ABSTRACT

MARTS, JENNIFER LEIGH. Understanding Student Success and Institutional Outcomes in Service-Learning Coursework at a North Carolina Community College: A Propensity Score Study. (Under the direction of Dr. James Bartlett II.)

Service-learning has roots deep in higher education. Community colleges and service-learning have an organic relationship as they both strive to represent and support their local communities. This study implemented propensity score matching to study the impact of service-learning on student outcomes for community college students. Much of the literature in the field of service-learning currently focuses on the benefits of participation for four-year college students and on “soft skill” development. Research has neglected community college students and service-learning impacts on academic outcomes.

Currently, completion of student outcomes through participation in service-learning coursework has received little attention in the research literature. This study is significant because it is necessary to understand the importance of expanding service-learning as a teaching tool in all areas of higher education. Understanding the impacts of service-learning participation on institutional outcomes such as GPA, transferability, and completion may allow for increased funding directed toward expanding these programs. Budgets in higher education are continuously shrinking while enrollment is increasing; demonstrating the validity of service-learning is important to continuing the implementation of this teaching tool.

The major research questions of this study examining the characteristics of those who completed service-learning coursework and what impacts service-learning participation had on GPA, transferability, and completion of coursework and academic goals.
The population for this study consisted of community college students at a large, urban, multi-campus community college located in the southeastern part of the United States. The college annually serves 70,000 students and offers a number of academic, vocational, and continuing education programs. The data for this project included students who were enrolled during the 2011–2012 academic year. Students varied in their ethnicity, age, gender, financial aid status, state, country, sexual identity, religious belief, economic status, class rank, and other demographic areas. Academically, the students varied in their enrollment status, developmental course needs, completion/transfer status, and academic achievement. This highly varied group of students either participated or did not participate in a service-learning course during the 2011–2012 academic year.

The study implemented propensity score matching. By using propensity score matching to guide this study, the research was able to create and study balanced groups of students to see how and where service-learning participation impacted students. The students were matched on ethnicity, gender, non-transfer, age, Pell recipient, full-time enrollment, late-entry, first time in college, and developmental course needs.

Logistic regression was conducted to determine which independent variables in the model were associated with the dependent variable—enrolling or not enrolling in a service-learning course. Logistic regression results indicated that the overall model of five predictors (African American, male, enrolled in a non-transfer degree, enrolled full-time, and first time in college) was statistically reliable in predicting membership in the dependent variable.

The findings of this study revealed that service-learning participants completed institutional and academic goals at a higher level than their counterparts. Outcomes of
students in the cohort who experienced service-learning courses were significantly different in college level credits attempted, college level credits completed, and college level credits completed with a grade of C or better. There were also significant average mean differences between first term grade point average; final grade point averages were higher for the service-learning participants. On average, students who participated in service-learning experienced positive effects in college level outcomes earning seven more college credits and higher average first-term and final grade point averages than students in the comparison group. Future research is needed to discover how service-learning impacts students longer term, what effects it has on students relative to the job market, and how it impacts community college students specifically.
Understanding Student Success and Institutional Outcomes in Service-Learning Coursework at a North Carolina Community College: A Propensity Score Study

by

Jennifer Leigh Marts

A dissertation submitted to the Graduate Faculty of North Carolina State University in partial fulfillment of the requirements for the Degree of Doctor of Philosophy

Adult and Community College Education

Raleigh, North Carolina

2016

APPROVED BY:

Dr. James Bartlett, II
Committee Chair

Dr. Michelle Bartlett
Committee Co-chair

Dr. Diane Chapman

Dr. Kevin Brady
DEDICATION

I would like to dedicate this dissertation to my loving husband, Jeremy, for his patience and support while I worked hard to further my education. Without his constant words of encouragement and his ability to inspire me in all I do, this dream may not have come true. I would also like to dedicate my work to my amazing parents, Gary and Rosemary, for motivating me, instilling the importance of education in me from a young age, and for always being my biggest cheerleaders. I love you all so very much and thank you for believing in me.
BIOGRAPHY

Jennifer (Jenn) Leigh Marts is a native Chicagoan who relocated to Charlotte, North Carolina ten years ago. She completed her undergraduate studies at Eastern Illinois University in Charleston, Illinois, where she earned a Bachelor of Arts in English. Jenn continued her studies at Indiana State University, where she completed her Master of Science in Student Affairs and Higher Education.

Jenn is currently the Director of Service-Learning at Central Piedmont Community College (CPCC) in Charlotte, North Carolina. Jenn has spent her entire career working in Student Affairs and Higher Education and has a true passion for helping students become the best they can be through academics and service to their community. Jenn serves in multiple college and state-wide committees in support of service-learning initiatives at Central Piedmont Community College. Jenn serves on the Skyline Run Committee, Digital Inclusion Committee, and many others at CPCC. Jenn serves at the state level with North Carolina Campus Compact, the North Carolina Service-Learning Coalition, and the Institute for Civic Engagement. Jenn supports and works toward making service-learning a standard practice utilized in all curriculums and classrooms across all colleges and universities. Her research interests focus on service-learning as a catalyst for social change and discovering how service-learning directly impacts academic outcomes and the influence this teaching method has on the ever-changing global job market.
ACKNOWLEDGEMENTS

I would like to thank my dissertation chair, Dr. James Bartlett, for his guidance, support, encouragement, and sense of humor throughout this dissertation process. Dr. Bartlett challenged me to think differently and taught me how to be a scholar, not just a student. I also want to recognize and thank my amazing committee members who provided me with outstanding feedback and constant support: Dr. Michelle Bartlett, Dr. Diane Chapman, and Dr. Kevin Brady.

Throughout my entire doctoral program, I have been fortunate enough to work for an amazing department full of professionals who have been supportive and engaged in my journey. Thanks are extended to Dr. Amanda Capobianchi, Dena Shonts, Mark Helms, Dr. Mary Margaret Kantor, and all of the Service-Learning and Student Life team. Thank you all for listening to my ideas, providing your suggestions, and helping me continue to grow in the amazing work we do with our students.

Finally, this dissertation would not have been possible without the assistance of Dr. Bobbie Frye, the Director of Institutional Research at Central Piedmont Community College. Dr. Frye was a great help along my doctoral journey, and I appreciate all of her help and guidance along the way.
TABLE OF CONTENTS

LIST OF TABLES ............................................................................................................ ix

LIST OF FIGURES............................................................................................................. x

CHAPTER ONE: INTRODUCTION ................................................................................1

Statement of the Problem ............................................................................................... 9

Purpose of the Study ....................................................................................................... 11

Theoretical Framework ................................................................................................. 13

Conceptual Framework ................................................................................................. 15

Research Questions and Research Methods ............................................................... 17

Research Questions .................................................................................................... 17

Research Methods ..................................................................................................... 18

Significance of the Study ............................................................................................. 18

Limitations ..................................................................................................................... 20

Delimitations ................................................................................................................ 21

Definition of Terms .................................................................................................... 22

Summary ...................................................................................................................... 25

CHAPTER TWO: LITERATURE REVIEW .................................................................. 27

Context of Community Colleges ................................................................................ 27
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical Background of Service-Learning in Community Colleges</td>
<td>33</td>
</tr>
<tr>
<td>Campus Compact and Higher Education</td>
<td>37</td>
</tr>
<tr>
<td>Service-Learning Principles</td>
<td>39</td>
</tr>
<tr>
<td>Criticism of Service-Learning</td>
<td>40</td>
</tr>
<tr>
<td>Benefits of Service-Learning</td>
<td>45</td>
</tr>
<tr>
<td>Theoretical Framework</td>
<td>48</td>
</tr>
<tr>
<td>Knowles’s and Freire’s Impacts on Service-Learning Development and Theory</td>
<td>49</td>
</tr>
<tr>
<td>Dewey’s Theoretical Framework for Service-Learning</td>
<td>52</td>
</tr>
<tr>
<td>Kolb’s Model of Experiential Learning</td>
<td>56</td>
</tr>
<tr>
<td>Summary</td>
<td>59</td>
</tr>
<tr>
<td>CHAPTER THREE: METHODS</td>
<td>61</td>
</tr>
<tr>
<td>Propensity Score Matching in Social Sciences</td>
<td>62</td>
</tr>
<tr>
<td>Population in the Study</td>
<td>63</td>
</tr>
<tr>
<td>Construction of the Data Set</td>
<td>64</td>
</tr>
<tr>
<td>Recoding Variables</td>
<td>65</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>68</td>
</tr>
<tr>
<td>Pre-Screening Data</td>
<td>68</td>
</tr>
<tr>
<td>Reporting Pre-Matched Difference on Outcome Variables</td>
<td>68</td>
</tr>
<tr>
<td>Reporting Pre-Matched Difference on Demographic and Academic Variables</td>
<td>70</td>
</tr>
<tr>
<td>Steps to Propensity Score Matching</td>
<td>70</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----</td>
</tr>
<tr>
<td>Covariate Identification</td>
<td>70</td>
</tr>
<tr>
<td>Propensity Score Model and Match and Selecting Propensity Score Estimates</td>
<td>71</td>
</tr>
<tr>
<td>Common Support</td>
<td>71</td>
</tr>
<tr>
<td>Assessing the Quality of the Match</td>
<td>72</td>
</tr>
<tr>
<td>Calculation of the Treatment Effect</td>
<td>72</td>
</tr>
<tr>
<td>Sensitivity Analysis</td>
<td>73</td>
</tr>
<tr>
<td>Summary</td>
<td>73</td>
</tr>
<tr>
<td>CHAPTER FOUR: RESULTS</td>
<td>75</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>76</td>
</tr>
<tr>
<td>Four-Year Outcomes</td>
<td>89</td>
</tr>
<tr>
<td>Summary</td>
<td>97</td>
</tr>
<tr>
<td>CHAPTER FIVE: DISCUSSION</td>
<td>99</td>
</tr>
<tr>
<td>Conclusions and Discussion</td>
<td>101</td>
</tr>
<tr>
<td>Research Question 1</td>
<td>101</td>
</tr>
<tr>
<td>Research Questions 2 and 3</td>
<td>102</td>
</tr>
<tr>
<td>Research Question 4</td>
<td>104</td>
</tr>
<tr>
<td>Research Question 5</td>
<td>105</td>
</tr>
<tr>
<td>Recommendations for Practice, Research, and Theory</td>
<td>106</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1  Variables Types and Coding Schemes .................................................................67
Table 2  Outcomes Variables Types and Coding Schemes ....................................................69
Table 3  Statistical Tests to be Used to Examine Service-Learning Impact on Student

Academic Outcomes ........................................................................................................70
Table 4  Statistical Tests to be Used to Examine Service-Learning Impact on Student

Outcomes After Propensity-Score Matching .................................................................73
Table 5  Descriptive Statistics for Treatment and Control Groups ......................................78
Table 6  Result of Logistic Regression Covariates in the Model ..........................................82
Table 7  Group Mean Characteristics of Covariates Before Propensity Matching .............85
Table 8  Group Mean Characteristics of Covariates After Propensity Matching .................87
Table 9  Outcomes for ANOVAs of Treatment and Control Groups After Propensity Matching ........................................................................................................90
Table 10 Chi-Square Results for Educational Completion Outcomes in Two Study Groups

After Matching .................................................................................................................95
LIST OF FIGURES

Figure 1. Conceptual framework describing population, covariates, propensity score matching, and outcomes being studied. .................................16

Figure 2. Kolb’s experiential learning model. Adapted from “What is Experience-Based Learning?” by Carleton College. Science Education Resource Center at Carleton College. .............................................................................................................57

Figure 3. Propensity score matching–implementation steps ..................................................68

Figure 4. Percentage share (bound by 0–100%) of the sum of each covariate mean for treatment and control group across characteristics of covariates (ethnicity, program type, age, Pell recipient, enrollment status, and developmental course needs) before propensity matching. In this example, the percentages demonstrate that the two group means are not equally balanced among the covariates in each group. The goal of matching is to yield equal 50/50 percentages for each category between both groups .................................................................86

Figure 5. Percentage share (bound by 0–100%) of the sum of each covariate mean for treatment and control group across characteristics of covariates (ethnicity, program type, age, Pell recipient, enrollment status, and developmental course needs) after propensity matching. In this example, the percentages demonstrate that after matching the two group means are more equally balanced among the covariates in each group. The goal of matching is to yield equal 50/50 percentages for each category between both groups .................................................................88
Figure 6. Comparison of average college credits attempted, college math credits attempted, and college English credits attempted for students in the treatment (service-learning) and control (no service-learning) groups ............................................. 91

Figure 7. Comparison of average college credits completed, college math credits completed, and college English credits completed for students in the treatment (service-learning) and control (no service-learning) groups ............................................. 92

Figure 8. Comparison of average college credits A–C grades, college math credits A–C grades, and college English credits A–C grades for students in the treatment (service-learning) and control (no service-learning) groups ............................................. 93

Figure 9. Comparison of average first term and last term grade point averages for students in the treatment (service-learning) and control (no service-learning) groups ......................... 94

Figure 10. Comparison of educational outcomes for students in the treatment (service-learning) and control (no service-learning) groups ............................................. 96
CHAPTER ONE

INTRODUCTION

A community college is “any institution regionally accredited to award the associate in arts or the associate in science as its highest degree, which includes the comprehensive two-year college as well as many technical institutes, both public and private” (Cohen & Brawer, 2008, p. 5). Public community colleges across the nation have similar goals of creating success for students that can be measured by outcomes related to completion, transfer, learning, and the labor market (Aspen Institute, 2015). While meeting these goals community colleges seek to create inclusive environments that create access and equitable outcomes. Community colleges across the United States are committed to an open-door policy and encouraging all citizens by offering the opportunity to get an education to help them achieve their greatest potential (Cohen & Brewer, 2008). While each institution is different due to the academic, technical, and continuing education programs they offer; the location of the campus; the size the institution; and the demographic make-up of the student body, the overall goal of student success is comparable.

In addition to the open-door policy, many of these institutions strive to develop strong rapport and connection with the local community. Often community college mission statements incorporate the continued desire to develop a connection between their institution and students and their local community. Zlotkowski et al. (2004) identified a variety of community colleges across the country that incorporate civic duty and responsibility within their mission statements. Portland Community College’s (n.d.) mission statement clearly
demonstrates the importance of a civic emphasis “…through effective teaching and
supportive student services, Portland Community College prepares students for success as
individuals, members of a democratic society, and citizens of a rapidly changing world.”
The All Hazards Safety and Security Plan from Malcolm X College (2002) in Chicago,
Illinois states,

Our mission is to empower each individual to be all he or she is capable of becoming
through quality, comprehensive, and affordable educational programs and services.
An important goal of the mission is to enhance the quality of life of an economically,
educationally, culturally, and socially diverse community. (p. 4)

These two institutions are prime examples of what hundreds of community colleges
across the nation are doing to connect their mission to their local communities. Not only are
community colleges incorporating these relationships within their mission statements, but
community college administrators are also encouraging more community connection for
students through programs supported by faculty and staff.

Cohen and Brawer (2008) stated that The American Association of Community and
Junior Colleges’ Commission on the Future of Community Colleges supported community
education concepts and highlighted the importance of open-door policies, ease of access to
education for all, and community partnerships and connections in the following excerpt from
the commission report:

The community college, at its best, can be the center for problem-solving in adult
illiteracy or the education of the disabled. It can be a center for leadership training,
too. It can also be the place where education and business leaders meet to talk about the problems of displaced workers. It can bring together agencies to strengthen services for minorities, working women, single parent heads of households, and unwed teenage parents. It can coordinate efforts to provide day care, transportation, and financial aid. The community college can take the lead in long-range planning for community development. And it can serve as the focal point for improving the quality of life in the inner city. (Boyer & Peltason, 1998, p. 41)

Many different opportunities for engaging students and learning have been implemented to ensure community colleges meet their goals. “Student engagement recently has become an increasingly prominent part of the vocabulary of the community college discussions about effective educational practice and student success” (McClenney, 2007, p. 137). Research has shown that engaged students are more academically successful and fulfilled in their education than their counterparts (Eyler, Giles, & Braxton, 1997; Smith, 2004; Speck & Hoppe, 2004). “Student involvement in college has long been recognized as an important contributor to overall success and achievement” (Cohen & Brawer, 2008, p. 202). One form of learning that has been shown to involve and engage students to enhance learning is service-learning. Service-learning is an experiential and integrative learning tool that helps achieve college-wide goals and supports student learning outside of the classroom. It is important to understand what experiential and integrative learning are prior to gaining a deeper perspective on service-learning, as service-learning derived from these types of education.
Experiential learning is defined as “a process through which students develop knowledge, skills, and values from direct experiences outside a traditional academic setting” (University of Colorado Denver, n.d.). Experiential learning encompasses a variety of activities including internships, service-learning, undergraduate research, study abroad, and other creative and professional work experiences (Jacoby et al., 2009). Experiential learning can be divided into two areas: a) learning experienced personally through one’s life events, and b) learning through programmatic opportunities created by others (such as within the classroom). Carver (1996) proposed a model of experiential learning with four features: a) active learning, b) assimilating the experience through cognitive and emotional work on materials, c) authenticity of the study matter (relevance for learners), and d) providing means of creating related experiences. This model supports the idea that integrating these features in the learning process might make it significantly more meaningful and help sustain the experience over time.

Integrative learning gives students a better understanding of the diversity and complexity of their environments and communities while promoting critical-thinking, intellectual judgment, and a heightened sense of social responsibility and civic engagement (Jacoby et al., 2009):

Integrative learning is…an essential element in the goal of helping students develop a strong sense of social responsibility and civic engagement. For too long, our campuses have made civic engagement and social responsibility an extracurricular activity, the realm of student affairs and off-campus life. Today, however, we see
abundant efforts to tie the educational experience to the “big questions” that matter both to students and [to] the health of our communities. Here too, successful integration of learning is surely the key to success. The more students transfer knowledge and skill from to the classroom to the community, and then back again, the better prepared they will be to take responsibility for their lifelong roles as citizens and human beings. (Schneider, 2003, p. 5)

There are multiple definitions cited for service-learning in current research. For this study, Service-Learning will be defined as “a form of experiential learning in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development.… Reflection and reciprocity are key concepts of service-learning” (Jacoby et al., 1996, p. 5). In addition to the formal definition, Jacoby et al. (1996) also present a discussion on the definition of Service-Learning that entails why it contains certain language and structure. For example, the hyphen utilized in service-learning throughout literature depicts the importance in the relationship of the two terms. This is often the way the words are commonly seen through research and the way the term is presented in this study.

The idea of community within the definition of service-learning refers to the areas close to the college, the state as a whole, the entire country, and our international community: “The human and community needs that Service-Learning addresses are those needs that are defined by the community” (Jacoby et al., 1996, p. 5). Service-learning can support the community college in achieving the goal of building relationships with the local community
while also offering opportunities for students to learn and grow personally. When examining the goals of service-learning and community colleges, a number of commonalities are present. Specifically, many of the outcomes for service-learning and community colleges overlap.

Currently there is not a vast amount of research that discusses service-learning participation in relation to student outcomes such as grade point average, course completion, graduation rate, and successful transfer rate to four year college (Prentice, Robinson, & Patton, 2012, p. 25). “While the political support on campuses for such programs has grown, there is very little empirical research to go along with the social and theoretical justifications for Service-Learning” (Eyler et al., 1997, p. 5) and the results of the outcomes have been conflicting. In 1997, at the beginning of the influx of service-learning studies, most of the research showed varied results on the outcomes of social and theoretical justifications. Today, however, there have been many studies and much documentation providing support for these areas. Even so, current research still fails to focus on the impact of service-learning on participatory student grade point average, course completion, graduation rate, and successful transfer rate. Prentice et al. (2012) stated, “Studies are needed that compare groups of service learners with groups of similar nonservice learners that are matched on the number and type of attrition risk factors” (p. 25).

