THE FINANCIAL STATE OF THE RETENTION RATE: AN ACTION RESEARCH CASE STUDY ADDRESSING FINANCIAL NEEDS AND STUDENT RETENTION

by

JAMES BRYANT HUTTO

(Under the Direction of Lorilee R. Sandmann)

ABSTRACT

This study explored the impact of unmet financial needs on students at a two-year technical college and the relationship of those needs to student retention. Three primary research questions guided this action research case study: (1) Is there a statistical correlation among socioeconomic factors and SAT scores that could help explain why some students enter college with an unmet financial need? (2) How do financial assistance strategies impact individual technical college students faced with academic dismissal due to nonpayment? (3) How do college leaders learn (individually and collectively) through an action research process designed to address student retention?

Through the action research process, the principal investigator, along with administrators and leaders from the study site, identified correlations between socioeconomic indicators and standardized test scores, and leveraged that data to develop an action plan to compensate students for unmet financial needs, with the goal of retaining more students at the institution. Data were collected through institutional research sources, interviews of organizational leaders, student essays, and researcher observations. The interventions comprised a cyclical process, allowing for the implementation and evaluation of the unmet financial need program.
Major findings indicated that: (1) income as a socioeconomic factor was related to lower standardized test scores, serving as an indicator for potential unmet financial need; (2) programs of scholarship had a positive effect on students’ unmet financial need; and (3) the college administration experienced transformational learning about students and unmet financial need through the action research process. The researcher concluded that: (1) socioeconomic factors are correlated with standardized test scores, suggesting potential indicators of unmet financial need; (2) students’ unmet financial need can be offset by scholarship initiatives focusing on retention; and (3) transformative learning of college leaders can occur within an action research process centering on the unmet financial needs of today’s students. This study extends Tinto’s (1975) theory of departure by adding the dimension of academic history and defining debt as unmet financial need, as these concepts relate to student retention. The results from this study could be used by higher education institutions as the basis for a model early-retention intervention program.

INDEX WORDS: Retention, Unmet financial burdens, Action research, Two-year college, Co-inquiry, Socioeconomic, Adult education
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by

JAMES BRYANT HUTTO
B.S., Troy University, 2007
M.P.A., Troy University, 2009

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by

JAMES BRYANT HUTTO

Major Professor:  Lorilee R. Sandmann
Committee:       Karen E. Watkins
                Talmadge C. Guy

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
December 2015
DEDICATION

To

Staci Hutto

My wife

For your never-ending support and tireless dedication through all of life’s journeys, especially this one and

Keith Crowley

My uncle

For your selfless support and dedication by providing opportunities that I would not have had without you and

Bryant Hutto

My son

God has blessed me abundantly with you in my life

I love you!
ACKNOWLEDGEMENTS

I would be remiss if I did not express my appreciation to the members of my doctoral advisory committee: Lorilee Sandmann, my major professor, and members Karen E. Watkins and Talmadge C. Guy. Thank you for walking with me on this amazing journey and investing your time and expertise in this study. I would also like to thank the educators who provided an unrivaled educational experience that shaped me into a scholarly practitioner: Drs. Aliki Nicolades, Robert Hill, Wendy Ruona, Jennett Hill, and Khalil Dirani.

I would like to add a special note of gratitude to Dr. Sandmann. As a mentor and friend, she encouraged diligence in my pursuit of academic achievement and served as the highest example of a scholarly mentor, demonstrating constant focus, strength, and support. I will remain ever grateful for her perseverance, patience, and guidance.

I would also like to thank my colleagues and friends at the study site who supported this research. Without your input and camaraderie, this would not have been possible.

Finally, a special thank you to my Adult Education Cohort at UGA. Each of you made learning fun, and for that, I am eternally grateful.
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CHAPTER 1
INTRODUCTION

Though achieving a degree or certification from an institution of higher education is often described as “a passport to the American middle class” (Pascarella & Terenzini, 1980, p. 369), many students never see this aspiration come to fruition. Many begin on the path to academic success but encounter financial, academic, personal, or other hardships along the way. Numerous students who wish to join the American middle class—and the dreams associated with it—begin at the two-year technical college level. The community college transfer function offers a wide array of adult learners the opportunity to access this dream. (For the purposes of this study, the two-year college level refers to the technical college system and no other two-year systems, such as community college systems, that can be found in other states.) Many of these students wish to continue with their academic pursuits and achieve a baccalaureate degree. Indeed, one of the primary functions of the two-year technical college is to serve as conduit to a four-year education (Cohen & Brawer, 2008).

This project is an action research case study that explored the impact of unmet financial needs on students at a two-year technical college, referred to by a pseudonym ABC Technical College (ABCTC), and the relationship of those needs to student retention, a critical issue facing adult-serving higher education institutions. Action research (AR) was the chosen methodology for this case study because it carried the potential for first-, second-, and third-order learning and change. It offered a substantial experience for not only ABC Technical College but also an action research team of college administrative leaders. Action research provided a unique,
internal approach to examining student retention at ABCTC and generated actionable results that were nontraditional and differed from the normative behavior for educational entities such as ABCTC. This chapter will overview the setting for this case, elaborate on the problem of retention in two-year technical colleges, present the study’s purpose, research questions, and significance, and close with the researcher’s positionality.

**Study Setting and the Technical College Context**

This AR project was conducted at ABC Technical College, located in a suburb of a major metropolitan area in Georgia. Since opening its doors as ABCTC in 1984, the college has added numerous programs, made two name changes, expanded its facilities, and experienced significant growth in student enrollment. In the 1980s, to meet the increasing demand for technological training, ABCTC expanded its offerings to include a wider variety of high-tech programs. In 1988, the name of the technical school was changed to ABC Technical Institute, aligning it with the network of state technical institutes comprising the Technical College System of Georgia. The following year, the Technical College System authorized ABCTC to offer associates degrees in applied technology in six programming areas, which paved the way for ABCTC to pursue regional accreditation.

During its 28-year history, ABCTC expanded its campus to include a variety of new facilities, including a health sciences building, corporate training center, environmental horticulture center, and computer training center. The technical college offers nearly 50 associates degrees, diploma and certificate programs, and hundreds of continuing education seminars and workshops each quarter to students wishing to improve job skills. At the time of this study, over 23,000 educational seekers were enrolled at ABCTC from across the state of
Georgia, and the institution aspired to continue expanding its scope to become a regional provider of educational opportunities throughout the southeastern United States.

The mission of the Technical College System of Georgia (TCSG)—of which ABCTC is a part—is to offer a statewide system of technical education whose purpose is to provide technical, academic, and adult education and training focused on building a well-educated, globally competitive workforce in Georgia. The system consists of Georgia’s 25 technical colleges and two technical divisions within the University System of Georgia (USG), and is guided by a statewide mandate for oversight into adult literacy programs and economic and workforce development programs. ABCTC is the second largest two-year technical college within this state system.

ABCTC serves a large and diverse student population, consistent with the observation that two-year institutions disproportionally serve students from groups that are historically underrepresented in higher education (Brint & Karabel, 1989). Once these students enter into college, it can be difficult to keep them enrolled due to a multitude of issues they face.

**Retention in Two-Year Technical Colleges**

Retaining students is an urgent issue for all colleges and universities in the United States, but particularly for institutions like ABCTC, whose funding is influenced by student retention. Knowing what criteria are used to classify a student as “retained” at a two-year technical college is essential for understanding fully the issue of retention. In contrast to Georgia’s community colleges and four-year institutions, the TCSG classifies a student as retained using specific criteria. Upon acceptance at ABCTC, a student must declare a major field of study in order to determine his or her qualifications for financial aid and the HOPE scholarship. (This is also required by the Southern Association of Colleges and Schools for an institution’s accreditation.)
A student is considered retained only if he or she completes a degree within the initially designated field of study. Moreover, retention is not college-specific within the TCSG; even if they transfer to another institution, students may be classified as retained as long as they graduate with the declared major. That is, students do not meet the criteria for retention if they complete a degree in a different academic program.

