

ABSTRACT

CURTIS, CATHARINE MCLEAN. Completion Rate Outcomes for Community College CTE Students Taught by Part-Time Faculty. (Under the direction of Dr. James Bartlett.)

The number of part-time community college instructors continues to increase. As the number of part-time instructors increases, the completion rate for students taught by part-time faculty decreases.

Community college programs of study typically fall into two categories: college transfer and career and technical education programs. Researchers found that CTE students possess qualities which make them different from transfer program students. Therefore, CTE students may not be negatively affected by a high percentage of courses taught by part-time instructors.

Two research questions were examined in this study:

1. Does a higher percentage of part-time faculty instruction predict the retention of CTE students?
2. Does a higher percentage of part-time faculty instruction predict the credit hour completion ratios of CTE students?

This quantitative study used logistic regression analysis to examine fall-to-fall retention rates and course completion rates for CTE students relative to their courses taught by part time faculty. The data analysis resulted in statistically significant positive results for career and technical education students taught by part-time faculty for fall-to-fall retention rates and completion rates of 67% of courses attempted.

© Copyright 2017 by Catharine McLean Curtis

All Rights Reserved

Completion Rate Outcomes for Community College CTE Students Taught by Part-Time
Faculty

by
Catharine McLean Curtis

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

Adult and Community College Education

Raleigh, North Carolina

2017

APPROVED BY:

Dr. James Bartlett
Committee Chair

Dr. Michelle Bartlett

Dr. Chad Hoggan

Dr. Lisa Bass

DEDICATION

This work is dedicated to my late sister Sandra (Sandie) Curtis, who inspired, encouraged, and supported me in any endeavor I chose to pursue. I think about you every day, and I miss your wisdom, humor, and love more than I can ever express.

I am thankful she was with me as I began this journey, and I believe she would be proud of my accomplishments. Sister, this work is for you.

BIOGRAPHY

Catharine (Cathy) McLean Curtis is a native of North Carolina. She earned a Bachelor of Arts degree in sociology from the University of North Carolina at Greensboro and her Master of Arts degree in counseling from the University of North Carolina at Charlotte.

Cathy is a NC Licensed Professional Counselor Supervisor who enjoys mentoring and supervising counselors for licensure. She is currently the Director of the TRIO-Student Support Services program at Central Piedmont Community College. As a first-generation student herself, she has a passion for working with first-generation college students providing services to increase their opportunities for success.

ACKNOWLEDGMENTS

I thank Dr. Bobbie Frye, without whose help and support I would not have had research data for this study. You would not give up on me, and would not let me give up. Thanks to you, Bobbie, I understand logistic regression.

To my cohort members who, when I had my finger on the button to withdraw from this program, supported and encouraged me and kept me going, I thank you. To my CPCC friends and surrogate family—Greg, yes I did work hard! Elizabeth, thank you for your constant encouragement. Marilyn, my scribe, technical writing advisor, chauffer, cheerleader, thank you! To Dr. Diann Back and Dr. Jenn Marts, thank you for convincing me to pursue this degree. Thank you to my TRIO-SSS staff you all were great cheerleaders!

Finally, thank you Dr. James Bartlett and Dr. Michelle Bartlett, I appreciate your support and encouragement. You both are the heart and soul of this program.

TABLE OF CONTENTS

LIST OF TABLES	vii
LIST OF FIGURES	viii
CHAPTER ONE	1
INTRODUCTION.....	1
Problem Statement.....	5
Purpose Statement	9
Theoretical Framework.....	10
Limitations.....	17
Delimitations.....	18
Definition of Terms	18
Significance of the Study	20
Conceptual Framework.....	22
Research Questions.....	23
Summary.....	24
CHAPTER TWO	25
LITERATURE REVIEW	25
History of the Community College.....	26
History of Career and Technical Education (CTE).....	27
Demographic Characteristics of CTE Students.....	30
Characteristics of Part-Time Faculty.....	32
Part-Time CTE Faculty.....	35
Tinto’s Theory of Student Retention and Part-Time Faculty	36
Part-Time Faculty Integration Model (PFIM).....	40
Student Engagement.....	40
College Completion Programs: The Aspen Institute and Student Outcomes.....	42
Part-time Faculty’s Impact on Student Outcomes	44
A Brief Examination of Low Student Performance.....	46
Summary.....	47
CHAPTER THREE	49
METHOD	49
Population.....	49
Construction of the Data Set.....	50
Research Questions.....	50
Data Collection	51
Data Analysis.....	53

Uses and Benefits of Logistic Regression	55
Relevance of Logistic Regression	56
Why Logistic Regression Was Chosen	56
Summary	56
CHAPTER FOUR	58
RESULTS	58
Data Screening	58
Descriptive Statistics	59
Data Analysis	64
Summary	75
CHAPTER FIVE	77
DISCUSSION	77
Research Conclusions	78
Research question 1	79
Research question 2	80
Implications from Theoretical Frameworks	82
Recommendations for Practice	83
Recommendation 1: Implications for community college leadership	85
Recommendation 2: Services for low-income students	87
Recommendation 3: Provision of clear expectations and feedback	88
Recommendation 4: Minority student services	89
Recommendation 5: Minority mentoring services	90
Recommendation 6: Learning communities	91
Recommendation 7: First-year experience	91
Recommendation 8: Supplemental instruction	92
Recommendation 9: Faculty development	92
Recommendations for Future Research	93
Recommendation 1: Focus on community college students	93
Recommendation 2: Programs of study	93
Limitations	94
Limitation 1	94
Limitation 2	94
Limitation 3	94
Conclusion	95
Summary	95
REFERENCES	97

LIST OF TABLES

Table 1. <i>Percentage Distribution of Demographics of CTE and Academic Program Students at the Community College of the Southeast</i>	31
Table 2. <i>Percentage Distribution of Demographic Data of Associate Degree Seeking Students</i>	32
Table 3. <i>Name, Abbreviation, Type, and Coding of Variables Used in Logistic Regression Model</i>	52
Table 4. <i>Gender by Number and Percent</i>	60
Table 5. <i>Age by Number and Percent</i>	61
Table 6. <i>Frequencies of Independent Variables</i>	61
Table 7. <i>Frequencies of Dependent Variables</i>	62
Table 8. <i>Frequencies of IPEDS Race</i>	62
Table 9. <i>Logistic Regression, Model 1</i>	67
Table 10. <i>Logistic Regression, Model 2</i>	70
Table 11. <i>Comparison of English, Math, College Credits by Non-CTE and CTE Students</i> ..	71
Table 12. <i>Number and Percent of Non-CTE and CTE Student Outcomes</i>	75

LIST OF FIGURES

<i>Figure 1.</i> This flowchart is adapted from Tinto’s Longitudinal Display of Departure (1993).	12
<i>Figure 2.</i> Part-time faculty integration model, Roueche et al. (1996, p. 37).	17
<i>Figure 3.</i> This model is adapted from Bean and Eaton’s (2001) model of retention.	21
<i>Figure 4.</i> Community College CTE students who are taught by part-time or full-time instructors are either completers or non-completers.	23
<i>Figure 5.</i> Part-time faculty ratio by frequency.	63
<i>Figure 6.</i> Full-time faculty ratio by frequency.	64

CHAPTER ONE INTRODUCTION

Part-time faculty provide community colleges with a cost effective, flexible, and expedient workforce that is the “new majority” (Meixner, Kruck, & Madden, 2010, p. 141). The reliance on part-time faculty in higher education has increased significantly in the last decade. The National Center for Educational Statistics (2014) reported a 162% increase in part-time faculty from 2001 to 2011. In fact, in the fall of 2013, 69.8% of public 2-year college faculty were part-time (Knapp, Kelly-Reid, & Ginder, 2010). In the seminal book *Rethinking Faculty Work*, Gappa, Austin, and Trice (2007) wrote about the expansion of part-time faculty that occurred as a result of a decline in state funding, an increase in student attendance, and the advancement of distance education.

Granted, utilizing part-time faculty brings academic and fiscal benefits to institutions. Accordingly, it appears the “fiscal benefits of employing part-time faculty members have become a critical part of the plan to meet enrollment demands in a climate of ever-tightening budgets” (Charlier & Williams, 2011, p. 160). Thus, the influx of part-time faculty does not seem to be slowing, creating a trend with widespread implications that include low retention rates, potential for decreased college funding, and a negative economic impact (Jaeger & Hinz, 2008; SuccessNC, 2016b).

Research on the impact of part-time instructors on student retention is clear. Studies show part-time faculty members frequently lack the time for meaningful student interaction. This is significant because, according to Tinto (2006), student interactions with faculty play a

vital role in student persistence. In order to achieve meaningful interactions, faculty need to be available and accessible to students (Jaeger & Hinz, 2008). Informal interactions with students enhance their sense of self-efficacy and that positively affects student retention (Bean & Eaton, 2001). Theorists' state faculty and student interactions are important to students and these exchanges make a difference in student persistence rates (Schreiner, Noel, Anderson, & Cantwell, 2001; Tinto, 2006).

Jaeger and Eagan (2011) agreed that community college investment in faculty, particularly part-time faculty and their effect on student completion rates, merits further study. While researchers like Jaeger and Eagan (2011) recognized a need to continue studying the effect of part-time faculty on community college retention rates, with few exceptions, current research has not examined retention rates based upon the students' program of study, specifically career education programs (Hirschy, Bremer, & Castellano, 2011).

Based upon a literature review, the researcher has found that studies on the impact that part-time instructors have on student completion outcomes are limited. Retention theorist Tinto (2006) stated,

Though we have reason to believe that putting the best first [i.e. full-time and experienced faculty] matters, we do not yet have research that provides reliable evidence of the impact of differential forms of institutional investment (e.g., in allocation of faculty and support services) on student retention. Here too there is much to be done. (p. 8)

Herein lies the impetus for this study. This study has the potential to impact the field of student success by adding to the limited body of knowledge on the effect of part-time faculty on college student outcomes, specifically community college students (Jaeger & Eagan, 2011). Positive student outcomes should be the goal of faculty, students, and community colleges. Hence, the results of this study can potentially affect practitioners from front-line staff to faculty and administrators. The results of this study can benefit all by providing the opportunity for data-driven recommendations that can impact community college policy and daily practice. Paying closer attention to community colleges' reliance on part-time faculty can improve outcomes (Datray, Saxon, & Martirosyan, 2014).

This study proposes to examine the effect of part-time instructors on career and technical education majors. Career and technical education (CTE) programs are those that “prepare students with technical knowledge and skills for specific occupations” (Hirschy et al., 2011, p. 297). Hirschy et al. (2011) hypothesized “different profiles emerge between career and academic majors” (p. 299). These differences “may lead to better predictive models of student success” (Hirschy et al., p. 99).

The differences between career and academic majors are the motivation for this study. The nature of the relationship between CTE students and part-time CTE faculty may lend itself to more positive student outcomes. Green (2007) addressed positive differences between CTE and other faculty by recognizing that part-time CTE faculty members often work outside of the college in the fields in which they teach. Thus, these part-time CTE faculty practitioners can provide their students with real world work experiences as opposed

to a part-time faculty member who works in a field unrelated to their subject, subsequently allowing for a student-faculty connection typically not available to their counterparts whose part-time faculty do not have the work and classroom connection.

In a study of student retention, it is important to include a brief discussion of developmental education. Large numbers of students arrive at the community college underprepared for college level mathematics and English courses, thus precipitating the need for developmental courses (Melguizo, Bos, & Prather, 2011). Furthermore, according to Saxon and Boylan (2010), “the overwhelming majority of developmental courses are taught by adjunct faculty” (p. 36) making developmental education an important topic to include. Remedial students, especially remedial mathematics students, often fail to take required developmental courses, and when they do take the courses they often fail to complete them (Bonham & Boylan, 2011). Thus, when studying the retention rates of CTE students, it is important to remember developmental courses may be included in course transcripts and may affect course completion data.

The remainder of Chapter 1 includes a discussion of the problem statement, the purpose statement, Tinto’s theory of student retention and attrition as the theoretical framework for this study, the significance of the study including the reliance on part-time faculty and the negative affect this practice appears to have on student success, the conceptual framework, research questions, limitations, delimitations, and a summary of the chapter.

Problem Statement

Whether labeled part-time, contingent, or adjuncts, non-full-time instructors have been increasingly relied on by community colleges. A 2009 survey conducted by the U.S. Department of Education reported that 69% of faculty members in 2-year public institutions were part-time (Kelly-Reid & Ginder, 2010). One reason for this is that part-time faculty are a cost-effective solution to fill a need (Meixner, Kruck, & Madden, 2010).

College retention literature shows that students taught by part-time instructors complete their programs at lower levels than their counterparts. Jaeger and Hinz (2008) stated, “As exposure to part-time faculty instruction increases, the odds of being retained decreases” (p. 265), and Jacoby (2006) stated, “graduation rates decrease as the proportion of part-time faculty employed increase” (p. 1100).

Are the savings from low wages and no benefits truly worth the effect this practice may have on student retention and completion? The consequences include low completion rates which affect the performance-based funding model being adopted in North Carolina community colleges and a student’s ability to find meaningful, well-paying work in order to contribute to the state’s economy (SuccessNC, 2016b).

As evidenced by new initiatives that are compelling a focus on completion, community colleges were not attentive to student completion rates until recently. Achieving the Dream (ATD) and Completion by Design (CBD) are two of the initiatives focusing on completion (Achieving the Dream, 2016; Completion by Design, 2016). Achieving the dream is an initiative created in 2004 with a vision of increasing student success at the

community college level. The ultimate goal of ATD is to increase the number of low-income students and students of color who graduate from college and obtain work that provides a sustainable income. Member colleges work with a data coach to analyze their strengths, weaknesses, and opportunities and to make a plan to enhance student success (Achieving the Dream, 2016). Built on the work of ATD, CBD uses a holistic approach of college faculty, staff, administrators, and students to create a vision for creating institutional policies and procedures that enhance student success (Achieving the Dream, 2016; Completion by Design, 2016).

Notwithstanding programs such as ATD and CBD, research shows that the message that community colleges need to be more concerned about completion rates has not made its way from administration down to faculty (Dougherty et al., 2014). This needs to change as low completion rates have pervasive ramifications for students, colleges, and the state. Among the implications of low student completion rates is funding. States, including North Carolina, are moving toward college funding based upon performance measures. The North Carolina Community College system created a Performance Measures Committee in 2011 to approve performance measures based upon student success.

The Performance Measures Committee defines performance funding as a:
funding model that allocates funds to colleges based on program quality and program impact. Program quality is evaluated by determining a college's rate of student success on each measure as compared to a system wide performance baseline and

goal. Program impact is evaluated based on the number of students succeeding on each measure. (SuccessNC, 2016b, para. 4)

Consequently, increasing retention and completion rates will become essential (Hermes, 2012).

Low completion rates also affect the NC economy. Skilled workers are needed in today's workforce. Students who leave college before completing their courses of study are not being adequately prepared for jobs requiring technical skills and thus are negatively affecting the state's economy (NC Commerce Workforce, 2016). Is it therefore logical to rely so heavily on part-time instructors if this practice proves to be detrimental to student retention and completion rates?

The problem inherent with the widespread use of part-time faculty is not their lack of teaching skill; it is the lack of time available for meaningful student interaction (Tinto, 2006; Schreiner, et al., 2011). Student interaction is at the core of retention researcher Tinto's (2006) assertion that student and faculty interaction both inside and outside of the classroom is essential for student success. A 2010 study by Gantt found that CTE students "indicated that access to faculty was a positive influence [and they] graduated at a higher rate of 71.0%" (p. 233).

In addressing the significance of the problem of low completion rates for community college students taught by part-time instructors, two issues emerge. First, although research is showing a negative impact on student completion rates, the number of part-time instructors is in no danger of decreasing (Jaeger & Eagan, 2011; Janssen, 2012). In fact, the reliance on

part-time faculty in higher education has increased significantly in the last decade. The National Center for Educational Statistics reported a 162% increase in part-time faculty from 2001 to 2011. According to Meixner, Kruck, & Madden (2010), part-time faculty have become “the new majority”—a majority that plays a big role in college education (p. 141). The works of Bean and Eaton (2001) and Tinto (2006) also validated this role. These researchers agreed that the actions of faculty could influence student retention. Bean and Eaton (2001) made this point by stating that faculty can influence student retention by engaging in informal interactions with students that enhance their sense of self-efficacy, unlimitedly positively affecting student retention. Recognizing that reliance on part-time faculty is not likely to change, it becomes incumbent on researchers to design studies that will potentially impact this problem (Crawford & Jervis, 2011; Kotamaraju & Blackman, 2011).

The second significant issue emerges from a practical standpoint. In addition to the desire to see students succeed, there is a more fundamental reason for increasing student retention rates. Student success is essential if North Carolina community colleges are to meet their curriculum completion and first year progression goals. According to the SuccessNC (2013) community college final report, consequences of a college’s poor performance can be catastrophic to their funding allocation.

While completion rates are an issue with all community college students it is especially a concern for CTE students as they have not been examined as a separate entity with any depth.

Purpose Statement

The intention of this study was not to malign the quality of part-time instructors' teaching skills or their commitment to both the institutions and students with whom they work, it is to address the potential consequences of employing this ever-increasing segment of the community college workforce. Consequently, the purpose of this study was to determine if there is a significant difference in the student outcomes of career and technical education (CTE) students whose courses were taught by a high percentage of part-time instructors as opposed to full-time instructors. The threshold for the high percentage of part-time instructors' will be determined by the logistic regression analysis. For example, the percentage may be different for health science students who likely experience more full-time instructors versus a business student who attends classes part-time in the evenings. For the purpose of this research, student outcomes are defined as fall-to-fall retention and completion of a minimum of 67% of the attempted credit hours (this percentage was selected in accordance with the standards of academic progress for Federal financial aid and for Central Piedmont Community College [2016d]).

With few exceptions, a review of the literature shows results from studies of part-time faculty and student retention as an aggregate of students' programs of study. There is a scarcity of literature that studies career and technical education students attending community colleges. This gap in the literature has provided the impetus for this study. This study examined retention rates of students who are being taught by part-time faculty, sorting study participants into two distinct areas: CTE students taught by part-time instructors versus

CTE students taught by full-time instructors. Hirschy et al. (2011) asserted that CTE students are “different from students seeking academic majors” (p. 297). This difference provided the motivation to examine completion rates of CTE students. Further review of the literature on CTE faculty shows the connection between part-time instructors’ careers and teaching concentrations might mitigate some of the negative effects of part-time instruction on student retention (Green, 2007; Wallin, 2004). Hence, the hypothesis is that the effect of part-time instructors on CTE student retention rates is not as negative as the effect on students of with full-time instructors.