Service-learning has gained popularity and is growing at a rapid pace within institutions of higher education across the country. Recent research has documented the positive effects that students experience when enrolling in service-learning courses. One
example of this was demonstrated in research that showed “service, combined with learning, adds value to each and transforms both” (Eyler et al., 1997, p. 5):

The growth in the number of service-learning classes in higher education during the 1990s has been a remarkable example of pervasive educational reform. This expansion, however, is somewhat paradoxical because educators and administrators have invested time and resources developing service-learning courses and campus infrastructure when there is paucity of research evidence documenting the effectiveness of service-learning in reaching educational objectives of the course, the curriculum, and the institutional mission. The increase in the number of service-learning courses without supporting evidence is all the more remarkable because it has occurred during a decade that has witnessed increased emphasis on assessment and accountability in higher education. (Bringle & Hatcher, 2000, p. 68)

In addition to learning about content areas (Eyler, 2000; Felton & Clayton, 2011), service-learning participation has positive impacts for student learning in a wide range of areas such as global understanding, social justice, and lifelong community involvement. “Research has demonstrated that students learn faster and more deeply through service-learning than in more traditional forms of education…Communities are served…Schools and institutions change” (Stanton, 2000, p. 119). Literature has suggested that service-learning impacts a student’s ability to understand cultural and racial inclusivity, to learn at a higher level, and to develop a lifelong commitment to community involvement. “Most of the service-learning research [over the past ten years] have explored the impact of service-
learning on such personal qualities as efficacy, interpersonal skills, reduced stereotyping, and on social responsibility or sense of commitment to future service” (Eyler, 2000, p. 11). One of the areas that service-learning research has neglected is discovering the impact of service-learning participation on academic student outcomes such as grade point average, course completion, graduation rate, and successful transfer rate.

According to Eyler (2000),

There has been a flood of service-learning research in the 1990’s and most studies have focused on the impact of service-learning programs on students. Unfortunately, this research is weakest in both concept and methodology precisely in the areas where we need the most guidance if we are to design powerful academic programs. (p. 11)

Additionally, this research does not provide evidence of the impacts empirically (Eyler, 2000). Literature has clearly overlooked the importance of understanding the impact of service-learning on participants’ academic outcomes such as grade point average, course completion, graduation rate, and successful transfer rate, which are often considered important in college-wide assessments. While those outcomes have not been examined empirically, research does support the impact on students’ community attitudes and desire to make a difference. More importantly, community colleges need to understand what impacts, if any, service-learning participation has on students’ completion rates, transfer rates, and academic success. Specifically related to service-learning, community colleges need a better understanding of the characteristics and completion outcomes of their students who participate in service-learning courses to determine the impact of these learning programs:
“Service thus forms a direct part of students’ learning experience, with a clear connection between academic courses and real-world problems, allowing students to experience the extent of the impact they can have on their community and their surroundings” (Cohen & Brawer, 2008, p. 377).

The culture in the United States is constantly changing. A college education no longer promises employment, people are less likely to remain with one employer throughout their working years, and the disconnect between individuals and their communities is increasing (Zlotkowski et al., 2004). Community colleges and service-learning practitioners need to work together to continue to encourage students to be more involved with democracy, create opportunities in the workplace, and inspire an exploration of new skills and learning: “It is more important than ever before that community colleges continue to be places where Americans find community and opportunity….Community colleges are uniquely positioned to become civic engagement leaders at home and abroad, both in principle and practice” (Zlotkowski et al., 2004, p. 19).

Statement of the Problem

It is imperative that community colleges understand the outcomes created by their service-learning departments, programs, and courses to provide evidence for change or continued support. It is important to understand the value of experiential learning that engages students in service-learning projects to enhance student outcomes. If the impacts of service-learning are not understood, it will be difficult to encourage more student and faculty support and participation, and more difficult to continue the growth of service-learning
within classrooms across the country. “Since it has long been a goal of American higher education—and particularly of America’s community colleges—to develop well-informed, critically thinking citizens, the challenge now is to harness the power if higher education to educate the next generation of active citizens” (Zlotkowski et al., 2004, p.1).

If the impacts of service-learning are not understood, it is not possible to determine the community colleges’ return on investments. By understanding the impact of service-learning programs it will be possible to make decisions about the potential implementation of new service-learning opportunities. If the impact of service-learning on students’ academic outcomes is not known, decisions will be made without quantitative data. It will not be possible to make strategic decisions that improve outcomes without more data on the impact of service-learning. This is critical for today’s community colleges that are challenged to improve student outcomes with diminishing funds. If students don’t participate in service-learning coursework, it is not known how that will impact students’ academic outcomes such as graduation rate, transfer, course completion, credit hour completion rates, term-to-term retention, fall-to-fall retention, credential completion, and successful transfer rate to four-year colleges. Community college administrators, faculty, and community partners needing to understand the effect of student participation in service-learning coursework on their educational goals at community colleges is a recent concern.

Service-learning as a teaching method has been consistently experiencing growth over the past twenty year: “In 1995, 31% of the community colleges incorporated service-learning in their courses, and by 2003 this number had doubled” (Cohen & Brawer, 2009, p.
As service-learning coursework continues to grow throughout a wider variety of majors and areas of study, it is important to gain a deeper understanding of the outcomes service-learning participants may experience in regard to their academic goals.

Most current service-learning research is designed around the effectiveness of four-year institutions of higher education. Less time and exploration has been devoted to two-year programs, which are increasing more quickly than their four-year counterparts. North Carolina Community Colleges have a large number of students who are self-electing to enroll and complete service-learning courses at their home institutions. For example, in the 2012–2013 academic year, one urban community college that had roughly 70,000 students enrolled in college courses with 2,042 students participating in service-learning completing over 33,266.5 hours for the academic year (Central Piedmont Community College, n.d.).

Understanding the successes and characteristics of students who choose service-learning courses as compared to students who do not enroll in this type of coursework will provide community college administrations, faculty, and practitioners with a greater understanding of the impact of the resources used on student outcomes. If this type of research is not completed it is unknown if the support of service-learning is impacting outcomes in positive, neutral, or even negative ways.

**Purpose of the Study**

The purpose of this quantitative study was twofold. First, this study sought to determine if there is a significant difference in demographics of those who participated and those who did not participate in service-learning courses. Second, this study examined if
participation in service-learning courses impacted student outcomes, specifically course completion rates, credit hour completion rates, term-to-term retention, fall-to-fall retention, credential completion, and successful transfers.

To achieve the purpose of this research, the study included subjects who had and had not participated in service-learning curriculum within a large, urban community college. In the 2011–2012 school year, the population consisted of students with a variety of majors, areas of study, and academic programs; all students also had a variety of personal academic goals (graduation, transfer, or certificate program). The student data included personal demographics, course enrollments, grade point averages, and successful transfer and completion rates. The student data were available from the Institutional Research Department at the community college being studied.

Propensity score matching is a scientific method in educational evaluation research that is utilized when randomization is not possible with observational data. Since there is no experimental control over the assignment of individuals to various programs or interventions, any estimates of possible treatment effects by comparisons with a contrast group are likely to be biased, all which can be eliminated by propensity score matching to identify a control group and eliminate bias due to nonrandom assignment (Rojewski, Lee, & Gemici, 2010). Propensity score matching can be used for adjusting covariates in a multiple regression analysis for stratification/matching of asymmetric data, which will allow the data being studied to be equal (Cleophas & Zwinderman, 2012). This study is critical for understanding the academic outcomes of utilizing service-learning in the classroom to aid in expanding this
form of experiential learning into community colleges comprehensively throughout the entire United States.

**Theoretical Framework**

The purpose of this study was to investigate the relationship between student enrollment in service-learning courses and the completion of institutional outcomes. The aim of this research is to encourage more faculty to include service-learning within their curriculum in all areas of study leading to an increase in students achieving success within the institutional outcomes.

There are many well-known theoretical frameworks that have been utilized to support and understand the benefits students gain from participating in service-learning opportunities. Research has shown that students acquire more knowledge from their coursework by participating in service-learning experiences (Saltmarsh, 1996). In understanding the foundation of service-learning initiatives, one should note that many great educational theorists’ philosophies are crucial in this field including Paulo Freire, John Dewey, David Kolb, and Malcolm Knowles. The two theories that have emerged as the most influential on the field of service-learning and which have, in turn, created the backbone of service-learning in higher education are John Dewey’s experiential learning theory and David Kolb’s learning cycle, a four stage model for experiential learning.

Dewey’s theory of Experiential Learning has established roots within service-learning instructions and is often discussed within the literature of service-learning. As Jacoby et al. (1996) stated, “Service-learning has its roots in Dewey’s theory of experience—which has
become the philosophical touchstone of the experiential movement” (p. 12). Dewey’s framework is a six-step process:

1) Encountering a problem
2) Formulating a problem or question to be resolved
3) Gathering information which suggests solutions
4) Making hypotheses
5) Testing hypotheses
6) Making warranted assertions. (Cone & Harris, 1996)

This six step formula has been the framework for modern day service-learning educators in developing effective uses of service-learning in the classroom through reflection and discussion as well as outside of the classroom through understanding issues affecting the community and the learner’s role in addressing it.

Kolb added to Dewey’s experiential learning theory by simplifying the six step framework into four cyclical phases that enable students to move fluidly throughout the experiential learning process. Kolb’s model gives students the opportunity to begin their experiential learning process at any point within the model that best fits within their current levels of education, understanding of the issues within the local community, and their awareness of course content.

Kolb’s model supports student engagement and service-learning opportunities. However, simply because a student participates in a curriculum-based service experience, there is no guarantee learning will happen. Kolb’s model shows that in order for students to
learn from their experience, they must “be actively involved in the experience, reflect on the experience, use analytic skills to conceptualize and better understand the experience, and possess the skills necessary to use the experience as a springboard to test new ideas” (SERC at Carleton College, Service-Learning and Experiential Learning, n.d.).

**Conceptual Framework**

It is necessary to research the impact of service-learning participation on student completion of academic outcomes. The conceptual framework for this study provides a map for the operationalization of propensity score matching to examine the impact of service-learning on completion, transfer, and academic success outcomes for students in community college. The conceptual framework for this study includes the population, the treatment variable (taking a service-learning course or not), covariates (demographic and academic), the process of propensity score matching and the outcome variables as measured by completion, transfer, and academic achievement.

The conceptual framework starts with a visualization of the two groups of students that were examined during the study: those that completed service-learning and those that did not. Initially, the groups were not matched based on the propensity scores. It was not assumed the groups would be equivalent and they were examined based on the covariates. The covariates used within this study included age, ethnicity, gender, first term grade point average, associate non-transfer program, enrolled full-time, Pell Grant recipient, late entry, first time in college, and returning for a second term. Propensity scores were used to match participants to create two balanced groups. Logistic regression was used to create the
propensity score used in the algorithm to match the participants. Once the groups were created, they were examined to see how well the propensity score model worked to create equivalent groups based off the matching. Finally, the outcomes of transfer to two or four year institution, completion of certificate or associates degree, college credits attempted, college credits completed, college credits, A–C grades, and final GPA were examined for those that completed and those that did not complete a service-learning course.

![Figure 1. Conceptual framework describing population, covariates, propensity score matching, and outcomes being studied.](image)
Research Questions and Research Methods

Research Questions

The research questions guided this study and ensured the purposes of the study were met. The questions examined the background of the students and then used the background of the students to create groups to examine the impact of service-learning. This research study examined the following research questions:

1. *Research Question 1:* What are the demographics and academic characteristics of the complete population of students that have participated and not participated in service-learning in 2011–2012?

2. *Research Question 2:* What are the demographics and academic characteristics of the two groups (those that participated in service-learning and those that did not participate in service-learning) in 2011–2012?

3. *Research Question 3:* Is there a difference in demographics and academic characteristics of students that participated and did not participate in service-learning?

4. *Research Question 4:* Is there a difference in demographics and academic characteristics of the two study groups after propensity score matching?

5. *Research Question 5:* Is there a difference between the students that participated in 2011–2012 service-learning and those that did not in terms of college outcomes as measured by course completion, grade point average, and successful transfer rate after propensity score matching?
Research Methods

To achieve the purpose of this study, propensity score matching was implemented. According to Rowjeski, Lee, and Gemici (2010), propensity scores can be used to identify a suitable control group and eliminate bias due to non random assignment. The propensity score is the conditional probability of an individual being in one group rather than the other. The propensity score takes a number or predictors and provides one single score that ranges from 0.0 to 1.0. (p. 8).

In this study, to understand the use of propensity score matching, a propensity score model was conducted to create equal control and experimental groups (those that participated in service-learning and those that did not participate). This technique allowed the researcher to meet the purpose of the study and determine the impacts of service-learning.

Significance of the Study

Currently, completion of student outcomes through participation in service-learning coursework has received little attention in the research literature:

With budgets being cut and enrollments remaining high, administrators are eager for interventions that are effective but cost-neutral. Service-learning is already being used by faculty in the majority of community colleges, and involvement in service-learning has been found to relate to gains in civic, academic, workplace, and personal benefits. If service-learning were also to foster gains in retention and persistence, then administrators who seek attrition interventions through programs already on
A survey of current research identifies the need for studies in academic outcomes as related to service-learning in order to continue the growth of this learning method in all areas of study. According to Prentice et al. (2012), further research is needed to compare year-to-year enrollment of service-learners and non-service learners and to examine if service-learning participation affects attrition rates and risk factors within the community college. This study sought to begin developing a deeper understanding of service-learning participation and completion of institutional outcomes.

The purpose of using propensity score matching for this study allowed for balanced and comparable groups of students who were service-learning participants and non-participants. “Propensity scores represent the conditional probability of a person being in one condition rather than another given a set of observed covariates used to predict a person’s condition” (Rojewski et al., 2010, p.7). After the matching was completed, groups were compared to determine what impacts service-learning participation had on institutional outcomes in completion, transfer, and GPA. The study will allow for faculty, staff, and administrators to continue to effectively utilize service-learning in all areas of academia. Furthermore, the findings will allow for further understanding of what service-learning needs to continue to be conducted to strengthen the civic engagement movement.

By analyzing the results of this study’s research questions, service-learning will continue to find a more welcomed community of faculty who embrace this type of instruction
in their courses. This study also seeks to provide meaningful research that will benefit other colleges and universities in understanding how service-learning affects student outcomes in GPA, transfer, and completion.

**Limitations**

There are five recognized limitations within this research. First, there is no control over which students enrolled in service-learning courses, which may mean that certain demographics are more present within the data. While there was no control for this limitation, propensity score matching allowed for dividing participants and non-participants into statistically comparable groups.

Second, not all students are required to enroll in service-learning coursework at the community college in the study. Even though it spans throughout all programs of study, participating in service-learning coursework is a choice made by students. Some students may be aware that they are choosing to enroll in classes that require service-learning, while other students may blindly enroll in service-learning coursework. Propensity score matching also assisted with this limitation when matching the students on specific characteristics.

Third, service-learning coursework may take place during different phases of a student’s community college career. Some students may begin taking service-learning coursework within their first semester in college, while others may enroll in a service-learning course in their final semester before transferring or graduating.

Fourth, service-learning instruction varies from course to course. For example, a student completing service-learning in a sustainability class by working on a weatherization
project with Habitat for Humanity may have a very different experience from a student completing service-learning for a course in journalism by meeting with and writing the life story of a resident from an assisted living facility. Although this is a limitation of the study, it also allows for more understanding of the benefits of service-learning across a wide variety of subject matter areas.

The final limitation identified for this study is that propensity score matching eliminates a large number of students from the analysis. Propensity score matching is supposed to reduce the problem of selection bias and non-random assignments (Titus, 2007). It is important to note that this study should not limit the population being studied to those enrolled in service-learning coursework, but should also include their counterparts: “Propensity score matching allows for estimates of the average treatment effect, average treatment on the treated effect, and the average treatment on the untreated effect on student outcomes” (Titus, 2007, p. 488).

**Delimitations**

This study was limited to one large, urban community college in North Carolina during the academic year 2011–2012. The student population being studied was chosen based on the researcher’s ability to access the data and secure accurate records through the Institutional Research and Design Department. There is no suggestion that this community college is representative of all large, urban community colleges within the United States.

The outcome variables being studied were also controlled through the research. The variables and college outcomes that were studied include final grade point average, transfer
to a four-year college, completion of a certificate program, completion of an associate’s
degree, and successful transfer rate to a four-year college. Demographic covariates used in
the study include: ethnicity, gender, age, financial aid status, first time college student, late
entry, and if the student returned for a second term. The final delimitation of this study is the
definition of service-learning. Specifically for this study, service-learning has been defined
as “a form of experiential learning in which students engage in activities that address human
and community needs together with structured opportunities intentionally designed to
promote student learning and development….Reflection and reciprocity are key concepts of
service-learning” (Jacoby et al., 1996, p. 5). While other research may provide other
definitions, even if similar, the above definition will serve as the description of service-
learning throughout the entire study.

**Definition of Terms**

*Propensity Score Matching (PSM).* PSM examines grouped data and the dependent
variable is categorical instead of quantitative. Covariate variables are the independent
variables with the highest degree of influence on the dependent variable. The use of logistic
regression permits the researcher to identify the covariate by using multiple quantitative
independent variables to predict the probability of group membership, a dependent variable
(Caliendo & Kopeinig, 2008).

*Propensity Score.* The covariates identified in the logistic regression before PSM are
combined into a single summary score whose value ranges between 0.0 and 1.0. A variety of
estimation techniques have been used to determine propensity scores; the appropriate
technique depends on the number of study groups being examined (Caliendo & Kopeinig, 2008).

**Integrative Learning.** The process of students utilizing classroom instruction to develop a better understanding of the diversity and complexity of their environments and communities while promoting critical-thinking, intellectual judgement, and a heightened sense of social responsibility and civic engagement (Jacoby et al., 2009).

**Experiential Learning.** A process through which students develop knowledge, skills, and values from direct experiences outside a traditional academic setting (University of Colorado Denver, n.d.).

**Service-Learning.** A form of experiential learning in which students engage in activities that address human and community needs with structured opportunities intentionally designed to promote student learning and development…Reflection and reciprocity are key concepts of service-learning (Jacoby et al, 1996).

**Course Completed.** Course completed means that the student completed the course or did not withdraw from the course.

**Credits—Attempted.** The total number of credits a student was enrolled in at the 10% census date.

**Credits—Completed.** The total number of credits associated with a course in which the student did not withdraw.

**Credits—Completed A–C.** The total number of credits associated with an official grade of C of better.
Late Entry. A term referred to a student who entered higher education at 24 years or older (non-traditional students).

Non-Transfer Program. A term referring to an academic program offered at a community college that does not transfer to a four year institution.

Diploma. A term referring to students’ completion of the GED (High School Equivalency) program at a community college.

Certificate. A term referring to students’ completion of a program that prepares them to directly enter the workforce in a broad range of occupational areas that do not require further completion of higher education.

Developmental Math. Required prerequisite courses designed to allow students entering the community college to gain further understanding of foundational math skills prior to beginning college level math to increase their potential success in math. Students placed into these developmental courses are determined through their performance on placement tests.

Developmental English. Required prerequisite courses designed to allow students entering the community college to gain further understanding of foundational English skills prior to beginning college level English to increase their potential success in English. Students placed into these developmental courses are determined through their performance on placement tests.

Developmental Reading. Required prerequisite courses designed to allow students entering the community college to gain further understanding of foundational reading skills
prior to beginning college level reading to increase their potential to success in reading. Students placed into these developmental courses are determined through their performance on placement tests.

Summary

Service-learning is an instructional tool that provides students with experiences within their local community that help translate classroom learning into skill sets (Jacoby, et al, 1996). For this study, data from one large, urban community college were synthesized using propensity score modeling in order to understand the impact participation in service-learning coursework had on students’ ability to complete institutional outcomes including graduation, program completion, grade point average, and successful transfer rate. Although this study focused on students and service-learning efforts within a single community college, the results of this research will impact the field of service-learning in community colleges and universities nationwide. The study findings will impact and expand current research in the field of service-learning, allowing for further growth in service-learning within higher education.

This chapter began with an introduction to service-learning, including a primer on how service-learning became a popular learning method within community colleges and other institutions of higher education. This chapter also discussed the research questions, methodology, and conceptual framework that guided this study. The definitions that guide service-learning and applied to this study were shared along with a brief introduction to the theoretical framework. The theoretical framework, as well as other important aspects of
service-learning, are examined further in the review of the literature in Chapter 2. Chapter 3 explores the propensity score matching and research design used for this study. Chapter 4 follows with a presentation of the data and findings. Finally, Chapter 5 provides a summary of this study, discusses implications within the research, and makes suggestions for further research.
CHAPTER TWO

LITERATURE REVIEW

This chapter provides a context for the study in community colleges, an overview of service-learning from a historical perspective, and a description the development of the Campus Compact Network. Next, an overview of the principles of service-learning is discussed. The benefits and criticisms of service-learning are presented. Following this discussion of service-learning, a connection between service-learning and community college goals is presented. Lastly, the theoretical frameworks that underpin this study are discussed. The chapter ends with a summary.

