013). Review of the responses on the fourteen Capacity for Life-Long Learning Index questions reveals that on each of the estimate of gain questions general students responded with “Very Much” at a higher rate than the student-athletes. The three questions with the greatest discrepancy in their “Very Much” responses were 1) Developing the Ability to Get Along with Different Kinds of People, (18.3 % difference), 2) Learning on Your Own, Pursuing Ideas, and Finding Information You Need, (18% difference), and 3) Synthesis: Recognizing Relationships, Similarities, and Differences Between Ideas, (17.7% difference). Conversely, the three estimate
of gain questions that had the most similar “Very Much” responses were 1) Developing the Ability to Function as a Member of a Team, (5.6% difference), 2) Analyzing Quantitative Problems, (7.2% difference), 3) Understanding New Developments in Science and Technology, (8.2% difference).

Notably, general students responded “very much” at a higher percentage than student-athletes and student-athletes responded “quite a bit” at a higher percentage than the general students group on each of the fourteen perceived estimate of gains questions. Collectively, nearly two-thirds of both groups responded to the fourteen perceived estimate of gains questions with a response indicating they had gained “quite a bit” or “very much.”

Implications for Practice

As a result of this study, a number of implications seem relevant for athletics administrators and higher education administrators in further analyzing the development of life-long learning skills.

In the area “Developing the Ability to Get Along with Different Kinds of People” 46.4% of the general students provided a response of “Very Much” while only 28.1 of student-athletes provided response of “Very Much”. This area showed the greatest discrepancy between the two groups and is consistent with a previous research by Josephine Potuto and James O’Hanlon (2007) that had 84% of student-athletes report that their participation in intercollegiate athletes prevented them from having experiences with general students. Does the amount of time student-athletes spend working on sport and academics leave enough time for interaction with general students? When student-athletes are assigned to work groups in specific classes, do they tend to work with other student-athletes or do they work with general students?

Research indicates that student-athletes are a unique group of students among undergraduates (Gayles, 2009), and that they are oftentimes less qualified and less prepared for the rigors of college academics, based on their incoming standardized test scores and grade
point averages, and are very much in need of significant academic support in order to become successful students (Spivey & Jones, 1975; Purdy, Eitzen, & Hufnagel, 1982; Alder & Alder, 1985; Sack, 1987; Shulman & Bowen, 2002). When compared to the general students in this study, overall, student-athletes did not have statistically significant lower perceived estimate of gains scores than the general student body, male student-athletes did not have statistically significant lower perceived estimate of gains scores than males in the general student body, and female student-athletes did not have a statistically significant lower perceived estimate of gains scores than females in the general student body. This begs the question, do incoming standardized test scores and grade point averages have a correlation with the CLLI estimate of gain scores? Could academic staff review the CLLI estimate of gain scores on a yearly basis to help ensure their students are progressing, not only toward a degree, but also toward a successful work career?

A study by Potuto and O’Hanlon (2007) shared that 69% of student-athletes reported that their participation in intercollegiate athletics prevented them from taking a course in which they were interested. Among student-athletes, the results of this study showed that the areas of Science, Technology, Writing, and Quantitative Analysis received the greatest frequency of responses in the “Very Little” category of perceived estimate of gains scores. This suggests a review of the curricula that are being pursued by student-athletes. Are students provided the opportunity to pursue these courses of study? Do academic counselors fear that these type of courses are more difficult and could jeopardize a student-athlete’s progress and thus his or her athletic eligibility?

Athletics administration professionals often use graduate rates, academic progress rates, and grade point averages as metrics to help determine progress and development. Is it possible to earn passing grades and graduate without developing the skills necessary to become a life-long learner? If so, the academic enhancement units could conduct the Capacity
for Life-Long Learning Index survey to the entire student-athlete population at the conclusion of each spring semester and do so on an annual basis to track their perceived estimate of gain scores over time. Doing so would provide an additional perspective on which to determine if their tutoring and life skills programming is preparing students to be successful after college.

Student-athletes who stop attending college prior to graduation, most especially those student-athletes who only attend one year of college before leaving to attempt a career in professional sports are not likely to develop the same level of life-long learning skills as those who remained in school through their senior year. In an effort to improve the student-athlete’s chances of having a successful career in any field, Division I athletics programs should develop opportunities for these students to return to the classroom during their professional careers or aggressively recruit the student back to the university to complete their education once their professional sports employment opportunities have expired.