In addition to the desire to see students succeed, there is a more fundamental reason for increasing student retention rates. It is imperative for North Carolina community colleges to examine completion rates because of a relatively new funding method based upon student performance. Poor student performance equals lower rates of funding.

Data for this study was collected and analyzed using the dependent variable of CTE fall-to-fall student retention rates and independent variables of a high percentage of part-time instructors, student GPAs, and number of credit hours completed along with available demographic data.

Theoretical Framework

The theoretical framework used in this research is two-fold. Tinto’s theory of student attrition and Roueche, J., Roueche, S., & Milliron’s (1996) theory of Part-Time Faculty Integration (PFIM) are both relevant to the topic of part-time faculty’s impact on CTE student completion. These two frameworks complement each other in that they both reflect

the importance of the relationship. Relationships, specifically relationships with students, faculty, staff and in the case of PFIM, the relationship with the part-time faculty member's college or university serve to connect these two theoretical models. Tinto's model of student retention is discussed first, followed by Roueche et al.'s PFIM.

As early as 1975, Tinto recognized a problem with college student retention. Using Durkheim's work on suicide as a foundation, Tinto began developing his theory of college student departure. Durkheim believed inadequate social integration into society could increase one's chances of suicide (Tinto, 1975). Tinto (1975) saw a connection between society and college culture and he believed the "social conditions" that led to suicide could be analogous to the conditions that led to dropping out of college (p. 91). Tinto (1975) looked at Durkheim's work and realized there were more factors involved in both theories than a person's background and interactions. To understand and potentially predict dropout behavior, Tinto added another facet to his theory. The additional component included student expectations and educational goals, which are included as goals and commitments (See Figure 1). However, recognizing his early theory did not adequately answer causes of low college completion rates; Tinto (1993) developed a model of "departure from institutions of higher education" (p. 112).

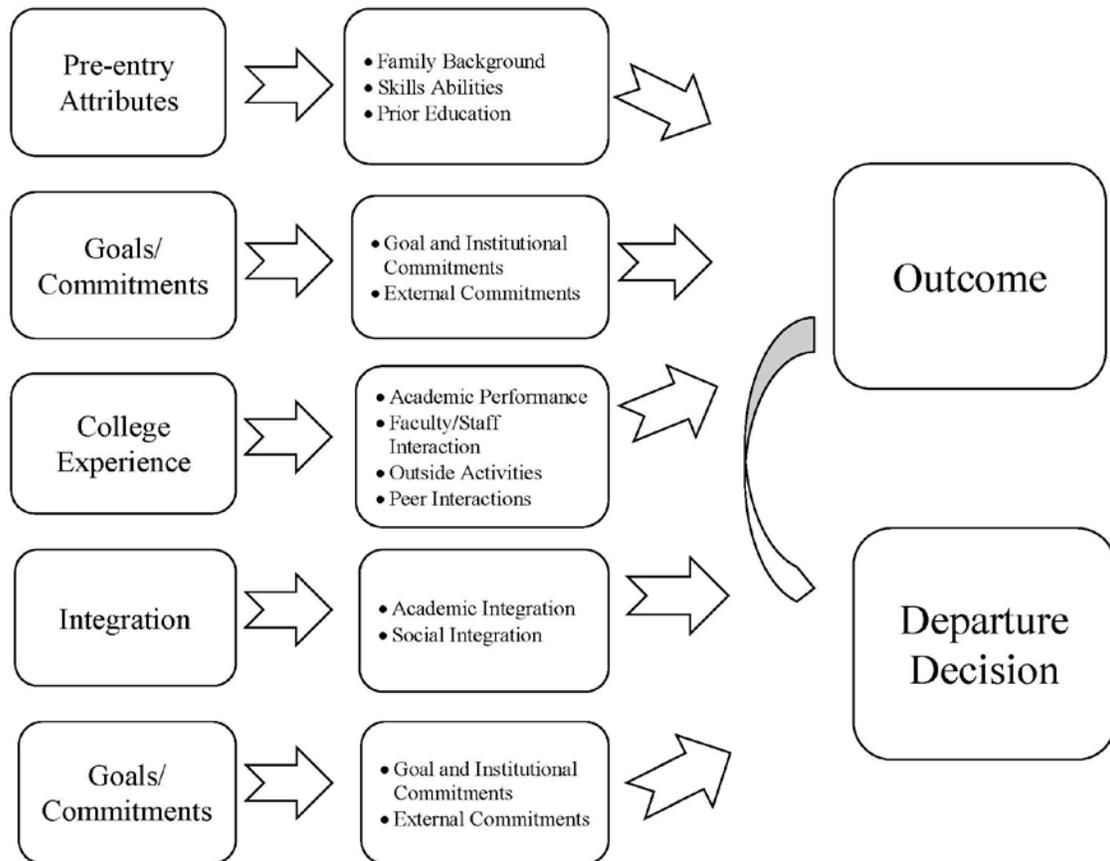


Figure 1. This flowchart is adapted from Tinto's Longitudinal Display of Departure (1993).

The model presented in Figure 1 is adapted from Tinto's (1993) model of college departure. Figure 1 illustrates how Tinto (1993) believed a student's departure from college happened as a result of "interactions between an individual with given attributes, skills, financial resources, prior educational experiences, and dispositions...and other members of the academic and social systems of the institution" (p. 113). Central to this adaptation of Tinto's (1993) model is an emphasis on the student's interface with faculty, staff, and the

entire college community, again reinforcing the importance placed on faculty interactions with students.

In sum, the student brings a compilation of background, skills, abilities, and prior education to college; these attributes influence their goals and intentions that impact student's college experience (Tinto, 1993). Students' college experiences affect their academic and social integration, which again impacts goals, intentions, and commitments which eventually leads to a decision to stay in or depart from college (Tinto, 1993).

As Tinto (1993, 2006, 2012) revised and refined his theory of student departure, two components remained: (a) the importance of student engagement (integration) and (b) a focus on the integral part faculty play in positive student outcomes (retention). Faculty, according to Tinto (1993), play a variety of roles in student engagement. Most obviously is the classroom experience of students. From formal instruction to more informal interactions both inside and outside of the classroom, faculty interactions affect a student's commitment to his or her college (Tinto, 1993).

Tinto's (2012) theory has evolved into four conditions that contribute to student retention: (a) clear expectations, (b) student support, (c) performance assessment and feedback, and (d) student involvement, a term Tinto used interchangeably with student engagement. All four conditions are described in this work; however, the emphasis in this paper is on the last condition, student involvement, as it directly relates to the issue of the effect of part-time instructors on student outcomes. The connection between faculty members' engagement with students is highlighted in each of the four conditions.

The first condition, consistent and clear expectations, refers to the type of expectations students are introduced to in “orientation activities, program advising, coursework, interactions with course faculty, and individual faculty and staff advising” (Tinto, 2012, p. 10). The second condition, student support, emphasizes the necessity of providing supportive services for students, especially in the presence of challenging expectations (Tinto, 2012). Tinto (2012) recommends assessment and feedback as the third condition for student engagement. The assessment needs to be relevant, timely, and followed by beneficial feedback (Tinto, 2012). Typically, according to Tinto (2012), assessment begins with college placement tests and involves such classroom interventions as early alert systems that notify students of impending academic problems. Finally, the most important condition for student retention, according to Tinto (2012), is “student involvement or what is now commonly referred as engagement” (Loc. 1299, para. 1). Engagement occurs both inside and outside the classroom and, especially for community college students, revolves around faculty (Tinto, 2012).

Tinto’s theory (2012) is particularly applicable to the proposed research study on the effect of part-time instructors on CTE student outcomes. By the very nature of having part-time status, part-time instructors’ opportunities for student engagement are limited. In fact, part-time faculty are often “less available and less accessible” than their full-time counterparts (Janssen, 2012, p. 37). The problem inherent with the widespread use of part-time faculty is not their lack of teaching skill; it is, according to research, the lack of time available for meaningful student interaction (Schreiner et al., 2011; Tinto, 2006). This

practice is in opposition to the assertion by Jaeger and Hinz (2008) that to achieve meaningful interactions faculty need to be available and accessible to students. Meaningful interactions, according to Schreiner et al. (2011), are those in which faculty and staff are honest and authentic both inside and outside the classroom.

Student interaction is at the core of Tinto's (2006) claim that student and faculty interaction both inside and outside the classroom is essential for student success. Indeed, a 2010 study by Gantt reinforced Tinto's assertion. The study found students "indicated access to faculty was a positive influence [and the students] graduated at higher rate [that] of 71.0%" as opposed to their counterparts" (Gantt, 2010, p. 233).

Roueche et al.'s (1996) Part-Time Faculty Integration Model (PFIM) operationalizes the experiences of part-time faculty into a model for improving organizational integration. Experiences which, as described by Bailey, Jagger, and Jenkins (2015), result in the plight of the part-time instructor having little attachment to their co-workers, their college, and their students. The model centers around three strategies: socialization, communication, and participation. Part-time faculty, according to Roueche et al. (1996), are typically employed in colleges with cultures that lack these three strategies, leading to a sense of exclusion.

According to Roueche et al. (1996), the part-time faculty member enters the institution with their personal characteristics, history, expectations, and intentions. Ideally, the part-timer encounters the positive organizational characteristics of socialization, communication, and participation in decision-making. Socialization involves becoming integrated into the college's culture and gaining an understanding of the student population

(Roueche et al., 1996). Communication can be fostered through formal mentorships and faculty organizations (Roueche et al., 1996). Finally, participation can be achieved through engaging in college activities, committees, and staff development (Roueche et al., 1996). These positive characteristics lead to part-time faculty identifying with the institution, leading to personal outcomes. Positive personal outcomes include a sense of belonging and loyalty to the institution along with positive organizational outcomes. Integrating part-time faculty can ultimately lead to a sense of inclusion and feelings of “belonging, trust, and similarity” and part-time faculty members who have been integrated into their institution may potentially positively influence student outcomes (Roueche et al., 1996, p. 45). Figure 2 is a graphic depiction of the Roueche et al. (1996) part-time faculty integration model; the model is intended to analyze the incorporation of part-time community college faculty into their institution.



Figure 2. Part-time faculty integration model, Roueche et al. (1996, p. 37).

Limitations

First, this study is limited by the extant data collected by the Community College of the Southeast thus limiting the generalizability of this research. The second limitation is high school GPA. The college did not collect high school GPA data for the year included in the study. High school GPA is a strong predictor of college success and these data may have an effect on the results (Ledesma, & Obukhova, 2015). Last, although CCSE is working to eliminate the problem of multiple program codes listed for individual students, this can hamper the distinction between CTE and non-CTE students.

Delimitations

The scope of this study is limited to data from the Community College of the Southeast because of the nature of the study. As this is a quantitative study, external variables that may contribute to student attrition are not available.

Definition of Terms

Associate in Applied Science is a degree “primarily designed for students who intend to enter the workforce upon graduation” (Central Piedmont Community College, 2016e, para. 1).

Attrition is “student departure from institutions of higher education” (Tinto, 1993, p. 18).

Career and technical education is “a job-ready credential that can lead to becoming a successful employee or employer in a global economy and provide for better skills, better jobs, better pay and continued educational attainment” (NC Community Colleges, 2016, p. 2).

College transfer programs are “for students who are interested in completing their general education requirements prior to transferring to a four-year institution. Students who intend to transfer to a four-year college or university should seek the A.A., A.S., or A.F.A. degrees” (Central Piedmont Community College, 2016a, para. 4).

Community College of the Southeast is located in a large metropolitan area. The 2014–2015 enrollment included 28,411 curriculum students attending one or more of eight campuses. The college offers 70 Associate in Applied Science (AAS) degrees and four

transfer program degrees: Associate in Arts (AA), Associate in Science (AS), Associate in Fine Arts (AFA), and Associate in Engineering (AE) (Central Piedmont Community College 2016e).

Developmental education “refers to a broad range of courses and services organized and delivered in an effort to help retain students and ensure the successful completion of their postsecondary education goals” (Boylan & Bonham, 2007, p. 2).

Logistic regression analysis is a mode of analysis used when the dependent variable is dichotomous, meaning the variable can place subjects into two groups (Vogt, 2005).

Part-time faculty is succinctly defined by Lester (2011) as a person hired to teach on a course-by-course basis. Central Piedmont Community College defines part-time as “employment for less than 75% of the full work-week or full work load defined for the job class which the employee is assigned...part-time employment must be limited to a total of less than 1,560 hours per fiscal year” (Central Piedmont Community College, 2016b, section 4.03)

Persistence is “the behavior of continuing action despite the presence of obstacles” (Rovai, 2003, p. 2).

Retention is “the ability of an institution to retain a student from admission through graduation” (Seidman, 2012, p. 12).

Student engagement is “the interaction students have with faculty (Wirt & Jaeger, 2014, p. 980).

Student involvement is “the amount of physical and psychological energy that the student devotes to the academic experience” (Astin, 1985, p. 134).

Significance of the Study

Several issues emerge when addressing the significance of the study of low completion rates for community college students taught by part-time instructors. First, although research is reporting a negative impact on student completion rates, the number of part-time instructors is not decreasing (Jaeger & Eagan, 2011; Janssen, 2012). The works of Bean and Eaton (2001) and Tinto (1975, 2003, 2006) also validate this role. These three researchers agreed that the actions of faculty could influence student retention. Bean and Eaton (2001) made this point by stating that faculty can influence student retention by engaging in informal interactions with students that enhance a student’s sense of self-efficacy, which ultimately affects student retention. Therefore, social integration and academic integration are related directly to student retention (Bean & Eaton, 2001; Eaton & Bean, 1995).

Self-efficacy is defined by researcher and psychologist Albert Bandura (1989) as “self-beliefs of efficacy [that] can exert their effects on performance through cognitive, affective, or motivational processes” (p. 733). Bean and Eaton (2001) believed as students’ “academic and social self-efficacy increase, academic and social integration also increase” (p. 77). Thus, the conclusion can be made that a strong sense of self-efficacy can lead to academic success and social integration which can ultimately lead to college student retention (Bean & Eaton, 2001).

Figure 2 contains an abridged depiction of Bean and Eaton’s (2001) “psychological model of college student retention” (p. 76). Entry to college characteristics include past behavior, personality, initial self-efficacy, motivation to attend, skills and abilities, the institutional environment of academic and social interactions—both internal and external, positive self-efficacy, coping processes, stress reduction, internal motivation leading to academic integration and social integration which affects environmental integration, psychological processes, psychological outcomes, and intermediate outcomes and attitudes. Academic integration and social integration affect institutional fit and commitment, which affects a student’s intention to persist in college (Bean & Eaton, 2001).

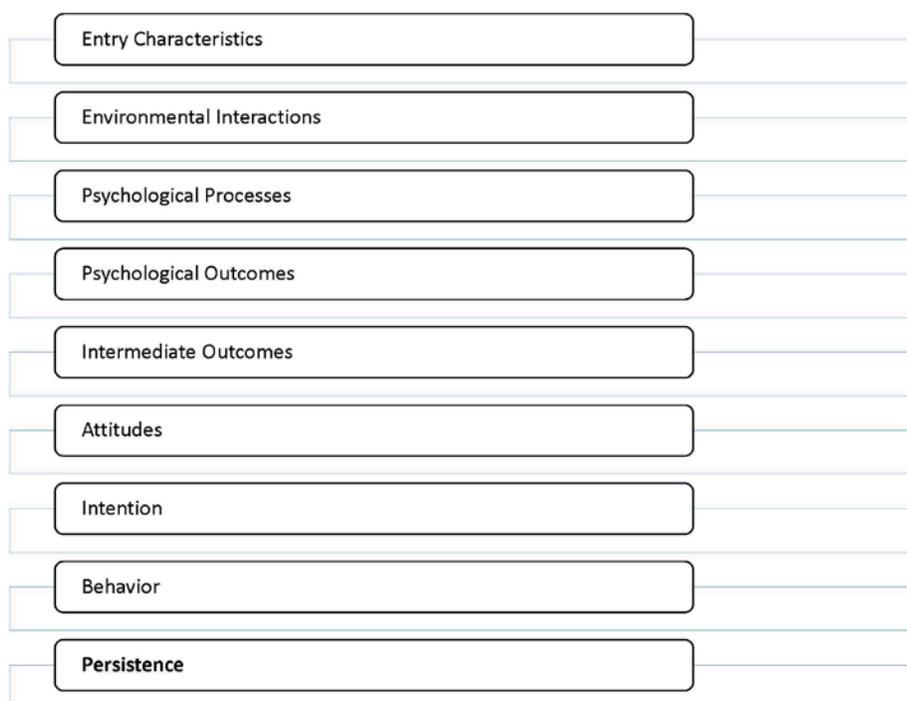


Figure 3. This model is adapted from Bean and Eaton’s (2001) model of retention.

The potential influence of part-time faculty on community college students is pervasive, from low completion rates that can affect college funding to a harmful effect on the state's economy. Recognizing this, is it logical to rely so heavily on part-time instructors if this practice proves to be detrimental to student retention and completion rates?

Conceptual Framework

After a review of literature, four understandings have emerged. First, student persistence, retention, and completion are a result of the connections community college students make both educationally and socially to their institution (Tinto, 2006). Second, exposure to courses taught by part-time faculty impacts student completion rates (Jaeger & Hinz, 2008). Third, completion rates affect college funding (SuccessNC, 2016b). Last, CTE students are an important population to study because of the nature of the programs; there are likely discernable differences in CTE students versus college transfer students (Hirschy et al., 2011).

Using these four beliefs as a guide, the conceptual framework was constructed and is pictured in Figure 3. Figure 3 is a graphic illustration of is there a significant difference in retention rates between CTE students who have a higher percentage of part-time faculty versus full-time faculty.