Context of Community Colleges

Several features of community colleges make them great avenues for college success. Community colleges are widely distributed across the country, located in urban, suburban, and rural areas. They are cheaper to attend than four-year colleges and universities: their tuitions are usually low, and they are nearby so dormitory residence is not necessary. And because of their open-door admissions ideal, they are more willing to take “nontraditional” students: high school dropouts, the academically deficient, vocational aspirants, and adults interested in leisure education. (Dougherty, 2006, p. 77).

Community colleges have continued to grow and gain popularity since the early 1900s. These institutions are popular for learners of all ages for a variety of reasons including accessibility, affordability, inclusivity, and the vast offering of programs of study:
Since the early 1980s, community colleges have grown in number, size, and organizational complexity, the “comprehensive community college” of the late 1990s and early twenty-first century offers a wide array of credit, non-credit, and lifelong learning experiences across a seemingly endless array of disciplinary and technical foci. (Amey, VanDerLinden, & Brown, 2006, p. 163)

Students of all ages and backgrounds have continued to enroll at community colleges across the United States with hopes of vocational training, earning an associate’s degree, or transferring to a four-year institution with their general education courses already completed. Community colleges have long been known for making education accessible to all students wishing to further their education. “The community college is not just a job trainer. It is also a central avenue into higher education and toward the baccalaureate degree, particularly for working class, nonwhite, and female students” (Dougherty, 2006, p. 77).

Many types of students have been drawn to community college including those who are unsure of their future career goals, those who are unsure what majors they are interested in, those who need a more affordable higher education option, those who need flexibility in their studies and a location close to home, and those who are working full-time and only want to take a few classes at a time:

Community colleges have prided themselves on their inclusiveness. The rhetoric about the people’s college and democracy’s open door has signaled the willingness of these institutions to serve lower-income students, immigrants, students whose parents have never been to college, older students including women returning to the labor
force, and other nontraditional students. This inclusiveness is a part of an old and
glorious tradition in American education dating from the 19th century: the tradition of
the common school that extended public support of education to everyone—initially
for political purposes and then for occupational reasons. At their best, community
colleges and their faculty are committed to their varied students and are supportive of
them in many ways (Grubb, Badway, & Bell, 2006, p. 227).

The demographics of community college and four-year institution student bodies are
very different. The combined student body of community colleges is 51% Caucasian, 14%
African American, 19% Hispanic, 6% Asian/Pacific Islander, 2% two or more races, 5%
other and/or unknown, and 1% nonresident alien (American Association of Community
Colleges, 2014). The median age for community college students is 24 and the average age
is 28, with the 57% in the 22-59 age group, compared to only 22% of public, four-year
college students (American Association of Community Colleges, 2014). Most community
college students attend part-time (Kane & Rouse, 2006). About one-third of all high school
graduates will attend a community college at some point in their lives (Kane & Rouse, 2006).
Community colleges have also provided opportunity for educational advancement for low to
middle class individuals and families. Many of these community college students may be
first generation college students, meaning that they are the first member of their immediate
family to attend an institution of higher education. Compared to students who first enroll in a
four-year college, community college students are more likely to be the first in their family to
attend college and are much less likely to have parents who have graduated from a four-year college.

A community college education appeals to many students because of the lower cost of attendance. With community colleges continuing their commitment to keeping costs affordable and offering financial aid and Pell grants, even when the economy dips, enrollment rises. The average tuition is less than one-half that of public four-year colleges, and because community colleges are located in most towns and cities many students can live at home while attending college.

Community colleges provide an opportunity for educational advancement to those who may not be able to attend traditionally formatted college courses: “…community colleges have increased overall educational attainment, and that a major role of community colleges is to provide a place in higher education for those not traditionally served by the four-year college system” (Kane & Rouse, 2006, p. 97). Due to the diversity within the student body, most students at community colleges have multiple obligations outside of the classroom. Many students enrolled at community colleges are employed with in a full-time career or have multiple part-time employment commitments. To accommodate these students, courses are not only offered during the “traditional” daytime hours, but also at night and on weekends. Many community colleges offer courses at worksites or via audio, video, or computer technologies. As a result, 84% of community college students work while attending college as compared to 78% of students attending public comprehensive four-year colleges (Kane & Rouse, 2006, p. 97).
As cited in Kane and Rouse (2006), community colleges are great places for students to begin their collegiate experience due to the vast programs of study that they offer:

Community colleges provide outstanding preparation for students hoping to transfer:
Most community colleges are comprehensive institutions, offering a wide variety of programs to a diverse student clientele. In most community colleges, a majority of students are enrolled in workforce preparation and economic development programs. However, three-quarters of all first-time community college students (including adults) aspire to get at least a baccalaureate degree and one-quarter transfer to a four-year college within five years of entering a community college (Kojaku & Nunez, 1998: 7; McCormick, 1997: 32, 41). (p. 97).

Unlike four-year institutions, community colleges are more focused on the ever-changing work environment, and less focused on research. These institutions tend to employ faculty who have more master’s degrees than doctoral degrees, and who spend more time in the classroom with students than out of the classroom directing their attention to research within their field. This type of instructions allows for faculty to have the time to continuously add experiences into the curriculum, including service-learning. Community colleges have experienced a growing trend toward utilizing service-learning as a teaching method in a variety of disciplines and majors to help their students put their learning into action within their local communities. The purpose of service-learning is to allow for a mutually beneficial relationship between the goals of community colleges across the nation and the goals of classroom instruction and learning.
Student participation in service-learning has proven effective in increasing student outcomes within community colleges. According to Cohen and Brawer (2009), students who participated in service-learning were more likely to stay enrolled in college: “Brevard Community College (Florida) found its service-learning students had higher graduation rates than its non-participants over a six-year period ending in 2005 (as cited in Robinson, 2007, p. 3)” (Cohen & Brawer, 2008, p. 379).

Community colleges commonly embrace goals for their students that include academic achievement and learning, inclusiveness, accessibility, responsiveness to ever-changing work environments, and preparing graduates for successful transfers to four-year institutions or successful immersion into the workplace. These two-year institutions are committed to an open-door policy and work hard at developing a strong rapport with the local community. Learning and personal development complement each other, as does the relationship between the goals of community colleges and the incorporation of service-learning within the classroom:

As community colleges became more widespread, their missions began to diverge in response to the specific needs of their communities. At the same time, higher education as a whole was beginning to reawaken to the notion of giving back to the community, both by establishing community service/partnership programs and by educating students to be active citizens. Although some critics have taken community colleges to task for focusing too closely on workforce readiness and other
goals at the expense of community engagement, community colleges by their nature remained tied to their communities on many levels. (Zlotkowski, 2004, p. 14)

Service-learning and community colleges’ goals share many commonalities and their desired outcomes are intertwined. According to Jacoby et al. (1996), service-learning is defined as “a form of experiential learning in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development….Reflection and reciprocity are key concepts of service-learning” (p. 5).

**Historical Background of Service-Learning in Community Colleges**

Throughout the past two decades, service-learning instruction has steadily increased in the community college curriculum. More community college students are participating in service-learning opportunities, which allow learners to take theories and concepts that they are discovering in their classrooms and put them into action by participating in service-driven initiatives supported by the college and local community partners.

Our colleges and universities could be of great help to students engaged in community service if they tried consistently and diligently to help students connect their experiences in such work with their academic courses. Students need more opportunity for moral and social reflection on the problems that they have seen at first hand…students need the chance to directly connect books with experience, ideas and introspection to continuing activity (Coles, 1994, p. A64).
Service-Learning as a teaching tool has continued to grow and be accepted by faculty in all areas of academia for many years, particularly because it allows students to have a stronger connection to the course content and a deeper of understanding of applying classroom learning in real-world situations.

Understanding what service-learning encompasses is essential to understanding its theoretical underpinnings: “Service-learning is a form of credit-bearing experiential education in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development. Reflection and reciprocity are key concepts of service-learning” (Jacoby et al., 1996, p. 5).

The concept and development of service-learning dates back to the 1960s when President John F. Kennedy developed the Peace Corps and encouraged more Americans to take an active role with being civically engaged (Jacoby et al., 1996). Accordingly, universities and community colleges began developing experiential learning opportunities for their students through internships, cooperative educational opportunities, and the early adoption of service-learning within the curriculum (Jacoby et al., p. 1996). After 20 years of momentum, the idea of service-learning began to fizzle out in higher education due to three main pitfalls. As cited in Jacoby et al. (1996) from Kendall’s Combining Service and Learning: A Resource Book for Community and Public Service (1990):

1. Most of the programs were not integrated into the central mission and goals of the schools and agencies where they were based.
2. Those in the community service movement learned several important programmatic lessons about the balance of power and the pitfalls of “helping others” or “doing good”...Paternalism, unequal relationships between the parties involved, and a tendency to focus only on charity – “doing for” or “helping” others – rather than on supporting others to meet their own needs all become gaping pitfalls for program after well-intentioned program...

3. We learned that while it sounds great to help young people learn through service experiences in the community, the service experience does not ensure that either significant learning or effective service will occur.

   In the late 1980s, service-learning began to experience an upswing and a makeover in the theories and desired outcomes this form of experiential learning was grounded in. More conferences, publications, and curriculums began to reflect on the importance of incorporating service-learning opportunities for students, staff, and faculty in higher education. “On September 8, 1994, President Clinton wrote a letter to all college and university presidents—the first time any president has ever done so for any reason—asking for their help in ‘inspiring an ethic of service across our nation’” (Jacoby et al., 1996, p. 17). This was the moment that experiential learning through service became and stayed a form of practiced learning in universities and community colleges. Between the years 1994 and 2002, service-learning grew quickly throughout community colleges across the United States due to the federal backing of this learning strategy—from less than one-third to more than two-thirds of all colleges (Prentice et al., 2012).
More recently, President Obama has also taken steps to increasing service-learning in higher education. In 2009, Obama signed two bills that increased service-learning funding from $10 million to $12.3 million and invested $7 million into a “Campuses of Service” program (Smith, 2009). This funding is expected to be inclusive of all middle school and high school students with a required amount of mandatory service-learning participation. The expectation for college students is that all students completing a certain amount of service-learning participation would receive tax incentives for their efforts:

- Obama and Biden will call on citizens of all ages to serve. They’ll set a goal that all middle school and high school students engage in 50 hours of community service a year, and develop a plan for all college students who engage in 100 hours of community service to receive a fully-refundable tax credit of $4,000 for their education. Obama and Biden will ensure that at least 25% of College Work-Study funds are used to support public service opportunities instead of jobs in dining halls and libraries. (Change.gov, n.d.)

- With the trend of service as learning continuing today in an ever-changing educational environment, providing educators with an understanding of the theoretical framework and their impact on a learner’s education are of utmost importance: “Given the increased momentum and transformational aims of the movement, it is becoming more difficult to dismiss as an educational fad” (Smith, 2009, p. 5).
Campus Compact and Higher Education

In a world of inflated grades and the consequent academic excellence of so many graduate schools and businesses are beginning to examine other qualifications of their applicants. Many rate service to the community high on the list of what separates the average applicant from the superior one not only [due] to the commitment it requires but also the skills it can produce that are frequently not acquired in the classroom. (Duncan & Taylor, 2013, p. 3)

With the rapid growth of service-learning within collegiate environments came the need for a national organization to support faculty, staff, and research efforts with civic engagement. According to the Presidents’ Declaration on the Civic Responsibility of Higher Education (1992), a commitment published by hundreds of university and community college presidents across the country to promote an increase of service-learning at their home institutions:

This country cannot afford to educate a generation that acquires knowledge without ever understanding how that knowledge can benefit society or influence democratic decision-making. We must teach the skills and values of democracy, creating innumerable opportunities for our students to practice and reap the results of the real, hard work of citizenship. (Zlotkowski et al., 2004, p. 18)

The political and educational developments within service-learning created a need for a partnership across community colleges and universities. In 1984, The Education Commission of the States began the Campus Compact Network, a consortium of college
presidents across the country that pledged to encourage and support community service at their home institutions (Jacoby et al., 1996). Campus Compact was the original, large-scale coalition that supported service-learning through curricular involvement and encouraged college mission statements to expand to include civic-mindedness for students, faculty, and staff. Campus Compact has continued to promote service initiatives that focus on increasing student citizenship skills, foster and nurture effective community partnerships, and provide resources and practical guidance for faculty seeking to integrate civic engagement into their classroom instruction (Zlotkowski et al., 2004). Campus Compact has grown into a national coalition that continues to work towards encouraging discourse and support for public and community service; to develop resource materials, grant programs, workshops, and institutes; and to support a network of state and specialized offices to provide targeted assistance to institutions (Jacoby et al., 1996). In addition to the individual state’s Campus Compact networks, the Center for Community Colleges and the Historically Black Colleges and Universities Network are also included within this service-learning network. Campus Compact also supports and recognizes outstanding faculty and practitioners within service-learning and publishes and funds service-learning and civic engagement research to members and nonmembers (Jacoby et al., 1996). According to Zlotkowski et al. (2004),

Campus Compact’s growth in membership is one strong indicator of higher education’s renewed commitment to its civic mission. Membership has grown by more than 30% in the past four years to more than 920 member institutions.

Furthermore, the rich diversity of Campus Compact’s membership reflects the civic
commitment of institutions across the spectrum of higher education, 52% of member campuses are public and 48% are private, encompassing women’s, faith-based, historically black, Hispanic-serving, and tribal institutions. Nearly 25% of its members are community or two-year colleges. (p.3)

More recently, the Campus Compact website stated that there are now 1,100 institutions in 35 states and regions across the country that are currently members of the consortium. Campus Compact has also turned their attention to high education’s movement to participate in more assessment opportunities and strategies, allowing for more service-learning research and studies to take place. Campus Compact publishes its Annual Member Survey Results and Reports as well as a variety of books and publications for practitioners and faculty alike. Each Campus Compact affiliate also hosts multiple annual conferences including updates in research and practice, state-wide meetings and trends within civic engagement and high education, and the student-led conference CSNAP (Citizens, Service, Networking, and Partnerships), which focuses on leadership, service-learning, and activism (Campus Compact, n.d.).

**Service-Learning Principles**

Many theories support the implementation and practice of service-learning, but currently there is not a universal set of principles that are utilized by all practitioners in this field. Service-learning is viewed as flexible instruction, allowing the curriculum needs to be met through a variety of opportunity and measurement—utilizing a variety of formats, learning outcomes, and opportunities for students to choose their experiences (Honnet &
Poulsen, 1989). Practitioners of service-learning utilize a set of core principles that set the expectations and standards of what service-learning must entail:

1. Engage people in responsible and challenging actions for the common good.
2. Provide structured opportunities for people to reflect on their service experience.
3. Articulate clear service and learning goals for everyone involved.
4. Allow for those with needs to define those needs.
5. Clarify responsibilities of each person and organization involved.
6. Match service providers and service needs through a process that recognizes changing circumstances.
7. Expect genuine, active, and sustained organizational commitment.
8. Include training, supervision, monitoring, support, recognition, and evaluation to meet the service-learning goals.
9. Ensure that the time commitment for service-learning is flexible, appropriate, and in the best interests of all involved.
10. Commit to program participation by and with diverse populations. (Jacoby et al., 1996, p. 30–32)

**Criticism of Service-Learning**

Though much of the research in service-learning discusses the positive outcomes for students participating in service-learning coursework, there are still naysayers who feel this type of instruction is a non-academic or non-substantive teaching tool within the classroom. Higher education has long been research-focused and the idea of allowing social and
experiential opportunities for classroom learning may be regarded as subpar and ineffective. Not all faculty at community colleges are receptive to the notion that service-learning is an important learning tool within their classroom. According to Elwell and Bean (2001),

Higher education is conflicted over research and social function of teaching. This conflict is representative of the clashes between competing views: “objective science versus social advocacy, classical versus utilitarian education, and critical thinking versus critical action” (as cited by Stanton, Giles, & Cruz, 1999, p.12). Some faculty fear that service-learning will dilute the academic rigor of course. Others, conversely, maintain that service-learning can “intensify the level of intellectual effort students invest, drawing students closer to the course content that they are supposed to be studying in the first place (as cited by Enos & Troppe, 1996, p. 158). (p. 49)

When instructors do not properly incorporate service into their classroom, the entire benefit of experiential learning is lost. Requiring student reflections on their experiences is what makes service projects truly experiential and encourages students to make the connection from the service to the in-classroom learning. If instructors requiring students to complete a service project fail to critically think through their own desired outcomes and lessons learned, the point of the service is moot.

Students may also have a negative perception and attitude toward service-learning within the classroom. Students are accustomed to attending class, studying, and completing homework assignments; the idea of spending multiple hours outside of the classroom in service projects can feel overwhelming. Service-learning should always be introduced at the
beginning of the semester and offer a realistic requirement that students can fulfill despite their busy schedules. Often, instructors at community colleges receive pushback from students required to participate in service-learning mainly due to work schedules, family commitments, and a lack of understanding about how experiential learning ties into the foundation of the course.

There are some unique challenges that community colleges across the country face with implementing effective service-learning programs. Campus Compact has identified three important areas that need recognition and extra attention in order to develop an effective service-learning program that allows and encourages students to bridge their learning from the classroom to the community. The challenges, as stated by Campus Compact, include a lack of overall understanding of service-learning and its desired outcomes, a lack of a connection between the academia and the community partner, and connecting adjunct instructor’s to service-learning opportunities:

Community Colleges would be well served if their understanding of service-learning, its rationale, and its uses were even more carefully articulated and monitored… because community colleges are engaged with their communities in so many different ways and on so many different levels, it is relatively easy for them to let one form of engagement slide to another. (Zlotkowski et al., 2004, p. 81)

It is important for community colleges to pay attention to this slippery slope so their service-learning instruction does not turn into another form of education such as cooperative education, internships, or pre-career field experiences: “Academic ‘quality control’ is a must
if the community college contribution to civic renewal is to be widely recognized and supported” (Zlotkowski et al., 2004, p. 81).

Most institutions in higher education offer internships, which often differ from but are commonly confused to be equivalent to service-learning experiences, as an opportunity for students to discover potential career interests. The most obvious differences between the two opportunities for student learning are the reflection component, which is an essential piece of service-learning, and the location where these opportunities occur, since service-learning opportunities are with non-profits and internships can occur with all companies. Some institutions have begun offering service-learning internships that offer a coursework plan that intertwines with their service-learning internships and encourages reflection on cross-cultural issues, application to real-world situations, and research design and development (Jacoby et al., 1996, p.177–178).

Special attention should be given to academic-community collaboration. Although community colleges are partners within their surrounding areas, businesses, schools, and neighbors, non-profits working with service-learning students require more consultation. Community partners are too often removed from the academic portion of the student’s learning experience, which may hinder the student’s ability to make connections between the classroom and service-learning experiences. These agencies and not-for-profits need to be viewed as much more than placement agencies and more as co-facilitators for student learning. Community partners are often limited to assisting with reflection practices, are not
included in service-learning and college strategic planning, and receive minimal gratitude for their service to the college. According to Prentice et al. (2012),

Many community partners prefer long-term relationships with individual faculty to develop mutually beneficial agendas, joint project planning, and continual assessment. This leads to greater benefits to and deeper impact on the communities involved, and greater reciprocity in the campus-community relationships (Sandy, 2007; Stoecker, Tryon, & Hilgendort, 2009). (p.11)

The third challenge area that Campus Compact identified within community college service-learning implementation and practice was with adjunct instructors. Zlotkowski et al. (2004) discussed how adjunct faculty tend to be less visible on their campuses, are often stretched into multiple directions, and function without office space—all of which makes their connection to the institution, their students, and the community more challenging. While these obstacles are real, adjunct instructors also bring a unique perspective to the incorporation of service-learning in their coursework, since many of the instructors may also teach at other institutions and community agencies:

The dual identity of these faculty members/community partners can help them emerge as cultural brokers, translating between the academic lexicon and community realities. Their understanding of the nuances of each culture can be invaluable in keeping implementation problems to a minimum and leading to more successful collaboration strategies. (Zlotkowski et al., 2004, p. 83)
Benefits of Service-Learning

Service-learning has gained popularity as a teaching method within community colleges over the past 10 years as more faculty have noticed the benefits of course curriculum including this component. Service-learning is a proven method for engaged teaching and learning for all levels and subjects of study and has also been recommended as a significant approach for civic learning and democratic engagement by the U.S. Department of Education (Prentice et al., 2012). According to Elwell and Bean (2001), “the core values of service-learning programs include caring and compassion, responsibility and accountability, individuality and diversity, critical thinking and creativity, and respect for self, others, and the environment” (p. 50).