Recommendations for Future Research

Based on the findings of this research study, future research should be considered in the following areas:

This study should be replicated at several Division I institutions across the nation to help determine if the results at this large, southern, institution are similar to or different than those in other regions of the country. Seeing the results of a similar study conducted on campuses from the Northeast, Midwest, and Far West could be helpful to researchers who have follow up questions, such as, is there a national trend among female students and their greater perceived capacity for the development of life-long learning skills during their undergraduate experience or is this an isolated result?

Student-athletes may represent a unique group of students with the undergraduate population, and furthermore, those student-athletes who participate in widely popular revenue generating sports, such as football, men’s basketball, and women’s basketball, may have an
experience unique among the student-athlete population. It would be beneficial to isolate the responses from student-athletes on these teams and compare their responses to those of other student-athletes and the general student population. A study that shows the role participation in these activities, as compared to other varsity sports and compared to the general student experience, has on the perceived development of life-long learning skills could be helpful to athletics administrators and student affairs professionals.

This study looks at the results from one specific point in time. Researchers may want to develop a longitudinal study to determine if student-athletes show an increase in perceived estimate in gain scores over the course of their undergraduate years. It would be very interesting to review the scores of the same student after each year in college to see if he or she reports similar Capacity for Life-Long Learning Index scores year after year, or if those scores rise or fall throughout his or her academic career. These scores could be reviewed on a team-by-team basis or by major to see if participation on a specific team or area of study reveals perceived increased risk of failing to develop a capacity for life-long learning.

When administering future studies, include the question, “Do you plan to enroll in graduate studies”? It would be helpful to learn if a student’s expectation to enroll in graduate studies has an effect on the perceived estimate of gain scores on the Capacity for Life-Long Learning Index. If so, and in a positive fashion, athletics administrators may want to consider introducing the benefits of graduate education early in the undergraduate counseling sessions.

It is reasonable to believe that a student’s opinion about their perceived gains could change over time. One may not realize the effect of an experience or be able to put that experience into proper context until more time has passed. A survey of former Division I student-athletes at various years after their undergraduate experience could provide an interesting perspective on estimate of gains scores. Would their assessment of the amount of gains in certain areas change over time? For example, could they find they experienced more or
fewer gains than they had thought immediately after their semester had ended? Perhaps only when placed in the workforce many students truly understand the areas in which they grew or failed to grow while they were undergraduate students.

This study had statistically valid numbers of Caucasians and African-American respondents, it did not have enough responses to get statistically valid responses from each minority group so each of the other minor responses we grouped together. It would be beneficial to replicate this study among larger student groups in order to acquire a statistically valid number of responses from students in specific minority classes, such as Asian, Hispanic, American Indian, and others.

The study revealed that the junior class within the student-athlete sample and the general student sample showed lower Capacity for Life-Long Learning Index scores than the sophomore class. Further research should be done on the individual survey responses of the junior class to try to identify why their Capacity for Life-Long Learning Index scores were lower than the sophomore class. Does the survey data reveal the number of transfer students, the number of students who changed majors, their age, in relation to legal drinking age, and any change to their marital status, each of which may have a causal relationship to their scores?

When trying to study personal perceptions, the use of an exploratory qualitative study may help provide context to many of the responses on the Capacity for Life-Long Learning Index questions. This could be especially helpful in the situations where you have a small group of students to examine and when the participates interpret the constructs of the questions in a personal way, such as the questions from the Estimate of Gains section within the College Student Experiences Questionnaire.

Conclusion

The purpose of this study was to assess student-athletes’ perceptions of their progress made, also known as an estimate of gains in skills, by engaging in a number of campus
experiences (Capacity for Life-Long Learning Index) that have been described as being important for the development of life-long learning skills and to compare their scores with those of non-athlete-students, referred to in this study as “general students”. The results of this study support the following conclusions:

Overall, student-athletes perceived that they were developing skills important to becoming a life-long learner, at a rate equal to non-athlete general students. On the basis of this research, student-athletes may not be at a disadvantage compared with their non-athlete peers when they enter the workforce.

Female students, both general students and student-athletes perceived they had gained or made progress to a greater degree than male students in both groups. Overall, female students may have more fully developed life-long learning skills and may be more prepared to succeed at the beginning of their careers and therefore, may have an advantage over male students upon entering the workforce.

Overall, students who were in their senior year perceived statically significant greater growth in life-long learning skills over freshman students. Undergraduates should strongly consider completing their degree requirements to help improve their chances of having a successful professional career.