The TCSG has relied mainly upon state dollars to offer two-year educational opportunities to more than 20,000 degree seekers. The criteria for state and federal funding of the operating budgets of two-year colleges in Georgia were initially governed by the USG in beginning in 1982, when the Georgia Appropriations Board adopted the “Funding for Excellence” (USG, 2011). Funding was based on several factors, including learning, graduation, and retention outcomes, data, and information collected from the four-year college system to establish precedents and thresholds. Initially, the funding formula placed greater priority on learning and graduation outcomes than it did on retention due to the scope and nature of the four-year college system. Consequently, the policy was initially applied to four-year institutions in Georgia, with little to no emphasis placed on two-year technical colleges. In 2015, the Georgia Appropriations Board adopted a drastically different funding formula that emphasized student retention within two-year technical colleges. Proponents of the updated policy see it as an opportunity to increase student retention while cutting the cost of higher education at two-year institutions in the state. Nevertheless, such outcomes remain uncertain; it is not yet known what impact retention-based funding formulas and programs will have on college budgets or the future financial climate of technical education.
Statewide Retention Programs

Additional contextual and situational factors significantly influencing student retention needed to be considered in defining the problem for this action research case study. Federal and state legislation, external to the institution, played an important role in determining the practical implications of this problem. Programs such as the University Task Force, Achieving the Dream National Reform Network, and Complete College Georgia were created by the state of Georgia and were influential in setting the stage for and spotlighting the issue of student retention. (Complete College Georgia, for instance, focuses on the retention and graduation of students within the state’s technical college system, while Achieving the Dream focuses on the completion of a degree from any Georgia educational institution.)

University Task Force. In 2004, the USG established the University System Task Force on Graduation Rates. This group was mandated to develop guidelines and protocols to ensure that the USG and its entities were the leading providers among educational institutions for student retention, graduation, and progression rates (USG, 2007). Within one year, the committee developed a study to assess and evaluate each institution’s efforts to improve retention rates. At the end of the study, the committee recommended that colleges and universities should increase retention by cultivating highly engaging collegiate environments focused on fostering academic excellence, holding high expectations for student achievement, ensuring that learning activities were “intentional, integrative, collaborative and academically driven, and by establishing a sense of belonging and inclusion for learners” (USG, 2007, p. 4).

Although the University System Task Force researched different institutions within the USG, little consideration was given to two-year institutions, on the premise that “USG institutions were similar in more ways [than not]” (USG, 2007, p. 3). This statement suggested
that two-year technical colleges could, in fact, adopt the same plan and initiatives as that of their four-year counterparts. The study did not investigate the fundamental differences between two-year and four-year institutions. While they are similar on many levels, the differences between the two systems have proven problematic in relation to the task force plan.

For instance, two-year and four-year institutions each provide services to different types of student and on-campus entities. Tinto (1975) stated that the retention of a student at any academic level must include other factors, such as “campus involvement and institutional interactions … for the student to be successful” (p. 65). However, Tinto also found that the typical technical college student is either a working adult or one who requires little on-campus integration outside of the classroom. In addition, the task force study’s recommendation for a collaborative and integrative environment is oftentimes more difficult to produce at a technical college due to the number of degree programs offered by two-year institutions. ABCTC, for instance, has over 60 different areas of study and more than 100 diploma or certification programs offered. Due to the sheer number of degree and continuing-education offerings at ABCTC, it is challenging to ensure collaborative and integrative environments for and among students.

Four-year and two-year institutions also differ regarding their stated mission and vision for enrolled students. Georgia universities offer rigorous academic programs focused on the completion of a degree, whereas technical colleges concentrate on workforce development and job opportunities. When these differences are communicated in a negative or demeaning manner, retention of students by technical colleges can be hindered. For example, by excluding the two-year technical college system from the original study by the USG task force, the state’s community colleges, stakeholders, and students were not represented within the report’s findings.
or the implementation of the state plan. By not producing a study that included the entire Georgia educational system, along with its diverse learners and educational seekers, a significant opportunity was lost as a result.

**Achieving the Dream.** In addition to legislation and efforts by the USG, in 2012 the state of Georgia implemented the Achieving the Dream National Reform Network in hopes of influencing the critical factor of student retention. Achieving the Dream recognizes that for the first time in U.S. history, college-aged Americans will be less educated than their parents’ generation at a time when the workforce requires more higher-level skills than ever before. The program is also founded on the belief that a healthy economy and democracy depend on an educated citizenry. Moreover, due to rapidly evolving demographics and record levels of poverty, it essential to create opportunities for low-income and minority students to achieve postsecondary degrees. In light of this increasing need, the Achieving the Dream National Reform Network established the three pillars—student-centered vision, equity and excellence, and evidence-based decision-making:

- These pillars lend strength, discipline, and focus as we work to close achievement gaps and accelerate student success, retention and completion nationwide. This extraordinarily complex work is advanced through four carefully designed approaches including: guiding evidence-based institutional improvement, influencing public policy, generating knowledge, and engaging the public. (Achieving the Dream, 2012, p. 2)

In 2012, ABCTC was one of 13 technical colleges in the U.S. to be selected, through a competitive process, to participate in this historic program. Considering Achieving the Dream’s focus on student completion and retention, it played an integral role in this study’s action research process by allowing a program-focused approach to student retention specific to the
Achieve the Dream is the first national model focusing on increasing retention and academic success with an emphasis on two-year colleges.

**Complete College Georgia.** An additional initiative that affects technical college retention rates is the Complete College Georgia initiative. Launched in 2011, this program projects that by 2020 more than 60% of jobs in Georgia will require that the employee hold a certificate, associate’s degree, or bachelor’s degree. Today, approximately 42% of Georgia’s young adults are prepared to enter the workforce having met these requirements. To remain competitive, Georgia institutions will need to maintain current graduation levels and produce an additional 250,000 graduates in the next five years (Complete College Georgia, 2013). Complete College Georgia is an additional resource being implemented at the two-year technical college system level that might allow for the placement of infrastructure and resources that better aid student retention.

Additionally, under the direction of the state governor, the USG and the TCSG are addressing the issue of student retention through Georgia’s Higher Education Completion Plan, a subsidiary of Complete College Georgia. This plan emphasizes the consequences of inaction, identifies what must be done, and outlines a collaborative process to guide the state’s 60 institutions of higher education on how to rapidly increase the number of young adults who will earn a certificate or degree, while maintaining a commitment to educational quality. The plans three areas of primary focus include partnerships and accountability; performance; and college readiness, retention, and access (Complete College Georgia, 2013).

To fund Complete College Georgia, the state has received over $12 million in College Access Challenge Grant funds from the U.S. Department of Education since 2008. The state department of education has also provided an additional $6 million in funds to show its
commitment to the initiative. The chancellor of USG, leads the state’s College Access Plan on behalf of the governor’s office and the Georgia Alliance of Education Agency Heads. This plan is a collaborative effort among the governor’s office, Georgia Department of Education, Georgia Student Finance Commission, Governor’s Office of Student Achievement, and TCSG. Additional partners include the Governor’s Office of Workforce Development, Southern Regional Education Board, Georgia Partnership for Excellence in Education, and Communities in Schools of Georgia. The Office of Educational Access and Success, a department within the USG, leads the project along with a cross-agency leadership team (Complete College Georgia, 2013).

Target populations for Complete College Georgia include K-12 students who are underrepresented in postsecondary education and their families, as well as low-income adults who are at risk of not earning a college degree. The goals of this program are to increase the number of underrepresented students who graduate from Georgia high schools and who are, informed about, and academically ready, supported, and motivated for postsecondary education; to increase the number of underrepresented students graduating from Georgia high schools who successfully transition to, persist in, and complete postsecondary education; and to increase the college degree attainment of low-income adults who have some college credit but have not been enrolled in the past year and have not attained a degree (Complete College Georgia, 2013).