Service-learning is a mutually beneficial relationship between students, faculty, and community that is beneficial to each participant in different ways. Students are benefitted through service-learning participation by gaining active learning opportunities outside of the classroom, developing social and ethical responsibilities, and gaining a deeper understanding of complex social issues (Smith, 2009). Through service-learning participation, students gain a sense of belonging and accountability as members of a larger community, feeling satisfied in their studies, ability to work collaboratively, career goal development, and understanding of human struggle:

Service and reflection experiences can be shaped to increase students’ knowledge of course content while encouraging them to think in a more critical and complex manner. Similarly, students can deepen their understanding of pressing social issues
while exploring their own racial identity and how it affects their thought and action. (McEwen, in Jacoby et al., 1996, p. 53).

Elwell and Bean (2001) also discussed how service-learning can help students become more invested in their education and become more self-directed learners:

Service-learning can remedy education alienation, which occurs at five levels: community (lack of connection between what the students are learning and the challenges encountered by the wider society), disciplines (lack of connections between the different disciplines from which the students are learning, other learners (lack of connection between students communicating with their classmates), self (lack of connection between students’ passions and interests and what the school wants students to learn), and generativity (lack of connection between students’ selfish learning motives and a more comprehensive vision which benefits the overall community). (Elwell & Bean, 2001, p. 50).

Faculty benefit from incorporating service-learning into their syllabi and curriculum by providing students with direct contact with non-academic audiences from within the community to help students become more engaged with the course content and their learning processes (Smith, 2009). As cited by Elwell and Bean (2001):

Service-learning projects offer faculty members an opportunity to conduct action research, putting the power of research and theory development into their hands rather than into the hands of those not connected to their particular situation who may be creating theory in a distant ivory tower….To put it another way, action research
can be defined as teacher initiated classroom research which seeks to increase the teacher’s understanding of classroom teaching and learning and to bring about improvements in classroom practices (Richards & Platt, 1992). (p. 51)

Other faculty benefits that can be seen through incorporating service-learning in their curriculum include:

- Improve student engagement, satisfaction, and retention.
- Better prepare students for work and transfer of other educational institutions.
- Improve college-community relations and increase opportunities for professional networking.
- Develop a stronger motivational base of instruction and learning.
- Enhance applied learning/experiential education opportunities.
- Develop a broader conception of your educational role.
- Increase public service delivery.
- Reorient the educational process to meet real human needs.
- Explore personal passions and creativity.
- Enjoy the personal rewards of students’ collective community impact. Presentations, portfolios, and posters are effective and enjoyable methods of sharing student success stories. (Lorain County Community College, n.d.)

Community partners benefit from service-learning participants through increasing awareness of the opportunities for assistance through their agency as well as having higher levels of involvement with community volunteers. The relationships that community
partners have with community colleges and service-learning students are mutually beneficial and offer reciprocity for both groups; the community partner receives more attention and assistance and the student turns classroom learning into skill through service and reflection. This involvement assists not-for-profits in reaching their goals related to helping the community. There are many other benefits that community partners experience including improved college-community relations; increased access to human, financial, and material resources; a gain of more contributions to meet human needs; an increase in future civic support and commitment; short-term volunteers to meet community needs; potential long-term volunteers and recruits for agency employment; an increased awareness of agency services and social issues within the community; and opportunities to participate in educational partnerships (Lorain County Community College, n.d.; Prentice et al., 2010).

**Theoretical Framework**

Service-learning has its theoretical basis in experiential learning. Due to the multiple definitions in the research literature, many theoretical frameworks can be applied to service-learning. Some of the theoretical models that have been utilized to support and understand the benefits students gain from participating in service-learning opportunities include the Philanthropic Approach, which states that charity and change are alternative forms of serving and learning; the Civic Approach, which has a strong focus on Dewey’s theoretical framework and focus on communities fully participating politically and socially to construct learning outside of the classroom; and the Communitarian Model, which emphasizes the
connection an individual has to his or her community and that everyone has a social responsibility to everyone (Speck & Hoppe, 2004).

Research has also documented that during their service-learning journeys students acquire more knowledge and experience as well as a deeper understanding for social justice, a stronger commitment to their local communities, and a better ability to transition classroom content into usable skills (Eyler et al., 1997; Saltmarsh, 1996). To understand the foundation of service-learning initiatives, one should note that many great educational theorists’ philosophies are crucial in this field. These include Paulo Freire, John Dewey, David Kolb, and Malcolm Knowles. The two theories that have emerged as the most influential on the field of service-learning and have created the backbone of service-learning in higher education are John Dewey’s experiential learning theory and David Kolb’s learning cycle, a four stage model for experiential learning.

**Knowles’s and Freire’s Impacts on Service-Learning Development and Theory**

Since Dewey and Kolb have provided the frameworks that are the most mentioned in service-learning literature, other adult education scholars such as Knowles and Freire may not be as widely known. Knowles and Freire provided theories that have been cited in many areas of service-learning research, yet their frameworks have not been adopted by the service-learning community the way Kolb’s and Dewey’s have. More extensive research can be found on Dewey’s and Kolb’s experiential learning models and how they impact service-learning opportunities at universities and community colleges across the country. Although Dewey and Kolb have had a great impact on the field of service-learning, it is also important
to briefly discuss the contributions that Knowles and Freire have given to experiential learning and civic engagement prior to discussing why the current framework is based off of learning theories formed by Dewey and Kolb.

Knowles contributed to service-learning by encouraging educators to understand the idea of andragogy, which is essential to the future of community college student civic engagement. As service-learning practices continue to gain momentum in community college education, there is a deeper need for instructors and practitioners to study the adult learner as a service-learning participant (Battistoni, 2002). Community colleges are experiencing a trend of adult learners returning to the classroom to increase their employment opportunities in the workforce or to try gaining new skills in a trade to obtain a new career. Engaging Knowles’s theory and philosophy in andragogy is an area where more research needs to be done to understand the impacts of service-learning on community college adult learners.

Knowles suggested that adult learners are more self-directed than younger college students and they should have the opportunity to spend more time learning about their areas of interest to make their learning more meaningful and impactful (Knowles, 1990). Knowles also stated that adult learners often rely on experiences when engaging in the classroom and learning new material, and that they are often more interested in new information when they are able to utilize it immediately (Knowles, 1990).

Many service-learning educators also refer to philosopher Paulo Freire’s model of education. Freire’s philosophy encourages empowering the learner and suggests moving past
the classroom philosophy of simply “banking” knowledge and more toward a concept of empowering communities for liberation and change through action and social justice efforts (Gent, 2009). The ideas of liberty, consensus building, dialogue, social equality, and critical participation were the core of Freire’s focus, and he wanted instructors and learners alike to view “education as the practice of freedom” (Gadotti & Torres, 2009, p. 1265).

Freire’s theory of adult education lends itself to service-learning because it incorporates reflection, discourse among students, and encouragement to reverse oppression. Freire drew upon Dewey’s model for experiential learning as well. Freire believed education should be related to life and experiences, which directly affects a learner’s ability to understand and grow with new information. According to Mayo (2007),

From Freire’s perspective, the best way to engage the learner’s framework of relevance is to allow space for the learners themselves to engage critically with the issues, to bring their own insights, culture and different aspects of their multiple subjunctives to bear on the learning process. (p. 537)

There are many contributing theories that have assisted service-learning development within the community college curriculum and allowed faculty to understand the value service has within the classroom. Freire and Knowles are both important to the service-learning movement and will continue to assist professionals in this field to explain the importance of this learning opportunity.
**Dewey’s Theoretical Framework for Service-Learning**

Service-learning has strong roots in the theoretical frameworks of Dewey, Kolb, and Knowles. For this study, John Dewey’s Grand Theory of experiential learning has provided a basis for explaining the importance and value students gain through their participation in service-learning. Dewey’s research has provided service-learning with a solid framework that continues to prove how important and essential experiential service-learning is to higher education and the community college classroom.

As Jacoby et al. (1996) stated, “Service-learning has its roots in Dewey’s theory of experience—which has become the philosophical touchstone of the experiential movement” (p. 12). When discussing the value and importance of service-learning with educators, it is common that the group refer to John Dewey as the “Modern Father of Experiential Learning” (Dr. Caryn McTighe Musil, personal communication, October 1, 2012). Dewey’s contributions to the world of experiential learning have allowed educators to understand the impact of experiential learning and the importance of having their students become locally and globally active through service-learning initiatives: “Dewey’s writings inform service-learning through a philosophy of education, a theory of inquiry, a conception of community and democratic life, and a means for individual engagement in society toward the end of social transformation” (Saltmarsh, 1996, p.13).

It is necessary to note that Dewey did not directly refer to service-learning as a teaching tool, rather his philosophy on education largely focused on experience, inquiry, and reflection (Giles & Eyler, 1994):
Dewey never specifically addresses “community service-learning” as a term signifying a particular conceptual framework of education; his writings analyze five specific areas of relevance to service-learning: 1) linking education to experience, 2) democratic community, 3) social service, 4) reflective inquiry, and 5) education for social transformation. (Saltmarsh, 1996, p. 13)

These five areas of learning have are part of what service-learning in higher education entails and they provide a strong framework for what civic engagement opportunities should entail in order to have them qualify as growing in service and grounded in learning.

Dewey’s system of experiential learning is developed around key concepts that he identified as most valuable in a learning opportunity. Experience is always the beginning point of the educational process, it is not considered to be the result. According to Knowles, Holton, & Swanson (2005) quoting Dewey (1938, p. 16-17),

The central challenge of an education based on experience is to select the kind of present experiences that live fruitfully and creatively in subsequent experiences. Dewey also maintained that democracy (social arrangements that promote a better quality of human experience), continuity (growing and developing through utilizing the surroundings of a learner), and interaction (education becomes a social process where the instructor is no longer the authority over learning) are key concepts in experiential education. (p. 94)
It is necessary, however, to break down the relevance of Dewey’s experiential learning theory even more to understand the beneficial impact of service-learning. Dewey (1938) noted that education is a six-step process that involves:

1) Encountering a problem
2) Formulating a problem or question to be resolved
3) Gathering information which suggests solutions
4) Making hypotheses
5) Testing hypotheses
6) Making warranted assertions (Cone & Harris, 1996)

This six step formula has been the framework for modern day service-learning educators in developing effective uses of service-learning in the classroom through reflection and discussion as well as outside of the classroom through understanding issues affecting the community and the learner’s role in addressing those issues.

Dewey’s process also lends itself directly to the core characteristics of service-learning. As service-learning continues to be widely incorporated into curriculum, it is important to embrace these core values of what service-learning should encompass:

1. Advance learning goals (academic and civic) and community purposes.
2. Involve reciprocal collaboration among students, faculty/staff, community members, community organizations, and education institutions to fulfill shared objectives and build capacity among all partners.
3. Include critical reflection and assessment processes that are intentionally designed and facilitated to produce and document meaningful learning and service outcomes. (Felton & Clayton, 2011, p. 76)

Dewey’s theory on experiential learning has received praise from service-learning educators for many years and continues to help define the idea of student engagement within service-learning initiatives. Dewey’s philosophy on experiential education provides a depth to service-learning that has consistently been tapped into when describing the importance of this type of education and the impact it has on a learner:

Human beings best develop their innate capacity for intelligent thought and action when they purposefully use it as a powerful instrument to help them solve a multitude of perplexing problems that continually confront them in their daily lives—and when they reflect on their experience and thereby increase their capacity for future intelligent thought and action. Intelligence does not simply develop simply as a result of problem-solving action and experience; it develops best as a result of reflective, strategic, real-world problem-solving action and experience. Dewy emphasized that action-orientated, collaborative, real-world problem solving education can function as the most powerful means to raise the level of instrumental intelligence in individuals, groups, communities, society, and humanity. (Saltmarsh, 2008, p. 63)

Dewey is a champion in the service-learning field for his ability to explain that colleges and universities are not the expert, but instead serve as the catalyst for students to become civically engaged through outside of the classroom learning experiences that
incorporate the theories and concepts that are being instructed in the class. Dewey’s framework has allowed colleges and universities to move away from an expert-centered belief to a more democratic-centered mindset that allows community partnerships and reciprocity between instructors, students, and the local community:

When students are active participants in education that is grounded in community-based public problem-solving, they are educated to become knowledge producers instead of knowledge consumers. The civic corollary to this form of education is that students are not only active participants in learning—they are educated to become active participants in democratic life instead of being spectators to a shallow form of democracy. (Saltmarsh, 2008, p. 66)

Kolb’s Model of Experiential Learning

Another important theory that is often utilized in service-learning is Kolb’s model of experiential learning. Kolb’s model is a variation John Dewey’s theory of experiential learning, which defines learning as, “the process whereby knowledge is created through transformation of experience” (Knowles et al., 2005, p. 197). Kolb “conceptualizes Dewey's six steps as a four stage experiential learning cycle involving concrete experiences, reflection, abstract conceptualization, and active experimentation” (Cone & Harris, 1996, p. 34).

Kolb suggests that there are four steps in an experiential learning cycle. According to Kolb, as cited by Knowles et al. (2005), these steps include:

1. *Concrete experience.* Full involvement in new here-and-now experiences.
2. **Observations and reflection.** Reflection on and observation on the learner’s experiences from many perspectives.

3. **Formation of abstract concepts and generalization.** Creation of concepts that integrate the learners’ observations into logically sound theories.

4. **Testing implications of new concepts in new situations.** Using these theories to make decision and solve problems. (p. 197)

Figure 2 illustrates how Kolb’s process is cyclical with each step flowing into the next. This model is easy to understand and integrate into service-learning, which has made it easier for faculty to put service-learning opportunities into practice within their courses.

![Figure 2.](image)

There is an obvious connection between Kolb’s and Dewey’s theories when looking at experiential learning through service. Kolb, however, also provided a practical model for experiential practice. Kolb’s model allows learners to enter the cycle anywhere in the
process, but in order for effective learning to occur, the entire process must be completed (Jacoby et al., 1996).

In Kolb’s student-centered model, experiential learning is a continuous investment, allowing the student to have a variety of opportunities to form and re-form beliefs and hypotheses through civic engagement and reflection opportunities that are instructor guided (Permaul, 2009). Kolb’s model is also inclusive of multiple learning styles (which is helpful in incorporating service-learning into the classroom) and promotes action reflection learning, one of the most an essential pieces of service-learning (Permaul, 2009). Combining Kolb’s theory into service-learning proves that educators are able to develop a better understanding of the importance of reflection in relating concrete experiences to abstract concepts. Kolb’s model has shown educators that reflection is essential in service-learning to bridge the gap of completing service hours to understanding how those hours relate to in-class learning. One of the major drawbacks of Kolb’s theory according to Cone and Harris (1996), is

Kolb's model is somewhat ambiguous for educators attempting to better understand their role within a service-learning paradigm. As a consequence, many educators continue to send students out to "learn in community settings" and "reflect" on their work without a clear understanding of how experiences instruct or how educators make use of the reflective process. (p. 33)

Service-learning considers both Dewey and Kolb to be essential to the development of today’s initiatives and service-learning frameworks. Dewey’s theory, however, is more tangible to an educator as it was created directly for instructors. Kolb’s theory was focused
on research outside of the classroom, specifically on the adult learner within the workplace for human resource development utilizing experiential learning to increase and improve work-related performance (Permaul, 2009). Both theorists laid a strong foundation for the development and growth of service-learning as a form of experiential learning in community colleges and universities. Dewey and Kolb will continue to be noted in scholarly works relating to service-learning in the classroom.

Summary

Service-learning curriculum has continued to gain momentum throughout community colleges across the nation. Although its growth is becoming more prominent in higher education, there is a lack of research focusing on the impact of service-learning participation on institutional outcomes (Eyler et al., 1997). Community colleges and service-learning form a natural partnership, since both are focused on learning, increasing institutional outcomes, and connecting with community partners. Campus Compact is a strong support network for civic engagement in higher education, providing publications, discourse opportunities, and further education or faculty and practitioners like utilizing service-learning strategies in the classroom.

It is also noted that service-learning stems from experiential and integrated learning, which has provided service-learning instruction with a solid theoretical framework and backing from research, but has also caused this type of learning somewhat of a multiple personality disorder. There are numerous definitions of what service-learning is depending
on which researcher or discipline area is being studied, making it crucial for a researcher to define his or her definition prior to completing a study.
CHAPTER THREE

METHODS

This study used a propensity score matching research design to examine the effect of service-learning on student outcomes. The student outcomes that were examined in this study included grade point average, successful transfer rate, and completion. Propensity score matching was originally a technique that helped control for confounding variables but now has been expanded and provides a tool that allows research to examine data “that can be further analyzed like randomized controlled trials” (Cleophas & Zwinderman, 2012, p. 329). This technique is useful with populations that have observational data or when a randomized trial is not possible.

To create the propensity score model, it is important to select the appropriate covariates. According to Rojewski et al. (2010), determining the covariates is the most important step in propensity score matching. The covariates used to create the propensity score for this study included demographic variables of ethnicity, age, and gender, plus program type, Pell recipient, academic variable enrollment status, late entry, first time in college, need for development math, need for developmental English, and retention from first to second semester. These variables were available and make sense to use as covariates to determine which group students are members of when developing the propensity score model.

This chapter highlights the methods for the study in detail. The six steps for conducting a propensity score study are presented. The study population, data set
construction, student level derived and recoded variables, and the dependent variables are presented. The analysis concludes with a calculation of the impact of the treatment effect.

**Propensity Score Matching in Social Sciences**

Propensity score matching is an innovative and groundbreaking tool of statistical methods that has proven to be useful in evaluating treatment effects shown using non-experimental or observational data (Guo & Fraser, 2010). The term “propensity scores” was first utilized in a 1983 article by Rosenbaum and Rubin, which described the estimation of casual effects from observational data. This development signified a convergence of two traditions in studying causal inferences: “the econometric tradition that primarily relies on structural equation modeling and the statistical tradition that primarily relies on randomized experiments” (Guo & Fraser, 2010, p. 4).

If researchers utilize the propensity score matching approach carefully with awareness of its limitations, propensity scoring may serve as a method for reducing bias in quasi-experimental and non-experimental research. According to Luellen, Shadish, and Clark (2005), “this bias reduction is particularly pertinent for research and accountability studies where random assignment to treatment and control groups is logistically, financially, and/or ethically impossible (typical situations in educational or social program evaluation)” (p. 2). Although prosperity score matching is useful in the research as mentioned previously, it is still less frequently seen in secondary and educational research.

Propensity score models aim to accomplish data balancing when “treatment assignment is non-ignorable, to evaluate treatment effects using nonrandomized or non-
experimental approaches, and/or to reduce multidimensional covariates to a non-dimensional score called a *propensity score*” (Guo & Fraser, 2010, p. 12). One advantage of using propensity scores in matching is that it provides a reduction in dimensions; although there are many covariates being studied, the propensity approach reduces all dimensionality into a one-dimensional score.

It is also important to note some of the limitations of utilizing propensity score matching in educational research, as this method is not a final solution for all non-experimental design or observational research study due to its limitations. The success of propensity score matching greatly depends on the identification and accessibility of suitable covariates in a research situation, and oversight of relevant covariates could lead to estimation bias for the statistical comparisons (Baser, 2006). It is important that the researcher makes a serious attempt to minimize this potential effect on the data, and uses caution in propensity score construction. In order for researchers to have successful results when using propensity score matching, it is necessary to have a large enough sample size: “As a group of sample sizes in propensity subclasses become too small, unstable estimation of subclasses is a possibility…Researchers interested in using this approach need to consider this factor, and attempt to avoid very small cell sample size conditions” (Fan & Nowell, 2011, p. 79).