Overall, student ethnicity does not appear to be a differentiator of perceived life-long learning skills for student-athletes or general students. A student’s ethnic status does not appear to offer any advantage or disadvantage for the perceived development of life-long learning skills.
References


Hakes, C. J. (2010). *Off-campus work and its relationship to students' experiences with faculty using the college student experiences questionnaire*. University of South Florida College of Education.


McLeod, N. Z. (Director). (1932). *Horse Feathers* [Motion Picture].


APPENDIX A
IRB Approval

February 2, 2015

Andrew Goodrich
L-CACHE - Leadership, Counseling, Adult, Career & Higher Education
Tampa, FL  33617
RE:  NOT Human Research Activities Determination
IRB#:  Pro00020977
Title:  An Investigation of the Perceived Development of the Life-Long Learning Skills of Division I Student-Athletes

Dear Mr. Goodrich:

The Institutional Review Board (IRB) has reviewed the information you provided regarding the above referenced project and has determined the activities do not meet the definition of human subjects research. Therefore, IRB approval is not required. If, in the future, you change this activity such that it becomes human subjects research, IRB approval will be required. If you wish to obtain a determination about whether the activity, with the proposed changes, will be human subjects research, please contact the IRB for further guidance.

All research activities, regardless of the level of IRB oversight, must be conducted in a manner that is consistent with the ethical principles of your profession and the ethical guidelines for the protection of human subjects. As principal investigator, it is your responsibility to ensure subjects’ rights and welfare are protected during the execution of this project

Also, please note that there may be requirements under the HIPAA Privacy Rule that apply to the information/data you will use in your activities. For further information about any existing HIPAA requirements for this project, please contact a HIPAA Program administrator at 813-974-5638.
APPENDIX A (continued)

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

John A. Schinka, Ph.D., Chairperson
USF Institutional Review Board
Appendix B
COLLEGE STUDENTS EXPERIENCES QUESTIONNAIRE


This questionnaire asks about how you spend your time at college—with faculty and friends and in classes, social and cultural activities, extracurricular activities, employment, and use of campus facilities such as the library and student center. The usefulness of this or any other survey depends on the thoughtful response of those who are asked to complete it. Your participation is very important and greatly appreciated.

The information obtained from you and other students at many different colleges and universities will help administrators, faculty members, student leaders, and others to improve the conditions that contribute to your learning and development and to the quality of the experience of those who will come after you.

At first glance, you may think it will take a long time to complete this questionnaire, but it can be answered in about 30 minutes or less. And you will learn some valuable things about yourself, as your answers provide a kind of self-portrait of what you have been doing and how you are benefitting from your college experience.

You do not have to write your name on the questionnaire. But as you will see on the next page we would like to know some things about you so that we can learn how college experiences vary, depending on students' age, sex, year in college, major field, where they live, whether they have a job, and so forth. To know where the reports come from, a number on the back page identifies your institution.

Your questionnaire will be read by an electronic scanning device, so be careful in marking your responses. Please use only a #2 black lead pencil. Do not write or make any marks on the questionnaire outside the spaces provided for your answers. Erase cleanly any responses you want to change. It is very important to answer all questions; if you are uncertain about what a question means, use your best judgment.

Thank you for your cooperation and participation!

This questionnaire is available from the Indiana University Center for Postsecondary Research and Planning, School of Education, 201 North Rose Avenue, Bloomington, IN 47405-1006. It is for use by individuals and institutions interested in documenting, understanding, and improving the student experience.
**BACKGROUND INFORMATION**

**DIRECTIONS:** Indicate your response by filling in the appropriate oval next to the correct answer.

### Age
- [ ] 19 or younger
- [ ] 20 - 25
- [ ] 26 - 30
- [ ] 31 - 35
- [ ] 36 - 40
- [ ] 41 - 45
- [ ] 46 - 50
- [ ] 51 - 55
- [ ] 56 - 60
- [ ] 61 - 65
- [ ] Over 65

### Sex
- [ ] Male
- [ ] Female

### What is your marital status?
- [ ] Not married
- [ ] Married
- [ ] Separated
- [ ] Divorced

### What is your classification in college?
- [ ] Freshman
- [ ] Sophomore
- [ ] Junior
- [ ] Senior
- [ ] Graduate student
- [ ] Underclass student

### Did you begin college here or did you transfer here from another institution?
- [ ] Started here
- [ ] Transferred from another institution

### Where do you now live during the school year?
- [ ] Dormitory (dormitory or other campus housing)
- [ ] Residence (house, apartment, etc.) within a 25-mile radius of campus
- [ ] Residence (house, apartment, etc.) within driving distance
- [ ] Fraternity or sorority house

### With whom do you live during the school year?
- [ ] No one, I live alone
- [ ] One or more other students
- [ ] My spouse or partner
- [ ] My child or children
- [ ] My parents
- [ ] Other relatives
- [ ] Friends who are not students at the institution
- [ ] I'm attending
- [ ] Other people who?