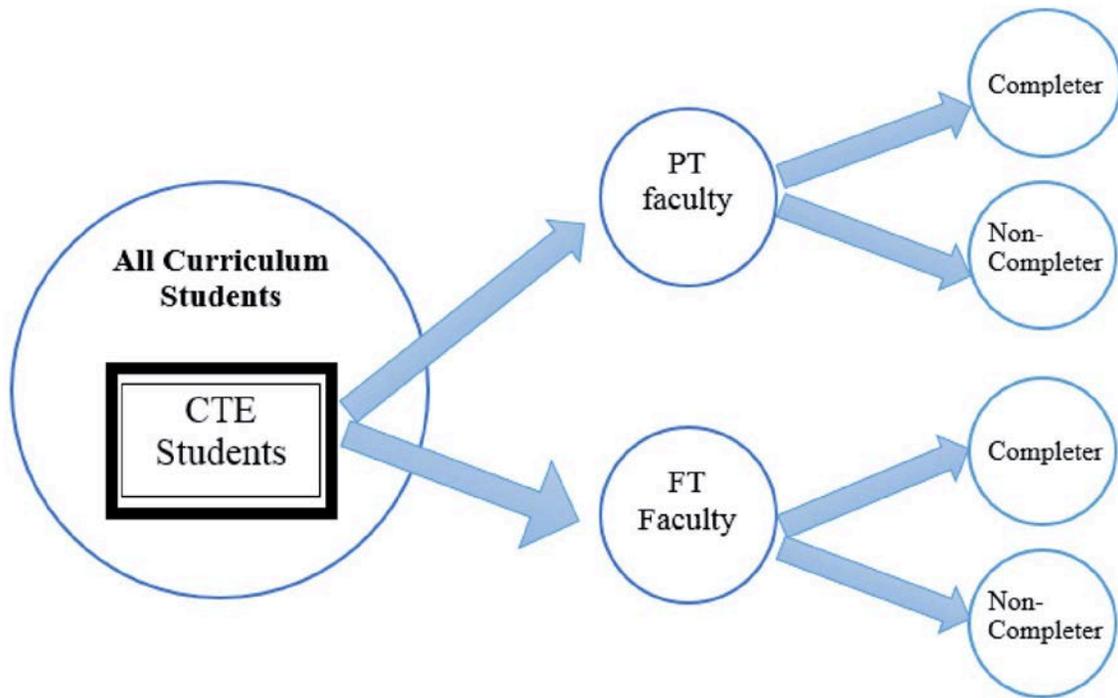


Figure 4. Community College CTE students who are taught by part-time or full-time instructors are either completers or non-completers.

Research Questions

Two understandings have occurred as a result of studying the research problem. First, exposure to courses taught by part-time faculty impacts student completion rates (Jaeger & Hinz, 2008). Second, completion rates will affect both students and the future of community colleges. This study will examine part-time community college faculty member's impact on CTE student retention. What is the impact of part-time faculty instruction on CTE community college student retention? The two research questions are:

1. Does a higher percentage of part-time faculty instruction predict the retention of CTE students?
2. Does a higher percentage of part-time faculty instruction predict the credit hour completion ratios of CTE students?

Summary

This chapter introduced the knowledge, based upon a literature review, that part-time faculty decrease student retention rates. Career and technical education students are the chosen population for this study based upon the lack of research in the area of part-time faculty's impact on CTE students' completion rates.

Included in Chapter 1 was a discussion of the problem and purpose of the study along with the theoretical framework for the research, conceptual framework, and definitions of important terms, the significance of the study, limitations, delimitations, and the research questions.

CHAPTER TWO LITERATURE REVIEW

Chapter 2 presents a review of literature relevant to a study of part-time faculty's impact on CTE student success. This literature review is designed to provide a basis for the study of part-time faculty's effect on CTE student success by offering a context from within which the topic has emerged. Using the research questions as a guide, ten topics are examined. The research questions are as follows:

1. Does a higher percentage of part-time faculty instruction predict the retention of CTE students?
2. Does a higher percentage of part-time faculty instruction predict the credit hour completion ratios of CTE students?

This chapter opens with an examination the history of the community college with an emphasis on the open access nature of the community college. Next is an exploration of the history of career and technical education beginning with its roots in apprenticeship programs. Following that, demographic data on CTE students are included along with characteristics of part-time faculty. The features of part-time faculty are narrowed to a discussion of part-time CTE faculty. Then the part-time faculty's impact on student success is examined. The review of literature revealed part-time faculty have a negative impact on student success, which naturally leads into an examination of Tinto's theory of student attrition. A discussion of the Part-Time Faculty Integration Model follows Tinto's theory of student attrition. Next there is a discussion of student engagement. The four areas of community college excellence

from the Aspen Institute are discussed with an emphasis on completion. Causes of low student performance are examined next. The chapter concludes with a discussion of part-time faculty's impact on student outcomes.

History of the Community College

No one reason, according to Cohen and Brawer (2008), can account for the development and growth of community colleges. From student demand for schooling beyond high school to business and industry need for skilled workers to a community's pursuit of prestige, community colleges experienced steady growth from the mid-1900s through the 20th century (Cohen & Brawer, 2008). Access has been both literally and figuratively associated with the community college. Access for students through open door policies and physical access through the influx of highways in the 1920s led to the expansion of the community college. Ideally a student would not have to travel more than 25 miles to reach a community college (Cohen & Brawer, 2008).

Community college growth increased until the mid-to-late 1960s; the innovative nature of the community college, with its emphasis on serving the underserved, fit well into the nature of a time that emphasized social change (Dassance, 2011). The community college served to "break down barriers" to college access and the faculty and staff believed they resembled missionaries, bringing education to underserved populations (Dassance, 2011, p. 32).

An additional, albeit more practical, reason for the surge in community colleges in the 1960s came as a result of an increase in high school graduation rates (Cohen & Brawer,

2008). Although 4-year colleges and universities could have expanded to meet the increased demand associated with higher graduation rates, educators believed freshman and sophomore students should attend junior colleges to “relieve the university of the burden of providing general education for young people” (Cohen & Brawer, 2008, p. 7). The junior college, as community colleges were first known, was created to allow these abundant high school graduates an educational setting wherein they could give higher education a try (Beach, 2011).

Support for community college growth also came from community leaders who saw the college as an “avenue to community prestige” (Cohen & Brawer, 2008, p.10). Business and industry leaders also recognized community colleges as a source of a trained workforce (Cohen & Brawer, 2008). Currently community colleges operate in every state in the United States and enroll 50% of the students who enroll in colleges and universities in the U.S. (Cohen & Brawer, 2008). Community colleges remain different from four-year institutions, embrace change, and are continually on the lookout for new programs and for new students (Cohen & Brawer, 2008). Finally, as community colleges have matured, the early passion has been replaced with a focus on successful student completion agendas (Dassance, 2011).

History of Career and Technical Education (CTE)

The modern career and technical education programs can trace their roots to early Europe (Gordon, 2014). Trade schools originated in nineteenth century America with three purposes: (a) training in a trade only; (b) general education studies along with trade training; (c) and schools with a three-fold purpose: apprenticeship, general education, and trade

training (Gordon, 2014). Apprenticeship in America initially took two forms: voluntary and involuntary. Voluntary apprenticeship often included an agreement that provided “food, clothing, and shelter; religious training; general education...[and] knowledge, understanding, and experience in the trade skills” (Gordon, 2014, p. 7). On the other hand, the indentured apprenticeship involved the apprentice entering into a contract with the “master or overseer” (Gordon, 2014, p.7). At the completion of a successful apprenticeship, a public announcement was made and the apprentice was allowed to practice the trade (Gordon, 2014).

According to Gordon (2014), there were several influential leaders in the early CTE movement. Three of these were Snedden, Prosser, and Dewey, each of whom advocated for CTE believing “thinking as well as doing” were valuable educational activities (Gordon, 2014, p.50).

Beginning in 1957, the state of North Carolina began funding community colleges. This funding specified community college programs were to provide training that prepared graduates for entry-level careers in both business and industry. These degrees were designated as Associate in Applied Science (AAS) degrees and were intended to be terminal (i.e. not transfer programs) (Cohen & Brawer, 2008). Career and technical education programs provide students the technical skills and education to prepare them for a career in a specific field (Hirschy, Bremer, & Castellano, 2011). Fields included in CTE are health sciences, business, computer science, engineering, and various trades (Hirschy et al., 2011).

The year 1963 was a significant year for CTE programs; the federal Vocational Education Act was passed. The Act increased funding, provided support for building vocational schools, promoted and supported college level (adult) education in the trades, and was the likely impetus for the increased enrollment into vocational programs in public two-year colleges (Friedel, 2011; Gordon, 2014). Later, the Perkins Act of 1984 addressed the needs of special populations such as persons with disabilities or those who have limited English proficiency (Friedel, 2011). The Perkins Act of 1984 changed the focus from program expansion to program enhancement (Gordon, 2014). In 1998, the third Carl D. Perkins Vocational and Technical Education Act (Perkins III) was adopted. Perkins III allowed for more flexibility of funds along with a greater emphasis on accountability (Friedel, 2011). The year 2006 saw the passage of Perkins IV, legislation that was significant because the term “vocational education” was replaced with “career and technical education” (Friedel, 2011).

The 1970s, according to O’Banion (2016), saw a surge in the “development of career and technical education called for specialization of programs and courses; and a more assertive community college faculty created specialized courses to represent their interests” (O’Banion, 2016, p. 328).

The growth surge began to level off in the 1980s (Cohen & Brawer, 2008); however, despite the leveling off in the 1980s, CTE programs remain. In fact, research shows that by the year 2020 “65% of all jobs in the economy will require postsecondary education and training” (Carnevale, Smith, & Strohl, 2014, p. 28). Technical careers, according to Pinchuk

(2015), are the “building blocks to American prosperity” (p. 14). Requiring an increase in post-secondary training results in an increase in salary. These careers will have an average salary from a low in the mid-\$30,000 to a high in the mid-\$90,000, generating a “gateway to the middle class” (SuccessNC, 2016a, p. 28). Cohen and Brawer (2008) believe career and technical education will continue to be a prime function of the community college. As long as workers are in demand, community colleges will continue to train them.

Demographic Characteristics of CTE Students

The demographics of community college CTE students differ from their counterparts who study programs other than CTE (Hirschy et al., 2011). Table 1 illustrates the percentages of associate degree seeking CTE and non-CTE (i.e. academic/transfer) program student demographic data. Not included in Table 1 but still of interest is the percentage of first-generation students included in the two groups. Of the CTE students, 72.1% were first-generation (neither parent has a bachelor’s degree) and of the academic program students 68% were first-generation.

Table 1

Percentage Distribution of Demographics of CTE and Academic Program Students at the Community College of the Southeast

Program	Male	Female	Under 25	White	Black	Hispanic	Other
CTE	41.6%	58.4%	49.2%	54.2%	18.8%	18.1%	8.8%
Non-CTE	44.5%	55.5%	63.5%	54.3%	16.0%	21.1%	9.6%

Note. Non-CTE students are in academic and or college transfer programs

CTE students are 58.4% female, evenly split between under and over the age of 25, and 54% White. According to curriculum enrollment data from the Community College of the Southeast in the 2014–2015 reporting year, 54% of the curriculum students were enrolled in CTE programs. The demographic data for 2014–2015 CCSE curriculum (non-CTE) students mirror those of CTE students in Table 1 with 55.5% female and 44.5% male (Central Piedmont Community College, 2016c).

The National Center for Education Statistics presented demographic data from the 2007–2008 year on CTE versus non-CTE students, which, similarly to CCSE demonstrated a difference in CTE and non-CTE students (National Center for Education Statistics, 2016c). These data are presented in Table 2. The national data as reported by the National Center for Education Statistics 2007–2008 report displayed similar demographic data to the Community College of the Southeast. A majority of the CTE students were female, under age 25, and White, non-Hispanic.

Table 2

Percentage Distribution of Demographic Data of Associate Degree Seeking Students

Program	Female	Under 25	White Non-Hispanic
CTE	60%	52%	59%
Non-CTE	56%	66%	63%

Note. Non-CTE students are in academic and or college transfer programs

Characteristics of Part-Time Faculty

As an employment classification, part-time faculty members are a growing group of college employees whose influence on students makes them an important entity to study (Eagan, 2007; Jaeger & Eagan, 2010; Jaeger & Hinz, 2008). In a 2009 study, Jaeger and Eagan (2010) reported 65.6% of faculty members in over 1,000 community colleges were part-time, making them a significant majority of instructional staff. Beach (2011) credited the financial struggles of community colleges in the 1970s and 1980s with the rise in the part-time faculty workforce. Part-time faculty, according to Beach (2011), grew from 38% in the mid-1960s to “50% in 1980...[and] by 1998 part-timers constituted close to 64% of all community college faculty” (p. 34).

Tuckman (1978) devised taxonomy in order to describe part-time faculty. Tuckman’s (1978) taxonomy consists of seven categories: “the semiretired, students, those wishing to become full-time (Hopeful part-timers), those with a full-time job (Full-Mooners), those with responsibilities in the home (Homeworkers), those with other part-time jobs (Part-Mooners), and all others (Part-Unknowners)” (p. 307). No matter to which category part-time faculty

members belong, they are likely to have a limited sense of or ability to participate in their institution's "academic environment" (Tuckman, 1978, p. 306).

In a study by Rifkin (1998), part-time and full-time faculty expressed differences in their professional attitudes. Five dimension of attitudes were examined in the study: "(1) knowledge acquisition...(scholarship); (2) service ethic; (4) autonomy; (4) commitment to a calling; and (5) integrity" (Rifkin, 1998, p.4). Part-time faculty status, according to Rifkin (1998), resulted in lower levels of classroom involvement and "less interest in scholarly activities" (p. 14).

A central characteristic of part-time faculty is that they spend much of their time teaching and as such part-time faculty are "less available to students and are less engaged with the campus environment" (Eagan, 2007, p. 265). Rifkin also found this to be true in a 1998 study, finding that while full-time faculty have to deliberately work toward setting boundaries with students, the nature of the part-time position naturally lends itself to less faculty and student interaction and allows for a higher level of autonomy. Many part-time faculty members hold full-time jobs elsewhere, perhaps even professions not related to their subject matter, which indicates they may have different career priorities from full-time faculty (Eagan, 2007).

Therefore, the conclusion can be made that part-time instructors may focus solely on teaching and not on integrating themselves into the college (Eagan, 2007). This integration into the college culture is the important puzzle piece missing for part-time faculty. This is important because integration into the college culture affects the part-time instructor's ability

to connect with students and, as has been reported earlier in this study, is key to positive student outcomes (Eagan, 2007).

According to Haeger, who wrote in 2002 about the absence of an office, other common characteristics of part-time faculty members are a lack of administrative support and lack of access to departmental and college meetings. More recent research conducted by Eagan, Jaeger, and Grantham (2015) stated that part-time faculty report feelings of alienation from their college and dissatisfaction with working conditions such as lack of private offices. Beach (2011) considered part-time faculty as “being exploited through lower wages, fewer benefits, and no job security” (p.35). Thus, part-time faculty members are part of a growing category of college employees who have little access to amenities like offices and administrative support (Eagan, 2007; Eagan, Jaeger, & Grantham, 2015; Jaeger & Eagan, 2009). Moreover, part-time faculty lack opportunity for relationships, growth and acceptance; supervision; mentoring and evaluation; a sense of community; an opportunity for growth and advancement; and often lack respect among their colleagues (Morton, 2012). Bailey, Jagger, and Jenkins (2015) summarized the plight of part-time instructors by characterizing them as “isolated and poorly incentivized” (p. 168) with little attachment to their co-workers, their colleges, and their students. Consequently, these often-overlooked employees, who have access to a great number of students, have the potential to negatively impact college student success, a situation which will be discussed in the next section of this paper (Eagan, 2007; Jaeger & Eagan, 2009; Jaeger & Eagan, 2010; Jaeger & Hinz, 2008).

Part-Time CTE Faculty

As a brief review, career and technical education faculty (CTE) typically teach in areas that prepare students for specific occupations. Stone (2011) outlined a comprehensive definition of CTE programs:

Although all CTE programs address some aspects of science, mathematics, and most certainly technology, not all are focused on engineering or engineering-related jobs. Many CTE programs do, however, address STEM-related careers, the second focus of the STEMEd caucus. These include careers in auto-technology, medical technicians, registered nurses, process control processors, machinists, financial managers, and many other kinds of technicians. (p. 1)

Although most literature focuses on the negative aspects of part-time instructors, there is a positive feature that exists with part-time career and technical faculty that is not present in other program faculty. This positive feature relates to the instructor whose primary career is as a professional or as a tradesperson. These part-time instructors bring their real world experiences to the classroom.

CTE instructors, in general, are more likely to come from industry but are less likely to be academically prepared than their general education counterparts (Gordon, 2014). Membership in a professional organization such as The Association for Career and Technical Education Research (ACTER) can mitigate some of the lack of educational attainment of CTE faculty (Gordon, 2014). The learning and development activities of ACTER, according to Gordon (2014), provide its members with opportunities for “research and development

activities” (p. 260) that can enhance their education, although it is not a replacement for formal education. However, these instructors are often more aware of the latest developments in their fields and have more in-depth knowledge of their work than full-time instructors who may be further removed from their fields. Career and technical program part-time faculty have an advantage over full-time faculty because they have the flexibility to continue working in the areas in which they teach, which allows for a richer experience for their students (Cohen & Brawer, 2008). Adjunct faculty, especially CTE adjuncts, bring a perspective only someone who is closely tied to business and or industry can offer (Wallin, 2004). Part-time faculty members are often hired as a result of their expertise in the area in which they teach. These part-time CTE instructors can appreciably add to students’ career exploration and preparation (Gappa et al., 2007). The benefits of part-time faculty who are practitioners is that these faculty members bring their work experiences into the classroom. This connection can bring both internships and career opportunities to their students, which make them an asset to their college and an advantage that benefits students (Cohen&Brawer, 2008; Green, 2007; Wallin, 2004). As Green (2007) stated, “Who better to teach in the fire administration program than the fire chief?” (p.30).

Tinto’s Theory of Student Retention and Part-Time Faculty

Tinto (2012) has been refining his theory of student retention since 1975. Tinto’s (2012) theory is based upon a sociological model that focuses on the college and its environment. Instrumental in the college environment are the faculty whose role, according

to Tinto (2012), is vital for student retention. Retention rates therefore can only be improved if institutions recognize the importance of the classroom experience (Tinto, 2012).