As noted earlier, technical colleges are not always considered when the state enacts legislation or implements programs that help students compete for or complete their educational goals. Complete College Georgia allows for more attention to be given to Georgia’s two-year technical college system, yet it lacks a solid plan for students who have unmet financial needs.
Complete College Georgia does not focus on economic or financial issues; rather, it emphasizes other areas that were deemed more pressing by the legislative minds that created the initiative.

**Student Retention at ABCTC**

As an open enrollment institution, ABCTC saw a surge in enrollment from 2002 to 2012, resulting in an increase of about 15,000 students. ABCTC currently serves approximately 23,000 students on its main campus, with an additional 10,000 students enrolling in 2015 at a new suburban branch campus. This ever-increasing enrollment creates a challenge for ABCTC: How will ABCTC retain greater percentages of students even as it grows exponentially each year?

Currently, ABCTC retains approximately 60% of its students in any given two-year framework (S. Meade*, personal communication, August 14, 2013). As the data showed, among the 30.51% of students who were not retained, there was a wide and varying scope of student and demographic characteristics. Data also show that there are approximately 1,200 ABCTC students dropped from registration each semester for nonpayment (S. Meaden, personal communication, August 14, 2013). While ABCTC has the highest student retention record within the TCSG, ABCTC administrators, nevertheless, monitor vigilantly this information in preparation for a decrease in the state funding. Additionally, it is known that the incidence of academic dismissal due to nonpayment may increase with future economic changes, increased tuition costs, and competition from other low-cost educational providers such as competing two-year technical colleges or internet based programs of study, making action research on this issue timely and relevant (S. Meade, personal communication, August 14, 2013).

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* Pseudonyms have been used for all individuals named in this dissertation.
Study Purpose and Research Questions

The purpose of this action research case study was to understand and address the effects that unmet financial burdens have upon the retention of first-year students at a two-year technical college. Adding to the urgency and concern of this issue was that, at the start of 2015, student retention becomes a new criterion of Georgia’s higher education funding formula. The research questions guiding this study were:

(1) Is there a relationship among socioeconomic factors and SAT scores that could help explain why students enter college with an unmet financial need?

(2) How do financial assistance strategies impact individual technical college students faced with academic dismissal due to nonpayment?

(3) How do college leaders learn and develop (both individually and collectively) through an action research process designed to address the issue of retention?

Significance of the Study

Little attention has been given to the relationship between unmet financial need and student retention, yet clearly such need plays a pivotal part in the elements of retention at colleges and universities nationally and globally. The development of unmet financial need programs places extreme burdens upon institutions, as well as the leadership and students who function as change agents within their institutions to alter the mindset of those around them. Capturing and analyzing data associated with the experiences of these students and higher education administrators contributes new knowledge that has vibrant implications for practice, policy, and theory. This study produced a dataset that correlated socioeconomic factors with standardized test scores and included an analysis of an unmet financial need program to help offset financial needs of students in hopes of increasing tuition rates. These data are valuable for
informing local, state, and national policy regarding the unmet financial needs of students and programmatic aspects of mechanisms for providing support. More generally, the study can be useful in issuing a call for change within institutions of higher education and fostering a better understanding of the unmet financial needs of students.

**Researcher’s Position**

At the time of this study, I was professionally situated at ABCTC as a staff member; my position entailed soliciting major gifts to the college that met or exceeded the $25,000 level. While I held this job for less than two years, my previous professional experience as a faculty member, academic counselor, and individual who had spearheaded efforts to identify financial needs at a college and worked toward a solution for them, positioned me well to facilitate a change effort on the issue of student retention. My financial knowledge was an important asset for leading a team of peers at ABCTC to formulate a strategic plan of action around a financial program to assist with the retention of students being dropped for non-payment. Furthermore, I facilitated a connection with foundation staff members who were assisting in this process by identifying funds to support the program.

Some of my colleagues and staff subordinates served on the AR committee. The sponsoring agent was the college president, who came to me initially with the proposal of looking at retention through the lens of action research. The AR committee members included a vice president, director, and coordinators, along with staff subordinates from various levels of the institution (see Table 1). The college president was actively involved in assisting with AR committee member selection and considered individuals from different departments within the institution, such as financial aid, recruitment, academic services, and advancement services, to potentially serve in the workgroup. A shared understanding of diversity and inclusion helped
foster a rich work environment for the committee which yielded results conducive to helping the largest number of students at ABCTC.

Table 1

*Action Research Team*

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<tr>
<th>Name*</th>
<th>Title</th>
<th>Years at ABCTC</th>
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<tr>
<td>Cindy Lou</td>
<td>Vice President of Student Affairs</td>
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<td>Jim Golf</td>
<td>Coordinator of Institutional Effectiveness</td>
<td>3</td>
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<tr>
<td>Greg Gregory</td>
<td>Assistant Registrar</td>
<td>3</td>
</tr>
<tr>
<td>Will Smith</td>
<td>Associate Director of Institutional Effectiveness</td>
<td>2</td>
</tr>
<tr>
<td>Joe Hutto</td>
<td>Director of Institutional Advancement</td>
<td>2</td>
</tr>
<tr>
<td>Sam Shells</td>
<td>Executive Director of Institutional Advancement</td>
<td>1</td>
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*Pseudonyms are used for ABCTC employees and AR team members.*

Working within the institution for which the AR team was conducting the action research had its benefits and complications. Coghlan and Brannick (2004) wrote that completing an action research project within one’s own organization is “a complex process and has its distinctive elements” (p. 41). These elements included the benefit of being familiar with the environments in which I worked and with the breadth and depth of the institution as a whole. At the same time, the main complication lay in my awareness of my institution and those working with it, creating potential credibility issues as I assumed my researcher role.

Coghlan and Brannick (2004) wrote of the concept of “role duality” (p. 97) of the insider who is engaged as an action researcher. As part of the action research team, I was cognizant of my role as well as that of others. Each member of the team had a strong personality, and I was
alert to struggles might erupt around certain positions. Some of the individuals on the team, such as a vice president, already possessed a hierarchical mindset. This current and historical institutional knowledge, set within a broader higher and adult education context, allowed me and the action research team to better understand the institution as we led it toward change.

The work of the AR team and the theoretical frameworks underpinning that work are discussed in the following chapters. Chapter 2 presents a review of the literature which focuses on the three major theoretical frameworks of this case study, factors that affect retention such as socioeconomic factors, and known retention research that informed this study. Chapter 3 discusses the methodology used in this case study project, including data collection. Chapter 4 describes the action research case study itself, while Chapter 5 details the findings resulting from an analysis of the data. Finally, Chapter 6 presents a summary of the case study, conclusions, along with implications of the study and concluding thoughts.
CHAPTER 2
LITERATURE REVIEW

A review of the academic literature was helpful in understanding and framing the issue of student retention at two-year technical colleges. The GALILEO system of the University of Georgia Libraries was used to conduct a search of the Educational Resources Information Center (ERIC) and other adult and higher education databases. These databases were searched using the following keywords or phrases: retention, financial burden, higher education, two-year colleges, and two-year students. The majority of sources used for this study comprised research conducted in the United States and Great Britain, though a small number of articles from Germany and other European countries were useful.

While much literature on higher education and retention is available, few of these resources focus on two-year students or technical college retention rates. The three most pertinent theories regarding student retention were analyzed for this study: theory of departure (Tinto, 1975), theory of change (Pascarella & Terenzini, 1980), and non-traditional student attrition theory (Bean & Metzner, 1985). Another body of literature important to this action research project related to elements influencing retention: entrance and retention, retention of enrolled or current students, factors of retention, and retention experiments.

**Major Theories**

This section describes the three major theories that informed this study: theory of departure, theory of change, and the non-traditional student attrition theory. These theories offer
a fundamental framework and understanding of both student retention and formal efforts to affect it; however, few theories exist regarding debt and unmet financial need.