### Do you have access to a computer where you live or work, or nearby that you can use for your school work?
- [ ] Yes
- [ ] No

### What have most of your grades been up to now at this institution?
- [ ] A
- [ ] A+
- [ ] A
- [ ] B+
- [ ] B
- [ ] C
- [ ] C+
- [ ] C
- [ ] C-
- [ ] D
- [ ] D+
- [ ] D
- [ ] More than F

### Which of these fields best describes your major, or your anticipated major? You may indicate more than one if applicable.
- [ ] Agriculture
- [ ] Biological sciences (biology, biochemistry, botany, zoology, etc.)
- [ ] Business (accounting, business administration, marketing, management, etc.)
- [ ] Communication (speech, journalism, television/radio, etc.)
- [ ] Computer and information sciences
- [ ] Education
- [ ] Engineering
- [ ] Ethnic, cultural, and area studies
- [ ] Foreign languages and literature (French, Spanish, etc.)
- [ ] Health-related fields (nursing, physical therapy, health technology, etc.)
- [ ] History
- [ ] Humanities (English, literature, philosophy, religion, etc.)
- [ ] Liberal studies
- [ ] Mathematics
- [ ] Multi/interdisciplinary studies (international relations, ecology, environmental studies, etc.)
- [ ] Parks, recreation, leisure studies, sports management
- [ ] Physical sciences (physics, chemistry, astronomy, earth sciences, etc.)
- [ ] Pre-professional (pre-dental, pre-medical, pre-veterinary)
- [ ] Public administration (city management, law enforcement, etc.)
- [ ] Social sciences (anthropology, economics, political science, psychology, sociology, etc.)
- [ ] Visual and performing arts (art, music, theater, etc.)
- [ ] Undecided
- [ ] Other: What?

### Did either of your parents graduate from college?
- [ ] No
- [ ] Yes, both parents
- [ ] Yes, mother only
- [ ] Yes, father only
- [ ] No idea

### Do you expect to enroll for an advanced degree when, or if you complete your undergraduate degree?
- [ ] Yes
- [ ] No

### How many credit hours are you taking this term?
- [ ] 6 or fewer
- [ ] 7 - 11
- [ ] 12 - 14
- [ ] 15 - 16
- [ ] 17 or more

### During the time school is in session, about how many hours a week do you usually spend outside of class or activities related to your academic program, such as studying, writing, reading, lab work, rehearsing, etc.?
- [ ] 5 or fewer hours a week
- [ ] 6 - 10 hours a week
- [ ] 11 - 15 hours a week
- [ ] 16 - 20 hours a week
- [ ] More than 20 hours a week
Appendix B (continued)

During the time school is in session, about how many hours a week do you usually spend working on a job for pay? To provide information about your work experiences on and off campus, fill in one oval in each column.

<table>
<thead>
<tr>
<th>Hours per Week</th>
<th>On-Campus</th>
<th>Off-Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>None: I don't have a job</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>1 - 10 hours a week</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>11 - 20 hours</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>21 - 30 hours</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>31 - 40 hours</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>More than 40 hours</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

If you have a job, how does it affect your school work?

☐ I don't have a job
☐ My job does not interfere with my school work
☐ My job takes some time from my school work
☐ My job takes a lot of time from my school work

How do you meet your college expenses? Fill in the response that best approximates the amount of support from each of the various sources.

- Self (savings, etc.)
- Spouse or partner
- Employer support
- Scholarships and grants
- Loan
- Other sources

What is your racial or ethnic identification? (Fill in all that apply)

☐ American Indian or other Native American
☐ Asian or Pacific Islander
☐ Black or African American
☐ Caucasian (other than Hispanic)
☐ Mexican-American
☐ Puerto Rican
☐ Other Hispanic
☐ Other: What?

COLLEGE ACTIVITIES

DIRECTIONS: In your experience at this institution during the current school year, about how often have you done each of the following? Indicate your response by filling in one of the ovals to the right of each statement.