**Population in the Study**

The population for this study consists of community college students at a large, urban, multi-campus community college. The community college is located in the
southeastern part of the United States. The college annually serves 70,000 students and offers a number of academic, vocational, and continuing education programs. The data for this project include students who were enrolled during the 2011–2012 academic year. Students varied in their ethnicity, age, gender, financial aid status, states, countries, sexual identities, religious beliefs, economic status, class rank, and other demographics. Academically, the students varied on their enrollment status, developmental course needs, completion/transfer status, and academic achievement. This highly variable group of students either participated or did not participate in a service-learning course during the 2011–2012 academic year.

**Construction of the Data Set**

The institution that provided the data for this study collects a large amount of observational data annually that is used in institutional planning and research. While these data were compiled to answer questions for this specific research project, the data from this project were pulled from a database used for other projects such as Completion by Design. The data sets are used by the Planning & Research Department to respond to federal and state reporting requirements; *ad hoc* data requests; and other institutional research functions such as meeting grant requirements, cohort tracking, and program review. The Office of Institutional Research collects official data for all students each term and routinely stores a robust collection of datasets including student course enrollments, course grades, credential completion, financial aid awards, transfer information from the national student clearinghouse, and placement test assessments in English, math, and reading subject areas.
Specifically, the data were extracted from the student information system (Colleague) and compiled into data collections, including class and student information transactional records. The records were used to populate data sets housed in the institutional research department. To complete the study, formal access to student information data through the college’s IRB process was requested once the proposal was defended and accepted for a dissertation study at North Carolina State University.

The Office of Service Learning at Central Piedmont Community College regularly documents students participating and enrolling in service-learning courses. That list of students was sent to the Office of Institutional Research and students were matched to the institutional research data sets, using an SAS merging technique and identified as service-learning participants during the period examined. Students not participating in service-learning courses were also retained in the dataset. Multiple-record transactional datasets were summarized for each student in the dataset using a ‘proc summary’ technique in SAS, and the final dataset reflected a single case or observation for each student. The Office of Institutional Research compiled the dataset for the researcher’s use. The dataset included the co-variates, outcomes and treatment/control group variable. Variables were pre-coded for all students in the dataset as detailed in Tables 1 and 2.

**Recoding Variables**

Table 1 shows the variables that were selected for use in this study. The covariates and the outcome variables are listed. Each variable was identified by type. Categorical and continuous variables were identified. Dummy variables were created for categorical
variables such as ethnicity. Ethnicity was re-coded into seven variables that included Caucasian, Hispanic, American Indian, Native Hawaiian, Mixed Race, Asian, and African American. For this example, Caucasian was coded as 1 and all others were coded as 0. This was the done in similar method for all categorical variables.
Table 1

*Variables Types and Coding Schemes*

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Type</th>
<th>Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrolled in Service-Learning Course</td>
<td>Categorical</td>
<td>1 = Yes</td>
</tr>
<tr>
<td>American Indian</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Caucasian</td>
</tr>
<tr>
<td>Asian American</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Caucasian</td>
</tr>
<tr>
<td>African American</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Caucasian</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Caucasian</td>
</tr>
<tr>
<td>Hispanic</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Caucasian</td>
</tr>
<tr>
<td>Non-Resident Alien</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Caucasian</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Caucasian</td>
</tr>
<tr>
<td>Other Race</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Caucasian</td>
</tr>
<tr>
<td>Male Gender</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Female</td>
</tr>
<tr>
<td>Non-Transfer Program</td>
<td>Dummy</td>
<td>1 = Yes, 0 = Associate</td>
</tr>
<tr>
<td>Age</td>
<td>Continuous</td>
<td>1 = Yes, 0 = No</td>
</tr>
<tr>
<td>Pell Recipient</td>
<td>Dummy</td>
<td>1 = Yes, 0 = No</td>
</tr>
<tr>
<td>Full-Time Enrollment</td>
<td>Dummy</td>
<td>1 = Yes, 0 = No</td>
</tr>
<tr>
<td>Late Entry</td>
<td>Dummy</td>
<td>1 = Yes, 0 = &lt; 24 years</td>
</tr>
<tr>
<td>First Time in College</td>
<td>Dummy</td>
<td>1 = Yes, 0 = No</td>
</tr>
<tr>
<td>Need Developmental Math</td>
<td>Dummy</td>
<td>1 = Yes, 0 = No</td>
</tr>
<tr>
<td>Need Developmental English</td>
<td>Dummy</td>
<td>1 = Yes, 0 = No</td>
</tr>
<tr>
<td>Need Developmental Reading</td>
<td>Dummy</td>
<td>1 = Yes, 0 = No</td>
</tr>
</tbody>
</table>
Data Analysis

Propensity score matching is a multivariate statistical technique and there are multiple steps involved in the examination. Data analysis for the propensity score matching is presented here with the six implementation steps: 1) pre-data screening, 2) covariate identification, 3) propensity score estimation, 4) matching of propensity score, 5) examining the quality of the match, and 6) presenting the results of the study.

Calienda and Kopeinig (2008, p. 33), created a graphic which outlines how to complete propensity score matching in a step-by-step process (see Figure 3).

Figure 3. Propensity score matching–implementation steps

Pre-Screening Data

Prior to data analysis, all data were screened for missing values and normality. Additionally, data were examined for outliers and errors. All missing data were examined to ensure the data was randomly missing. Additionally, tests to assess multi-collinearly were conducted.

Reporting Pre-Matched Difference on Outcome Variables

Prior to matching, the differences between the outcome variables were reported for the control and treatment groups. Means and standard deviations, along with frequency and
percent were used to describe the groups. The researcher used $t$-tests and chi-square to examine if differences exist between the groups (see Table 3). Effect sizes were reported.

Table 2

*Outcomes Variable Types and Coding Schemes*

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Credits Attempted</td>
<td>Continuous</td>
</tr>
<tr>
<td>College Credits Completed</td>
<td>Continuous</td>
</tr>
<tr>
<td>College Credits A–C Grades</td>
<td>Continuous</td>
</tr>
<tr>
<td>College Math Credits Attempted</td>
<td>Continuous</td>
</tr>
<tr>
<td>College Math Credits Completed</td>
<td>Continuous</td>
</tr>
<tr>
<td>College Math Credits A–C Grades</td>
<td>Continuous</td>
</tr>
<tr>
<td>College English Credits Attempted</td>
<td>Continuous</td>
</tr>
<tr>
<td>College English Credits Completed</td>
<td>Continuous</td>
</tr>
<tr>
<td>College English Credits A–C Grades</td>
<td>Continuous</td>
</tr>
<tr>
<td>College Service-learning Credits Attempted</td>
<td>Continuous</td>
</tr>
<tr>
<td>College Service-learning Credits Completed</td>
<td>Continuous</td>
</tr>
<tr>
<td>College Service-learning A–C Grades</td>
<td>Continuous</td>
</tr>
<tr>
<td>Transfer to 4 Year College</td>
<td>Categorical</td>
</tr>
<tr>
<td>Completion of Associate Degree</td>
<td>Categorical</td>
</tr>
<tr>
<td>Completion of Certificate</td>
<td>Categorical</td>
</tr>
<tr>
<td>Transfer to 2 Year College</td>
<td>Categorical</td>
</tr>
<tr>
<td>Completion of Diploma</td>
<td>Categorical</td>
</tr>
<tr>
<td>Not Enrolled</td>
<td>Categorical</td>
</tr>
<tr>
<td>Last Term GPA</td>
<td>Continuous</td>
</tr>
</tbody>
</table>
Table 3

Statistical Tests Used to Examine Service-Learning Impact on Student Academic Outcomes

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Variable Types</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Grade Point Average</td>
<td>Continuous</td>
<td>t-test</td>
</tr>
<tr>
<td>Transfer to 4 year College</td>
<td>Dummy</td>
<td>chi-square</td>
</tr>
<tr>
<td>Completion of Certificate</td>
<td>Dummy</td>
<td>chi-square</td>
</tr>
<tr>
<td>Completion of Associate’s</td>
<td>Dummy</td>
<td>chi-square</td>
</tr>
<tr>
<td>Transfer to 2 year College</td>
<td>Dummy</td>
<td>chi-square</td>
</tr>
</tbody>
</table>

Reporting Pre-Matched Difference on Demographic and Academic Variables

Prior to matching, the differences between the demographic and academic variables were reported for the control and treatment groups. Means and standard deviations, along with frequency and percent were used to describe the groups. The researcher used t-tests and chi-square to examine if differences exist between the groups. Effect sizes were reported.

Steps to Propensity Score Matching

To conduct the propensity score matching six steps were used: 1) pre-data screening, 2) covariate identification, 3) propensity score estimation, 4) matching of propensity score, 5) examining the quality of the match, and 6) presenting the results of the study.

Covariate Identification

The covariates were examined to see which variables best predicted whether students belong to either the service-learning or non-service-learning group. Previous research and the data available supported the selection of identification variables.
Propensity Score Model and Match and Selecting Propensity Score Estimates

The purpose of creating a propensity score is to determine the probability of an individual being in the control or the treatment group based on the covariates. Rosenbaum and Rubin (1984) stated that the actual propensity score provides the “conditional probability of a person being in one condition rather than another given set of observed covariates use to predict a person’s condition” (p. 4). Once the covariates are selected, the next step is to calculate a propensity scores. For the propensity score it is important to determine the odds of an individual with one characteristic receiving a treatment. Using the combined odds ratio, a combined propensity score is calculated.

Propensity scores ranged from 0.0 to 1.0. These scores were used to match students from a large dataset of a potential comparison group to produce a comparison group that was similar to one another on the significant covariates. The propensity score was then used to create the matched groups. Propensity scores were assessed to guarantee that the distributions were similar across the two groups and that outliers that could impact the analysis were not present in the propensity scores. There are a number of methods that can be used to match. Rojewski et al. (2010) stated that STATA provides algorithms appropriate for matching.

Common Support

According to Rowjeski (2010), common support “requires that any combination of individual characteristics observed in the treatment group is also observed in the non-treatment group” (p. 13). In some cases, outliers can be eliminated using a minimum
maxima technique of common support. For example, if the propensity scores between the two groups do not overlap, those participants need to be deleted from the data.

**Assessing the Quality of the Match**

After matching, the differences between the demographic and academic variables were reported for the control and treatment groups. Means and standard deviations, along with frequency and percent, were used to describe the groups. The researcher used *t*-tests and chi-square to examine if differences exist between the groups. Effect sizes were reported. Additionally, another propensity score was created to assess if there was not significance.

**Calculation of the Treatment Effect**

After the match, the differences between the outcomes variables were reported for the control and treatment groups. Means and standard deviations, along with frequency and percent, were used to describe the groups. The researcher used *t*-tests and chi-square were used to examine if differences existed between the groups. Effect sizes were reported.
Table 4

*Statistical Tests Used to Examine Service-Learning Impact on Student Outcomes After Propensity Score Matching*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Variable Type</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Grade Point Average</td>
<td>Continuous</td>
<td>*-test</td>
</tr>
<tr>
<td>Transfer to 4 year College</td>
<td>Dummy</td>
<td>chi-square</td>
</tr>
<tr>
<td>Completion of Certificate</td>
<td>Dummy</td>
<td>chi-square</td>
</tr>
<tr>
<td>Completion of Associate’s</td>
<td>Dummy</td>
<td>chi-square</td>
</tr>
<tr>
<td>Transfer to 2 year College</td>
<td>Dummy</td>
<td>chi-square</td>
</tr>
</tbody>
</table>

**Sensitivity Analysis**

Rowjeski (2010) suggested that there are possible biases with this approach to propensity matching and, specifically, discussed the impacts of not selecting all covariates that influence individuals participate in the treatment. It was suggested that the Mantel-Haenszel test (MH, 1959) be used to examine this impact. “The MH statistic compares the successful number of individuals in the treatment group with an expected number and follows the chi-squared distribution with 1 degree of freedom” (Caliendo & Kopeinig, 2005). The Mantel-Haenszel test was conducted in the analysis of the research.

**Summary**

The purpose of this chapter is to describe the methodology utilized in this study. The purpose of this study was to determine if service-learning participation had an impact on institutional outcomes including student completion rate, transfer rate, and grade point
average. Data collected from the planning and research department at a large, urban community college in the southeast were used to complete this study in conjunction with the propensity score model. The data were inclusive of service-learning and non-service-learning students, and shared participants’ demographic information, course completion data, and transfer/graduation information.

Propensity score matching was used for this study. The goal of propensity score matching was not to create groups that were equal across all variables, but to create two groups of students who were equivalent on average. Once the match was completed, a logistic regression was completed to create a propensity score that would demonstrate the impact service-learning participation had on institutional outcomes including grade point average, completion, and graduation.
CHAPTER FOUR
RESULTS

Propensity score matching was used to explore service-learning and non-service-learning students and how their involvement in this type of experiential learning affected academic outcomes including grade point average, completion rates, and transferability. The use of propensity score matching allowed the researcher to create two balanced groups of students, the treatment and control groups, to better understand the impacts of service-learning coursework participation.

Chapter 4 provides the results for the study. In this chapter, there is an overview that describes the study followed by a description of the data analysis, a summary of the completion outcomes and findings, and the conclusion.

This study explores the use of propensity score matching as a tool to model the impact of enrolling in a service-learning course at a community college. The model is complex and utilizes a variety of covariates at student levels that in theory are related to the student outcomes and also to the probability that a student will choose to enroll in a service-learning course. The goal if propensity score matching was not to create groups that are equal across all independent variables, but to create a purposeful sample of students who are equivalent on average (Gelman & Hill, 2007). Propensity score matching allows the researcher to simplify the analysis by creating a one-number composite of all the covariates and then using the propensity score to match students. Propensity scores represent the
“conditional probability of a person being in one condition rather than another given a set of observed covariates used to predict a person’s condition” (Rosenbaum & Rubin, 1984, p. 4).

**Data Analysis**

The data analyses began with an examination of the student record data. Data was checked for missing values and outliers to confirm that the data were complete. Frequencies revealed that age was missing for 32 records; the missing values were replaced with the mean age so before and after tests yielded little differences between the results. After the data cleansing process, 26,336 student records were kept in the final data set. These 26,336 records included all students in the 2011–12 college dataset with an official grade in one or more credit bearing courses. A student was considered a service-learning student if enrolled in a service-learning class during the study period. In total, 735 (2.79%) of students in the dataset were identified as service-learning students and selected for potential inclusion in the study group.

The case sample dataset for the two groups of interest for this study was 26,336 students. The group dependent variable was coded as one for students who enrolled in at least one service-learning course and zero for students who did not enroll in a service-learning course. An initial descriptive examination of covariates indicated that the service-learning group differed from the potential control group among the covariates included in the model. The final analytical sample used in the propensity score model consisted of 26,336 students. Table 5 provides an overview of the demographics and covariates for each group prior to matching. African American students in the control group (33.02%, \( n = 8,454 \))
outnumbered those in the service-learning group (29.65%, n = 218). Service-learning students were less represented among male students (36.87%, n = 271) than control group students (44.14%, n = 11,303). The majority of students in the service-learning group (56.05%, n = 412) were pursuing non-transfer degrees while a smaller percentage of students in the control group (45.92%, n = 11,757) were pursuing non-transferring degrees. However, 59.59% (n = 458) of service-learning students were enrolled full-time compared to 37.45% (n = 9,589) of students in the control group. Service-learning students were less likely to be first time in college students (16.05%, n = 118) than non-service-learning students (24.88%, n = 6,369). Service-learning students (58.91%, n = 433) also entered the college late (> 24 years of age) compared to of students in the control group (53.74%, n = 13,759). Service-learning students received Pell awards at a higher percentage (48.84%, n = 359) compared to of students in the control group (43.48%, n = 11,131). Table 5 shows the demographic information for the students in the study database.
Table 5

**Descriptive Statistics for Treatment and Control Groups**

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Treatment (n = 735)</th>
<th>Control (n = 25,601)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Enrolled in Service-Learning Course</td>
<td>735</td>
<td>100%</td>
</tr>
<tr>
<td>American Indian</td>
<td>6</td>
<td>0%</td>
</tr>
<tr>
<td>Asian American</td>
<td>10</td>
<td>1.36%</td>
</tr>
<tr>
<td>African American</td>
<td>218</td>
<td>29.65%</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>52</td>
<td>7.07%</td>
</tr>
<tr>
<td>Non-Resident Alien</td>
<td>39</td>
<td>5.30%</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>19</td>
<td>2.59%</td>
</tr>
<tr>
<td>Other Race</td>
<td>40</td>
<td>5.44%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>351</td>
<td>47.76%</td>
</tr>
<tr>
<td>Male Gender</td>
<td>271</td>
<td>36.87%</td>
</tr>
<tr>
<td>Non-Transfer Program</td>
<td>412</td>
<td>56.05%</td>
</tr>
<tr>
<td>Age</td>
<td>735</td>
<td>100%</td>
</tr>
<tr>
<td>Pell Recipient</td>
<td>359</td>
<td>48.84%</td>
</tr>
<tr>
<td>Full-Time Enrollment</td>
<td>458</td>
<td>59.59%</td>
</tr>
<tr>
<td>Late Entry</td>
<td>433</td>
<td>58.91%</td>
</tr>
<tr>
<td>First Time in College</td>
<td>118</td>
<td>16.05%</td>
</tr>
<tr>
<td>Need Developmental Math</td>
<td>412</td>
<td>56.05%</td>
</tr>
<tr>
<td>Need Developmental English</td>
<td>210</td>
<td>28.57%</td>
</tr>
<tr>
<td>Need Developmental Reading</td>
<td>230</td>
<td>31.29%</td>
</tr>
</tbody>
</table>
After data exploration, the data analysis procedure began with running logit analyses on the selected independent variables in SPSS and estimating and testing propensity scores to be used in the final model. The logit analyses were executed in SPSS version 23 using the propensity score matching function. The SPSS function checked for propensity score balance, and the researcher was instructed to check the model if balanced propensity scores were not achieved.

Propensity scores ranged from 0.0 to 1.0 and these scores were used to match students from a database of a potential comparison group to produce a comparison group that was similar to the study group on the significant covariates. Propensity scores were assessed to ensure that the distributions were similar across the two groups and that outliers that could affect the analysis were not present in the propensity scores. Outliers were eliminated using a minima-maxima technique of common support. Common support implied that if propensity scores fell in the range of 0.14–0.94 for the study group and in the range of 0.09–0.79 for the comparison group, then the region of common support using minima-maxima criteria was defined as the interval 0.14–0.79. In no instance was the minimum or maximum value of the propensity score in one group and not present in another (Rojewski et al., 2009). The SPSS function allowed the researcher to select the tolerance level of common support of 0.05, ensuring adequate overlap between propensity scores in both groups (Leuven & Sianesi, 2003). The imposition of common support was used to ensure reasonable estimates of study effects and better-balanced matches (Caliendo & Kopeinig, 2008; Titus, 2007).
The researcher chose the most common matching algorithm used, which is nearest neighbor matching. Within nearest matching, a few options are available to researchers, specifically, matching with replacement and without replacement. “With replacement” means an individual is considered more than once in the matching procedure. Matching “without replacement” means, once matched, the case is removed from further consideration for matching. Both types of nearest neighbor matching affected the variance explained by the model and the bias on key indicators. Some of the analyses reported in this study were generated multiple times to test the effect of different matching algorithms; in general, the results were similar, but the best balance between variance and bias utilized the “with replacement” option. Matching can be thought of as a method of eliminating cases so that the remaining cases show good balance and overlap (Gelman & Hill, 2007). After the propensity scores were estimated, SPSS created the matched groups for the final analyses.

Logistic regression analyses were used to determine the background and factors that explain membership in the two groups of study and to create a propensity score that was used in the matching technique. Logistic stepwise regression yielded significant independent variables that predicted membership in the comparison or study groups (Rojewski et al., 2010). An analysis of Nagelkerke R-Squared, chi-squared, beta coefficients, and independent variables with \( p \) value \( \leq .05 \) indicated significant predictors and covariates that were retained in the model (Hair et al., 2010).

Logistic regression was conducted to determine which independent variables in the model were associated with the dependent variable—enrolling or not enrolling in a service-
learning course. Logistic regression results indicated that the overall model of five predictors (African American, male, enrolled in a non-transfer degree, enrolled full-time, and first time in college) were statistically reliable in predicting membership in the dependent variable (-2 Log Likelihood = -6403.62; chi-squared = 305.286, p< .001; Nagelkerke R Squared= .051).