**Theory of Departure**

Tinto’s (1975) theory of departure is the most commonly referenced study regarding student retention rates. It was first published in a literature review organized under a central theme of "integration" that considered how the degree of academic and social integration can predict whether a student earns a degree or chooses to drop out. This theory has evolved over time, as integration and commitment interact, with dropout decisions becoming more dependent on the student’s commitment. According to Tinto, academic integration—in terms of its effect on retention—includes any of the following components: grade/mark performance, personal development, enjoying subjects taught, enjoying studying the subjects, identifying with academic norms/values, or identifying with one's role as a student. Social integration relates to the number of friends present in a student’s collegiate setting or the number of personal contacts a student has with academic personnel. Tinto (1975) stated that:

> It may even be important to measure small amounts of contact (no matter how small), such as how many staff members know the students, how many staff members smile at them, the number of personal interactions the staff may have with the student, and how much the student is enjoying being at the college or university. (pp. 12-19)

Critics of the theory of departure, such as Argyris (1993), have questioned the paucity of empirical testing in Tinto’s work. Argyris found that the literature supporting the theory of departure seemed to focus on reporting weakly consistent evidence, without controlled experiments or alternative theory comparisons. Despite these shortcomings, this action research process viewed ABCTC and student retention through the lens of the theory of departure, namely
in regard to the areas collectively described as debt, counseling, medical, personal, and family within this retention model. Tinto (1975) did not offer much in-depth information about the issue of debt and the role it plays within an academic setting in relation to student retention; even so, it is one of the few scholarly works that addresses student retention’s relationship to unmet financial needs. While Tinto’s theory excludes some areas of interest, it is a comprehensive piece of research that relates directly to student retention within arena of unmet student financial needs.

**Theory of Change**

The theory of change (Pascarella & Terenzini, 1980) pertains to the effects of college on students. There are four models contained within this theory: psychosocial, cognitive-structural, typological, and person-environment interaction. These models all provide varying dimensions of how students approach their work in college and how it changes them. However, Pascarella and Terenzini’s (1980) study focused primarily on the first three models because person-environment interaction does not describe change or development. Much of the theory of change is described in stages, which assumes that development occurs across a person’s lifetime in a series of age-related, sequentially occurring phases. The theory’s five-scale measurement, developed from a theoretical model of college attrition, correctly identified or predicted the persistence of voluntary withdrawal decisions at a rate of 78.5%. The study sampled freshmen at a large, residential university and was based on the four models mentioned earlier. According to Pascarella and Terenzini, a particularly important predictor of “freshman-yearpersisters, or voluntary dropouts” (p. 94) was the quality of students’ relationships with faculty members. As mentioned, the theory of change takes into account psychological, cognitive, and typological factors. It also allows for the “financial aspect of the collegiate experience to be combined into a
larger view that can be seen within many of the aforementioned areas” (Pascarella & Terenzini, 1980, p. 201); however, that remains a secondary focus of the theory.

The theory of change centers squarely on the change that takes place within the student and offers little insight into how debt or debt management can impact a student’s academic life. Although the model described in Pascarella and Terenzini’s (1980) study incorporated social and economic factors, the authors did not include in their research or findings the pivotal role of college debt and its potential effect on student’s withdrawal decisions. This action research study argued that financial health can and does affect the retention of students in ways that Pascarella and Terenzini overlooked.

**Nontraditional Student Attrition Theory**

Nontraditional student attrition theory (Bean & Metzner, 1985) addresses the rise in nontraditional enrollments, defines the characteristics of nontraditional undergraduate students, and posits a conceptual model of the attrition process for these students. Older, part-time, and commuter students comprise a large and growing percentage of collegiate student bodies, and this is especially evident within the technical college system. The chief difference between the attrition processes of nontraditional and traditional students is that nontraditional students are more affected by external factors such as family dynamics and factors existing in the life of the student outside of college, while traditional students are more widely influenced by social integration variables. Unlike the theory of departure (Tinto, 1975), Bean and Metzner’s (1985) model is based on findings that nontraditional students leave college for reasons that are unrelated to social factors at the institution. It was found that the dropout rate, or lack of retention, was a result of poor academic performance and/or a lack of affinity for the actual institution.
Table 2 summarizes each of the theories discussed in this section. While each theory relates to student retention, the inputs, outcomes, and goals of each vary.

Table 2

*Summary of Theoretical Works on Student Retention*

<table>
<thead>
<tr>
<th>Author</th>
<th>Summary</th>
<th>Information and Inputs/Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tinto  (1975)</td>
<td><strong>Student Departure Theory</strong> Interactive model seeks to explain the college student withdrawal process.</td>
<td>1. Pre-entry attributes 2. Goals and commitments 3. Institutional experiences 4. Integration 5. Outcomes</td>
</tr>
<tr>
<td>Pascarella &amp; Terenzini (1980)</td>
<td><strong>General Model for Assessing Change</strong> The model assesses student change and considers the direct and indirect effects of both an institution's structural characteristics and its environment.</td>
<td>1. Student background &amp; pre-college traits 2. Structural and organizational characteristics 3. Institutional environments 4. Interactions with agents of socialization 5. Quality of student effort</td>
</tr>
<tr>
<td>Bean &amp; Metzner (1985)</td>
<td><strong>Model and Theory of Involvement</strong> College outcomes are viewed as functions of three sets of elements. Theory of involvement explains the dynamics of how students change or develop.</td>
<td>1. Inputs: demographics, student background, and previous experiences 2. Environment: range of experiences encountered during college 3. Outcomes: characteristics, knowledge, attitudes, beliefs, values, etc. that exist after college</td>
</tr>
</tbody>
</table>

**Elements Influencing Retention**

This section examines literature that highlights other research areas related to student retention. These include challenges for entrance and retention, retention of enrolled and current
students, factors of retention, and retention experiments. Each area plays a role in the overall depth and breadth of retention at a two-year college.

**Socioeconomic Factors**

O’Sullivan, Rassel, and Berner (2003) suggested that in order “to find out how the elements are linked, an examination of previous research studies and exploratory data analysis is particularly helpful” (p. 27). A relatively small number of quantitative research studies and data analyses have been conducted and published that underscore the use and misuse of SAT scores. In one of the earliest studies, Powell and Steelman (1996) examined the dilemma of using raw state SAT scores to draw conclusions about the relative quality of education among U.S. states. Published in the *Harvard Educational Review*, Powell and Steelman determined that “more than 80% of the variation in average SAT scores could be attributed to the percentage of students in a state taking the test” (p. 26). Their study revealed an inverse relationship between the percentage of SAT participation and state SAT averages. Put another way, where SAT participation was low, state SAT averages tended to be high, and vice-versa.

In his published paper in the *Journal of Educational Measurement*, Gohmann (1988) examined biases in SAT score regressions and concluded that states with low percentages of students taking the SAT have consistently higher scores than states with higher percentages of students taking the exam. Page and Feifs (1985) examined six variables affecting SAT scores, most of which are reported by the U.S. Census Bureau. As an example, each state’s unemployment rate was taken into account. The study identified three important background variables: the statewide percentage of minority students, the employment rate, and the average income. However, “the most powerful influence on the state means, of course, is the percentage of high school graduates who take the SAT exams” (Page & Feifs, 1985, p. 55).
In 1996, Powell and Steelman revisited the topic of state SAT scores using contemporary data; they also extended the study by considering other independent variables. Powell and Steelman concluded that “state rankings based on SAT scores change dramatically once they have been adjusted for factors such as participation rate or the class rank of the student test-taking population” (p. 22). Furthermore, other characteristics of the test-taking population (e.g., gender and race composition and median family income) explained state differences and rankings.

The Institute for Wisconsin’s Future sanctioned a study in 1996 to examine the impact of collective bargaining among teachers on student performance. The primary conclusion of this well-focused study was that “student performance on the test is significantly better in states with higher levels of unionization with other variable held constant” (Nelson & Rosen, 1996, p. 31). However, the study also concluded that “other factors [determining] student performance are social factors such as family size, household income, race, gender, region, and discrimination” (p. 24).