There are researchers who argue that Tinto's theory of student retention is not relevant to community college students; however, Deil-Aman (2011) disagreed. Deil-Aman (2011) stated, "Tinto's theory, despite its origins, leaves room for an examination of students' institutional experiences in a way that does not necessarily need to be dependent on the traditional college-student lifestyle" (p.55). In Deil-Aman's 2011 study, 92% of the community college student's interviewed reported college faculty and or staff members played an integral part in their integration to the college community. Helping to support the assertion Tinto's work does translate to the community college setting.

One needs only to look to Tinto's (2012) work to support Deil-Aman's (2011) assertion and see that Tinto's work is applicable to community college students. Tinto's (2012) work included numerous examples from community college programs that promote retention. Recognizing the importance of community colleges, Tinto (2012) included best practices from six community colleges in this work. Each of the colleges in Tinto's work designed programs and services to enhance student retention, such as first-year experience, peer mentoring, summer bridge, learning communities, student success courses, and supplemental instruction programs. Measures of success included an increase in retention to 81% at Metropolitan Community College for students enrolled in an academic success program and an increase in the pass rate at the Community College of Baltimore County from 27% to 63% in college level English attributed to an accelerated learning program.

Tinto (2006, 2012) laid a foundation for the importance of faculty and classroom interaction on student outcomes. Unfortunately, studies have revealed part-time faculty lack the time for meaningful interaction with students (Eagan, 2007; Jaeger & Eagan, 2009). In order to achieve meaningful interactions, the student-faculty contact needs to occur both inside and outside the classroom (Tinto, 1993). Thus, faculty need to be accessible to and concerned with students in order for important contact to occur (Tinto, 1993; Wirt & Jaeger, 2014). This type of contact needs time and effort in order to be accomplished, and by the nature of the part-time faculty position, meaningful contact opportunities are limited (Eagan, 2007; Jaeger & Eagan, 2009).

Successful retention measures involve participation from faculty, which may not be reasonable or practical for part-time faculty (Tinto, 1993, 2012). Additionally, Wirt and Jaeger (2014) corroborated Tinto's (1993, 2003, 2012) assertions that students with more faculty interaction perform at higher levels with better positive student outcomes.

Community college students face additional obstacles. As they are typically commuter students, engagement characteristically occurs in the classroom. Therefore, faculty need to structure class time for faculty and student interaction, not just lecture (Tinto, 2012). Success, according to Jaeger, Dunstan, and Dixon (2015), "begins and ends in the classroom" (p. 629). This type of course content can be unfamiliar to both full-time and part-time instructors but can be taught during faculty development opportunities. But once again, these types of professional development activities are often unavailable to part-time faculty (Eagan, 2007; Jaeger & Eagan, 2009; Tinto, 2012).

As the underlying premise of this study involves the positive nature of student-faculty interaction, Chan and Wang's (2015) study is particularly relevant. In their study, Chan and Wang (2015) examined CTE student and faculty interaction. As a result of their analysis Chan and Wang (2015) created three categories of interaction: "interaction as a response to curricular demands, interaction for broader educational purposes, and interaction for diverse experiences" (p. 26). Each of the categories is focused upon the student's underlying motivation for the interaction. Interaction, as described in the first category, involves communication that occurs as a result of meeting course requirements. The second motivation for communication moves beyond a singular focus on course requirements to communicating about broader topics such as career goals and advice. The third motivation for communication is to interact with and gain understanding of "ethnic and cultural diversity" (Chan & Wang, 2015, p. 42). This engagement, according to Chan and Wang (2015), should move beyond discussions of coursework to broader topics such as career advice. Who better to offer this type of interaction than an instructor who has a connection with the fields of study being taught?

The literature has established that (part-time) faculty's role in student retention is vital (Eagan, 2007; Jaeger & Eagan, 2009; Tinto, 2012). Unfortunately, part-time faculty may not have the interest, training, or time to meaningfully engage with students in order to facilitate positive outcomes.

Part-Time Faculty Integration Model (PFIM)

Roueche et al. (1996) developed the PFIM to offer a set of strategies that may lead to part-time faculty's increased integration into their colleges' cultures. Colleges need to address part-time faculty's socialization, communication, and participation in order to increase positive assimilation into the institution (Roueche et al., 1996). According to Roueche et al. (1996), in a random survey administration found college administrators were not encouraging the assimilation of part-time faculty in any systematic or directive manner. However, using the PFIM model, negative feelings and experiences of part-time faculty may dissipate. Positive institutional assimilation may perhaps lead part-time faculty to engage meaningfully with students to facilitate positive outcomes.

Spaniel and Scott (2013) included additional effective integration strategies into their research study:

Among the integration strategies found most effective were: discussion groups to explore adjunct faculty issues on campus; occasions for participating in college life such as advising and social functions; activities to permit full-time and part-time faculty interaction; a faculty center to support adjuncts; and recognition programs for years of service or teaching excellence. (p.3)

Student Engagement

For the purposes of this study, the terms student engagement and student involvement are used interchangeably. The underlying focus of this study is student engagement and its effect on positive student outcomes. The point has been made several times that the more

students interact with their faculty members, the more likely the students are to learn, persist, and graduate (Eagan 2007; Tinto 1993, 2012).

In their research on community college retention and graduation rates, Price and Tovar (2014) stated that student engagement plays an important role. In fact, Price and Tovar's 2014 study, bivariate correlation found the three benchmarks active and collaborative learning, student and faculty interaction, and providing support for students were significantly correlated to graduation rates for the 261 community colleges included in the study.

Therefore, the best way to facilitate student involvement is for faculty to take full advantage of opportunities to increase contact with students. Increasing engagement is possible. As reported by The Center for Community College Student Engagement, in the 14-year period from 2004 to 2014 student engagement had either remained steady or risen. Student faculty interaction through email communication increased from 66% to 92% for part-time students and from 79% to 96% for full-time students, and interaction through career plan discussion rose from 61% to 70% for part-time students and from 74% to 80% for full-time students (Center for Community College Student Engagement, 2015).

The purpose of higher education is to educate students, and it stands to reason that maximizing engagement ought to be part of that goal. Price and Tovar (2014) challenged community colleges to design activities that support students and enhance engagement. Colleges can look to Astin (1985) who believed actions are the key to involvement. Astin's

(1985) involvement theory is comprised of five principles. For the purposes of this work, the most important principles can be found in the following remarks:

The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program. [Additionally] the effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement. (Astin, 1985, p. 136)

The importance of student involvement as a component of student success cannot be overemphasized. Consequently, faculty members need to consider their role in facilitating and encouraging student involvement with their entire college experience (Astin, 1985).

College Completion Programs: The Aspen Institute and Student Outcomes

For many years, community colleges were highly regarded for their emphasis on open access (Bailey, Jaggars, & Jenkins, 2015). However; this reputation changed as a result of legislation such as the Student Right-to-Know and Campus Security Act of 1990 which required colleges that participated in the federal financial aid program to report data including graduation rates (Bailey et al., 2015). Publishing the graduation rates proved to be a disquieting experience with colleges reporting graduation rates in the “single digits” (Bailey et al., 2015, p. 5).

The new emphasis on and scrutiny of completion rates make high student retention and completion the gold standard of outcomes for colleges, especially community colleges. For the Aspen Institute, recognizing successful student outcomes continues to be a challenge

for community colleges in working toward helping community colleges balance the open door philosophy with increased completion rates (Zatynski, Witham, & Wynar, 2014). With these goals in mind, the Aspen Institute developed four indicators of “community college excellence” (Zatynski et al., 2014, p. 6):

The Aspen Institute’s College Excellence Program aims to advance higher education practices, policies, and leadership that significantly improve student outcomes in four areas:

1. Completion. Do students earn degrees and other meaningful credentials while in college?
2. Equity. Do colleges work to ensure equitable outcomes for minority and low-income students, and others often underserved?
3. Labor market. Do graduates get well-paying jobs?
4. Learning. Do colleges and their faculty set expectations for what students should learn, measure whether they are doing so, and use that information to improve? (Zatynski et al., 2014, p 2)

Although all four of the community college indicators of excellence are important, for the purposed of this research, completion is the essential piece. Completion is important for a variety of reasons. Completion rates in community colleges are abysmally low. The Aspen institute reports the completion/transfer rate among community colleges to be under 40% (Zatynski et al., 2014). Increasing the completion rate is important for community colleges

and most importantly for the student who stands to achieve “better employment and wage prospects” (Zatynski et al., 2014, p. 6).

To increase completion rates, excellent community colleges, according to Zatynski et al. (2014), must engage faculty and not just full-time faculty. Faculty engagement is important because faculty input into the process of student learning is imperative. Office hours as well as increased incentives for attending orientation and advising students each can serve to increase faculty engagement. Teaching and learning must both improve for student outcomes to improve (Zatynski et al., 2014). As the number of part-time faculty continues to increase, the need for professional development opportunities for part-time faculty becomes more apparent (Zatynski et al., 2014). Creative ways must and can be employed to develop part-time faculty in order for standards to increase.

Part-time Faculty’s Impact on Student Outcomes

The consensus from the literature reviewed for this study is that college students are negatively affected from exposure to courses taught by part-time faculty (Jaeger & Eagan, 2009; Jaeger & Eagan, 2010; Jaeger & Hinz, 2008). In their 2014 study of faculty and student interaction, Wirt and Jaeger found community college students with higher levels of interface with their faculty reportedly put more effort into their coursework and experience greater academic success which ultimately leads to a more positive outcome. Astin (1985), found faculty member involvement has significant implications for student and institutional success. According to Astin (1985), faculty “noninvolvement” (p. 144) takes two forms, with part-time work status being instrumental for reducing the time the faculty member is on

campus; hence, engagement and involvement with students is limited. Thus, integration leads to engagement, which in turn often leads to student success (Eagan 2007; Tinto 1993, 2012). Conversely, a lack of engagement with faculty leads to negative outcomes (Jaeger & Eagan, 2009; Jaeger & Eagan, 2010; Jaeger & Hinz, 2008). Colleges may be convinced of this; nonetheless, two to three part-time faculty members cannot replace full-time faculty when it comes to meaningful faculty and student involvement (Astin, 1985).

Part-time faculty members often experience an absence of common college employee amenities, which may hamper them from becoming fully integrated into the campus culture (Eagan, 2007). Often hired at the last minute with no time to assimilate into their department or college, engaging part-time faculty remains a challenge (Zatynski et al., 2014). Unlike full-time faculty, few requirements are placed upon part-time faculty; from not being required to attend departmental meetings to condensed or non-existent orientations, part-time faculty remain disengaged (Zatynski et al., 2014). This integration into campus culture, which part-time faculty often lack, is what leads to engagement with both the college and ultimately the students (Wirt & Jaeger, 2014).

It is important to note, although the majority of research on part-time faculty presents negative results, there is an alternative study worthy of mention. Ronco and Cahill's (2006) research found "little evidence that instructor type has a widespread impact on student outcomes" (p. 11). Other factors such as students' educational background and experience may play a more important role in student success than employment type of the instructor (Ronco & Cahill, 2004).

It may be fiscally impractical for community colleges to decrease their numbers of part-time faculty. As budget cuts continue, colleges search for ways to cut operating costs. The primary way community colleges are accomplishing lower operating costs is by relying on part-time faculty (Bailey et al., 2015; Cohen & Brawer, 2008). Inexpensive part-time labor keeps community college budgets balanced (Cohen & Brawer, 2008). Consequently, the desire of college administrators to save money ensures the ratio of part-time to full-time faculty remains skewed toward part-time faculty (Cohen & Brawer, 2008).

Therefore, it is in the best interest of the college and the students served to address issues important to part-time faculty. If community colleges make changes, such as offering benefits, orientation, and training, part-time faculty job commitment may increase which can only have positive effects on student outcomes (Jaeger & Eagan, 2009; Zatynski et al., 2014).

A Brief Examination of Low Student Performance

There are a variety of reasons for low performance and poor outcomes for students other than the employment status of faculty. An important theme for student success continues to be the importance making connections to the college, the faculty, and the staff. Tinto's (1993) theory addresses this statement with the idea that students make decisions to leave college as a result of their skills, personal attributes, resources, prior experiences, and connections with the faculty and staff of their institution. One subset of college students, African American male college students, is important to examine because of a tradition of poor performance (Heaven, 2015). Heaven (2015) stated that these students have years of subjugation, despair, and negative socialization to overcome in order to increase success.

The lack of involvement in the college environment also leads to poor outcomes. Strayhorn and Terrell's (2007) research found student involvement in the form of mentoring programs increases interaction leading to increased satisfaction, which leads to increased performance.

Another factor is student employment. Students who work off campus more than 20 hours per week also demonstrate a decrease in academic performance. Logan, Hughes, and Logan (2015) found that first and second year students who worked more than 20 hours had a decline in their academic performance.

Additionally, the income status of students affects performance. Mendoza, Mendez, and Malcolm's (2009) research indicated the receipt of financial aid, Pell grant in particular, negatively affects student persistence. Tinto (1993) agreed: "Short-term fluctuations in finances can and do cause a number of students to withdraw from college... [and] it is more difficult to finish a degree program after having 'stopped out' than it would have been if one had remained continuously enrolled" (p. 179).

Summary

Student-faculty engagement plays an integral part in student success and part-time faculty generally have a negative effect on student outcomes like retention (Astin, 1985; Eagan, 2007; Eagan, Jaeger & Grantham, 2015; Tinto, 2003, 2012). However, the literature on part-time CTE faculty showed an exception. Part-time CTE faculty have an advantage over other part-time faculty if they work in their curriculum area (Wallin, 2004).

The literature reviewed for this chapter focused on several points and included a discussion of 11 topics pertinent to a study of the effect of part-time faculty on CTE student

outcomes: a history of the community college, the history of career and technical education, demographic data on CTE students, characteristics of part-time faculty, the features of part-time faculty narrowed to a discussion of part-time CTE faculty, part-time faculty's impact on student success, Tinto's theory of student attrition and the Part-Time Faculty Integration Model which are the two theories underlying this study, The Aspen Institute's four areas of excellent community colleges, and reasons for low student performance are examined. Finally, the literature review ends with a review of relevant literature on student engagement and an examination of low performance explanations.

CHAPTER THREE METHOD

This quantitative study used logistic regression analysis to examine the effect of part-time faculty members' instruction on career and technical students' fall-to-fall retention rates and completed credit hours. Logistic regression analysis is a mode of analysis used when the dependent variable is dichotomous, meaning the variable can place subjects into two groups (Vogt, 2005). Typically, logistic regression is used when a researcher wants to know whether something is going to occur (Mertler & Vannatta, 2010; Vogt, 2005). The goal of logistic regression, according to Hosmer and Lemeshow (2013), is to find the "best fitting and most parsimonious...[and] most reasonable model to describe a relationship" between dependent and independent variables (p. 1).

This chapter contains a description of the study population, a description of the data set, the instrumentation, research questions and the variables included in the study, data collection, a discussion on the relevance of using logistic regression, and the potential impact of research for part-time community college faculty impact on student outcomes. Reasons for choosing this method along with a description of logistic regression's uses, critique, and benefits are also included in this chapter. The chapter concludes with a summary.

Population

The population for this study included curriculum community college students at a large urban community college, identified as Community College of the Southeast. Both CTE and non-CTE students were included in the data set. The community college is located

in a large metropolitan area. The 2014–2015 enrollment included 28,411 curriculum students attending classes at one or more of eight campuses. The college offers 70 Associate in Applied Science (AAS) degrees and four transfer programs: Associate in Arts (AA), Associate in Science (AS), Associate in Fine Arts (AFA), and Associate in Engineering (AE). Additionally, part-time faculty members were included in the data set.

Construction of the Data Set

The planning and research department of the community college provided the data set from archived data. The planning and research office is the official site for institutional data on student enrollment. The data set included 2309 students from the 2011-2012-cohort year. The variables included in the data set are outlined in Table 3. The approval for access and use of the data was given through the IRB process at CCSE and NC State University.

Research Questions

Two research questions accompanied by hypotheses were examined in this study. The questions and corresponding hypotheses are:

1. Does a higher percentage of part-time faculty instruction predict the retention of CTE students?

H₀: A higher percentage of part-time faculty instruction does not predict community college CTE student retention.

H_a: A higher percentage of part-time faculty instruction does predict community college CTE student retention.

2. Does being taught by a higher percentage of part-time instructors predict the credit hour completion ratio of CTE students?

H₀: A higher percentage of part-time faculty instruction does not predict community college CTE student credit hour completion ratios.

H_a: A higher percentage of part-time faculty instruction does predict community college CTE student credit hour completion ratios.

Data Collection

The variables included in the research study are outlined in Table 3. The table includes the name, abbreviation, type, and coding of the variables used in the logistic regression model. The dependent variables are “retained to the fall of the second year” and “credits completion ratio in year one.” Both categorical and were coded 1 for yes and 0 for no. Independent variables, with the exception of age and part-time faculty exposure ratio, which were continuous variables, were dummy coded. Dummy coding is defined as a procedure that allows the researcher to use variables that have more than two categories as binary categorical variables (Vogt, 2005).