The model correctly classified 97.2% of the cases and explained 5.1% of the variance in the dependent variable. Regression coefficients are presented in Table 6. Wald statistics indicated that five variables significantly predicted group membership in the dependent variable. Service-learning students were 20% less likely to be African American students, 40% less likely to be first time in college, and 30% less likely to be male. The odds of membership in a service-learning course were 3.07 (207% magnitude) times higher for full-time students, and the odds were 1.66 (67% magnitude) times higher that service-learning students were enrolled in non-degree programs. Table 6 shows the results of the logistic regression for all covariates in the study database.
Table 6

*Results of Logistic Regression Covariates in the Model*

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Beta</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian</td>
<td>0.599</td>
<td>0.429</td>
<td>1.948</td>
<td>1.000</td>
<td>0.163</td>
<td>1.821</td>
</tr>
<tr>
<td>Asian American</td>
<td>0.121</td>
<td>0.330</td>
<td>0.134</td>
<td>1.000</td>
<td>0.714</td>
<td>1.129</td>
</tr>
<tr>
<td>African American</td>
<td>-0.203</td>
<td>0.096</td>
<td>*4.443</td>
<td>1.000</td>
<td>0.035</td>
<td>0.816</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>-17.569</td>
<td>9920.707</td>
<td>0.000</td>
<td>1.000</td>
<td>0.999</td>
<td>0.000</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.061</td>
<td>0.154</td>
<td>0.157</td>
<td>1.000</td>
<td>0.692</td>
<td>0.941</td>
</tr>
<tr>
<td>Non-Resident Alien</td>
<td>0.023</td>
<td>0.175</td>
<td>0.017</td>
<td>1.000</td>
<td>0.898</td>
<td>1.023</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>-0.117</td>
<td>0.241</td>
<td>0.234</td>
<td>1.000</td>
<td>0.629</td>
<td>0.890</td>
</tr>
<tr>
<td>Other Race</td>
<td>0.223</td>
<td>0.172</td>
<td>1.677</td>
<td>1.000</td>
<td>0.195</td>
<td>1.249</td>
</tr>
<tr>
<td>Male Gender</td>
<td>-0.361</td>
<td>0.080</td>
<td>***20.494</td>
<td>1.000</td>
<td>0.000</td>
<td>0.697</td>
</tr>
<tr>
<td>Non-Transfer Program</td>
<td>0.477</td>
<td>0.082</td>
<td>***34.103</td>
<td>1.000</td>
<td>0.000</td>
<td>1.611</td>
</tr>
<tr>
<td>Age</td>
<td>0.004</td>
<td>0.005</td>
<td>0.661</td>
<td>1.000</td>
<td>0.416</td>
<td>1.004</td>
</tr>
<tr>
<td>Pell Recipient</td>
<td>0.053</td>
<td>0.086</td>
<td>0.386</td>
<td>1.000</td>
<td>0.534</td>
<td>1.055</td>
</tr>
<tr>
<td>Full-Time Enrollment</td>
<td>1.121</td>
<td>0.083</td>
<td>***182.956</td>
<td>1.000</td>
<td>0.000</td>
<td>3.068</td>
</tr>
<tr>
<td>Late Entry</td>
<td>0.119</td>
<td>0.109</td>
<td>1.185</td>
<td>1.000</td>
<td>0.276</td>
<td>1.126</td>
</tr>
<tr>
<td>First Time in College</td>
<td>-0.517</td>
<td>0.105</td>
<td>***24.364</td>
<td>1.000</td>
<td>0.000</td>
<td>0.596</td>
</tr>
<tr>
<td>Need Developmental Math</td>
<td>-0.036</td>
<td>0.086</td>
<td>0.179</td>
<td>1.000</td>
<td>0.673</td>
<td>0.964</td>
</tr>
<tr>
<td>Need Developmental English</td>
<td>-0.073</td>
<td>0.106</td>
<td>0.476</td>
<td>1.000</td>
<td>0.490</td>
<td>0.930</td>
</tr>
<tr>
<td>Need Developmental Reading</td>
<td>-0.080</td>
<td>0.104</td>
<td>0.583</td>
<td>1.000</td>
<td>0.445</td>
<td>0.924</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.185</td>
<td>0.160</td>
<td>680.334</td>
<td>1.000</td>
<td>0.000</td>
<td>0.015</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001, -2 Log Likelihood = 6403.62, chi-squared = 305.286, p < .001, Nagelkerke R squared = .051, 97.2% Predicted Correctly
To further analyze whether there was a difference in demographics characteristics of the two study groups prior to propensity score matching, F-tests were provided and analyzed. Means, standard deviation, significance levels, F-values and Cohen’s d (effect size) were reported using analyses of variance analyses (ANOVAs). Bias percentages (standardized effect sizes) before and after matching were also reported (Oakes & Johnson, 2006). The standardized percent bias is the percent difference of the sample means in the treated and non-treated (full or matched) sub-samples as a percentage of the square root of the average of the sample variances in the treated and non-treated groups (Rosenbaum & Rubin, 1985). Given the number of students in the initial sample, significance levels in ANOVA analyses were less reliable than effect sizes as indicated in Cohen’s d and in reported biased predictors (Rojewski et al., 2010).

The model examined the student demographics of gender, age, race, transfer goals, enrollment status, Pell recipient status, and the need to take remedial courses. The initial F-tests yielded significant differences in gender, $F(26,334) = 15.379, p < .001$; non-transfer program, $F(26,334) = 29.531, p < .001$; age, $F(26,334) = 7.117, p < .01$; full-time enrollment, $F(26,334) = 188.424, p < .001$; late entry, $F(26,334) = 7.68, p < .001$; and first time in college, $F(26,334) = 29.995, p < .001$. The results also indicated that students needing developmental English or reading differed significantly, $F(26,334) = 3.924, p < .05$ and $F(26,334) = 3.097, p < .05$ respectively. Given the probability of large sample size influence, Cohen’s $d$ (Korendijk, Hox, Moerbeek, & Maas, 2011) provided effect sizes of the significant covariates. The results indicated that effect sizes were moderate for male gender.
(-.143), non-transfer programs (.201), and first time in college (.224). The largest effect size was strong for students enrolled full-time (.516).

After matching, the results indicated that only one predictor, late entry, was statistically different between the two groups, $F(1,468) = 4.155, p < .05$ with an effect size of -0.103 yielding 10.3% bias between the two groups. In short, the model achieved good balance. Caliendo and Kopeinig (2008) recommended that, after matching, predictors should yield 5% or less bias. One predictor met this criteria of bias ≤ 5%. Gelman and Hill (2007) contended that the goal of propensity matching is to achieve equivalent groups on average of students in both the study and comparison groups. The matching procedure matched all 735 students in the service-learning group with a student in the control group; the overall matching procedure was successful in creating a purposeful sample of students in the treatment group who were not significantly different from students in the control group. No cases in the treatment group were discarded during the matching procedure. In summary, differences between the two groups in subsequent analyses can be attributed to the service-learning experience and not to differences in students’ demographics and other pre-treatment characteristics. Tables 7 and 8 reflect the group mean characteristics of covariates before and after propensity matching.
Table 7

**Group Mean Characteristics of Covariates Before Propensity Matching**

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Treatment ($n = 735$)</th>
<th>Control ($n = 25,601$)</th>
<th>$F$</th>
<th>$p$</th>
<th>$d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>$N$</td>
<td>$M$</td>
<td>$SD$</td>
<td>$N$</td>
<td>$M$</td>
</tr>
<tr>
<td>American Indian</td>
<td>735</td>
<td>.008</td>
<td>.090</td>
<td>25,601</td>
<td>.004</td>
</tr>
<tr>
<td>Asian American</td>
<td>735</td>
<td>.013</td>
<td>.115</td>
<td>25,601</td>
<td>.012</td>
</tr>
<tr>
<td>African American</td>
<td>735</td>
<td>.296</td>
<td>.457</td>
<td>25,601</td>
<td>.330</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>735</td>
<td>.000</td>
<td>.000</td>
<td>25,601</td>
<td>.000</td>
</tr>
<tr>
<td>Hispanic</td>
<td>735</td>
<td>.070</td>
<td>.256</td>
<td>25,601</td>
<td>.075</td>
</tr>
<tr>
<td>Non-Resident Alien</td>
<td>735</td>
<td>.053</td>
<td>.224</td>
<td>25,601</td>
<td>.043</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>735</td>
<td>.025</td>
<td>.158</td>
<td>25,601</td>
<td>.029</td>
</tr>
<tr>
<td>Other Race</td>
<td>735</td>
<td>.054</td>
<td>.227</td>
<td>25,601</td>
<td>.044</td>
</tr>
<tr>
<td>Caucasian</td>
<td>735</td>
<td>.477</td>
<td>.499</td>
<td>25,601</td>
<td>.460</td>
</tr>
<tr>
<td>Male Gender</td>
<td>735</td>
<td>.370</td>
<td>.483</td>
<td>25,601</td>
<td>.440</td>
</tr>
<tr>
<td>Non-Transfer Program</td>
<td>735</td>
<td>.560</td>
<td>.497</td>
<td>25,601</td>
<td>.460</td>
</tr>
<tr>
<td>Age</td>
<td>735</td>
<td>29.555</td>
<td>10.893</td>
<td>25,601</td>
<td>28.486</td>
</tr>
<tr>
<td>Pell Recipient</td>
<td>735</td>
<td>.490</td>
<td>.500</td>
<td>25,601</td>
<td>.430</td>
</tr>
<tr>
<td>Full-Time Enrollment</td>
<td>735</td>
<td>.620</td>
<td>.485</td>
<td>25,601</td>
<td>.370</td>
</tr>
<tr>
<td>Late Entry</td>
<td>735</td>
<td>.590</td>
<td>.492</td>
<td>25,601</td>
<td>.540</td>
</tr>
<tr>
<td>First Time in College</td>
<td>735</td>
<td>.160</td>
<td>.367</td>
<td>25,601</td>
<td>.250</td>
</tr>
<tr>
<td>Need Developmental Math</td>
<td>735</td>
<td>.560</td>
<td>.496</td>
<td>25,601</td>
<td>.576</td>
</tr>
<tr>
<td>Need Developmental English</td>
<td>735</td>
<td>.285</td>
<td>.452</td>
<td>25,601</td>
<td>.320</td>
</tr>
<tr>
<td>Need Developmental Reading</td>
<td>735</td>
<td>.313</td>
<td>.464</td>
<td>25,601</td>
<td>.348</td>
</tr>
</tbody>
</table>

* $p < .05$. ** $p < .01$. *** $p < .001$. 735$^a$ = 735 $n$, 25601$^b$ = 25,601 $n$. $^c d = \frac{M_t - M_c}{\sigma_{pooled}}$, where $\sigma_{pooled} = \sqrt{\sigma^2_t + \sigma^2_c / 2}$

Davis’s (1971) descriptors for effect size .01 to .09 – negligible, .10 to .29 low association, .30 to 49 – moderate associate, .50 to .69 substantial associate, .70 to higher – very strong association
Figure 4. Percentage share (bound by 0–100%) of the sum of each covariate mean for treatment and control group across characteristics of covariates (ethnicity, program type, age, Pell recipient, enrollment status, and developmental course needs) before propensity matching. In this example, the percentages demonstrate that the two group means are not equally balanced among the covariates in each group. The goal of matching is to yield equal 50/50 percentages for each category between both groups.
### Table 8

**Group Mean Characteristics of Covariates After Propensity Matching**

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Treatment (n = 735)</th>
<th>Control (n = 735)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>American Indian</td>
<td>735</td>
<td>.008</td>
<td>.090</td>
<td>735</td>
<td>.009</td>
<td>.098</td>
</tr>
<tr>
<td>Asian American</td>
<td>735</td>
<td>.013</td>
<td>.115</td>
<td>735</td>
<td>.017</td>
<td>.132</td>
</tr>
<tr>
<td>African American</td>
<td>735</td>
<td>.296</td>
<td>.457</td>
<td>735</td>
<td>.309</td>
<td>.462</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>735</td>
<td>.000</td>
<td>.000</td>
<td>735</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Hispanic</td>
<td>735</td>
<td>.070</td>
<td>.256</td>
<td>735</td>
<td>.072</td>
<td>.259</td>
</tr>
<tr>
<td>Non-Resident Alien</td>
<td>735</td>
<td>.053</td>
<td>.224</td>
<td>735</td>
<td>.053</td>
<td>.224</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>735</td>
<td>.025</td>
<td>.158</td>
<td>735</td>
<td>.022</td>
<td>.146</td>
</tr>
<tr>
<td>Other Race</td>
<td>735</td>
<td>.054</td>
<td>.227</td>
<td>735</td>
<td>.042</td>
<td>.201</td>
</tr>
<tr>
<td>Caucasian</td>
<td>735</td>
<td>.477</td>
<td>.499</td>
<td>735</td>
<td>.460</td>
<td>.498</td>
</tr>
<tr>
<td>Male Gender</td>
<td>735</td>
<td>.370</td>
<td>.483</td>
<td>735</td>
<td>.360</td>
<td>.480</td>
</tr>
<tr>
<td>Non-Transfer Program</td>
<td>735</td>
<td>.560</td>
<td>.497</td>
<td>735</td>
<td>.580</td>
<td>.494</td>
</tr>
<tr>
<td>Age</td>
<td>735</td>
<td>29.555</td>
<td>10.893</td>
<td>735</td>
<td>30.548</td>
<td>11.284</td>
</tr>
<tr>
<td>Pell Recipient</td>
<td>735</td>
<td>.490</td>
<td>.500</td>
<td>735</td>
<td>.510</td>
<td>.500</td>
</tr>
<tr>
<td>Full-Time Enrollment</td>
<td>735</td>
<td>.620</td>
<td>.485</td>
<td>735</td>
<td>.580</td>
<td>.494</td>
</tr>
<tr>
<td>Late Entry</td>
<td>735</td>
<td>.590</td>
<td>.492</td>
<td>735</td>
<td>.640</td>
<td>.480</td>
</tr>
<tr>
<td>First Time in College</td>
<td>735</td>
<td>.160</td>
<td>.367</td>
<td>735</td>
<td>.160</td>
<td>.369</td>
</tr>
<tr>
<td>Need Developmental Math</td>
<td>735</td>
<td>.560</td>
<td>.496</td>
<td>735</td>
<td>.586</td>
<td>.493</td>
</tr>
<tr>
<td>Need Developmental English</td>
<td>735</td>
<td>.285</td>
<td>.452</td>
<td>735</td>
<td>.264</td>
<td>.441</td>
</tr>
<tr>
<td>Need Developmental Reading</td>
<td>735</td>
<td>.313</td>
<td>.464</td>
<td>735</td>
<td>.312</td>
<td>.463</td>
</tr>
</tbody>
</table>

Note: *p < .05. **p < .01. ***p < .001. 735^n. 735^N. of pooled; 2

Davis's (1971) descriptors for effect size .01 to .09 – negligible, .10 to .29 low association, .30 to .49 – moderate associate, .50 to .69 substantial associate, .70 to higher – very strong association.
Figure 5. Percentage share (bound by 0–100%) of the sum of each covariate mean for treatment and control group across characteristics of covariates (ethnicity, program type, age, Pell recipient, enrollment status, and developmental course needs) after propensity matching. In this example, the percentages demonstrate that after matching the two group means are more equally balanced among the covariates in each group. The goal of matching is to yield equal 50/50 percentages for each category between both groups.
Four-Year Outcomes

After matching, four-year outcomes were analyzed and reported for each group in order to determine the effect of enrolling in a service-learning course while pursuing a degree at the community college. Table 9 shows that the outcomes of students in the cohort that experienced service-learning courses were significantly different in college level credits attempted, $F(1,468) = 37.096, p < .001$; college level credits completed, $F(1,468) = 43.791, p < .001$; and college level credits completed with C or better, $F(1,468) = 36.522, p < .001$ with moderate effects sizes of .319, .349, and .327 respectively. There were also significant average mean differences between first term grade point average, 3.07 for the service-learning group versus 2.73 for the control group. Final grade point averages were higher for the study group, an average of 2.99 compared to 2.67 for the control group with moderate effect sizes of .385 and .380, respectively. On average, students who experienced a service-learning course experienced positive effects in college level outcomes by earning seven more college credits than students in the comparison group as well as earning higher average first-term and final grade point averages than students in the comparison group. Table 9 shows the results of the ANOVAs of the treatment and control groups after propensity matching.
Table 9

*Outcomes for ANOVAs of Treatment and Control Groups After Propensity Matching*

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Treatment</th>
<th>Control</th>
<th>F</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
</tr>
<tr>
<td>College Credits Attempted</td>
<td>735</td>
<td>37.140</td>
<td>20.989</td>
<td>716</td>
<td>30.120</td>
</tr>
<tr>
<td>College Credits Completed</td>
<td>733</td>
<td>35.500</td>
<td>20.200</td>
<td>696</td>
<td>28.130</td>
</tr>
<tr>
<td>College Credits A–C Grades</td>
<td>726</td>
<td>31.430</td>
<td>19.096</td>
<td>635</td>
<td>24.960</td>
</tr>
<tr>
<td>College Math Credits Attempted</td>
<td>314</td>
<td>5.460</td>
<td>3.602</td>
<td>226</td>
<td>5.410</td>
</tr>
<tr>
<td>College Math Credits Completed</td>
<td>306</td>
<td>5.180</td>
<td>3.316</td>
<td>209</td>
<td>4.910</td>
</tr>
<tr>
<td>College Math Credits A–C Grades</td>
<td>268</td>
<td>4.500</td>
<td>2.430</td>
<td>173</td>
<td>4.370</td>
</tr>
<tr>
<td>College English Credits Attempted</td>
<td>291</td>
<td>4.820</td>
<td>2.153</td>
<td>318</td>
<td>5.180</td>
</tr>
<tr>
<td>College English Credits Completed</td>
<td>285</td>
<td>4.670</td>
<td>1.985</td>
<td>305</td>
<td>4.850</td>
</tr>
<tr>
<td>College English Credits A–C Grades</td>
<td>271</td>
<td>4.370</td>
<td>1.666</td>
<td>260</td>
<td>4.220</td>
</tr>
<tr>
<td>College Service-learning Credits Attempted</td>
<td>735</td>
<td>4.030</td>
<td>2.118</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>College Service-learning Credits Completed</td>
<td>728</td>
<td>4.040</td>
<td>2.112</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>College Service-learning A–C Grades</td>
<td>735</td>
<td>4.050</td>
<td>2.166</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>First Term GPA</td>
<td>735</td>
<td>3.076</td>
<td>.712</td>
<td>735</td>
<td>2.730</td>
</tr>
<tr>
<td>Last Term GPA</td>
<td>735</td>
<td>2.992</td>
<td>.662</td>
<td>735</td>
<td>2.673</td>
</tr>
</tbody>
</table>

Note. Davis’s (1971) descriptors for effect size .01 to .09 – negligible, .10 to .29 low association, .30 to 49 – moderate associate, .50 to .69 substantial associate, .70 to higher – very strong association

$d = M_t - M_c / \sigma_{pooled}$; where $\sigma_{pooled} = \sqrt{\frac{\sigma_t^2 + \sigma_c^2}{2}}$

*p < .05. **p < .01. ***p < .001
Figure 6. Comparison of average college credits attempted, college math credits attempted, and college English credits attempted for students in the treatment (service-learning) and control (no service-learning) groups.
Figure 7. Comparison of average college credits completed, college math credits completed, and college English credits completed for students in the treatment (service-learning) and control (no service-learning) groups.
Figure 8. Comparison of average college credits A–C grades, college math credits A–C grades, and college English credits A–C grades for students in the treatment (service-learning) and control (no service-learning) groups.
Completion outcomes were categorical and a chi-square analysis was used to determine the service-learning program impact between the two study groups. Table 10 shows that students in the treatment group earned a higher percentage of associate degrees (38.60%, n = 284) than students in the comparison group (18.20%, n = 134). In addition, students in the service-learning group transferred to a four-year institution at higher rates (13.50%, n = 100) than the comparison group (8.40%, n = 62) while transfers to two-year institutions were higher among the comparison group (5.40%, n = 40) versus the service-learning group (2.60%, n = 19).
Overall, the results indicated a significant chi-squared of 105.620, $p < .001$. Cramér’s V is an indication of the strength of the association between the proportions of categorical outcomes examined and the expected values of those proportions and Cramér’s V was moderate (0.268).