Similarly, socioeconomic status was a key factor underscoring the findings in a 1997 report by the National Center for Education Statistics (NCES). In the report, the NCES examined changes over time in the makeup of students in terms of family income, parent’s education, and family structure. Despite the breadth of the study, two key findings related to the this study were that: (a) parent’s education level is strongly associated with student achievement, and (b) high school graduates from high-income families are more likely to graduate than high school students from low-income families (National Center for Education Statistics, 1997). The latter finding is supported by the statistic that, in 1995, 34% of high school graduates from low-income families went directly to college compared to 83% of those from high-income families.
In a more recent study, Merchant and Paulson (2006) examined the differences among states’ average SAT scores. Based on 2006 SAT data, they concluded:

SAT scores are almost entirely attributable to differences in percentage of test-takers, parent education and income of the test taker, and the high school rank and GPA [grade point average] of the test takers rather than to the quality of states’ education systems. (p. 71)

A literature review inclusive of socioeconomic factors related to the SAT would be incomplete without a reference from the organization responsible for the SAT—the College Board. In response to inferences made regarding the interpretation of SAT scores and the quality of education by the media and politicians as well as the few quantitative research studies supporting such inferences, the College Board (2013a), in its 2013 Total Group Report contended:

Relationships between test scores and other factors such as educational background, gender, racial/ethnic background, parental education, and household income are complex and interdependent. These factors do not directly affect test performance; rather, they are associated with educational experiences both on tests such as the SAT Reasoning Test and in schoolwork. (p. 5)

Since there appears to be disagreement between the College Board and previous empirical analyses regarding SAT scores, a pilot study was undertaken as part of this study to assess if a relationship exists between the College Board’s reported statistical and socioeconomic indicators and SAT results and states’ rankings.
Retention of Enrolled or Current Students

The gap between college access and degree completion has put a new focus on ramping up retention rates. While students have multiple reasons for dropping out—from money to academic failure to lack of direction—various initiatives at the state and institutional levels are emerging to improve college completion rates. For example, Adams (2011) reported that counselors and mentors are using text messages to remind students of tests, connect families with financial aid resources, and guide students through the social transition to college. Freshman seminars, tutors, course placement tests, and comprehensive learning assistance centers and labs are also used to help students navigate the college transition period.

Colleges over the past decade have developed new modes of financial mobilization in response to declining public support for higher education. One strategic initiative that has gained popularity in public colleges and universities is the tuition-paying admission track policy (also known as dual-track or fee-paying), which is a variant of cost sharing. Using official institutional data, Atuahene (2012) compared the retention and graduation rates of students enrolled as “tuition-paying” to regular-admission students at the University of Ghana. While the fee-paying students had some potential successes in revenue generation and enrollment expansion, there was a graduation gap and disparity between tuition-paying and regular-admission students.

In another study, Audet (2010), investigated the relationship among student enrollment, financial aid needs, and retention at Mid-Atlantic Community College, a large, urban, two-year public community college in Paterson, New Jersey. Not surprisingly, he found that there were considerable challenges with respect to the academic progress and retention rates associated with the urban nature of the student population. More specifically, Audet examined the relationship
among the time a cohort of first-time students applied for admission to the college, when they applied for financial aid, their academic progress at the end of the 2005-2007 award years, and whether they persisted to their sophomore year. The study explored whether there was a predictive relationship between when students applied for admission and financial aid and their subsequent academic progression and retention. Audet found that there was a direct correlation of 0.5 between the time students applied for admission and financial assistance and their eventual retention at the college. This higher significance level found in the correlation suggests that there is a significant relationship between academic success and unmet financial needs.

With a focus on Pell Grant recipients, Crockett (2012) investigated the relationship between levels of financial aid and student success in Louisiana community colleges. Crockett measured success by determining if a student earned a certificate or an associate's degree within three years of enrolling as a first-time, full-time student or if he or she transferred to a four-year Louisiana university within the same timeframe. In this study, Crockett used student unit record data that had been merged with detailed information from student financial awards. The study showed that strategically targeting financial aid increased the likelihood of student success within the Louisiana community college system. The study specifically found that as the number of developmental courses the student was enrolled in increased, the rate of student success also increased; grants overcame differences in success rates across income levels among students with equivalent academic preparation; the level of community college students who received “Need Met With Gift Aid” affected student completion; and higher levels of Need Met With Gift Aid were associated with greater student success for students who took more than one developmental course. As a result of Crockett’s study, Louisiana colleges concluded that by
more effectively targeting their scholarships and grants, they could increase student retention and save nearly $400,000 per year.

A study by Kennamer (2011) reviewed the most recent literature on student financial aid as a retention tool at community colleges to better understand the role of unpaid financial burdens among students. Enrollment and tuition data from the NCES, Integrated Postsecondary Education Data System (IPEDS), and federal direct grant student aid data from the Student Financial Aid Survey were used to analyze changes from the 2000-2001 academic year to the 2005-2006 academic year. The information revealed differences among rural, suburban, and urban community college students, as well as differences among states with and without significant local funding. A key finding was that the 42% increase in tuition and the 2.2 million new students who enrolled in the previous five years overwhelmed the very modest increases in federal direct grant student aid over the same period. This reduced the ability of student aid to positively impact retention rates at community colleges in the U.S.

**Factors Affecting Retention**

There are numerous factors that can affect college student retention in varying ways. This section looks at case studies and experiments that have attempted to impact student retention by adjusting one or more core features related to student enrollment.

During the early 1960s, Summerskill published a series of studies on student retention rates that received wide critical acclaim. Since that time, interest in the topic of attrition and retention has never waned. One of the studies in the series (Summerskill, 1962) explored the relationship between race and retention. Summerskill posited that alienation through debt, one of the aspects of student change, is an important theoretical reference for exploring first-year retention. Factors affecting retention were examined by using both binary and multinomial
logistic regression to analyze the heterogeneous student population that did not return in the second year. Findings suggested that race is related to retention and that debt alienation is a factor in the efforts to retain students.

Student retention and low graduation rates are the most significant problems associated with state-provided student aid, and evidence suggests that the problems are chronic to certain populations in state colleges and universities. Menifield (2012) examined lottery scholarship data to determine those factors that affect scholarship retention and graduation. Specifically, the 2007 fall semester’s lottery scholarship and financial aid data from the Tennessee Higher Education Commission indicated that low-income African Americans and students who scored low on the ACT were most likely to lose their scholarship at the undergraduate level. Also, the data showed that high school GPA, undergraduate GPA, gender, Pell Grant eligibility, adjusted gross family income, and the student’s major were positively correlated with retention. These findings strongly suggest that while lottery-funded scholarships promote access to higher education, they are insufficient for academic success for certain populations. Thus, if state and higher education institutions want to maintain higher levels of retention while also maintaining a diverse student body, they should do much more than simply provide lottery scholarship funding. Rather, they should provide additional institutional support for these students by creating mechanisms that positively affect student achievement. Such mechanisms might include support groups, specialized learning communities, and innovative faculty/student relationships that accentuate the learning experience.

In a study by Whalen (2010), logistic regression models of students’ one-year retention and six-year retention/graduation rates for students in the entering Class of 2000 at a midwestern university were estimated by combining university, financial aid, and Cooperative Institutional
Research Program data (n = 1,905; 45% female, 87% Caucasian, 75% in-state). Statistically significant predictors of continuation to the second year were first-year cumulative GPA, financial aid variables, learning community membership, information technology use in high school, and in-state residence. Six-year retention/graduation was predicted significantly by the students’ cumulative GPA in the last registered term, number of years living on campus, transfer credits, financial aid variables, gender, ability measures including high school rank, ACT composite score, in-state residence, and female gender. This study showed that financial aid factors were of utmost importance to student retention.