Table 3

Name, Abbreviation, Type, and Coding of Variables Used in Logistic Regression Model

Dependent Variables	Abbreviation	Type	Coding	
Retained to the Fall of the Second Year	RetF2F	Categorical	1 = Yes	0 = No
Credits Completion Ratio in Year One	CollCrdCom	Categorical	1= \geq 67%	0=<66%
Independent Variables	Abbreviation	Type	Coding	
Non-Resident Alien	NonResAlien	Dummy	1 = Yes	0 = White
Hispanic	Hisp	Dummy	1 = Yes	0 = White
American Indian	AmerInd	Dummy	1 = Yes	0 = White
Native Hawaiian	NatHaw	Dummy	1 = Yes	0 = White
Two or More	TwoMor	Dummy	1 = Yes	0 = White
Asian	Asian	Dummy	1 = Yes	0 = White
Black	Black	Dummy	1 = Yes	0 = White
Other (Unknown)	Other	Dummy	1 = Yes	0 = White
Male	Male	Dummy	1 = Yes	0 = Female
Career & Technical Education (AAS, C, D)	AssocNT	Dummy	1 = Yes	0 = AA,AS
Age	Age	Continuous		
Pell Recipient	Pell	Dummy	1 = Yes	0 = No
Part-time Faculty Exposure Ratio (0-100%)	FRatio	Continuous		
Enrolled Full Time	FullTime	Dummy	1 = Yes	0 = Part-time
Late Entry	LateEntry	Dummy	1 = Yes	0 = No
First Time in College	FirstColl	Dummy	1 = Yes	0 = No
Need Developmental Math	NeedDM	Dummy	1 = Yes	0 = No
Need Developmental English	NeedDE	Dummy	1 = Yes	0 = No
Need Developmental Reading	NeedDR	Dummy	1 = Yes	0 = No
Transfer to 4 Year College	Trans4Yr	Dummy	1 = Yes	0 = Not Enrolled
Completion of Certificate	CompCert	Dummy	1 = Yes	0 = Not Enrolled
Completion of Associate Degree	CompAssoc	Dummy	1 = Yes	0 = Not Enrolled
Transfer to 2 Year College	Trans2Yr	Dummy	1 = Yes	0 = Not Enrolled

Note: Table 1 provided by Dr. Bobbie Frye, CPCC office of planning and research

Data Analysis

The steps for logistic regression analysis are based upon SPSS software. The first step in logistic regression analysis is to gather data. For this study, extant data were gathered from the Community College of the Southeast planning and research department. Student retention data for students who were being taught by part-time instructors will made up the data set. The data set was screened for part-time faculty instruction using a list of instructors. Student data were screened based upon the percentage of courses taught by part-time instructors. Additionally, identifying information for students was eliminated. Credit hours completed were split into two groups: students who completed 67% of their attempted credit hours and students who did not. Students were also considered in good standing if they earned a GPA of 2.0 or higher. The standards of academic progress for federal financial aid and for the Community College of the Southeast were the basis for these levels (Central Piedmont Community College, 2016d).

The dependent variables (DVs) are retention yes = 1 or no = 0 and the credits completion ratio. The independent variables (IVs) include age, race, gender, GPA, part-time faculty, program of study, race/ethnicity, full-time enrollment, late entry, first time in college, need for developmental education, transfer status, and completion. The independent variables were chosen based upon the literature review in conjunction with the researcher's experiences.

Once the DV and IVs were established, the first step was to screen the data for missing data, multivariate outliers, and multicollinearity. The credit hours completed IV was

subject to multicollinearity because of the credit hours used to determine full-time enrollment status. It was important to examine and address any missing data. Several techniques were available. Cases with missing values could have been deleted or the missing values could have been estimated using the researchers experience or previous knowledge (Mertler & Vannatta, 2010). Lastly, using the available data, the means could have been calculated (Mertler & Vannatta, 2010).

Outliers also needed to be addressed in order to avoid distortion of the test results. Mahalanobis distance measures outliers (Mertler & Vannatta, 2010). The tolerance statistic is used to determine multicollinearity; if the tolerance for the variables exceeds .1, multicollinearity is not a problem (Mertler & Vannatta, 2010).

The next step was to calculate descriptive statistics: mean, median, mode, and standard deviation. To conduct the logistic regression the DV retention was moved to the dependent box the IVs are moved to the covariates box. The independent variables included age, race, gender, GPA, part-time faculty, program of study, and credit hours completed. Then, the method selected from among the five methods was the enter method. If there were any categorical variables between the IVs, they were moved to the categorical covariates box and contrast method and reference category were selected (Mertler & Vannatta, 2010). Finally, the appropriate options were selected and the logistic regression was run (Mertler & Vannatta, 2010).

Logistic regression has three components to the output: model fit, moved variables, and the classification table which shows the percentage of variables classified correctly.

Model fit uses the -2 Log Likelihood for an index (Mertler & Vannatta, 2010). A perfect -2 Log Likelihood would have a value of 0. A low value represents a better model fit; meaning a greater percentage of the variable is classified correctly (Mertler & Vannatta, 2010). Three other statistics are used in determining model fit: Cox & Snell R Square, Nagelkerke R Square, and model Chi Square (Mertler & Vannatta, 2010). Cox & Snell R Square and Nagelkerke R Square both estimate the variance amount in the DV that the model accounts for (Mertler & Vannatta, 2010). The Hosmer and Lemeshow (2013) statistic is also used to determine goodness of fit. The Hosmer and Lemeshow (2013) test groups variables based upon the value of the estimated probabilities. Finally, the summary of model variables displays statistics that signify a variable's contribution to the model.

Uses and Benefits of Logistic Regression

Logistic regression is used when there is an independent variable that is dichotomous. In other words, logistic regression is used when the researcher wants to know if an event happened or if it did not (Van der Heijden, 2012). Sperandei (2014) summarized the benefits of logistic regression: "Logistic regression is a powerful tool allowing multiple explanatory variables being analyzed simultaneously, meanwhile reducing the effect of confounding factors" (p. 18). Stoltzfus (2011) remarked on the versatility of logistic regression: The "techniques are versatile...because they can measure associations, predict outcomes, and control for confounding variable effects" (p. 1099). Finally, logistic regression analysis is also flexible because it can produce models that are non-linear (Mertler & Vanatta, 2010).

Relevance of Logistic Regression

Logistic regression is relevant to a study of the impact part-time community college faculty have on student outcomes because this research contains a dichotomous dependent variable and independent variables that can be either categorical or continuous (Vogt, 2005). The term “outcome” is used in the study title, but for research purposes the term “retention” was being used. The independent variable was whether college students who are being taught by part-time faculty are retained. Retained or not could be coded 1 and 0 respectively.

Why Logistic Regression Was Chosen

Logistic regression was the method of choice because using this method has become a recognized practice in the social sciences and there is a dichotomous dependent variable (retained) in this study. The dependent variable is whether college students who are being taught by part-time faculty are retained. Retained yes or no could be coded 1 or 0 respectively. The nature of logistic regression analysis is that the dependent variable only has two options: either the event occurred or it did not (Van der Heijden, 2012). As the dependent variable for this study is dichotomous, logistic regression was the most practical choice.

Summary

This chapter contained a definition of logistic regression which is a statistical method used when the researcher wants to determine if an event is going to happen or not (Van der Heijden, 2012). A description of a logistic regression analysis followed which included a description of the determination of the DV and IV and the data screening process. A

discussion on why logistic regression was selected as a relevant method for this research study on part-time community college faculty impact on student outcomes was next. The reasons for choosing this method, it was the appropriate for the dichotomous variables. Lastly a description of logistic regression's uses and benefits as a powerful, useful and appropriate method concluded this chapter.

CHAPTER FOUR RESULTS

This chapter includes the results of the logistic regression analysis tool used to study the effects of part-time instruction on CTE students' fall-to-fall retention and credit completion ratio of 67% or higher. The results were separated into two models. Model 1 was constructed to predict the fall-to-fall retention rate of CTE students. Model 2 was constructed to predict the credit hour completion ratio of 67% or higher of CTE students.

Logistic regression was selected as the statistical method as it is applicable when the occurrence of an event is to be predicted (Vogt, 2005). Logistic regression analysis permitted the researcher to explore two dichotomous dependent variables: retained and credit completion. The dependent variables (DVs) are retention yes = 1 or no = 0 and the credit completion ratio, defined as 67% or higher credit completion ratio, yes = 1 or no = 0. The independent variables (IVs) included gender, age, race/ethnicity, program status (CTE versus college transfer), Pell grant status, need for developmental education in math, need for developmental education in English, full-time enrollment, and part-time faculty ratio.

This chapter commences with a description of the pre-data analysis data screening; next the descriptive statistics were outlined, both graphically and in a narrative; then the data were analyzed; and the chapter concluded with a summary.

Data Screening

In order to accurately report the results of the data analysis, pre-screening is an essential element of data analysis (Mertler & Vannatta, 2010). Data analysis began with an

examination of the dataset variables to check for missing values and outliers. Frequencies revealed there were no missing values or outliers. The continuous metrics were examined for outliers and no outliers were found among the continuous metrics. The dataset was checked for multicollinearity (meaning the independent variables are highly correlated with each other). Data screening led to the elimination of one variable, late entry, due to the threat of multicollinearity. The independent variable of late entry, defined as the student entering the college at age 24 or higher, the age tolerance was greater than .1, and the variance inflation factor (VIF) was .846. Therefore, the variable late entry was removed from the analysis due to the high intercorrelation with age (Mertler, 2010). Age was retained as it was a continuous variable significant at the .01 level, and it is an important variable in the explanation of retention and student success (Owen, 2003). Normality and linearity are not issues with logistic regression analysis and do not need to be addressed (Mertler & Vannatta, 2010).

Descriptive Statistics

The data set included $n = 2,309$ student records from the 2011–2012 cohort year. Demographic data are provided in Tables 4, 5, and 6. Descriptive statistics are outlined in this portion of the chapter. Female students (50.2%, $n = 1,159$) outnumbered male students (49.8%, $n = 1,150$). The majority of students were placed into the two age groups of 18 and 19 with $n = 1,592$, 68.90% of the $n = 2,309$ placing into those two ages. The majority of students were in the college transfer programs (57.9%, $n = 1,338$) that outnumbered the CTE students (42.1%, $n = 971$). Pell grant recipients (54.2%, $n = 1,252$) outnumbered non-Pell grant recipients (45.8%, $n = 1,057$). The frequency data showed the retention rate from fall-

to-fall to be 51% and $n = 1,181$ retained and 48.9% and $n = 1,128$ students not retained. The data revealed the majority of students were advised to enroll into developmental courses. The frequencies for developmental course advisement referral were 67.9%, $n = 1,568$ for math, 58.7%, $n = 1,355$ for English, and 58.7%, $n = 1,356$ for reading.

Tables 4 through 8 depict frequency data from the study. Table 4 includes the frequencies and percentages of the males and females in the study.

Table 4

Gender by Number and Percent

Variable	Number	Percent
Male	1,150	49.8%
Female	1,159	50.2%

Note: N = 2,309

Table 5 includes the number and percent of the students included in the study by age. The ages ranged from 16 to 65, excluding age 58. The majority of students in the 2011–2012 academic year were ages 18 and 19 ($n = 1,592$, 68.90%).

Table 5

Age by Number and Percent

Age range	Number	Percent
16–25	1,980	85.6%
26–35	177	7.6%
36–45	96	4.2%
46–65	56	2.2%

Note. $N = 2,309$

Table 6 includes the frequencies of the independent variables along with the number and percent of the variables used in the logistic regression analysis.

Table 6

Frequencies of Independent Variables

Variable	Yes		No	
	Number	Percent	Number	Percent
Pell	1,252	54.2%	1,057	45.8%
Full-time Student	1,295	56.1%	1,014	43.9%
CTE Student	971	42.1%	1,338	57.9%
Need Dev. Math	1,568	67.9%	741	32.1%
Need Dev. English	1,355	58.7%	954	41.3%
Need Dev. Reading	1,356	58.7%	953	41.3%

Table 7 includes the number and percentage of the dependent variables, which were retained and college credits completed.

Table 7

Frequencies of Dependent Variables

Variable	Yes		No	
	Number	Percent	Number	Percent
Retained	1,181	51.1%	1,128	48.9%
College Credits Completed	1,512	65.5%	797	34.5%

The race/ethnic frequencies, as defined by the Integrated Post-Secondary Data Systems (IPEDS) federal reporting definitions, are depicted in Table 8. The two most prevalent races/ethnicities are White/Caucasian ($n = 1,014$, 43.9%) and Black/African American ($n = 756$, 32.7%) of the $n = 2,309$ in the data set.

Table 8

Frequencies of IPEDS Race

Variable	Number	Percent
American Indian	12	0.5%
Asian	12	2.6%
Black/African American	756	32.7%
Native Hawaiian	5	0.2%
Hispanic/Latino	199	8.6%
Non-Resident Alien	94	4.1%
Two or More Races	65	2.8%
Unknown	104	4.5%
White/Caucasian	1,014	43.9%

Note: $N = 2,309$

Figure 4 shows that $n = 500$ students in the study had 100% of credit hours taught by part-time faculty. The mean ($M = 71.41$) indicated a relatively high percentage of students had part-time instructors and standard deviation was ($SD = 27.015$). Conversely, Figure 5 shows that $n = 500$ students had no full-time instructors. The mean percentage of students with full-time instructors was relatively small ($M = 28.59$, $SD = 27.015$).

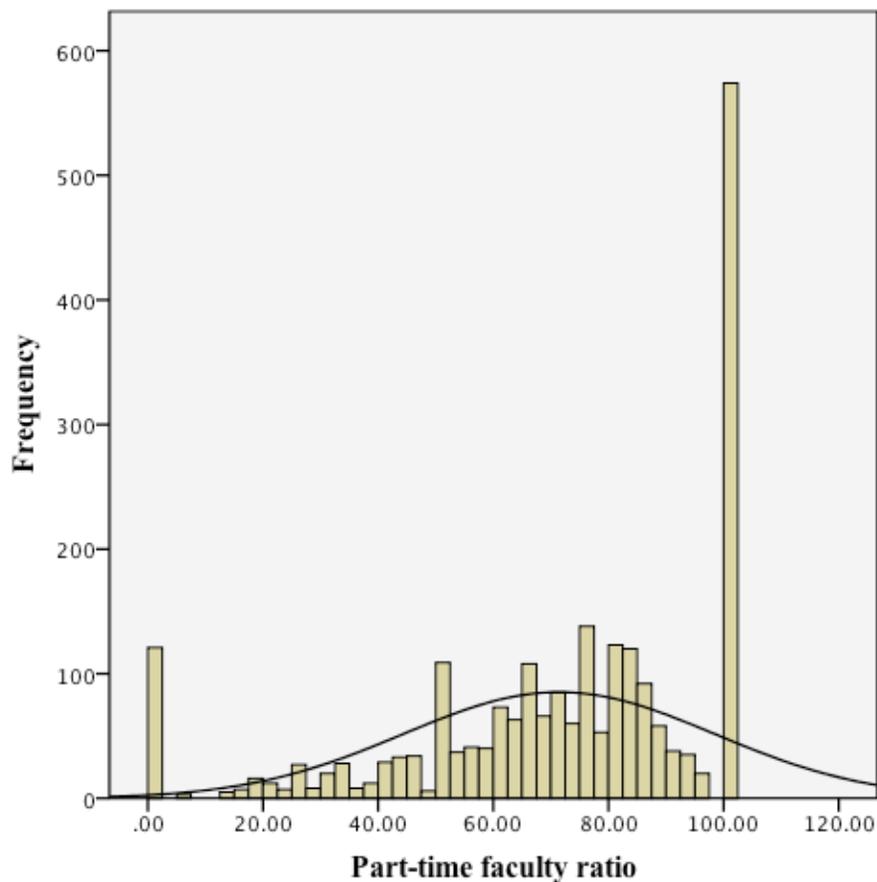


Figure 5. Part-time faculty ratio by frequency.

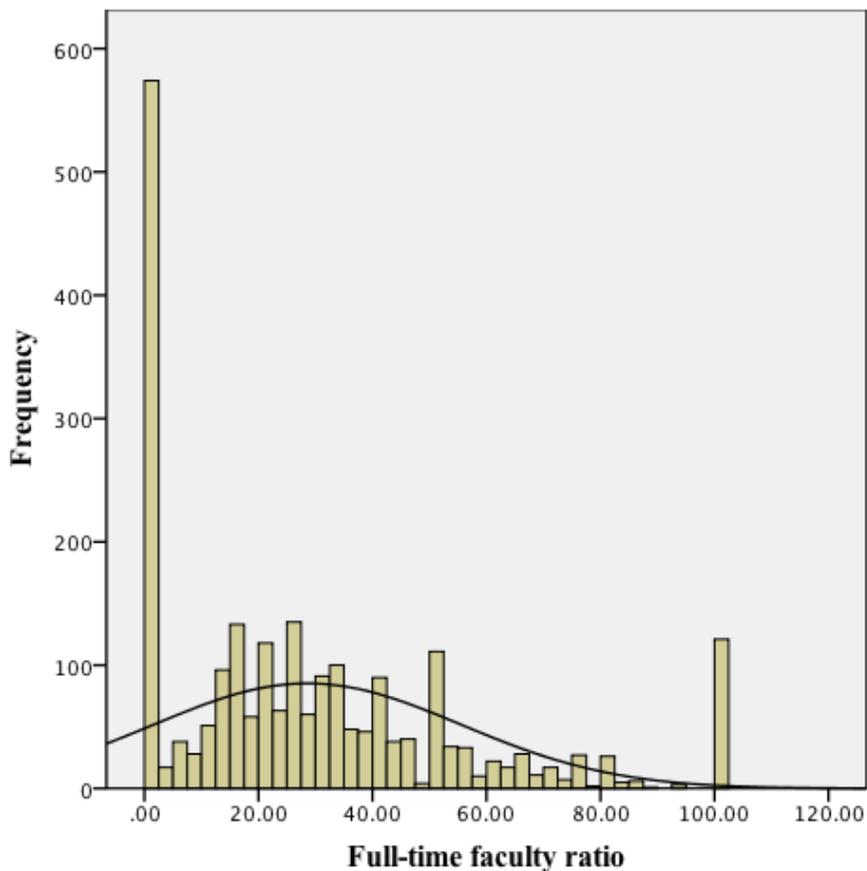


Figure 6. Full-time faculty ratio by frequency.

Data Analysis

After the data were screened the logistic regression analysis was conducted. Using SPSS the dependent variable (retained) was moved to the dependent box and the independent variables including age, race/ethnicity, gender, program status (CTE versus college transfer), Pell status, need for developmental education in math, need for developmental education in

English, need for developmental education in reading, full-time enrollment, and part-time faculty ratio were moved to the covariates box.

The logistic regression for Model 1 (fall-to-fall retention) was conducted using the enter method in order to determine which variables were predictors of CTE student retention. Data screening led to the elimination of one variable, late entry, due to the threat of multicollinearity. Goodness of fit tests were used in order to assess if the model fits the data, thus matching the expectations of the researcher's theory (Vogt, 2005). The goodness of fit was assessed using -2 Log likelihood, Cox & Snell R square and Nagelkerke R square. The regression was significant (-2 Log Likelihood = 3061.951, $X^2 = 137.786$, $p < .001$) and Nagelkerke $R^2 = .077$. The model correctly classified 60.4% of the cases in the retention model and explained 8% of the variance in the two groups. The Hosmer and Lemeshow test of goodness of fit denoted $p = .658$. As the probability was greater than .05 the model is a good fit and is structurally sound (Hosmer & Lemeshow, 2013).