Table 10

*Chi-Square Results for Educational Completion Outcomes in Two Study Groups after Matching*

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Treatment</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N$</td>
<td>$%$</td>
<td>$N$</td>
</tr>
<tr>
<td>Not Enrolled</td>
<td>311</td>
<td>42.30%</td>
<td>472</td>
</tr>
<tr>
<td>Associate</td>
<td>284</td>
<td>38.60%</td>
<td>134</td>
</tr>
<tr>
<td>Transfer 2 Year</td>
<td>19</td>
<td>2.60%</td>
<td>40</td>
</tr>
<tr>
<td>Transfer 4 Year</td>
<td>100</td>
<td>13.60%</td>
<td>62</td>
</tr>
<tr>
<td>Diploma</td>
<td>3</td>
<td>0.40%</td>
<td>8</td>
</tr>
<tr>
<td>Certificate</td>
<td>18</td>
<td>2.40%</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>735</td>
<td>50.00%</td>
<td>735</td>
</tr>
</tbody>
</table>

Note. Alpha = 0.050, Chi-Squared = 105.620, Degrees of Freedom = 5, $p$ value < .001, Cramér’s V = 0.268
Figure 10. Comparison of educational outcomes for students in the treatment (service-learning) and control (no service-learning) groups.
Summary

Chapter 4 presents the results of the study utilizing propensity score matching to determine how students who participated in service-learning and students who did not differed in terms of educational outcomes as measured by GPA, completion, and transferability. Prior to matching, the major of individuals in the treatment group were Caucasian females, enrolled full-time, and were late entry students.

The logistic regression model provided a good fit in determining that five variables (coded as African American, male, enrolled in a non-transfer degree, enrolled full-time, and first time in college) were statically reliable in predicting membership in the dependent variable (participation or non-participation in service-learning. Before matching, service-learning students were 20% less likely to be African American students, 40% less likely to be first time in college, and 30% less likely to be male. After matching there were no statistical differences in the demographics and covariates between the groups except that those who participated in service-learning were more likely to be late entry students.

The study results provided evidence that those who participated in service-learning coursework attempted and completed more credits than their counterparts, had more college credits with A–C grades, had higher grade point averages in their first and last terms, and were more likely to stay enrolled. The students in the two groups did not have a difference between math and English credits attempted, completed, or grades in math or English of A–C. The group that participated in service-learning had a higher percentage of students that completed the associate degree, fewer students that transferred to other community colleges,
and more students that transferred to a four-year program. The diploma and certificate students were a very small sample that did not provide enough data for generalizations.
CHAPTER FIVE  
DISCUSSION  

The final chapter provides conclusions, a discussion of the findings, and recommendations for future research and practice. The conclusions and discussion are organized by the research questions. The chapter concludes with a review of the limitations of the study, recommendations for future research, and impacts of practice in community college and higher education, and conclusions.

Service-learning continues to grow and spread across higher education in all fields of academia (Barnett, 1996). This trend makes understanding the impacts of service-learning participation on student outcomes even more vital to understanding how colleges and universities should be investing in the support of service-learning to increase the integration of this teaching tool widely in college curriculum:

Experiential learning and learning-centered approaches to instruction have received increased attention in higher education. A service learning program can facilitate both of these activities simultaneously if properly designed and evaluated. Allowing students to make their own choices offers them freedom and control, which may improve their college learning experience and better prepare them for entry-level positions. Service learning opportunities may also help students' marketability by providing unique opportunities to develop skills and gain knowledge through civic engagement. The role of service learning in higher education has increased. A national report estimated that 24.8% of college students were volunteers in 2007, and
a 2010–2011 survey reported that 37% of students engaged in service learning at 
Campus Compact-participating institutions. The estimated value of service learning 
according to the Campus Compact report increased from $5.7 billion in 2008 to $9.1 

The primary purpose of this study was to examine how participation in service-
learning courses impacted student outcomes, specifically, course completion rates, credit 
hour completion rates, term-to-term retention, fall-to-fall retention, credential completion, 
and successful transfers. Secondarily the study determined if there was a significant 
difference in demographics of those who have participated and those who have not 
participated in service-learning courses.

Although there is much research on service-learning benefits for student participants, 
the research shows a gap in examining the student outcomes at community colleges. Prior to 
the study, an exhaustive review of the literature pertaining to the research was discussed, and 
thetical and conceptual frameworks supporting the research were also shared. The 
quantitative methodology used in this specific study was propensity score matching. 
Propensity score matching usage, analysis, and interpretation was shared and a 
prehensive analysis of the collected data was discussed. This chapter outlines the major 
findings of the study, provides a discussion on the limitations, and shares recommendations 
based off of the findings.
Conclusions and Discussion

For this study, research questions were developed to guide the study in determining what data and information were the most important throughout the study. The research questions focused on demographic and academic characteristics of the students who did and did not participate in service-learning coursework. The findings of the research questions provided the researcher with an understanding of how service-learning participation affected student success outcomes of grade point average, transferability, and completion rates.

Research Question 1

Research Question 1 sought to describe the demographics and academic characteristics of the complete population of students that have participated and not participated in service-learning coursework in 2011–2012. Records of 26,336 students were utilized in this study with 735 (2.79%) of the students in the dataset identified as service-learning students. Both the treatment and the control groups for this study consisted of a larger number of female students. Caucasian students were the most represented in the study; African American and Hispanic students had the second and third most representation respectively.

The students who made up the sample for this study were a strong representation of the demographic make-up of this community college and the surrounding community. According to the United States Census Bureau (2014), the demographic make-up of the surrounding urban community where the community college is located is 50% Caucasian,
35% African-American, 13% Hispanic, and 2% Other. Women made up most of the overall community population, and represented 51% of the entire population.

The entire student body at the study’s community college also had similar demographics. At this institution in 2011–2012, the total student body was 52% female; 47% Caucasian, 32% African American, 10% Hispanic, and 11% Other (Central Piedmont Community College, n.d.). The American Association of Community Colleges’ data from community colleges across the United States also support that this representation of the student population for this data is a solid representation of community college students across the country. The total community college student population is 52% African American, 21% Caucasian, 21% Asian/Pacific Islander, 2% Hispanic, and 4% Other. The majority (60%) of enrolled community college students are female, and 61% of the total community college student population are part-time community college students.

**Research Questions 2 and 3**

Research Question 2 sought to describe the demographics and academic characteristics of those that participated in service-learning and those that did not participate in service-learning in 2011–2012 and then Research Question 3 built upon this question to examine if there was a difference in demographics and academic characteristics of students that participated and did not participate in service-learning.

The students in the study were described by the following demographics:

- Service-learning students were less likely to be African American (29.65%, \(n = 218\)) than students in the control group (33.02%, \(n = 8,454\)).
• Service-learning students were more likely to be male (36.87%, \(n = 271\)) than students in the control group (44.14%, \(n = 11,303\)).

• Service-learning students were pursuing non-transfer degrees at a higher rate (56.05%, \(n = 412\)) than students in the control group (45.92%, \(n = 11,757\)).

• Service-learning students were enrolled full-time at a higher rate (59.59%, \(n = 458\)) compared to students in the control group (37.45%, \(n = 9,589\)).

• Service-learning students were less likely to be in college for the first time (16.05%, \(n = 118\)) than non-service-learning students (24.88%, \(n = 6,369\)).

• Service-learning students entered college late at a higher rate (58.91%, \(n = 433\)) compared to students in the control group (53.74%, \(n = 13,759\)).

• Service-learning students received Pell awards at a higher rate (48.84%, \(n = 359\)) compared to students in the control group (43.48%, \(n = 11,131\)) (see Table 5).

Research suggests that women are more likely to participate in a broad range of service-learning as compared to men:

Having more females involved in service-learning opportunities is thought to be due in part that women are believed to have a greater affinity for service work and preparation for service orientated careers, and that women traditionally have a greater openness to non-traditional educational programs. (Chesler & Vasques Scalera, 2000, p. 20)

This study revealed this to be true of the demographics in the study school as well.
Research has also noted that more Caucasian students participate in service-learning across the United States than those of other races and ethnicities. This was the case for the current study. Service-learning research has explored why this is and has concluded that it is due, in part, to privilege, time, and access:

White and middle class students disproportionately elect to participate in community service-learning...students of relatively privileged backgrounds may more often have the time and energy available in time-consuming alternatives to traditional coursework (students from less wealthy backgrounds may have to work for wages in their non-class hours in order to afford the costs of higher education); some students of color may be reluctant to engage in community programs led by white faculty/staff and white institutions; and, students of color may have other options available for community service interests, options organized outside the educational system via local churches and agencies. (Chesler & Vasques Scalera, 2000, p. 20)

Since the study found there were impacts on student outcomes, it is important to examine these demographics to ensure equity and accessibility of the service-learning curriculum for all students. The research results validate the importance of finding more service-learning opportunities for the following demographics: minority students, men, non-transfer students, and those enrolled in college level coursework for the first time.

**Research Question 4**

Research Question 4 sought to examine if there were differences in demographics and academic characteristics of the two groups after propensity score matching. The only
difference after matching was that there were more individuals identified as late-entry (those who started school after age 24) in the control group. There were fewer individuals that started school after age 24 in the service-learning group. However, according to Davis’s (1971) descriptors, the effect size would interpret the difference as a low association (Kotrlik, Williams, & Jabor, 2011).

This is consistent with the literature that provides evidence that more traditional aged students participate in service-learning. Research has suggested that service-learning programs often do not meet the needs of nontraditional (late entry) students, as most service-learning efforts target traditional aged, inexperienced, unemployed, full-time students (Largent, 2013).

While study specifically related to service-learning among nontraditional students is limited, there is much research related to nontraditional students in other areas within the higher education environment. Late entry students are found to need flexibility, opportunities for application of material, and encouragement to connect their learning to previous experiences. Research has also discovered that late entry students “embraced learning for learning’s sake, had higher grade point averages, and were more likely to cope with stress by being more task focused than their traditional age counterparts” (Largent, 2013, p. 310).

**Research Question 5**

Research Question 5 sought to determine if there were differences between the students that participated in service-learning in 2011–2012 and those that did not in terms of
college outcomes as measured by course completion, grade point average, and successful transfer rate after propensity score matching. The students that completed service-learning coursework attempted and completed more credits than their counterparts. The students that participated in service-learning had more college credits with grades of A–C. Overall the grade point averages of the students that participated in service-learning were higher in their first and last terms than those of the students in the control group. The students in the two groups did not have a difference between math and English credits attempted or completed or in their rate of receiving grades of A–C in math or English. The service-learning students were also more likely to stay enrolled. The service-learning group had a higher percentage of students that completed the associate degree, fewer students that transferred to other community colleges, and more students that transferred to a four-year program. The diploma and certificate students had a very small sample that does not provide enough data for generalizations.

**Recommendations for Practice, Research, and Theory**

Understanding the future directions of service-learning in curriculum is vital to ensuring continuous support for and encouraging student involvement in service-learning. This study highlights the importance of service-learning participation and the impact it had on grade point average, transferability, and course completion. This study also revealed that not all students are benefitting from service-learning coursework and showed the importance of making service-learning coursework accessible to all community college students. Service-learning faculty, college administrations, and other practitioners with need to focus
on the future of service-learning and develop practices that work best for their students and instructors, while creating opportunities that encourage assessment and research on the current data. Continuing research regarding all facets of service-learning is crucial, but quantitative studies that demonstrate the effectiveness of service-learning coursework are vital to the growth and incorporation of service-learning.

**Recommendations for Practice**

Recommendations for practice include requiring service-learning coursework in the curriculum for all higher education students, focusing more on minority and special student populations, and creating a nation-wide tracking system to promote further research in service-learning and to assist students’ marketability after community college.

**Recommendation 1.** Furco and Miller (2009), describe the goal of engaged colleges and universities as working “synergistically to build and sustain an institutional culture in which community-engaged research, teaching, and public service are valued to the extent that they become fully infused within the academic fabric” (p. 47). The literature review and findings of this study both show the benefits of service-learning participation at the community college level. In order to encourage student learning at a deeper level and produce students who are academically engaged, earn better grades, and have a higher likelihood at over all collegiate success, higher education institutions should implement service-learning curriculum requirements.

In the study, service-learning students completed more credit hours, completed more college credits with grades of A–C, had higher grade point averages overall than students
who did not participate in service-learning. They were also more likely to stay enrolled, complete associate’s degrees, less likely to transfer to another community college, and more likely to transfer to a four-year program. Requiring a service-learning component for all college students will create an equal environment that encourages all students to achieve the same levels of success in grade point average, transferability, and completion.

With this recommendation comes many benefits for students, however, it is important to remember that faculty are on the front lines of implementing service-learning coursework. Service-learning instructors often go above and beyond their job descriptions in order to provide their students with meaningful service-learning experiences, assisting students in making connections and developing reflections that blend service experiences and in-classroom instruction (Mintz & Abramovita, 2004).

According to Zlotkowski et al. (2004), faculty culture, attitude, and involvement in service-learning can help or hinder service-learning efforts. By providing detailed trainings, curriculum examples, and guidelines for faculty, service-learning departments can help programs achieve greater success and faculty buy-in. The best practices for educating, developing, and retaining service-learning faculty need to be implemented when developing a required service-learning curriculum. Zlotkowski et al. identified the best practices for faculty retention and development:

- Centralize faculty development resources and build engagement into development efforts.
• Create a culture of service through hiring and buy-in from key academic administrators.
• Provide on-campus training and incentives for participation.
• Actively recruit adjunct faculty to participate in community-related activities.
• Seek external funding to support engagement efforts.
• Document results to justify resource allocations.
• Provide faculty with in-house opportunities to become familiar with teaching methods and practices related to service-learning.
• Develop mechanisms to help faculty mentor and support each other in learning to design and implement service-learning courses.
• Enhance their ability to offer quality service-learning courses, faculty have access to curriculum development grants, reductions in teaching loads, and/or travel grants to attend regional and national conferences focused on engaged work. (p. 43)

In order to create mandatory service-learning curriculum components, service-learning requirements must be clear and integrated into the curriculum. In order to incorporate service-learning into the curriculum smoothly, guided pathways should be implemented. The Community College Research Center (2015), shared the structure and reasoning behind what the creation of the guided pathway program:

The idea behind guided pathways is straightforward. College students are more likely to complete a degree in a timely fashion if they choose a program and develop an
academic plan early on, have a clear road map of the courses they need to take to complete a credential, and receive guidance and support to help them stay on plan. However, most community colleges, rather than offering structured pathways to a degree, operate on a self-service or “cafeteria” model, allowing students to choose from an abundance of disconnected courses, programs, and support services. Students often have difficulty navigating these choices and end up making poor decisions about what program to enter, what courses to take, and when to seek help. Many drop out of college altogether….To address this problem, a growing number of community colleges and four-year universities are adopting a guided pathways approach, which presents courses in the context of highly structured, educationally coherent program maps that align with students’ goals for careers and further education. Incoming students are given support to explore careers, choose a program of study, and develop an academic plan based on program maps created by faculty and advisors. This approach simplifies student decision-making and allows colleges to provide predictable schedules and frequent feedback so students can complete programs more efficiently. (p. 1)

Incorporating required service-learning directly into the curriculum students must persist through makes it easy and consistent for all students going through their chosen majors.

The final recommendation for making service-learning a required component of the curriculum is to outline specific goals and identify desired student outcomes. Service-learning departments and faculty alike need to work together to create feasible academic
outcomes for all students across the curriculum that also support the college’s mission and core competencies. By being detailed and specific in goals and outcomes, measuring and understanding student achievement through service-learning participation and addressing areas of weakness to suit the needs of the service-learning curriculum become much easier.

Assessment is vital to achieving goals and outcomes, so developing a tool that is proactive in measuring student’s success is important as well:

Conducting systematic scientific research with meaningful indicators of educational outcomes represents public, peer-reviewed, and replicable type of information gathering that is important for increasing confidence among practitioners, providing a justification to those in positions to support the expansion and recognition of service-learning, and developing theory to enhance our understanding of practice. (Bringle & Hatcher, 2000, p. 68)

**Recommendation 2.** Adding to the first recommendation for future practice, the researcher also recommends providing a more inclusive service-learning curriculum as a vital component in creating campus-wide success for all students. This study revealed that there was a lack of participation from minority students; current research supports this finding. This is an issue for all of higher education, but especially for community colleges where student population demographics represent the diversity of their local communities. Knowing this, it would be a mistake not to target minority students in service-learning curriculums when the benefits of participation are clear.
With African American, Hispanic, Asian American, and other minorities making up roughly 50% of community college environments, neglecting them within the service-learning dialogue is irresponsible:

We must continue to pay special attention to the dynamics of race and gender in service-learning. Not only for its own sake, but because advances in this arena will have implications for understanding and resolving issues of institutional racism and sexism (and classism, etc.) that trouble all our higher educational organizations and all our local communities and agencies. (Chesler & Vasques Scalara, 2000, p. 26)

Providing a more intentional approach to recruiting minority students to participate in service-learning will foster a classroom environment where the lessons shared among peers will be more insightful and the experiences will be richer and more robust, allowing for increased learning, especially in the areas of social change and global learning.

Another population that community colleges should begin paying more attention to in the area of service-learning is the virtual student. This topic may be the most researched and studied trend in service-learning at the moment, with the popularity on online learning increasing. The virtual student is enrolled at the community college yet completes all courses online and may never set foot on the physical campus. Once known as “Distance Education,” online learning description have shifted to incorporating terminology associated with virtual communities to make these spaces more inclusive and to make campus resources available to all students (Jacoby et al., 2009)
Similar to most community colleges in the country right now, the community college in this study has experienced a consistent annual increase in their virtual campus community, making it necessary to determine how to best involve these students in all facets of campus life. Service-learning departments need to work on developing and implementing easy strategies for instructors to include service-learning components student can complete in locations removed from. The service-learning completed for these courses needs to have a direct correlation to the course content and include reflection and reciprocity components.

Some examples of potential service-learning projects include developing a brochure for an assisted living facility that synthesizes how to use different components of Microsoft Office or an Apple device for computer software courses; producing educational videos about the importance of customer service skills in certain areas of study at the college for theatre courses; and creating a deliverable that talks about the importance of flu vaccinations to be utilized at free health screenings in the community for healthcare courses. These examples are only the beginning of creating an important virtual service-learning program that is inclusive of all community college students.

Research shows that participating in service-learning coursework it is vital to all students’ success, which means offering access to these programs to all students should be a priority for community colleges seeking inclusivity.

**Recommendation 3.** The final recommendation for this study is to develop and utilize a system that allows for easy collection and tracking of student outcomes and data through their service-learning participation. Creating a database for this information will
allow for more consistent analysis to take place on effects of service-learning participation based off of all considered factors. If community colleges invest in software to track student service-learning participation, more students will have access to a transcript that documents their service-learning involvement. Transcripts such as these demonstrate to admissions departments and potential employers that student has been engaged in the community and developed skills that are a direct result of service-learning participation. Tracking service-learning efforts is crucial in furthering service-learning research and demonstrating the effectiveness of the teaching tool across all curriculums.

Most institutions track their own data in-house within their institutional research departments. These data can be obtained and accessed through IRB processes, yet may not be available to the greater higher education community. Developing a nation-wide database for service-learning faculty and departments to share their data could create more excitement for and continued acceptance of this teaching method, continue the growth of and implementation in course curriculums, and provide an easier way of gathering and capturing data for those who wish to continue research similar to this study on a larger scale.

Of course, this recommendation brings about its own sets of challenges including financial burdens, FERPA regulations for protecting student identity, and security. Two of the service-learning databases that already exist to house some of this data include the National Center for Service and Leadership and the Campus Compact National Service-learning Clearinghouse. A database for all researchers and practitioners to access with ease could create the opportunity for more service-learning research focusing on the quantitative
results of service-learning participation including completion of academic outcomes and providing evidence of support for the college’s core competencies.

Providing students with records of their service-learning participation allows them the opportunity to show potential employers what they have accomplished and may, in turn, increase their marketability. In recent years, employers have begun recognizing the significant positive impacts service-learning experiences have on new hires (Matthews, Dorfman, & Wu, 2015). By maintaining a systematic approach to tracking service-learning and providing documentation for students to include with a resume or application upon request, institutions of higher education can provide an opportunity for students to demonstrate their involvement and perhaps make them more marketable to potential employers. Some institutions also provide incentive for students who complete a certain number of curriculum-based service-learning hours. Examples of possible incentives include graduation regalia, student scholarship opportunities, invitations to networking functions, and college-wide recognition (Zlotkowski et. al., 2014). Including students in the service-learning journey by fostering a positive feedback system, could increase student participation, leading to more instances of completed academic goals and outcomes.