Tyson (2012) analyzed interviews with faculty, administrators, staff, and students at four-year colleges and revealed the role of undergraduate student financial well-being on retention and timely degree completion. Dueling narratives emerged between student approaches to earning a degree and the expectations of faculty, administrators, and staff who advised students on proper time management and were frustrated that student employment reflects a lack of commitment to their specified field of study. Students acknowledged the challenges of balancing school and work, yet they considered employment or financial well-being just as important to student life. Some students adjusted their course schedules to meet work demands, thus increasing the time to complete their degrees. Faculty described a seamless pathway to a career through coursework, scholarships, undergraduate research opportunities, and internships. As the students noted, however, scholarships do not sufficiently meet students’ financial needs, and internships are not convenient for all students, so they made continual efforts to meet those financial needs outside of their academic setting. This resulted in an adverse effect on their academic performance, ultimately leading to retention issues.
Retention Experiments

Saltiel (2011) used a quasi-experimental design to examined academic student outcomes among a cohort of employed community college commuter students. The treatment group (n = 198) participated in a comprehensive support and access intervention program. This group was compared with similar students not participating in the program (n = 297). The study was confined to one large, urban community college designated as both a minority-serving and a Hispanic-serving institution, and was conducted ex post facto using data collected over a period of six consecutive semesters. Saltiel focused on a subgroup classified as low-income and working poor, terms used to describe individuals who are economically disadvantaged despite being partially or fully employed. The program that was studied offered a new-student seminar and orientation, learning communities, supplemental instruction, mentoring and advising, career counseling, job development and placement services, and financial assistance. The program was designed to provide consistent, proactive, and sustained intervention over the course of a students’ enrollment, from matriculation to graduation. Students in the comparison group were matched to the treatment group through propensity score matching using such covariates as age, gender, race and ethnicity, household income, financial aid awarded during academic preparation, enrollment load, and academic major. Student outcomes included measures of retention, graduation, early transfer, GPA, credits earned, and pass rates for college-level gateway courses. The relationship between the treatment group and student outcomes was determined using descriptive methods and multivariate analyses. Results demonstrated that participation in a comprehensive support and access intervention program for low-income and working poor students is associated with a significant positive effect on semester-to-semester community college retention and graduation rates. Furthermore, over the study period,
participants in the program maintained a higher cumulative GPA, attempted and earned more college credits, and had higher pass rates for college-level gateway courses. Correlation between the treatment and early-student transfer groups was statistically insignificant, although early-student transfer among students in the treatment group was less frequent compared to students in the matched comparison group. Based on these findings, Saltiel’s (2011) research served as a foundational piece to inform the statistical analysis of this action research case study.

Additionally, Herzog (2008) estimated the effect of financial aid on freshman retention at a moderately selective public university using propensity score matching in a multi-stage regression analysis. The correlational pattern that emerged from 24 models suggested that higher income students accrue a retention benefit from financial aid. Conversely, as Herzog’s study hypothesized, retention of low-income freshmen is more likely due to academic performance compared to those from high-income backgrounds. This suggests a direct linkage between unmet financial needs and the retention of college students. Table 3 summarizes the reviewed literature of empirical studies related to student retention.
### Table 3

*Empirical Works on Student Retention*

<table>
<thead>
<tr>
<th>Author</th>
<th>Study focus/summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams (2011)</td>
<td>Emerging issues around student retention</td>
</tr>
<tr>
<td>Atuahene (2012)</td>
<td>Retention of “fee-paying” students vs. regular admissions</td>
</tr>
<tr>
<td>Audet (2010)</td>
<td>Relationship between student retention and financial aid</td>
</tr>
<tr>
<td>Crockett (2012)</td>
<td>Relationship between levels of financial aid and student success in Louisiana community colleges</td>
</tr>
<tr>
<td>Gohmann (1988)</td>
<td>SAT scores and national averages by state</td>
</tr>
<tr>
<td>Herzog (2008)</td>
<td>Estimated effects of financial aid on freshmen retention at a moderately selective public university using propensity score matching in multi-stage regression analyses</td>
</tr>
<tr>
<td>Kennamer (2011)</td>
<td>Review of recent literature on student financial aid as a retention tool at community colleges to better understand the role of unpaid financial burdens upon students</td>
</tr>
<tr>
<td>Menifield (2012)</td>
<td>Analysis of lottery scholarship data to determine factors affecting scholarship retention and graduation</td>
</tr>
<tr>
<td>Nelson &amp; Rosen (1996)</td>
<td>Relationship of economic factors to SAT scores</td>
</tr>
<tr>
<td>O’Sullivan, Rassel, &amp; Berner (2003)</td>
<td>Linkages among socioeconomic factors and SAT scores</td>
</tr>
<tr>
<td>Powell &amp; Steelman (1996)</td>
<td>State ranking of SAT scores</td>
</tr>
<tr>
<td>Saltiel (2011)</td>
<td>Effects of student academic outcomes among a cohort of employed community college commuter students</td>
</tr>
<tr>
<td>Summerskill (1962)</td>
<td>Relationship between race and retention; examination of debt alienation as a factor in the process of student retention</td>
</tr>
<tr>
<td>Tyson (2012)</td>
<td>Role of undergraduate student financial well-being in retention and timely degree completion among students; based on interviews with students, faculty, administrators, staff at four-year colleges</td>
</tr>
<tr>
<td>Whalen (2010)</td>
<td>Relationship between financial aid factors and student retention</td>
</tr>
</tbody>
</table>
Transformative Learning

According to transformative learning theory, the process of “perspective transformation” has three dimensions: psychological, convictional, and behavioral or relational (Mezirow, 1991). Transformative learning comprises the expansion of consciousness through the transformation of one’s basic worldview and of specific capacities of the self; it is facilitated through consciously directed processes, such as action research, and through symbolic contents of the unconscious and by critically analyzing underlying premises (Mezirow, 1991).

A defining characteristic of the human condition is the need to understand the meaning of one’s experience. For some, any uncritically assimilated explanation by an authority figure will suffice, but in contemporary societies, one must learn to make one’s own interpretations rather than act on the purposes, beliefs, judgments, and feelings of others. The action research process facilitates such understandings, and it is the cardinal goal of adult education. Transformative learning develops autonomous thinking (Mezirow, 1991).

Transformative learning offers a theory of learning that is uniquely adult, abstract, idealized, and grounded in the nature of human communication. It is partly a developmental process, but more a framework by which “learning is understood as the process of using a prior interpretation to construe a new or revised interpretation of the meaning of one’s experience in order to guide future action” (Mezirow, 1991, p. 162). Transformative learning attempts to explain how expectations, framed within cultural assumptions and presuppositions, directly influence the meaning derived from one’s experiences. The theory of perspective transformation addresses the revision of meaning structures from experiences.

Mezirow (1991) considered critical reflection to be the distinguishing characteristic of adult learning. Only in adulthood does one become aware of the “uncritically assimilated half-
truths of conventional wisdom and power relationships . . . [and] come to recognize being caught in his/her own history and reliving it” (Mezirow, 1991, p. 11). Critical reflection refers to questioning the integrity of assumptions and beliefs based on prior experience. It often occurs in response to an awareness of a contradiction among one’s thoughts, feelings, and actions. These contradictions are generally the result of distorted epistemic, psychological, and sociolinguistic assumptions. In essence, one realizes that something is not consistent with what one holds to be true in relation to the world. “Reflection is the apperceptive process by which we change our minds, literally and figuratively. It is the process of turning our attention to the justification for what we know, feel, believe, and act upon” (Mezirow 1991, p. 46).

Perspective, or relational, transformation provides a model of adult learning by explaining the process of how personal paradigms evolve and expand in adulthood. It explains adult development as the acquisition of greater adaptive capacity to capitalize and act on prior knowledge and experience through critical reflection. “Anything that moves the individual towards a more inclusive, differentiated permeable, and integrated meaning perspective, the validity of which has been established through rational discourse, aids an adult’s development” (Mezirow, 1991a, p. 7). Transformative learning, according to Mezirow, reflects a process of adult development.

Some, of course, have criticized Mezirow’s (1991) ideas. Collard and Law (1989), for example, maintained that Mezirow’s work lacks a detailed political dimension and commitment to social action. Clark and Wilson (1991) claimed that by locating perspective transformation within the individual, Mezirow fails to account for the relationship between individuals and their sociocultural, political, and historical contexts. Indeed, since Mezirow first posed his theory, the
number of dissenters has grown as academics in Australia, England, and elsewhere have revised or rejected outright the notion of transformative learning.