The Wald statistic, a test of statistical significance of coefficients, indicated the significant predictors of retention to the fall term were part-time faculty ratio, age, race, receipt of Pell grant, and full-time student status (Vogt, 2005). The odds ratios (e^B), a "measure of association," for the significant variables were: age, $e^B = 1.018$; Asian students, $e^B = 2.009$; Black/African American students, $e^B = .653$; non-resident alien students, $e^B = 1.724$; Pell grant recipients, $e^B = .648$; full-time enrollment status, $e^B = 1.642$; and part-time faculty ratio, $e^B = 1.009$ (Vogt, 2005, p. 219). The percent magnitude of the odds ratios, measured as $e^B - 1.00$ multiplied by 100 (B. Frye, personal communication February 1, 2017),

indicated students with a higher percentage of credit hours taught by part-time faculty were minimally affected with .90% more likely to be retained.

As age increased by one year, students were more likely to be retained, but only by 1.8%. With White/Caucasian students as the reference group, Asian students were 100.9% more likely to be retained, full-time students were 65.2% more likely to be retained than part-time students, and non-resident alien students were 72% more likely to be retained.

Conversely, with White/Caucasian students as the reference group, Black/African American students were -34.7% less likely to be retained and students receiving Pell grants were -35.2% less likely to be retained than students not receiving Pell grants. The college transfer status of the students did not have a statistically significant impact on the fall-to-fall retention when controlling for the other independent variables in the study. The coefficients are presented in Table 9, which includes the variables in the equation with the dependent variable of retained from fall-to-fall.

Table 9

Logistic Regression, Model 1, Fall-to-Fall Retention

	B	S.E.	Wald	Df	Sig.	Exp(B)
Gender	.074	.087	.718	1	.397	1.077
Age	.018	.007	7.798**	1	.009	1.018
Race			42.436***	8	.000	
American Indian	-1.328	.683	3.779	1	.052	.265
Asian	.698	.291	5.741*	1	.017	2.009
Black/African American	-.426	.109	.095	1	.758	1.329
Native Hawaiian	.284	.921	.095	1	.758	1.329
Hispanic	.048	.162	.090	1	.765	1.050
Non-Resident Alien	.545	.235	5.393*	1	.20	1.724
Two or More Races	.321	.267	1.442	1	.230	1.379
Other Race	-.111	.210	.280	1	.597	.895
CTE	-.059	.091	.420	1	.517	.942
Pell	-.434	.099	19.404***	1	.000	.648
Ned Dev. Math	-.001	.002	.168	1	.682	.648
Need Dev. English	-.002	.002	1.348	1	.246	.998
Enrolled Full Time	.502	.089	31.542***	1	.000	1.652
Part-Time Faculty Ratio	.008	.002	25.717***	1	.000	1.009
Constant	-.942	.243	15.082***	1	.000	.390

Note: *** $p < .001$ level, ** $p < .01$, * $p < .05$

The second logistic regression (Model 2) (credit hours completion ratio) was conducted using SPSS. The dependent variable (credit hours completion ratio) was moved to the dependent box and the independent variables including gender, age, race/ethnicity, program status (CTE versus college transfer), Pell status, need for developmental education in math, need for developmental education in English, full-time enrollment status, and part-time faculty ratio were moved to the covariates box.

Goodness of fit was assessed using -2 Log likelihood, Cox & Snell R square and Nagelkerke R square. The regression for Model 2 was significant indicating the likelihood that the differences were not due to chance (-2 Log Likelihood = 2812.765, $X^2 = 163.102$, $p < .001$), Nagelkerke $R^2 = .079$. The model correctly classified 66.5% of the college credit completed model. The Hosmer and Lemeshow test of goodness of fit indicated a significance of $p = .317$. As the probability was $> .05$ indicating a non-significant result, the model can be considered a good fit and structurally sound (Hosmer & Lemeshow, 2013).

The Wald statistic indicates the significant predictors were age, gender, Asian race/ethnicity, Black/African American race/ethnicity, receipt of Pell grant, and full-time enrollment student status. The odds ratios for the significant variables were: age, $e^B = 1.019$; gender, $e^B = 1.449$; Asian students, $e^B = 4.603$; Black/African American students, $e^B = .585$; non-resident alien students, $e^B = 3.125$; Pell grant recipients, $e^B = .706$; full-time students, $e^B = 1.546$; and part-time faculty ratio, $e^B = 1.005$. The percent magnitude of the odds ratios, measured as $e^B - 1.00$ multiplied by 100, indicated that as age increased by one year, students were more likely to have credit completion ratios higher than 67%, but only by 1.9%. The

odds ratios indicated female students were 44.9% more likely to earn higher college credit completion ratios than male students. With White/Caucasian students as the reference group, Asian students are 360.3% more likely to earn more college credits and non-resident alien students were 212.5% more likely to earn more college credits. Full-time students were 54.6% more likely to earn higher credit completion ratios than part-time students. Students with a higher percentage of credit hours taught by part-time faculty were minimally impacted with .50% more likely to earn higher credits completion ratios than students with a smaller percentage of credit hours provided by part-time faculty. Conversely, with White/Caucasian students as a reference group, Black/African American students are -41.5% less likely to earn higher credit hour completion ratios and students receiving Pell grant are -29.4% less likely to earn higher credit hour completion ratios than students not receiving Pell grant. The coefficients are presented in Table 10 which includes the variables in the equation with the dependent variable of college credit completion ratio at 67% or higher.

Table 10

Logistic Regression, Model 2, Credit Hour Completion Ratio or 67% or Higher

	B	S.E.	Wald	Df	Sig.	Exp(B)
Gender	.371	.092	16.211***	1	.000	1.449
Age	.018	.008	5.9191*	1	.015	1.019
Race			61.421***	8	.000	
American Indian	-.091	.623	.021	1	.884	.913
Asian	1.527	.441	11.975***	1	.001	4.603
Black	-.537	.113	22.559***	1	.000	.585
Native Hawaiian	-1.348	.939	2.61	1	.151	.260
Hispanic	-.103	.170	.366	1	.545	.902
Non-Resident Alien	1.140	.333	11.722***	1	.001	3.125
Two or More Races	.194	.290	.449	1	.503	1.214
Other Race	-.097	.222	.189	1	.664	.908
CTE	.002	.096	.001	1	.981	1.002
Pell	-.350	.105	11.194***	1	.001	.706
Ned Dev. Math	.002	.002	1.017	1	.313	1.002
Need Dev. English	.002	.002	1.266	1	.261	1.002
Enrolled Full Time	.435	.094	21.569***	1	.000	1.546
Part-Time Faculty Ratio	.005	.002	9.426***	1	.002	1.005
Constant	-.634	.256	6.125	1	.013	.530

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Table 11

Comparison of English, Math, College Credits by Non-CTE and CTE Students

	<i>df</i>	Non-CTE		CTE		<i>t</i>	<i>p</i>	<i>d</i>
		Mean	SD	Mean	SD			
Eng. Credits Attempted	1,588	6.14	2.475	5.99	2.58	1.085	.278	.054
Eng. Credits Completed	1,533	5.91	2.304	5.71	2.308	1.555	.12	.079
Eng. Credits with Grade A–C	1,332	5.29	1.68	5.17	1.806	1.119	.263	.061
Math Credits Attempted	1,186	7.15	4.784	5.38	3.958	6.512***	.000	.356
Math Credits Completed	1,112	6.79	4.412	5.13	3.633	6.487***	.000	.376
Math Credits with Grade A–C	910	5.64	3.645	4.4	2.788	5.334***	.000	.353
College Credits Attempted	2,307	45.36	29.535	41.21	30.832	3.273**	.001	.222
College Credits Completed	2,114	37.61	27.319	36.06	25.89	1.246	.213	.054
College Credits with Grade A–C	2,060	34.91	25.890	34.01	27.856	0.75	.453	.033
First GPA	2,307	2.3399	1.24941	2.3666	1.34563	-0.491	.623	-.020
Last GPA	2,307	2.2108	1.09966	2.272	1.20057	-1.269	.205	-.052

Note: N = 2,309

Although Table 11 does not directly relate to a research question, the researcher felt it important to include because it contains data beneficial to expand the representation of the sample and to add to the understanding of the outcomes of the comparisons between CTE and non- CTE student outcomes. Table 11 includes a comparison of English, math, and college credits attempted, completed, and completed with a grade of A through C as well as the first-term and last-term grade point average by non-CTE and CTE student status. Non-CTE students are those in college transfer programs. Effect size was calculated for this table and interpreted using Cohen's rule for evaluation. According to Cohen, an effect size of .8 is large, .5 is medium, and .2 is small (Kotrlik, Williams & Jabor, 2011). The study revealed the following results. For the components English variables attempted for non- CTE students ($M = 6.14, SD = 2.475$) and English credits attempted for CTE students ($M = 5.99, SD = 2.58$) the results $t = 1.085, p = .278, df = 1,588$ and Cohen's $d = .054$ indicated no significance. The component English credits completed for non-CTE students resulted in ($M = 5.91, SD = 2.304$) and ($t = 1.555, p = .12, df = 1,533$); for CTE students the English credits completed were ($M = 5.71, SD = 2.308$); and Cohen's effect size $d = .079$ indicating no significance. English credits completed with a grade of A through C for non-CTE students resulted in ($M = 5.29, SD = 1.68$) and ($t = 1.119, p = .263, df = 1,332$). For CTE students, English credits with a grade of A through C were ($M = 5.17, SD = 1.806$). Effect size for English credits completed with a grade of A through C resulted in Cohen's effect size $d = .061$, indicating no significance.

The next component was math credits attempted for non-CTE students, the results were ($M = 7.15$, $SD = 4.784$), and ($t = 6.512$, $p < .000$, $df = 1,186$) and Cohen's effect size $d = .356$ indicating moderate practical significance. Math credits completed for non-CTE students were ($M = 7.15$, $SD = 4.784$) and ($t = 6.487$, $p < .000$, $df = 1,112$); and for CTE students the results were ($M = 5.38$, $SD = 3.633$), and Cohen's effect size $d = .376$ indicating moderate practical significance. Math credits completed with a grade of A through C for non-CTE students were ($M = 5.64$, $SD = 25.890$) and ($t = 5.334$, $p < .000$, $df = 910$); and for CTE students the results were ($M = 4.40$, $SD = 27.856$), and Cohen's effect size $d = .033$ indicating moderate significance.

College credits attempted, completed, and completed with a grade of A through C were also analyzed for both non-CTE and CTE students. The results for college credits attempted indicated ($M = 45.36$, $SD = 29.535$) and for non-CTE students and ($M = 41.21$, $SD = 30.832$) for CTE students with Cohen's $d = .222$ indicating small significance. College credits completed for non-CTE students were ($M = 37.61$, $SD = 27.319$) and ($M = 36.06$, $SD = 25.89$) and ($t = 1.246$, $p = .213$, $df = 2,114$) for CTE students with Cohen's $d = .054$ indicating no significance. College credits completed with a grade of A through C for non-CTE students were ($M = 34.91$, $SD = 25.89$), and ($M = 34.01$, $SD = 27.856$) and ($t = 3.273$, $p < .001$, $df = 2,307$) for CTE students with Cohen's $d = .033$ indicating no significance.

The final components were first term and last term grade point average (GPA). The results of the first term GPA for non-CTE students were ($M = 2.339$, $SD = 1.24941$), and ($M = 2.367$, $SD = 1.34563$) and ($t = -.491$, $p = .653$, $df = 2307$) for CTE students with Cohen's d

= -.020 indicating no significance. The last term GPA for non-CTE students was ($M = 2.211$, $SD = 1.09966$) and ($M = 2.272$, $SD = 1.20057$) and ($t = -1.269$, $p = .205$, $df = 2,307$) and for CTE students with Cohen's $d = -.052$, indicating no significance.

Table 12 illustrates the number and percent of the chi-squared test in order to determine if there are differences that are statistically significant between the non-CTE students versus CTE students and their outcomes (Vogt, 2005). The results indicated, as this work theorized there were differences between non-CTE and CTE students.

Table 12

Number and Percent of Non-CTE and CTE Student Outcomes

Outcome	Non-CTE		CTE	
	Number	Percent	Number	Percent
Assoc. Degree	197	14.7%	119	12.3%
Certificate	4	0.3%	20	2.1%
Diploma	8	0.6%	16	1.6%
Still Enrolled	75	5.6%	38	4.9%
Transfer: 2-Year	163	12.2%	118	12.2%
Transfer: 4-Year	287	21.4%	121	12.5%
Unknown	604	45.1%	529	54.5%

Note: Chi-squared = 61.444, $df = 6$, $p < .001$

Summary

This chapter presented the results of the logistic regression analysis performed in order to research two models. Model 1 studied the effect of a high percentage ratio of part-time instruction on career and technical student retention. Model 2 explored the effect of a high percentage ratio of part-time faculty instruction on career and technical student college course completion of 67% or higher. The course completion ratio of 67% was selected because it reflects the standard of academic progress for financial aid purposes as defined by the community college under study (Central Piedmont Community College, 2016d).

The logistic regression analysis determined a number of variables were found to be significant for both of the models. While the part-time faculty ratio was found to be statistically significant $p < .001$ for CTE students in Model 1, the effect was found to be minimal. The significant predictors for Model 1 were part-time faculty ratio; gender, race,

receipt of Pell grant, and full-time student status, and the significant predictors for Model 2 were gender, race, receipt of Pell grant, and full-time student status.

Additionally, this chapter included the results of Cohen's d measure of effect size comparison of English, math, and college credits attempted, completed, and completed with a grade of A through C, and the first-term and last-term grade point average by non-CTE and CTE student status. The chapter concluded with a chi-squared test in order to see if there were differences between the non-CTE students versus CTE students and their outcomes that are statistically significant.

CHAPTER FIVE DISCUSSION

There is scant literature on the effect of part-time instruction on community college student retention. Even less research has been conducted on the effects of part-time instruction on students by program of study, namely regarding career and technical education students. According to research, career and technical education students and their faculty are unlike students in other programs of study; this researcher surmised this difference could provide insight into potential remedies for low completion rates (Hirschy et al., 2011; Wallin, 2004).

The need to retain community college students is well documented and the exploration of this need was the impetus for this study. Retention is important for both community college students and their institutions. Among the implications of low student completion rates are institutional funding and economic impact. States, including North Carolina, are moving toward college funding based upon performance measures. Colleges could be funded based upon completion rates, consequently affecting the colleges' operating funds (SuccessNC, 2016b). Low completion rates also have an effect on the state's economy. When students leave college before completing their course of study, they have not been adequately prepared for jobs requiring technical skills and thus are negatively affecting the state's economy with wages and spending remaining low (NC Commerce Workforce, 2016).

This study proposed to explore the effect of part-time instruction on career and technical student fall-to-fall retention and credit hours completed. Student retention

continues to be a pertinent issue in higher education and is a “prevalent issue for all stakeholders in higher education” (Pruett & Asher, 2015, p. 32).

This chapter includes the results of the research within the context of the two research questions:

1. Does a higher percentage of part-time faculty instruction predict the retention of CTE students?
2. Does a higher percentage of part-time faculty instruction predict the credit hour completion ratios of CTE students?

The conclusions reached from the research are included in this chapter along with a discussion of the implications from the two theoretical frameworks, Tinto’s retention hypothesis and Roueche et al.’s part-time faculty integration model. Next, nine recommendations for practice are outlined, then recommendations for future research are included, and the limitations are discussed. The chapter concludes with a summary.

Research Conclusions

After conducting a literature review on student completion and the influence part-time instructors have on student retention and completion of credit hours, two research questions were created. The two research questions accompanied by hypotheses were examined in this study. Each of the research questions along with their hypotheses and the conclusion drawn from the data analysis are presented in the next portion of this research study. Research Question 1 follows along with the results of the data analysis.

Research question 1. Does a higher percentage of part-time faculty instruction predict the retention of CTE students?

The hypotheses were as follows:

H₀: A higher percentage of part-time faculty instruction does not predict community college CTE student retention.

H_a: A higher percentage of part-time faculty instruction does predict community college CTE student retention.

Result: The null hypothesis can be rejected.

With little exception, the review of the literature found college students' success was negatively affected by part-time faculty instruction (Jaeger & Eagan, 2009; Jaeger & Eagan, 2010; Jaeger & Hinz, 2008). Student success, which can be defined as both retention and graduation rates, according to Jaeger and Hinz (2008) and Jacoby (2006), are both negatively affected by part-time faculty instruction. Thus, the literature review laid the foundation for this research question.

The results of this research found the impact of part-time faculty instruction on community college student retention resulted in an odds ratio of $e^B = 1.009$. The results of this researcher's work show that students with a higher percentage of part-time faculty instruction had 1.009% odds of being retained. The results were significant at the $p < .001$ level; however, the odds ratios indicate minimal effects. Therefore, the college transfer status (whether students were in a college transfer program as opposed to a CTE program) of

the students did not have a statistically significant impact on fall-to-fall retention when controlling for the other independent variables in the study.

There were, however, additional variables in this study that were found to be significant predictors of student retention. These variables were age, Asian students, Black/African American students, non-resident alien students, Pell grant recipients, and full-time enrollment status. Using the percent magnitude of the odds ratios to interpret study results, as a student's age increased by one year, they were 1.8% more likely to be retained; Asian students were 100.9% more likely to be retained; full-time students were 65.2% more likely to be retained than part-time students (12 or more credit hours is considered full-time at the research institution); and non-resident alien students were 72% more likely to be retained.

In opposition, retention was negatively affected by the following variables: race and receipt of Pell grant. Conversely, with White students as the reference group, Black/African American students were -34.7% less likely to be retained and students receiving Pell grant were -35.2% less likely to be retained than students not receiving Pell grant.

Research question 2. Does a higher percentage of part-time faculty instruction predict the credit hour completion ratios of CTE students?

The hypotheses were as follows:

H₀: A higher percentage of part-time faculty instruction does not predict community college CTE student credit hour completion ratios.

H_a: A higher percentage of part-time faculty instruction does predict community college CTE student credit hour completion ratios.

Result: The null hypothesis can be rejected.