Library
- Used the library as a quiet place to study or read materials you brought with you.
- Found something interesting while browsing in the library.
- Asked a librarian or staff member for help in finding information on a topic.
- Read assigned materials other than textbooks in the library (readings, etc.).
- Used an index or database (computer, card catalog, etc.) to find material on a topic.
- Developed a bibliography or reference list for a term paper or other report.
- Gave back a book to a library or a reference or document that other authors referred to.
- Made a judgment about the quality of information obtained from the library, World Wide Web, or other sources.

Computer and Information Technology
- Used a computer or word processor to prepare reports or papers.
- Used an email to communicate with an instructor or other students.
- Used a computer tutorial to learn material for a course or computer/aids laboratory program.
- Participated in class discussions using an electronic medium (email, listserve, chat group, etc.).
- Searched the World Wide Web or Internet for information related to a course.
- Used a computer to retrieve materials from a library at this institution.
- Used a computer to produce visual displays of information (charts, graphs, spreadsheet, etc.)
- Used a computer to analyze data (statistics, forecasting, etc.).
- Developed a Web page or multimedia presentation.
Appendix B (continued)

**DIRECTIONS:** In your experience at this institution during the current school year, about how often have you done each of the following? Indicate your response by filling in one of the oval to the right of each statement.

<table>
<thead>
<tr>
<th>Course Learning</th>
<th>Experiences with Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Never</strong></td>
<td><strong>Never</strong></td>
</tr>
<tr>
<td><strong>Occasionally</strong></td>
<td><strong>Occasionally</strong></td>
</tr>
<tr>
<td><strong>Often</strong></td>
<td><strong>Often</strong></td>
</tr>
<tr>
<td><strong>Very Often</strong></td>
<td><strong>Very Often</strong></td>
</tr>
</tbody>
</table>

**Course Learning**
- Completed the assigned readings for class.
- Took detailed notes during class.
- Contributed to class discussions.
- Developed a role play, case study, or simulation for a class.
- Tried to see how different facts and ideas fit together.
- Summarized major points and information from your class notes or readings.
- Worked on a class assignment, project, or presentation with other students.
- Applied material learned in class to other areas (your job or internship, other courses, relationships with friends, family, co-workers, etc.).
- Used information or experiences from other areas of your life (job, internship, interactions with others in class discussions or assignments).
- Tried to explain material from a course to someone else (another student, friend, co-worker, family member).
- Worked on a paper or project where you had to integrate ideas from various sources.

**Writing Experiences**
- Used a dictionary or thesaurus to look up the correct spelling of words.
- Thought about grammar, sentence structure, word choice, and sequence of ideas or points as you were writing.
- Asked other people in class to edit something you wrote to see if it was clear to them.
- Referred to a book or manual on writing style, grammar, etc.
- Revised a paper or composition two or more times before you were satisfied with it.
- Asked an instructor or staff member for advice and help to improve your writing.
- Prepared a major written report for a class (20 pages or more).

**Experiences with Faculty**
- Talked with your instructor about information related to a course you were taking (grades, make-up work, assignments, etc.).
- Discussed your academic program or course selection with a faculty member.
- Discussed class, a term paper or other class project with a faculty member.
- Discussed your career plans and ambitions with a faculty member.
- Worked harder as a result of feedback from an instructor.
- Socialized with a faculty member outside of class (had a snack or coffee, etc.).
- Participated with other students in a discussion with one or more faculty members outside of class.
- Asked your instructor for comments and criticisms about your academic performance.
- Worked harder than you thought you could to meet an instructor's expectations and standards.
- Worked with a faculty member on a research project.

**Art, Music, Theater**
- Talked about art (painting, sculpture, artists, etc.) or the theater (plays, musicals, dance, etc.) with other students, friends, or family members.
- Went to an art exhibit/gallery or a play, dance, or other theater performance, on or off the campus.
- Participated in some art activity (painting, pottery, weaving, drawing, etc.), or theater event, or worked on a music, theatrical production (acted, danced, worked on scenery, etc.), on or off the campus.
- Talked about music or musicians (classical, popular, etc.) with other students, friends, or family members.
- Attended a concert or other music event, on or off the campus.
- Participated in some music activity (orchestra, choir, dance, etc.) on or off the campus.
- Read or discussed the opinions of art, music, or drama critics.
### Appendix (continued)

**DIRECTIONS:** In your experience at this institution during the current school year, about how often have you done each of the following? Indicate your response by filling in one of the ovals to the right of each statement.