**Implications for Practice**

Researchers acknowledge the limitations of comparing student performance, progression, or retention in a non-scientific study where participants are not randomly assigned or equivalent in terms of motivation, intentions, background, or skill level (Titus, 2007). While random selection is the “gold standard” of experimental designs (St. Pierre,
116

2006), random selection is often impractical, perceived unethical and resisted in educational settings. Propensity score matching techniques are alternatively used to measure the counterfactual; that is, what would have happened to a similar group not receiving the treatment through choice or self-selection (Titus, 2007). An assumption of randomized selections is that biases are randomly distributed across categories in both the experimental treatment and control groups. Propensity score matching is a technique designed to simulate an experimental design, controlling for selection bias and creating almost equivalent experimental treatment and control groups on key indicators.

Propensity score matching is non-experimental but allows the researcher to simplify the analysis by creating a one-number composite of all the covariates and then using the propensity score to match students. Propensity scores represent the “conditional probability of a person being in one condition rather than another given a set of observed covariates used to predict a person’s condition” (Rosenbaum & Rubin, 1984, p. 4). Propensity scores range from 0.0 to 1.0, and these scores are used to match students from a large database of a potential comparison group to produce a comparison group that is similar to the study group on the significant covariates.

There are other methods available to control for selection bias and to address non-randomized study groups. Multiple regression techniques provide useful information on treatment effects and can be used to account for confounding covariates. However, multiple regression analyses require linear, normally distributed relationships and the dependent variable is typically continuous. In addition, multiple regression techniques on large
observational datasets are subject to sample size influence. In contrast, logistic regression offers an alternative to multiple regression and is used to generate the probability of membership in a group when the dependent variable is a dichotomous, categorical variable. Logistic regression is often preferred to multiple regression since a curvilinear relationship is acceptable and analyses using logistic regression are not as sensitive to violations of linearity and normality. Propensity scores generated in the logistic regression technique are used to create purposeful samples for further analyses. Since matching on the propensity scores, creates two equivalent groups on average, $t$-tests can subsequently be used to measure program impact. Comparisons of student outcomes using propensity matching has been shown to yield less biased results than are derived using simple $t$-test comparisons (Rojewski et al., 2010). Therefore, propensity score matching is an extremely useful tool for evaluating programs in educational environments. Propensity score matching is not a panacea for researchers interested in measuring program impact in educational settings. Well-designed theoretically and statistically sound research studies are paramount to executing a good propensity study. There are several recommendations for researchers when applying the propensity score method:

- Ensure adequate sample sizes for the techniques being used (Rosenbaum & Rubin, 1985).
- The non-treatment group should be 2.5 to 3 times larger than the treatment group in order to find comparable propensity score matches for the treatment group examined (Caliendo & Kopeinig, 2005; Imbens, 2000).
• Provide a table with all study variables and explain their measurement levels.

• Run frequencies and check for missing values on all study variables. A rule of thumb is that a small number of missing values is not an issue. List-wise deletion is the preferred method when there are less than 5% of missing values (Hair et al., 2006). Variables with more than 5% of missing values need further investigation.

• Under any definition, outliers have the potential to distort results and must therefore be assessed for their possible impact. Boxplots offer one method for outlier screening.

• Screen proposed covariates for collinearity (variables highly correlated to each other) using correlation statistics in logistic regression. If collinearity is present consider removing the covariate with the least theoretical importance to the topic.

• A logistic regression is used to estimate the propensity scores. Before proceeding with score matching, the distribution of the propensity score estimation values should be examined for both the control and treatment groups (Rojewski et al., 2009). There should be a similar distribution of values for each group. Distributions may be examined visually or quantitatively through the use of t-tests. Check for outliers in propensity scores in both groups.

• When presenting data from propensity score matching analysis results should be included both pre- and post-match (Rojewski et al., 2009). If propensity score matching has been successful, there should be few significant differences between the groups on the initial covariates.
• The methodology used to determine propensity score estimation should be identified, as should the methodology used to determine matching success.

• Assess outcomes on the matched data sets and compare treatment to non-treatment groups across outcome variables using $t$-tests or chi-square according to the data types.

• Compare different models as appropriate in explaining more of the variation in the dependent variable and also to include independent variables that have the highest influence on the dependent variable.

**Recommendations for Research**

Currently, there are research pieces missing from the service-learning literature. The following is a detailed summary of areas where service-learning research needs attention as well as suggestions for research that will continue to support and further the field as a whole. It is very important that researchers take the time to explore these suggestions for future study to increase understanding of how service-learning supports institutional goals and desired outcomes in higher education and prepares students for ever-changing work environments.

The recommendations for research include further research on the benefits of service-learning participation outside of “soft skill” development; the effects of service-learning participation at the community college level, career potential, and outlook for service-learning participants; employer interpretation of service-learning participation and job-seeker
marketability; and how service-learning can impact non-transfer programs, including diploma and certificate students.

**Recommendation 1.** As mentioned in the literature review of this study, there is a plethora of research that discusses certain benefits of service-learning participation including development of communication skills, civic engagement in the future, and students’ connections to their neighborhoods and their communities (Eyler et al., 1997). All of these areas of growth are extremely important to holistic student development and in overall improvement of engaged communities and proactive citizens. Most of the current research is heavy handed with a focus on “soft skill” benefits that students experience through service-learning participation that are measured through qualitative data, but does not focus much on the quantitative results of service-learning participation:

We are especially interested in promoting quantitative research on service-learning that systematically collects information by following the prescription of scientific research. Other types of assessment are important and meaningful; however, scientific research holds great potential for improving practice, building a conceptual basis for understanding the strengths and limitations of service-learning, sustain growth and institutionalization of service-learning, and convincing colleagues about the merits of service-learning. (Bringle & Hatcher, 2000, p. 69)

While soft skills research is important there is a strong need for researchers to explore what other impacts service-learning participation has beyond student commitment to the community. It is necessary to understand the value that service-learning participation can
have on a variety of desired academic outcomes in order to defend its methodology and relevance in higher education. This study provided insight on the effects of service-learning participation at one community college for one academic year; a longer and more in-depth study looking at similar outcomes at multiple institutions would allow researchers to develop a broader picture of the long term effects of service-learning participation.

It would also be interesting to discover if there is a correlation between participation in service-learning coursework and achieving higher levels of education such as bachelor’s, master’s, and doctoral degrees. It is widely known that those who complete post-secondary education have a higher degree of employability, are more fulfilled in their work, have better health and longer life, and achieve higher earnings as compared to their counterparts (Matthews, Dorfman, & Wu, 2015). If research demonstrates that service-learning participation throughout students’ higher education careers could potentially raise their marketability in these areas of advancement, service-learning would most likely experience another surge utilization in all academic disciplines at all institutions of higher education similar to the re-birth of civic engagement in collegiate environments in the 1990s.

Recommendation 2. In 2016, the American Association of Community Colleges stated that almost half of all students enrolled in higher education are at community colleges, however, two-year institutions have been consistently forgotten about in service-learning research. The field of service-learning has been researched consistently. There is a lot of information supporting service-learning as a positive and impactful instructional tool, but most of this research (no matter what the aim or scope of the topic) has been focused either
on kindergarten through 12th grade impacts or on four-year bachelor degree programs. It is extremely challenging to find research geared toward the community college level, which is problematic when recruiting service-learning instructors and having a consistent message on the value of service-learning participation to community college students. According to Prentice (2011),

A review of the research on higher education and civic engagement revealed no studies that had been conducted specifically and exclusively on service-learning’s relationship to the civic engagement of community college students. Such studies would be important in understanding the influence of service-learning on a wider range of students because the overall demographics and backgrounds of students who attend community colleges are different from students who attend four year colleges and universities. (p. 845)

More students in the United States are choosing to begin at a community college as an affordable option that will allow them to begin discovering their strengths, talents, and skillsets (The National Center for Public Policy and Higher Education, n.d.). Service-learning research at the community college level is vital to student success and increasing student outcomes.

**Recommendation 3.** As job placement continues to be competitive across America, it is becoming a necessity to understand the relationship between service-learning coursework participation and the career potential and outlook for these students.
In a world of inflated grades and the consequent academic excellence of so many graduates, graduate schools and businesses are beginning to examine other qualifications of their applicants. Many rate service to the community high on the list of what separates the average applicant from the superior one not only [due] to the commitment it requires but also the skills it can produce that are frequently not acquired in a classroom (Duncan & Tyler, 2013, p. 3). (Matthews, Dorfam, & Wu, 2015, p. 1).

There is a strong need for further research that explores the relationship of service-learning participation compared to their non-participating counterparts in the area of initial job placement. Research should demonstrate how service-learning coursework impacts a student’s ability to obtain a higher starting salary, the length of time to gain employment, and the likelihood of receiving a promotion and/or raise.

This suggestion for future research builds upon the recommendation for practice to better track the outcomes of service-learning. If a strong tracking system is implemented, then research could be done to examine labor-market outcomes for those that participate in service-learning. Service-learning research has consistently demonstrated that student participation will increase their social responsibility, social capital, and civic responsibility (Astin et al., 2000). The literature surrounding service-learning also has shown how effective service-learning is at providing participants experiences that make them more marketable in the workforce, as they learn and utilize skills and knowledge that may not be able to be taught in a traditional classroom environment (Wittman & Crews, 2012).
One recent study noted that students who spent time participating in service-learning through their collegiate educational journey were more likely to work in areas of public service, such as governmental agencies, non-profits, and the health care field (Fenzel & Peyrot, 2005). According to Astin et al. (2000)

Our study found that the students’ career choice is particularly sensitive to participation in service-learning. These effects operate in at least two ways: to encourage students initially pursuing non-service careers to switch their choice to service career, and to reinforce an initial choice of a service career. Students often choose career paths based on limited knowledge of themselves or the world of work, or simply because of what their parents or friends suggest. Service-learning opens new possibilities to such students, who can learn that their vocational calling in life may involve more than making money; it may involve serving others as well. (p. 87)

Most research that mentions the job market as related to service-learning fails to look at the lifetime financial impact service-learning participants have gained. It would be interesting though challenging to discover the true impacts that service-learning coursework has on graduates throughout their entire career journey (Matthews, Dorfman, & Wu, 2015).

In a 2015 study at the University of Georgia, Matthews, Dorfman, and Wu researched the impact of undergraduate service-learning on post-graduation employment outcomes. This study was the first data-driven research project to estimate the potential job-related benefits associated with service-learning participation. Their findings provided strong support for service-learning participation and the positive impact it has on graduates in the
job market. This study found that students who completed service-learning coursework were more likely than their counterparts to be hired at a higher mean starting salary, and that graduates who participated in service-learning received raises almost two months prior than their counterparts (Matthews, Dorfamn, & Wu, 2015). Although these findings are encouraging to service-learning participants and practitioners, one study does not surmise the entire career outlook for service-learning participation and more energy and focus needs to be directed to this.

**Recommendation 4.** Another area of research about which it would be beneficial to gain more insight is understanding employers’ perspectives on service-learning and why they may be more likely to be hire service-learning candidates over their counterparts. Many questions surround this topic, but most focus on why employers would be more likely to choose a student who participated in service-learning and what skills are gained through this learning opportunity that directly translate to the work environment.

Are employers more likely to choose a candidate that has service-learning experience because research has stated that these students tend to have stronger soft skills? Do service-learning participants gain enough understanding through their experiences of reciprocity and reflection that it makes them better at interviewing and sharing their strengths and talents? Do employers want to see on a resume that a potential new hire participated in service-learning? Why would that make a candidate stand out more than another?

As discussed in the literature review, service-learning has been studied and shown to improve students’ soft skills such as working more effectively with others, having stronger
oral communication skills, and exhibiting leadership development. These types of skills are currently being sought out by employers, especially as the job market becomes more saturated, diverse, and global. According to Sternberg (2013) as cited in Matthews et al. (2015), “…in surveys of employers in the business and nonprofit sectors, critical thinking, communication, problem-solving, intercultural skills, and applied knowledge in real-world settings top the list of competencies they report looking for in job candidates” (p. 10).

According to previous research, students who have participated in service-learning have consistently demonstrated higher levels of achievement in these. This research also supports the idea that students are more likely to be successful with their educational goals, which would result into a higher likelihood of the student acquiring desired employment.

Currently, this area of service-learning research is the most lacking. With today’s trends and focus on assessment, knowledge and numbers in these areas are vital to increasing service-learning student participation, faculty engagement, and funding of service-learning programs at all institutions of higher education.

**Recommendation 5.** According to Prentice (2007), “Service learning can be used in virtually any discipline and course as a tool to allow students to discover the connection between the academics of the class and the political and community issues related to that academic disciple” (p. 851). Service-learning instruction is versatile and inclusive, making it a universal tool that, when used properly, is effective in all courses of academia. In this particular study, there was a low number of students in diploma and certificate programs who participated in service-learning. Future research needs to address why these programs have
demonstrated less participation and are rarely noted in any service-learning research. This recommendation for research also refers back to suggestions for practice of developing a solid system for tracking service-learning hours for community colleges, which will prevent certain programs from being overlooked in collected data.

Most community colleges offer a variety of certificate programs in multiple fields of study. Some of these programs include welding; heating, ventilating, and air conditioning (HVAC); cosmetology; baking and pastry/culinary arts; sustainability; paramedics and emergency medical technicians; and personal athletic training. In all actuality, many of these certificate programs are likely completing service-learning hours that could impact their future careers if properly documented.

These programs of study do not transfer, and most of the curriculum for these courses is hands-on learning that directly benefits the community and incorporates a reflection component to synthesize the learning, embodying the definition of service-learning. Although research does not support why these programs are less likely to document these hours, it is most likely a direct effect of these programs being in place for job readiness, with less of a focus on increasing student marketability to transfer to a four year institution. Providing more research on the impact of service-learning on certificate and diploma program students allows practitioners and faculty alike to continue to develop the most impactful opportunities for students within these fields.
Recommendation for Theory

There are many theoretical frameworks used when researching service-learning and its impact in higher education. For this study, the theoretical frameworks used were from John Dewey and David Kolb. Dewey (1963) is regularly referred to as the “father of service-learning” and his theory laid the initial groundwork for service-learning to surface as an instructional method (Speck & Hoppe, 2004). Kolb (1984) is well-known for his research and theoretical updates to Dewey’s original groundwork.

Although these theories are tried and true for understanding service-learning and other forms of experiential learning, further service-learning research could benefit from expanding the scope of utilizing traditional theories as the framework for study. This researcher recommends looking at the service-learning impacts on the job market and employability of service-learning participants. Perhaps using a bigger picture theory that examines outcomes that cannot be validated through Kolb and Dewey’s theories could be beneficial to the field. Looking at service-learning as a method that creates and builds human and social capital instead of as a teaching tool would provide some unique insight that would produce important results to further service-learning research.

Taking the time to see service-learning and its impacts on other areas of the holistic student is important as well. If this same study was completed using Tinto’s Retention Theory (1987), the results and the findings would yield different information, nevertheless benefiting the field of service-learning. If Astin’s (1984) theory of Student Involvement was used to study the role of service-learning in student development, the results would also
contribute to understanding important impacts service-learning participation has for students (Jacoby et al., 1996).

Looking at service-learning through a different lens in future research is important. Understanding every way in which service-learning benefits students is key to keeping faculty and administration engaged and wanting to continue developing and investing in this learning tool. Future research examining service-learning should build upon theory that incorporates student achievement, retention, and labor market outcomes; this would be valuable to the field as a whole. Continued research utilizing a variety of theoretical frameworks would provide support and new information to service-learning, hopefully leading to more growth across higher education and requirement in all academic curriculums. As the higher education environment, the ways in which students learn, and the job market continuously grow and change, researchers need to expand service-learning research to respond to the new needs of students, staff, faculty, administration, and employers.

Limitations

There were five recognized limitations within this study. First, there was no control over which students enrolled in service-learning courses and which students did not. This limitation meant that certain demographics were more prevalent within the data. The data demonstrated that more women, late entry, Caucasian, and non-transfer students were enrolled in service-learning courses as compared to their peers. Propensity score matching allowed for dividing participants and non-participants into statistically comparable groups.
The second limitation is that not all students are required to enroll in service-learning coursework at the community college in the study. Service-learning coursework is chosen by the student, even though it spans throughout all programs of study. Certain academic programs may have a service-learning requirement within their own department, requiring students who enroll in these programs to participate, while other students do not have to participate in order to complete their educational goals. Furthermore, some students may be aware that they are choosing to enroll in classes that require service-learning while other students may have blindly enrolled in service-learning coursework. Propensity score matching assisted with this limitation by matching the students on these specific characteristics.

Third, service-learning coursework took place in different phases in students’ community college careers. Some students began taking service-learning coursework within their first semester in college while others enrolled service-learning coursework in their final semester before transferring or graduating.

Fourth, service-learning instruction varies from course to course. For example, a student completing service-learning in a sustainability class by completing service hours at Habitat for Humanity in a weatherization project may have a very different experience from a student completing service-learning for a course in journalism by meeting with a resident from an assisted living facility and writing his life story. Although this is a limitation of the study, it also allows for deeper understanding of the benefits of service-learning within a wide range of subject matter areas.
The final limitation identified for this study was that propensity score matching eliminated a good number of students who were not a part of the analysis. Propensity score matching is supposed to reduce the problem of selection bias and non-random assignments (Titus, 2007). It is important to note that this study should not only limit the population being studied to those enrolled in service-learning coursework, but to also include their counterparts: “Propensity score matching allows for estimates of the average treatment effect, average treatment on the treated effect, and the average treatment on the untreated effect on student outcomes” (Titus, 2007, p. 488).

**Conclusion**

Although many campuses have long had economic development initiatives in place, the impact of campus engagement efforts on local economies has become increasingly important as the long-term effects of the global financial turndown take hold. With so much at stake, it is vital that colleges and universities focus their efforts on creating effective partnerships that move beyond short-term fixes to create a nexus of change. By integrating economic development with civic and community engagement efforts in strategic and holistic ways, institutions can create *engaged learning economies* that have the ability to foster positive civic and economic change. The basic premise of an engaged learning economy is that civic engagement is the mechanism that connects economic outreach and democratic education. (Wittman & Crew, 2012, p.2)
There is much intentional work ahead for college practitioners, researchers, and service-learning faculty. This study supports the value and educational impacts of student participation in service-learning programs in all areas of academia. Continuing to emphasize and demonstrate the importance and effectiveness service-learning instruction has on core competencies and college outcomes will allow for more community college students to achieve their educational and career goals. Now is time that community colleges must pay closer attention to how service-learning participation affects their students regarding institutional outcomes. In response they should develop required service-learning curricula to make these programs accessible, and to increase faculty and administration understanding about the positive economic and job market effects that service-learning offers. Community colleges are uniquely positioned to become the civic engagement leaders and must share these important findings with all of America’s institutions of higher education.
REFERENCES


American Association for Community Colleges. (n.d.). Community college trends and
statistics: Fast facts. Retrieved February 6, 216 from:
http://www.aacc.nche.edu/AboutCC/Trends/Pages/default.aspx

college leadership: Twenty years in the making. In B. Townsend & D. Bragg (Eds.),
ASHE Reader on Community Colleges (pp. 163–172). Boston, MA: Pearson.


from Continuums of Service Conference ’00: Relationships, Responsibility, and


service-learning faculty in all disciplines. Providence, RI: Campus Compact.


Permaul, J. S. (2009). Theoretical bases or service-learning: Implications for program

http://www.pcc.edu/about/mission.html.

doi: 10.1080/10668920802205014

classroom*. American Association of Community Colleges: HBP Inc.

Rojewski, J.W., Gemici, S., & Lee, I.H. (2009). *Propensity score matching with
observational data*. Unpublished manuscript, University of Georgia, Athens, GA

determine the efficacy of secondary career academies in raising educational

Rosenbaum, P.R., & Rubin, D.B. (1984). Reducing bias in observational studies using
subclassfication on the propensity score. *Journal of the American Statistical

Saltmarsh, J. (1996). Education for critical citizenship: John Dewey’s contribution to the
pedagogy for community service learning. *Michigan Journal of Community Service
Learning, 3*(1), 13–21.