The literature review led to the hypothesis that CTE students possessed unique qualities that may have resulted in a lack of negative impact of part-time instruction. Hirschy et al. (2011) asserted that CTE students possessed qualities that made them different from other college students. The researchers Green (2007) and Wallin (2004) found part-time CTE instructors to have a connection with their students that might mitigate reported negative effects of part-time instruction. With this in mind, this research theorized career and technical education students were dissimilar from college transfer students and these differences may positively impact student retention. However, this research found the college transfer status of the students did not have a statistically significant impact on the fall-to-fall retention, when controlling for the other independent variables in the study.

Students with a higher percentage of credit hours taught by part-time faculty were minimally impacted with .50% more likely to earn higher credits completion ratios than students with a smaller percentage of credit hours provided by part-time faculty. This research found the more impactful significant predictors of credit hour completion (67% or higher) were gender, age, Asian race/ethnicity, Black/African American race/ethnicity, receipt of Pell grant, and full-time enrollment student status. This research found female students were 44.9% more likely to earn higher college credit completion ratios than male students. As age increased by one year, students were more likely to have credit completion

ratios higher than 67%, but only marginally by 1.9%. With White/Caucasian students as the reference group, Asian students and non-resident alien students were more likely to earn more college credits at 360.3% and 212.5% respectively. Full-time students were 54.6% more likely to earn higher credit completion ratios than part-time students.

Finally, with White/Caucasian students as a reference group, Black/African American students were -41.5% less likely to earn higher credit hour completion ratios; and students receiving Pell grant were -29.4% less likely to earn higher credit hour completion ratios than students not receiving Pell grant.

Implications from Theoretical Frameworks

Two theoretical frameworks guided this research: Tinto's (1993) theory of student retention and the Rouehe et al. (1996) part-time faculty integration model (PFIM).

Implications and insight gained from this work are presented below.

Tinto's (1993) theory in sum stated that students make decisions to leave college as a result of their personal skills, attributes, resources, prior experiences, and interactions with the faculty and staff of their institution. Tinto's (1993) model outlines five aspects of retention, traits such as students' background, abilities and previous educational experiences; students' goals; students' interaction with faculty, staff, and peers; and students' social and academic assimilation that influence their college outcomes, which ultimately leads to the departure decision. The results of this research confirm Tinto's theoretical hypothesis that no one factor, i.e. part-time faculty instruction, can account for the fall-to-fall retention rates or credit hour completion ratios of CTE students.

Student success, according to this research, was more affected by the personal characteristics, race, ethnicity, gender, age, financial status, non-resident alien status, and whether a student attends college full-time or part-time, thus, confirming the decision to depart college is not based upon a single facet. The individual's decision to depart college is based upon a collection of factors that come together as a whole to influence a student's departure decision.

Also clear through the literature review and research data, part-time faculty is an employment category that continues to grow. As such, it is incumbent on the institution to recognize this category of employee exists, shows no evidence of slowing, and is deserving of services. The Roueche et al. (1996) theory emerged from a combination of job satisfaction theory and institutional integration theory. Three strategies, according to Roueche et al. (1996), are integral to part-time faculty integration: socialization, communication, and participation. Part-time faculty, according to Roueche et al. (1996), are typically employed in colleges with cultures that lack these three strategies, leading to a sense of exclusion. Integrating part-time faculty into the campus culture will take deliberate, intentional services directed to include part-time faculty into the campus culture, thus leading to a stronger sense of community for the part-time faculty.

Recommendations for Practice

The practical purpose of this research study, in addition to adding to the body of literature regarding part-time faculty and student completion, was to provide recommendations for those interested in college student retention services. The underlying

premise of this research was that CTE students and faculty possessed unique qualities that might negate the reported negative effects of part-time faculty instruction (Hirschy et al., 2011; Wallin, 2004).

This result leads to the first recommendation for college administrators, which counters suggestions made in the current literature on part-time faculty and student success. As this research found the effect of part-time faculty on CTE student outcomes to be significantly positive, the practical significance was minimal. Therefore, the outcomes could be interpreted, as the employment status of faculty does not affect student success.

This study found the part-time faculty ratio did not affect student success, specifically CTE student success as defined as fall-to-fall retention and the credit hour completion ratio, as markedly as other variables did. Most notably, among positive significant factors affecting retention were Asian students, full-time students, and non-resident alien students who were more likely to be retained. Less likely to be retained were Black/African American students and students receiving Pell grant. Neither did this study find that the part-time faculty ratio affected the completion of 67% of courses as remarkably as other variables. The significant positive predictors were gender, age, Asian race/ethnicity, and full-time enrollment student status. The significant predictors that negatively affected the credit completion ratio were Black/African American race/ethnicity and receipt of Pell grant.

In sum, this study agreed with Tinto (1993) in that the student brings a compilation of background, skills, abilities, and prior education to college; these attributes influence their goals and intentions and impact their college experiences. In the case of this research, these

factors are more influential than the employment status (part-time or full-time) of the faculty. Students' college experiences affect their academic and social integration, which in turn impact goals, intentions, and commitments which eventually leads to a decision to stay in or depart from college (Tinto, 1993). The value of student engagement is not in question in this study, and it is important to note "successful integration was dependent upon the favorable daily interactions between faculty and students" (Umbach & Wawrzynski, 2005, p. 156).

With these study results in mind, the following nine recommendations to potentially positively impacting community college students' fall-to-fall retention and credit hours completed are suggested.

Recommendation 1: Implications for community college leadership. College leadership acknowledges the benefits part-time faculty bring to their institution. Part-time faculty are both cost effective and flexible. This knowledge has been understood, however, within the context of negative research results of the effect of part-time faculty on student success (Jaeger & Eagan, 2009; Jaeger & Eagan, 2010; Jaeger & Hinz, 2008). In contrast to the previous body of research, this researcher's study supports the continued practice of hiring part-time faculty in career and technical education programs. This research hypothesized CTE faculty and students are different from college transfer faculty and students (Green, 2007; Hirschy et al., 2011; Wallin, 2007). These differences might diminish the negative effects of part-time instruction on student success. This researcher's study found this to be the case. According to this research for CTE part-time faculty and

students, the odds ratio for fall-to-fall retention was 1.009. For course completion ratios, the odds ratio was 1.005 indicating minimal positive results.

This researcher can attest to the cost effectiveness and flexibility of part-time versus full-time staff. One full-time position was replaced with three part-time staff members. This change did cause concern because of the lack of benefits such as insurance and a fixed salary as opposed to an hourly rate for the part-time staff. However, this change allowed for more flexible scheduling which increased student contact, and the cost savings permitted funds to go towards additional student services.

Again, according to this research, CTE student fall-to-fall retention and completion rates of students taught by part-time faculty might not be as negatively affected as once reported in previous research. Certainly, full-time faculty are needed to serve on college committees, make curriculum decisions, develop courses, and advise students while performing their teaching responsibilities. However, part-time faculty members are beneficial to the institution in that they are cost effective and flexible, comprise a plentiful pool of workers, and are hired to function primarily as instructors. Thus, college administrators who have been reluctant to hire part-time CTE faculty based upon negative research results may want to revisit this hesitancy.

This research, while providing support for part-time CTE faculty, does not offer college administrators any research results, support, or suggestions of what may be a correct percentage of full-time versus part-time faculty. Further research needs to be conducted to determine the correct mix of faculty employment types.

Recommendation 2: Services for low-income students. The purpose of this research was to investigate potential barriers to community college career and technical education student retention using the effect of part-time faculty instruction as the focus of the study. Recognizing the importance of community college student retention and credit hour completion, additional variables were studied. One such variable was whether the student received a Pell grant. Pell grant is a grant aid program awarded based upon a student's low-income status (Mendoza, Mendez, & Malcolm, 2009). The research of Mendoza et al. (2009) indicated the receipt of financial aid, Pell grant in particular, negatively affects student persistence.

Similarly, this study found the receipt of a Pell grant to be a significant predictor of lack of persistence with community college students -35.2% less likely to be retained from fall-to-fall and -29.4% less likely to complete credit hours at the 67% level. Thus, the researcher recommends the provision of services targeted for low-income students. An example of one such program is the TRIO Student Support Services program (SSS). Student Support Services is a federally funded program designed to provide a variety of services to ensure low-income college students persist and graduate (Council for Opportunities in Education, 2017). The SSS program is awarded to colleges and universities based upon a grant competition.

Understanding that low-income students often lack access to financial information, one of the services required is providing financial aid information and assistance with filing the FAFSA along with financial literacy instruction (Council for Opportunities in Education,

2017). The SSS program allows colleges to provide a variety of support services that allow students of similar backgrounds to engage in retention activities (Tinto, 2012).

Certainly financial support programs are equally important. Community colleges, in addition to the traditional financial aid offerings, could offer and advertise work-study programs. Such programs can enhance and provide funds in addition to Pell grant, potentially alleviating financial stress (Tinto, 2012).

Recommendation 3: Provision of clear expectations and feedback. Tinto's (1975, 1993, 2012) theory of student retention was the underlying theoretical orientation for this research. Tinto's (2012) theory evolved to include four conditions that contribute to student retention: (a) clear expectations, (b) student support, (c) performance assessment and feedback, and (d) student involvement.

The manner in which each of these conditions can be operationalized is the focus of this recommendation. The second recommendation encompasses clear expectations and feedback. Students need clear and consistent feedback to enable them to continually assess their academic progress. Students can be made aware of expectations by understanding the areas included in the feedback. Typically, the feedback includes information on absences and poor academic performance, lack of class participation, and low test scores.

Providing clear expectations along with appropriate feedback can be accomplished through early alert programs that provide students with both positive and negative feedback on their progress. The purpose of early alert systems is to engage students in their own success (Faulconer, Geissler, Majewski, & Trifilo, 2014). Early alert programs typically

utilize software programs to provide feedback on areas impacting student success (Faulconer et al., 2014). The Falconer et al. (2014) study reported that 80% of the faculty surveyed found the alert system to be both useful and effective.

Integral to the success of such programs is the timeliness of the intervention, hence the proactive nature of these programs. The earlier in the semester students can be made aware of their potential academic problems, the more effective the programs. With delay in such information, students find it more difficult to recover from their academic issues (Tinto, 2012).

Also important to this type of alert program is the offer of academic support. Students need to be made aware of support services such as tutoring, advising, and counseling services available to assist them in meeting their academic goals. One such successful program is the Success Through Academic Reporting (STAR) program at Central Piedmont Community College. The STAR program reported for fall 2016 that $N = 686$ students were referred to one of five areas for assistance (tutoring center, counseling, library, career services, and the STAR success coach); 6% of the students followed through with a referral appointment, and that group was retained at 69% (S. Wilde, personal communication, January 19, 2017).

Recommendation 4: Minority student services. For both Models 1 and 2 of the research, Black/African American students were less likely to be retained and less likely to earn higher credit completion ratios. The data revealed Black/African American students were -34.7% less likely to be retained and -41.5% less likely to earn higher credit hour

completion ratios. Consequently, Recommendation 4 suggests additional services targeting minority students.

Mentoring can take a variety of forms, target groups being one form. Targeting means a specific group is singled out for the mentoring services (Strayhorn & Terrell, 2007). As a result of the research findings from this study, it is recommended that mentoring programs for Black/African American students be instituted to positively affect student retention and credit hour completion.

Satisfaction with one's college experience is an important predictor of retention (Tinto, 2012). Therefore, it can be useful, especially for minority students, to increase academic and social involvement, eventually leading to increased satisfaction (Strayhorn & Terrell, 2007). Results of the Strayhorn and Terrell (2007) research found mentoring to increase Black/African American college students' satisfaction with their college experience leading to the recommendation for minority mentoring programs in college settings. Mentoring situations, especially mentoring with peers, can alert college staff to difficulties in order for staff to potentially intervene before the student makes the decision to withdraw. Therefore, the third recommendation for increasing student retention is to institute a mentoring program for minority students.

Recommendation 5: Minority mentoring services. Recommendation 5 merges Recommendation 4, minority mentoring, with services for male students. This research indicated female students were 44.9% more likely to earn higher college credit completion ratios than male students. Therefore, the researcher recommends combining minority

mentoring and services for male students into a minority male mentoring program. Heaven (2015) entreated student success professionals to address barriers to Black/African American male students. Mentoring is, according to Heaven (2015), a beneficial and meaningful experience for Black/African American male college students. Students who are involved in a variety of services, including mentoring, are more likely to find success in their college experience (Heaven, 2015).

Recommendation 6: Learning communities. Recommendation 6 is to suggest learning communities for students, particularly targeting students taught by part-time faculty. Learning communities involve the linking of courses from either the same or different areas of study with the same students matriculating together (Schnee, 2014; Tinto, 2012). Learning communities are popular modes of instruction in community colleges and tend to promote student success (Schnee, 2014). The learning community needs to be intentionally created in order to promote a common experience among the participants (Tinto, 2012). The support of peers can positively affect student outcomes, and the intentional faculty and student interaction ultimately results in an improvement in student performance (Tinto, 2012).

Recommendation 7: First-year experience. A first-year experience program is Recommendation 7. Tinto (1993) suggested the decision to withdraw from college is often made in the first few semesters of college. Therefore, it is important the college work quickly to aid students in the transition to college process. The first-year experience programs can range from the provision of college orientation to the provision of academic

assistance courses. From college information to teaching social and academic skills, the first-year experience program can do much to promote student success.

Recommendation 8: Supplemental instruction. The eighth recommendation is for supplemental instruction (SI). Supplemental instruction involves peer-led study sessions, not to be confused with tutoring. A student who completed the course with an A becomes the SI leader. The leader attends the class then meets with members of the class facilitating a discussion in areas of content that the group finds unclear or confusing. The focus of SI is to use the peer leader to teach fellow students how to effectively learn the material (Congos & Schoepes, 1993).

Recommendation 9: Faculty development. The ninth recommendation is for faculty development. Faculty development must include part-time faculty. Research cited in the literature review revealed a lack of access to training for part-time faculty. Roueche et al.'s (1996) PFIM corroborates this recommendation. Tinto (2012) outlined a summer institute as an example of effective faculty training. This institute included sessions on teaching practices, effective assessment techniques, and even more importantly, the ways in which students' ethnicity, background, and income levels affect student success (Tinto, 2012). As Zatynski et al. (2014) stated, part-time faculty need increased incentives for attending orientation, and teaching and learning must both improve for student outcomes to improve.

In addition to recommending the implementation of programs as outlined in Recommendations 1 through 9, the research includes hints for the successful enactment of programs and services. Tinto (2012) presented four such suggestions worth noting:

1. Plan for the service, recognizing planning may take up to one year.
2. Intentionally recruit faculty and staff for the program.
3. Be sensitive to the culture of the campus.
4. Make data-driven decisions about the program or service.

Recommendations for Future Research

Recommendation 1: Focus on community college students. After the execution of an extensive literature review, the researcher recognized a lack of research on the effect of part-time faculty on community college students. The National Center for Educational Statistics (2014) reported a 162% increase in part-time faculty from 2001 to 2011, and in the fall of 2013, Knapp, Kelly-Reid, & Ginder (2010) reported 69.8% of public 2-year college faculty were part-time. Part-time faculty is a category of college employees that continues to grow, thus making them important to continued study. The studies cited in the literature review, with few exceptions, were conducted in four-year institutions. These data ought to provide motivation for researchers to continue studying the effects of this category of college faculty with a focus on the community college.

Recommendation 2. Programs of study. As this study was a snapshot of one year of career and technical students' experiences with part-time instruction, this researcher recommends future research be conducted on a variety of programs of study because current

literature is lacking in studies that disaggregated program of study data (Hirschy, Bremer, & Castellano, 2011).

Recommendation 3. Faculty Demographics. This researcher recommends analyzing the racial make-up of the faculty under study. Looking at similarities and differences of students and part-time faculty can add another aspect to the research results and implications (Kim & Sax, 2007).

Limitations

There were three limitations noted for this study.

Limitation 1. First, this study was limited by the extant data collected by the community college under study. The community college is unique in that it has a large student body and is located in a large, urban area, thus limiting the generalizability of this research.

Limitation 2. The second limitation is of high school GPA. The college did not collect high school GPA data for the year included in the study. High school GPA is a strong predictor of college success and the lack of this data may have had an effect on the study results (Ledesma, & Obukhova, 2015).

Limitation 3. The distinction between career and technical education program codes and college transfer program codes were hampered by the presence of multiple program codes. Although the college studied is working to eliminate the problem of multiple program codes listed for individual students, this can hamper the distinction between CTE and non-CTE students.

Conclusion

This logistic regression analysis of the effect of part-time instruction on career and technical student completion outcomes served to contribute to the body of research on part-time instructors' influence on community college students. The researcher's literature review found much emphasis had been placed upon the negative effect of part-time instruction on student success (Jaeger & Hinz, 2008; Jacoby, 2006).

There was one exception in the form of a study from Ronco and Cahill (2004) which, similar to this research, found factors such as student "background and educational experience" (p. 11) rather than the employment type (full-time or part-time) of faculty serve to affect student success. Just as students are not one identical group, part-time faculty are also not all the same, and each faculty member brings his or her unique qualities to the position, qualities that are more varied than just their employment type.

The outcomes of this research were contradictory to the majority of works cited in this study, thus creating a need to broaden the exploration for reasons for low retention and credit hour completion rates. It is hoped these results will serve as an impetus for further research, which will ultimately lead to data-driven, practical solutions for community college students' lack of successful outcomes.

Summary

Chapter 5 included the results of the logistic regression analysis of the effects of part-time faculty instruction on CTE student success. This research found a higher percentage of part-time faculty instruction to have a minimal effect on CTE student fall-to-fall retention

and credit hour completion ratio. However, there were other factors that were significant predictors of either student success or lack thereof. Asian students, full-time students, and non-resident alien students were more likely to be retained. Less likely to be retained were Black/African American students and students receiving Pell grant. The significant predictors for credit hour completion were gender, age, Asian race/ethnicity, Black/African American race/ethnicity, receipt of Pell grant, and full-time enrollment student status.

This chapter included conclusions reached as a result of the research along with a discussion of the implications from the two theoretical frameworks, Tinto's retention hypothesis and Roueche et al.'s (1996) PFIM. Next, nine recommendations for practice were outlined, the suggestions for future research were included, and the limitations were discussed.