<table>
<thead>
<tr>
<th>Campus Facilities</th>
<th>Never</th>
<th>Occasionally</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used a campus lounge to relax or study by yourself.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Met other students at some campus location (campus center, etc.) for a discussion.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Attended a cultural or social event in the campus center or other campus location.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Went to a lecture or panel discussion.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Used a campus learning lab or center to improve study or academic skills (reading, writing, etc.)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Used campus recreational facilities (pool, fitness equipment, courts, etc.).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Played a team sport (intramural, club, intercollegiate).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Followed a regular schedule of exercises or practice for some recreational sporting activity.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clubs and Organizations</th>
<th>Never</th>
<th>Occasionally</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attended a meeting of a campus club, organization, or student government group.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Worked on a campus committee, student organization, or project (publications, student government, special events, etc.).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Worked on an off-campus committee, organization, or project (civic group, church group, community event, etc.).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Met with a faculty member or staff advisor to discuss the activities of a group or organization, on or off the campus.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personal Experiences</th>
<th>Never</th>
<th>Occasionally</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Told a friend or family member why you reacted to another person the way you did.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Discussed with another student, friend, or family member why some people get along smoothly, and others do not.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Asked a friend for help in solving a personal problem.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Read articles or books about personal growth, self-improvement, or social development.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Identified with a character in a book, movie, or television show and wondered what you might have done under similar circumstances.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Taken a test to measure your abilities, interests, or attitudes.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Asked a friend to tell you what he or she really thought about you.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Told a faculty member, counselor, or other staff member about personal concerns.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Acquaintances</th>
<th>Never</th>
<th>Occasionally</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Became acquainted with students whose interests were different from yours.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Became acquainted with students whose family background (economic, social) was different from yours.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Became acquainted with students whose age was different from yours.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Became acquainted with students whose race or ethnic background was different from yours.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Became acquainted with students from another country.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Had serious discussions with students whose philosophy of life or personal values were very different from yours.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Had serious discussions with students whose political opinions were very different from yours.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Had serious discussions with students whose religious beliefs were very different from yours.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Had serious discussions with students whose race or ethnic background was different from yours.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Had serious discussions with students from a country different from yours.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scientific and Quantitative Experiences</th>
<th>Never</th>
<th>Occasionally</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memorized formulas, definitions, technical terms and concepts.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Used mathematical terms to express a set of relationships.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Explained your understanding of some scientific or mathematical theory, principle or concept to someone else (translates into vernacular, etc.)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Read articles about scientific or mathematical theories and concepts in addition to those assigned for a class.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Completed an experiment or project using scientific methods.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Practiced to improve your skill in using a piece of laboratory equipment.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Showed someone else how to use a piece of scientific equipment.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Explained an experimental procedure to someone else.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Compared the scientific method with other methods for gaining knowledge and understanding.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Explained to another person the scientific basis for concerns about scientific or environmental issues (pollution, recycling, alternative sources of energy, acid rain, or similar aspects of the world around you).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
**CONVERSATIONS**

**DIRECTIONS:** In conversations with others (students, family members, co-workers, etc.) outside the classroom during this school year, about how often have you talked about each of the following?

<table>
<thead>
<tr>
<th>Topics of Conversation</th>
<th>Never</th>
<th>Occasionally</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current events in the news</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social issues such as peace, justice, human rights, equality, race relations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Different lifestyles, customs, and religions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The ideas and views of other people such as writers, philosophers, historians.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The arts painting, poetry, dance, theatrical productions, symphony, movies, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science (theories, experiments, methods, etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computers and other technologies.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social and ethical issues related to science and technology such as energy, pollution, chemtrails, genetics, military use.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The economy (employment, wealth, poverty, debt, trade, etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International relations (human rights, free trade, military activities, political differences, etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Information in Conversations</th>
<th>Never</th>
<th>Occasionally</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referred to knowledge you acquired in your reading or classes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explored different ways of thinking about the topic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referred to something one of your instructors said about the topic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsequently read something that was related to the topic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changed your opinion as a result of the knowledge or arguments presented by others.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persuaded others to change their minds as a result of the knowledge or arguments you cited.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**READING/Writing**

<table>
<thead>
<tr>
<th>More than 20</th>
<th>Between 10 and 20</th>
<th>Between 5 and 10</th>
<th>Fewer than 5</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textbooks or assigned books</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assigned packet or course readings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-assigned books</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>More than 20</th>
<th>Between 10 and 20</th>
<th>Between 5 and 10</th>
<th>Fewer than 5</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essay exams for your courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term papers or other written reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OPINIONS ABOUT YOUR COLLEGE OR UNIVERSITY**

- How well do you like college?
  - I am enthusiastic about it.
  - I like it.
  - I am more or less neutral about it.
  - I don’t like it.