Summary

The preceding review of the literature on current and past retention efforts by colleges and universities in the U.S. and around the world indicates that while many authors have investigated the relationship between standardized test scores and retention, scant evidence exists establishing a direct linkage of socioeconomic factors with debt and unmet financial need and student retention. However, Kennamer’s (2011) study reported that retention can be influenced by unmet financial need, and Menifield (2012) researched the application lottery monies to help address unmet financial need. Further exploration is needed in order to achieve sustainability and systematic implementation of unmet financial need programs across broad spectrums. Whereas the theoretical and fundamental principles of unmet financial need are covered in the literature, fusion of these constructs and concepts are not addressed. The findings from this action research study brought these areas together in hopes of leading to key learnings about retention, with implications for students, higher education leaders, and policy makers.
CHAPTER 3

METHODOLOGY

This chapter presents the methodology used for this action research case study, which, by definition, involved cyclical processes of “plan, act, observe, and reflect” (Stringer, 2007, p. 8). Through these cycles, the AR team first analyzed and interpreted existing institutional data, then formulated an intervention based on that data, and then evaluated the results of the plan of action. The research design utilized both qualitative and quantitative approaches to data collection and analysis. The following sections detail the study’s conceptual framework, design, and data-collection and analysis methods, including the measurements of reliability and validity.

Conceptual Framework

The conceptual framework for this case study comprised three retention theories and a cooperative inquiry approach. The conceptual framework allowed the AR group to ground itself in the three major theories while taking into consideration the macro- and micro-environments of the students at ABC Technical College when formulating the plan of action. A depiction of the framework is located in the figure below.
Tinto’s theory of departure (1975), Pascarella and Terenzini’s theory of change (1980), and Bean and Metzner’s nontraditional student attrition theory (1985) served as strong foundations for this study. Each theory addresses the issue of debt, to varying degrees: Tinto’s theory of departure focuses heavily on debt management within the theory, while the theory of assessing change and the nontraditional student attrition theory only mention debt and its attributes as parts of a much larger theoretical framework. This study combined the debt-related
aspects of each theory and utilized those areas as the core of the framework for the action research.

In this study, the core constructs were encompassed within a cooperative inquiry approach to action research. Cooperative inquiry, also known as collaborative inquiry, was first delineated by John Heron in 1971 and later expanded by Peter Reason (2008). Cooperative inquiry is research “with” rather than “on” people (Reason & Bradberry, 2008). It emphasizes that all active participants in a study are fully involved as co-researchers in decision making. Cooperative inquiry creates a research process involving four different types of knowledge:

(1) Propositional knowing, as in contemporary science;
(2) Practical knowing—the knowledge that comes with actually doing what you propose;
(3) Experiential knowing, or the feedback we get in real time about our interaction with the larger world; and,
(4) Presentational knowing—the artistic rehearsal process through which we craft new practices. (Reason & Bradberry, 2008 p. 22)

Research Design

Generally, a clear conceptual framework focuses the research study and guides the selection of research questions, the study design, and the methods of data collection. Drawing upon the conceptual framework of this study, the research plan focused on the three research questions: (1) Is there a statistical correlation among socioeconomic factors and SAT scores that could help explain why some students enter college with an unmet financial need? (2) How do financial assistance strategies impact individual technical college students faced with academic dismissal due to nonpayment? (3) How do college leaders learn (individually and collectively) through an action research process designed to address student retention? For each area of
research, a cooperative, collaborative approach was used with respect to the action research team and ABCTC. Two of the three research questions were researched via the intervention plan (as developed by the action research team), and the aforementioned criteria were utilized as a framework. A logic model that guided this study is depicted below.

Figure 2. Study logic model.

Tinto’s (1975) theory of student retention guided this study, which adopted a qualitative case study approach—informed by quantitative statistics—and employed action research
methodology. Critical incident techniques (used in interviews and meetings, and via scholarship applications) served as the primary method of data collection. Figure 1 illustrates the theory of change statement that provided hypothetical grounding for this action research: If this study utilizes Tinto’s (1975) theory of departure and debt factors while drawing from qualitative data from a co-inquiry process and a program addressing unmet financial need, then an application of the findings should result in an increase in retention in academic programs, greater funding for ABCTC, and an increase in overall retention at the college should occur.

Figure 3. Depiction of the theory of change central to the action research case study.

This study involved a college-level action research team that engaged in three cycles of cooperative inquiry. The first cycle was conceived by the AR committee and consisted of running a pilot study to determine if there was a statistically proven correlation directly linking student’s SAT scores with certain socioeconomic factors. It was the hope of ABCTC and the AR committee that if SAT scores and socioeconomic factors could be linked, these factors might serve as predictors of knowledge for students who might arrive at ABCTC with unmet financial need or develop such need during their academic tenure.
The first cycle also consisted of data gathering as well as an initial reflection phase to clarify focal issues, and to determine the topics and methods of inquiry. Activities during this cycle included a brief orientation to action learning and in-depth discussions about the action research project. Determining the appropriate call to action regarding student retention at ABCTC was certainly a high priority during this stage. The first cycle primarily involved propositional knowing and the collection of information regarding socioeconomic issues as they related to Tinto’s (1975) theory.

The second cycle included two rounds of scholarship awards. Round one served as the first action phase for the group and functioned as a test of the actions and data outcomes from testing results that were agreed upon in stage one. This phase also included observations about whether or not the actions conformed to the original ideas from the first cycle. Round one primarily involved practical knowing. Round two served as a second action phase during which the experiences and consequences of one’s new inquiries in action generated profound new feelings and self-awareness. In this phase, the experiences led to new fields, actions, and insights that departed from the original ideas. Round two of the second cycle predominantly involved experiential knowing but was not necessarily confined to it.

The third cycle served as the reflection stage in which researchers reflected on the data collected and our experiences during cycles one and two. Original ideas were reframed and inquiry procedures amended based on actual findings or reflections about the findings, including AR team members’ personal insights. During this stage, co-researchers, or in this case, ABCTC personnel, the action research group, and/or the research sponsor decided whether or not to continue with further cycles of the inquiry processes. This stage involved primarily
presentational knowing or developing new images and ways of acting. Figure 2 illustrates the action research planning process.

![Figure 2. Action research planning process.](image)

**Case Study**

As a research method, a case study contributes to the knowledge of individual, organizational, and group learning. It is used when the focus of the study is to answer “why or
“how” questions and when the researcher cannot manipulate the actions or behaviors of those involved or if the researcher wishes to cover any contextual conditions that he or she finds relevant to the study (Yin, 2009, p. 4). Case study methodology allows the researcher to exploit differences and similarities within data as they relate to literature and past findings. The method also allows for easy readability of the research narrative in that the researcher can formulate the findings into a story that illustrates the case (Yin, 2009).

**Action Research Methodology**

Action research (as described in Chapter 1) was the preferred methodology for this case study for several reasons. Action research held the potential for first-, second-, and third-order learning and change for ABCTC and the study participants. From previous conversations with the president of ABCTC, I learned that she wanted me to take a unique approach to the issue of student retention at the college, one that valued internal appreciation and understanding of complex problems and solutions. Action research provided this distinctive, internal means to examine closely issues of student retention within the college.

Action research also has the potential to yield actionable results that ran counter to the normative behavior of educational entities, such as ABCTC. Previous attempts were made by college administration to justify or clarify large issues, such as retention, using information from textbooks and academic literature at the college level; however, virtually no action was ever taken, and the results were less than stellar, according to President Simon. A strong desire to demonstrate action at various levels of the institution and engagement from the college’s staff and faculty was at the forefront of the president’s mission to accomplish greater student retention. It was expected that this research would yield such actionable results, unlike previous efforts.
In practice, action research can be a complex and convoluted process requiring careful documentation and methodical oversight of data. For the purpose of this case study, we sought to explore the essence of the unmet financial needs of students at ABCTC and the transformative learning process of educational leaders affiliated with an unmet financial need program. As data sources, student participants were asked to complete an essay to obtain scholarship dollars and AR members were asked to journal about their experiences and to participate in an exit interview at the end of the study. Sensitivity of data was characterized by measures “having sufficient values to detect variations among respondents” and by “the degree of variation captured by a measure” (O’Sullivan et al., 2003, p. 34). Although some of the data supplied by the College Board were categorized, responses to many of the questions on the SAT Questionnaire were distributed across many categories. In addition, categories were devised to sensitize measures and facilitate non-parametric analysis.