REFERENCES

- Achieving the dream. (2016). Retrieved 2016, from <http://www.achievingthedream.org>
- Astin, A. W. (1985). *Achieving educational excellence*. San Francisco, CA: Jossey-Bass.
- Bailey, T. R., Jaggars, A. S., & Jenkins, D. (2015). *Redesigning America's community colleges*. Cambridge, MA: Harvard University Press.
- Bandura, A. (1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology, 25*(5), 729–735.
- Beach, J. M. (2011). *Gateway to opportunity? A history of the community college in the United States*. Sterling, VA: Stylus Publishing, LLC.
- Bean, J., & Eaton, S. B. (2001). The psychology underlying successful retention practices. *Journal of College Student Retention, 3*(1), 73–89.
- Boylan, H. R., & Bonham, B. S. (2007). 30 years of developmental education: A retrospective. *Journal of Developmental Education, 30*(3), 2–4.
- Carnevale, A., Smith, N., & Strohl, J. (2014). The road to recovery. *Community College Journal, 84*(3), 26–29. Retrieved from <http://proxying.lib.ncsu.edu/index.php?url=http://search.proquest.com.prox.lib.ncsu.edu/docview/1553169799?accountid=12725>
- Center for Community College Student Engagement. (2015). *Engagement rising: A decade of CCSSE data shows improvements across the board*. Austin, TX: The University of Texas at Austin, Program in Higher Education Leadership.

Central Piedmont Community College. (2016a). College level programs. Retrieved from <http://catalog.cpcc.edu/programsofstudy/collegelevelprograms/>

Central Piedmont Community College. (2016b). Employment of part-time personnel. Retrieved from <https://www.cpcc.edu/administration/policies-and-procedures/4-03-employment-of-part-time-personnel>

Central Piedmont Community College. (2016c). Enrollment and graduation by program codes. Retrieved from <http://www.cpcc.edu/planning/data-and-information?searchterm=data+and+information>

Central Piedmont Community College. (2016d). Standards of academic progress. Retrieved from http://www.cpcc.edu/financial_aid/fyi/scope?searchterm=financial+aid+Standards+of+progress

Central Piedmont Community College. (2016e). Associate in applied science, degrees, diplomas, certificates. Retrieved from <http://catalog.cpcc.edu/programsofstudy/collegelevelprograms/associateinappliedscienceasdegreesdiplomasampcertificates/>

Chan, H., & Wang, X. (2015). Interact for what? The relationship between interpersonal interaction based on motivation and educational outcomes among students in manufacturing programs at two-year technical colleges. *Community College Review*, 44(1), 26–48. Retrieved from <http://dx.doi.org/10.1177/009155211512560>

- Charlier, H. D., & Williams, M. R. (2011). The reliance on and demand for adjunct faculty members in America's rural, suburban, and urban community colleges. *Community College Review, 39*(2), 160–180.
- Cohen, A. M., & Brawer, F. B. (2008). *The American community college* (5th ed.). San Francisco, CA: Jossey-Bass.
- Completion by design. (2016). Retrieved from http://completionbydesign.org/sites/default/files/site-uploads/main-site/pdf/cbd_concept_paper.pdf
- Council for Opportunities in Education. (2017). Retrieved from http://coenet.org/who_we_are.shtml
- Congos, D. H., & Schoeps, N. (1993). Does supplemental instruction really work and what is it anyway? *Studies in Higher Education, 18*(2), 165–177.
- Dassance, C. R. (2011). The next community college movement. *New Directions for Community Colleges, 2011*(145), 31–39. Retrieved from <http://dx.doi.org/10.1002/cc.464>
- Datray, J. L., Saxon, D. P., & Martirosyan, N. M. (2014). Adjunct faculty in developmental education: Best practices, challenges, and recommendations. *Community College Enterprise, 20*(1), 35–48.
- Deil-Aman, R. (2011). Socio-academic integrative moments: Rethinking academic and social integration among two-year college students in career-related programs. *The*

- Journal of Higher Education*, 82(1), 54–91. Retrieved from <http://dx.doi.org/10.1353/jhe.2011.0006>
- Dougherty, K. J., Jones, S. M., Lahr, H., Natow, R. S., Pheatt, L., & Reddy, V. (2014). Performance funding for higher education: Forms, origins, impacts, and futures. *The Annals of the American Academy of Political and Social Science*, 655(1), 163–184. Retrieved from <http://dx.doi.org/doi:10.1177/0002716214541042>
- Eagan, K. (2007). A national picture of part-time community college faculty: Changing trends in demographics and employment characteristics. *New Directions for Community Colleges*, 140, 5–14. Retrieved from <http://dx.doi.org/DOI:10.1002/cc.299>
- Eagan, M. K., Jaeger, A. J., & Grantham, A. (2015). Supporting the academic majority: Policies and practices related to part-time faculty job satisfaction. *The Journal of Higher Education*, 86(3), 448–483. Retrieved from <http://dx.doi.org/DOI:10.1353/jhe.2015.0012>
- Faulconer, J., Geissler, J., Majewski, D., & Trifilo, J. (2014). Adoption of an early-alert system to support university student success. *Delta Kappa Gamma Bulletin*, 80 (2), 45–48.
- Friedel, J. N. (2011). Where has vocational education gone? The impact of Federal legislation on the expectations, design, and function of vocational education as reflected in the reauthorization of the Carl. D. Perkins Career and Technical Education Act of 2006. *American Educational History Journal*, 38.1/2, 37–53.

- Gantt, A. J. (2010). Graduation Rates of Students in Technical Programs at an Urban Community College. *Community College Journal of Research and Practice*, 34(3), 227–239. Retrieved from <http://dx.doi.org/10.1080/10668920903504992>
- Gappa, J. M., Austin, A. F., & Trice, A. G. (2007). *Rethinking faculty work*. San Francisco, CA: Jossey-Bass.
- Gordon, H. R. (2014). *The history and growth of career and technical education in America* (4th ed.). Long Grove, IL: Waveland Press, Inc.
- Green, D. W. (2007). Adjunct faculty and the continuing quest for quality. *New Directions for Community Colleges*, 29–39.
- Haeger, J. D. (2002). Part-time faculty, quality programs, and economic realities. *New Directions for Higher Education*, 1998, 81–88. Retrieved from <http://dx.doi.org/doi:10.1002/he.10408>
- Heaven, A. (2015). A conceptual framework for transforming African American males through student affairs programs. *Race, Gender & Class*, 22(1), 54–64. Retrieved from <http://proxying.lib.ncsu.edu/index.php?url=http://search.proquest.com.prox.lib.ncsu.edu/docview/1757044909?accountid=12725>
- Hermes, J. (2012). State trends towards performance funding. *Community College Journal*, 82(4), 26–29.
- Hirschy, A. S., Bremer, C. D., & Castellano, M. (2011). Career and technical education (CTE) student success in community colleges: A conceptual model. *Community*

- College Review*, 39(3), 296–318. Retrieved from <http://dx.doi.org/10.1177/0091552111416349>
- Hosmer, D. W., & Lemeshow, S. (2013). *Applied logistic regression* (3rd edition). Retrieved from ProQuest ebrary
- Jacoby, D. (2006). Effects of part-time faculty employment on community college graduation rates. *The Journal of Higher Education*, 77(6), 1081–1103.
- Jaeger, A. J., Dunstan, S. B., & Dixon, K. G. (2015). College student success: How articulation agreements support rural students. *Peabody Journal of Education*, 90(5), 615–635. Retrieved from <http://dx.doi.org/DOI:10.1080/0161956X.2015.1087771>
- Jaeger, A. J., & Eagan, M. K. (2011). Examining retention and contingent faculty use in a state system of public higher education. *Educational Policy*, 25(3), 507–537. Retrieved from <http://dx.doi.org/10.1177/0895904810361723>
- Jaeger, A. J., & Hinz, D. (2008). The effects of part-time faculty on first semester freshmen retention. A predictive model using logistic regression. *Journal of College Student Retention: Research, Theory and Practice*, 10(3), 265–286. Retrieved from <http://dx.doi.org/10.2190/CS.10.3b>
- Janssen, B. W. (2012). Paradigm shift: A new look at contingent faculty members in higher education. *Comparative & International Higher Education*, 4, 35–39.
- Kena, G., Aud, S., Johnson, F., Wang, X., Zhang, J., Rathburn, A., & Kristapovich, P. (2014). *The condition of education 2014* (NCES 2014-083). Washington, DC: Government Printing Office.

- Kim, Y., & Sax, L. (2009). Student-faculty interaction in research universities: differences by student gender, race, social class, and first-generation status. *Research in Higher Education, 50*(5), 437–459. Retrieved from <http://www.jstor.org.prox.lib.ncsu.edu/stable/29782935>
- Knapp, L. G., Kelly-Reid, J. E., & Ginder, S. A. (November 2010). *Employees in postsecondary institutions, fall 2009, and salaries of full-time instructional staff, 2009–10* (NCES 2011-150). Washington, DC: US Department of Education.
- Kotamraju, P., & Blackman, O. (2011). Meeting the 2020 American graduation initiative (AGI) goal of increasing postsecondary graduation rates and completions: A macro perspective of community college student educational advancement. *Community College Journal of Research and Practice, 35*(3), 202–219.
- Kotrlik, J. C., Williams, H. A., Jabor, M. K. (2011). Reporting and interpreting effect size in quantitative agricultural education research. *Journal of Agricultural Education, 52*(1), 132–142.
- Ledesma, R. G., & Obukhova, N. (2015). Predictors of first-semester success in a small private college. *Atlantic Economic Journal, 43*(1), 161–162.
doi:<http://dx.doi.org.prox.lib.ncsu.edu/10.1007/s11293-014-9444-0>
- Lester, J. (2011). Use of adjunct faculty in delivery of distance education in ALA-accredited LIS master's degree programs in the U.S. and Canada. *Journal of Education for Library and Information Science, 52*(3), 212–237.

- Logan, J., Hughes, T., & Logan, B. (2015). Overworked? An observation of the relationship between student employment and academic performance. *Journal of College Student Retention: Research, Theory and Practice*, 18(3), 250–262.
- Meixner, C., Kruck, S. E., & Madden, L. T. (2010). Inclusion of part-time faculty for the benefit of faculty and students. *College Teaching*, 58(54), 141–147. Retrieved from <http://dx.doi.org/10.1080/87567555.2010.484032>
- Melguizo, T., Bos, J., & Prather, G. (2011). Is developmental education helping community college students persist? A critical review of the literature. *American Behavioral Scientist*, 55(2), 173–184. Retrieved from <http://dx.doi.org/DOI:10.1177/0002764210381873>
- Mertler, C., & Vannatta, R. (2010). *Advanced and multivariate statistical methods: Practical application and interpretation* (4th ed.). Glendale, CA: Pyrczak.
- Morton, D. R. (2012). Adjunct faculty embraced: The institution's responsibility. *Christian Education Journal*, 9(2), 396–407. Retrieved from <http://proxying.lib.ncsu.edu/index.php?url=http://search.proquest.com.prox.lib.ncsu.edu/docview/1112266303?accountid=12725>
- NC Commerce. (2016). Retrieved from <http://www.nccommerce.com/workforce>
- NC Community Colleges. (2016). Align4NCworks strategic plan: A plan of plans for collaborative workforce development NC community colleges 2015-2018 draft. Retrieved from http://www.nccommunitycolleges.edu/sites/default/files/state-board/planning/plan_01_-_align4ncworks_strategic_plan.pdf

- National Center for Education Statistics. (2016a). Employees in degree-granting postsecondary institutions, by employment status, sex, control and level of institution, and primary occupation: Fall 2013. Retrieved from https://nces.ed.gov/programs/digest/d14/tables/dt14_314.20.asp
- National Center for Education Statistics. (2016b). U.S. background information prepared for the OECD postsecondary vocational education and training “skills beyond school” study. Retrieved from nces.ed.gov/surveys/ctes/pdf/PostsecVet.pdf
- National Center for Education Statistics. (2016c). Percentage of postsecondary students with each background characteristics, by postsecondary institution type: 2007–08. Retrieved from nces.ed.gov/surveys/ctes/pdf/postsecvet.pdf
- O’Banion, T. (2016). A brief history of general education. *Community College Journal of Research and Practice*, 40, 327–334. Retrieved <http://dx.doi.org/10.1002/cc.464>
- Owen, T. R. (2003). Retention implications of a relationship between age and gpa. *College Student Journal*, 37(2), 181.
- Performance measures and funding. (2016). Retrieved from www.successnc.org/initiatives/performance-measures-funding
- Pinchuk, N. T. (2015). Technical careers can rebuild the middle class. *Community College Journal*, 85(3), 14. Retrieved from Retrieved from <http://proxying.lib.ncsu.edu/index.php?url=http://search.proquest.com.prox.lib.ncsu.edu/docview/1648981957?accountid=12725>

- Price, D. V., & Tovar, E. (2014). Student engagement and institutional graduation rates: Identifying high-impact educational practices for community colleges. *Community College Journal of Research and Practice*, 38(9), 766–782.
- Pruett, P. S., & Asher, B. (2015). *Factors influencing retention of developmental education students in community colleges*. *Delta Kappa Gamma Bulletin*, 81(4), 32–40.
- Rifkin, T. (1998, April). *Differences between the professional attitudes of full- and part-time faculty*. Paper presented at the American Association of Community Colleges Convention, Miami, FL.
- Ronco, S. L., & Cahill, J. (2004). *Does it matter who's in the classroom? Effect of instructor type on student retention, achievement and satisfaction*. Paper presented at the 44th Annual Forum of the Association for Institutional Research. Boston, Massachusetts.
- Roueche, J. E., Roueche, S. D., & Milliron, M. D. (1996). Identifying the strangers: Exploring part-time faculty integration in American community colleges. *Community College Review* 23(4), 33–48.
- Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *Internet and Higher Education*, 6(1), 1–16.
- Ryan, T. P. (2000). Some issues in logistic regression. *Communications in Statistics—Theory and Method*, 29, 2019–2032. <http://dx.doi.org/doi:10.1080/03610920008832593>

- Saxon, P., & Boylan, H. R. (2010). Editorial: What are we going to do about it? *Journal of Developmental Education*, 34(2), 36–37.
- Saxon, P., & Boylan, H. R. (2011). Developmental mathematics: Challenges, promising practices, and recent initiatives. *Journal of Developmental Education*, 34(3), 2–4, 6, 8–10.
- Schnee, E. (2014). A foundation for something bigger: Community college students' experience of remediation in the context of a learning community. *Community College Review*, 42(3), 242–261. Retrieved from <http://proxying.lib.ncsu.edu/index.php?url=http://search.proquest.com.prox.lib.ncsu.edu/docview/1543467002?accountid=12725>
- Schreiner, L. A., Noel, P., Anderson, E., & Cantwell, L. (2011). The impact of faculty and staff on high-risk college student persistence. *Journal of College Student Development*, 52(3), 321–338. Retrieved from <http://dx.doi.org/10.1353/csd.2100.0044>
- Spaniel, Suzann H., and Joyce A. Scott. (2013). Community college adjunct faculty inclusion: Variations by institution type. *Research in Higher Education Journal*, 21.
- Seidman, A. (2012). *College student retention Formula for student success* (2nd ed.). Retrieved from Google Books
- Sperandei, S. (2014). Understanding logistic regression analysis. *Biochemia Medica*, 24(1), 12–18. Retrieved from <http://dx.doi.org/doi.org/10.11613/BM.2014.003>

- Stoltzfus, J. C. (2011). Logistic regression: A brief primer. *Research Methods and Statistics, 18*(10), 1099–1104. Retrieved from <http://dx.doi.org/doi:10.1111/j.1553-2712.2011.01185.x>
- Stone, R. J. (2011). Delivering STEM education through career and technical education schools and programs. Retrieved from http://sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_072641.pdf
- Strayhorn, T. L., & Terrell, M. C. (2007). Mentoring and satisfaction with college for black students. *Negro Educational Review, 58*(1), 69–83,132. Retrieved from <http://proxying.lib.ncsu.edu/index.php?url=http://search.proquest.com.prox.lib.ncsu.edu/docview/219027853?accountid=12725>
- SuccessNC. (2013). *NC community colleges final report*. Retrieved from <http://www.successnc.org/sites/default/files/SuccessNC%20Report.pdf>
- SuccessNC. (2016a). Initiative: Career & technical education high school to college articulation. Retrieved from <http://www.successnc.org/sites/default/files/SuccessNC%20Report.pdf>
- SuccessNC. (2016b). Performance measures and funding. Retrieved from <http://www.sucessnc.org/initiatives/performance-measure-funding>
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125.

- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). The University of Chicago Press.
- Tinto, V. (2003, November). *Promoting student retention through classroom practice*. Paper presented at the Enhancing Student Retention: Using International Policy and Practice, Amsterdam.
- Tinto, V. (2006). Research and practice of student retention: What next? *Journal of College Student Retention*, 8(1), 1–19.
- Tinto, V. (2012). *Completing college: Rethinking institutional action*. [Kindle version].
- Tinto, V. (2013). Isaac Newton and student college retention. *Journal of College Student Retention*, 15(1), 1–7. Retrieved from <http://dx.doi.org/doi:10.2190/CS.15.1.a>
- Tuckman, H. (1978). Who is part-time in academe? *AAUP Bulletin*, 64(4), 304–315. Retrieved from <http://www.jstor.org/prox.lib.ncsu.edu/stable/40225146> doi:1
- Umbach, P. D., & Wawrzynski, M. R. (2005). Faculty do matter: The role of college faculty in student learning and engagement. *Research in Higher Education*, 46(2), 153–156. doi: 10.1007/s11162-004-1598-1
- Van der Heijden, H. (2012). Decision support for selecting optimal logistic regression models. *Expert Systems with Applications*, 39(10), 8573–8583. Retrieved from <http://dx.doi.org/doi:10.2026/j.eswa.2012.01.168>
- Vogt, W. P. (2005). *Dictionary of statistics and methodology* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Wallin, D. (2004). Valuing professional colleagues: Adjunct faculty in community and technical colleges. *Community College Journal of Research and Practice*, 28(4), 373–391.

Wirt, L. G., & Jaeger, A. J. (2014). Seeking to understand faculty-student interaction at community colleges. *Community College Journal of Research and Practice*, 38(11), 980–994. Retrieved from <http://dx.doi.org/DOI: 10.1080/10668926.2012.725388>

Zatynski, M., Witham, K., & Wynar, J. (2014). *Using comparative information to improve student success*. Washington, DC: The Aspen Institute. Retrieved from <https://dorutodpt4twd.cloudfront.net/content/uploads/2016/06/structural-equity.pdf>