- If you could start over again, would you go to the same institution you are now attending?
  - Yes, definitely.
  - Probably yes.
  - No, definitely.
Appendix B (continued)

THE COLLEGE ENVIRONMENT

Colleges and universities differ from one another in the extent to which they emphasize or focus on various aspects of students' development. Thinking of your experience at this institution, to what extent do you feel that each of the following is emphasized? The responses are numbered from 7 to 1, with the highest and lowest points illustrated. Fill in the oval with the number that best represents your impression on each of the following seven-point rating scales.

Emphasis on developing academic, scholarly, and intellectual qualities
Strong Emphasis 7 6 5 4 3 2 1 Weak Emphasis

Emphasis on developing aesthetic, expressive, and creative qualities
Strong Emphasis 7 6 5 4 3 2 1 Weak Emphasis

Emphasis on developing critical, evaluative, and analytical qualities
Strong Emphasis 7 6 5 4 3 2 1 Weak Emphasis

Emphasis on developing an understanding and appreciation of human diversity
Strong Emphasis 7 6 5 4 3 2 1 Weak Emphasis

Emphasis on developing information literacy skills (using computers, other information resources)
Strong Emphasis 7 6 5 4 3 2 1 Weak Emphasis

Emphasis on developing vocational and occupational competence
Strong Emphasis 7 6 5 4 3 2 1 Weak Emphasis

Emphasis on the personal relevance and practical value of your courses
Strong Emphasis 7 6 5 4 3 2 1 Weak Emphasis

The next three ratings refer to relations with people at this college. Again, thinking of your own experience, please rate the quality of these relationships on each of the following seven-point rating scales.

Relationships with other students
Friendly, Supportive, Sense of belonging 7 6 5 4 3 2 1 Competitive, Uninvolved, Sense of alienation

Relationships with administrative personnel and offices
Helpful, Considerate, Flexible 7 6 5 4 3 2 1 Rigid, Impersonal, Bound by regulations

Relationships with faculty members
Approachable, Helpful, Understanding, Encouraging 7 6 5 4 3 2 1 Remote, Discouraging, Unsympathetic

Go to next page
ESTIMATE OF GAINS

DIRECTIONS: In thinking about your college or university experience up to now, to what extent do you feel you have gained or made progress in the following areas? Indicate your response by filling in one of the ovals to the right of each statement.

Acquiring knowledge and skills applicable to a specific job or type of work (vocational preparation).

Acquiring background and specialization for further education in a profession, scientific, or scholarly field.

Gaining a broad general education about different kinds of knowledge.

Gaining a range of information that may be relevant to a career.

Developing an understanding and enjoyment of art, music, and drama.

Broadening your acquaintance with and enjoyment of literature.

Seeing the importance of history for understanding the present as well as the past.

Gaining knowledge about other parts of the world and other people (Asia, Africa, South America, etc.).

Writing clearly and effectively.

Presenting ideas and information effectively when speaking to others.

Using computers and other information technologies.

Becoming aware of different philosophies, cultures, and ways of life.

Reawakening your own values and ethical standards.

Understanding yourself, your abilities, interests, and personality.

Developing the ability to get along with different kinds of people.

Developing the ability to function as a member of a team.

Developing good health habits and physical fitness.

Understanding the nature of science and experimentation.

Understanding new developments in science and technology.

Becoming aware of the consequences (benefits, hazards, dangers) of new applications of science and technology.

Thinking analytically and logically.

Analyzing quantitative problems (understanding probabilities, proportions, etc.).

Putting ideas together, seeing relationships, similarities, and differences between ideas.

Learning on your own, turning ideas, and finding information you need.

Learning to accept change (new technologies, different jobs or personal circumstances, etc.).

ADDITIONAL QUESTIONS

1. [ ] [ ] [ ] [ ]
2. [ ] [ ] [ ] [ ]
3. [ ] [ ] [ ] [ ]
4. [ ] [ ] [ ] [ ]
5. [ ] [ ] [ ] [ ]
6. [ ] [ ] [ ] [ ]
7. [ ] [ ] [ ] [ ]
8. [ ] [ ] [ ] [ ]
9. [ ] [ ] [ ] [ ]
10. [ ] [ ] [ ] [ ]
11. [ ] [ ] [ ] [ ]
12. [ ] [ ] [ ] [ ]
13. [ ] [ ] [ ] [ ]
14. [ ] [ ] [ ] [ ]
15. [ ] [ ] [ ] [ ]
16. [ ] [ ] [ ] [ ]
17. [ ] [ ] [ ] [ ]
18. [ ] [ ] [ ] [ ]
19. [ ] [ ] [ ] [ ]
20. [ ] [ ] [ ] [ ]

THANK YOU FOR YOUR PARTICIPATION!

PLEASE DO NOT WRITE IN THIS AREA
**APPENDIX C**

**ALL STUDENT FREQUENCY SCORES FOR ESTIMATE OF GAIN ON CAPACITY FOR LIFE-LONG LEARNING INDEX ITEMS**

### Growth in Acquiring a Specialization

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Very Little</td>
<td>44</td>
<td>5.9</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>Some</td>
<td>242</td>
<td>32.2</td>
<td>38.0</td>
</tr>
<tr>
<td></td>
<td>Quite a Bit</td>
<td>317</td>
<td>42.2</td>
<td>80.2</td>
</tr>
<tr>
<td></td>
<td>Very Much</td>
<td>149</td>
<td>19.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>752</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### Gaining a Broad General Education About Different Fields of Knowledge

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Very Little</td>
<td>29</td>
<td>3.9</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>Some</td>
<td>239</td>
<td>31.8</td>
<td>35.6</td>
</tr>
<tr>
<td></td>
<td>Quite a Bit</td>
<td>316</td>
<td>42.0</td>
<td>77.7</td>
</tr>
<tr>
<td></td>
<td>Very Much</td>
<td>168</td>
<td>22.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>752</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### Writing Clearly and Effectively

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Very Little</td>
<td>42</td>
<td>5.6</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>Some</td>
<td>207</td>
<td>27.5</td>
<td>33.1</td>
</tr>
<tr>
<td></td>
<td>Quite a Bit</td>
<td>306</td>
<td>40.7</td>
<td>73.8</td>
</tr>
<tr>
<td></td>
<td>Very Much</td>
<td>197</td>
<td>26.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>752</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
### Presenting Ideas and Information Effectively When Speaking to Others

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Very Little</td>
<td>29</td>
<td>3.9</td>
<td>3.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Some</td>
<td>207</td>
<td>27.5</td>
<td>27.5</td>
<td>31.4</td>
</tr>
<tr>
<td>Quite a Bit</td>
<td>331</td>
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### Using Computers and Other Information Technologies

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### Understanding Yourself, Your Abilities, Interests, and Personality

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### Learning on Your Own, Pursuing Ideas, and Finding Information You Need

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## APPENDIX D
DESCRIPTIVE STATISTICS OF ALL STUDENT RESPONSES FOR THE ESTIMATE OF GAINS ON CAPACITY FOR LIFE-LONG LEARNING INDEX ITEMS

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APPENDIX E
RESPONSES ON CAPACITY OF LIFE-LONG LEARNING ESTIMATE OF GAINS ITEMS – PERCENTAGE CHARTS

Acquiring Background and Specialization for Further Professional Education

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Appendix E (continued)

Gaining a Broad General Education
About Different Fields of Knowledge

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Writing Clearly and Effectively

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Presenting Ideas and Information Effectively When Speaking to Others

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Appendix E (continued)

Using Computers and Other Information Technologies

Understanding Yourself, Your Abilities, Interests, and Personality

Student-Athletes
Non-Athlete Students
Appendix E (continued)

Developing the Ability to Get Along with Different Kinds of People

Developing the Ability to Function as a Member of a Team
Understanding New Developments in Science and Technology

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Appendix E (continued)

Thinking Analytically and Logically

- Very Little: 3.4% (Student-Athletes), 4.0% (Non-Athlete Students)
- Some: 27.1% (Student-Athletes), 26.0% (Non-Athlete Students)
- Quite a Bit: 49.8% (Student-Athletes), 37.5% (Non-Athlete Students)
- Very Much: 19.7% (Student-Athletes), 32.4% (Non-Athlete Students)
Appendix E (continued)

Synthesis: Recognizing Relationships, Similarities, and Differences Between Ideas

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## Learning on Your Own, Pursuing Ideas, and Finding Information You Need

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Learning to Adapt to Change

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