**Study Participants**

In addition to the AR team (described in Chapter 1), students also acted as key study participants. As determined by a criteria established by the AR team, students involved in the study were required to have completed a minimum of 12 credit hours, fall within the SAT conditional admissions standards for ABCTC (i.e., a score of 1100 or below), and be within two years of graduation from their initially selected program of study at ABCTC. Students could be working toward a degree or diploma at ABCTC and still maintain eligibility for the program, but those seeking a certificate were not eligible. The number and characteristics of students meeting these criteria will be described in Chapter 4.
Data Collection and Analysis

Table 4 presents the data collection method and the data analysis strategy used for each of the research questions that guided this action research study. An in-depth presentation of data collection and analysis of each research question follows.

Table 4

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data Sources</th>
<th>Analysis Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there a statistical correlation between socioeconomic factors and SAT scores that could result in students entering college with an unmet financial need?</td>
<td>• National SAT Board</td>
<td>• Statistical</td>
</tr>
<tr>
<td>How do financial assistance strategies impact individual technical college students faced with being dropped academically for nonpayment?</td>
<td>• Retention rates increase &lt;br&gt;• Degree completion &lt;br&gt;• Critical incident interviews &lt;br&gt;• In vivo coding from scholarship applications</td>
<td>• Pre- and post-analysis of retention numbers from ABCTC’s Office of Institutional Effectiveness &lt;br&gt;• Graduation rates</td>
</tr>
<tr>
<td>How do college leaders learn and develop individually and collectively when addressing the issue of retention?</td>
<td>• AR team self-assessments &lt;br&gt;• Critical incident interview meetings &lt;br&gt;• Meeting transcripts</td>
<td>• In vivo coding &lt;br&gt;• Journaling</td>
</tr>
</tbody>
</table>

Research Question 1

During the first cycle, a quantitative study was conducted to address research question 1. The study served as the foundation for data collection, compilation, and analysis for action
cycles two and three—premised on the data supplied by the College Board from its 2013 SAT profile reports. Because the data were related to SAT participation that had already occurred, there was no control (from an experimental perspective) against which to measure altered behaviors or results. Thus, it was appropriate to implement a descriptive design for this study. Specifically, the pilot was a cross-sectional study, which, in general, is “particularly suited for [research] that involve[s] collecting data on many variables, from a large group of subjects [and] from subjects who were dispersed geographically” (O’Sullivan, Rassel, & Berner, 2003, p. 26).

Data mining was accomplished via a comprehensive and targeted review of all 50 state reports (College Board, 2013b), as well as the national report (College Board, 2013a). Most of the variables used in this study were derived from calculations based upon College Board reported data.

Table 5 shows the dependent and independent variables examined in this examination. Some variables were reported by the College Board while others were calculated for this study by the me as the researcher. A description of each variable and how the variables were derived follows.
<table>
<thead>
<tr>
<th>SAT Score Rank</th>
<th>State</th>
<th>Total SAT Score</th>
<th>Non-Minority Part.</th>
<th>SAT Part. Rate †</th>
<th>Parent's Ed. Level</th>
<th>High School Rank (Top 10%) Rate</th>
<th>High Family Income (&gt; $100,000) Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Alabama</td>
<td>1,126</td>
<td>0.70</td>
<td>0.10</td>
<td>0.846</td>
<td>0.29</td>
<td>0.25</td>
</tr>
<tr>
<td>30</td>
<td>Alaska</td>
<td>1,042</td>
<td>0.64</td>
<td>0.52</td>
<td>0.636</td>
<td>0.19</td>
<td>0.14</td>
</tr>
<tr>
<td>26</td>
<td>Arizona</td>
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<td>0.64</td>
<td>0.33</td>
<td>0.691</td>
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<td>0.17</td>
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<tr>
<td>19</td>
<td>Arkansas</td>
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<td>0.74</td>
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<td>0.768</td>
<td>0.38</td>
<td>0.20</td>
</tr>
<tr>
<td>35</td>
<td>California</td>
<td>1,026</td>
<td>0.36</td>
<td>0.50</td>
<td>0.578</td>
<td>0.14</td>
<td>0.15</td>
</tr>
<tr>
<td>16</td>
<td>Colorado</td>
<td>1,120</td>
<td>0.74</td>
<td>0.26</td>
<td>0.836</td>
<td>0.24</td>
<td>0.22</td>
</tr>
<tr>
<td>32</td>
<td>Connecticut</td>
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<td>0.66</td>
<td>0.86</td>
<td>0.661</td>
<td>0.10</td>
<td>0.17</td>
</tr>
<tr>
<td>45</td>
<td>Delaware</td>
<td>1,005</td>
<td>0.64</td>
<td>0.74</td>
<td>0.624</td>
<td>0.13</td>
<td>0.15</td>
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<tr>
<td>47</td>
<td>Florida</td>
<td>996</td>
<td>0.52</td>
<td>0.65</td>
<td>0.621</td>
<td>0.13</td>
<td>0.12</td>
</tr>
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<td>Georgia</td>
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<td>0.57</td>
<td>0.75</td>
<td>0.608</td>
<td>0.13</td>
<td>0.14</td>
</tr>
<tr>
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<td>0.605</td>
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<td>Illinois</td>
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<td>0.860</td>
<td>0.30</td>
<td>0.29</td>
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<td>0.571</td>
<td>0.17</td>
<td>0.12</td>
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<td>0.34</td>
<td>0.25</td>
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<tr>
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<td>1,120</td>
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<td>0.12</td>
<td>0.798</td>
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<td>0.23</td>
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<tr>
<td>13</td>
<td>Louisiana</td>
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<td>0.791</td>
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<td>0.21</td>
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<td>0.75</td>
<td>0.630</td>
<td>0.15</td>
<td>0.09</td>
</tr>
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<td>Maryland</td>
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<td>0.52</td>
<td>0.71</td>
<td>0.658</td>
<td>0.12</td>
<td>0.18</td>
</tr>
<tr>
<td>29</td>
<td>Massachusetts</td>
<td>1,047</td>
<td>0.68</td>
<td>0.86</td>
<td>0.672</td>
<td>0.10</td>
<td>0.14</td>
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<tr>
<td>10</td>
<td>Michigan</td>
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<td>0.10</td>
<td>0.834</td>
<td>0.27</td>
<td>0.26</td>
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<tr>
<td>5</td>
<td>Minnesota</td>
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<td>0.866</td>
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<td>0.28</td>
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<tr>
<td>18</td>
<td>Mississippi</td>
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<td>0.65</td>
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<td>0.19</td>
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<tr>
<td>7</td>
<td>Missouri</td>
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<td>0.24</td>
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<td>0.822</td>
<td>0.36</td>
<td>0.20</td>
</tr>
<tr>
<td>37</td>
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<td>0.580</td>
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<td>0.16</td>
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<tr>
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<td>0.81</td>
<td>0.697</td>
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<td>0.14</td>
</tr>
<tr>
<td>38</td>
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<td>0.86</td>
<td>0.612</td>
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<td>0.16</td>
</tr>
<tr>
<td>20</td>
<td>New Mexico</td>
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<td>0.55</td>
<td>0.13</td>
<td>0.779</td>
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<td>0.18</td>
</tr>
<tr>
<td>42</td>
<td>New York</td>
<td>1,008</td>
<td>0.52</td>
<td>0.92</td>
<td>0.599</td>
<td>0.10</td>
<td>0.11</td>
</tr>
</tbody>
</table>

† Reported by the College Board as based on the projection of high school graduates in 2013 by the Western Interstate Commission for Higher Education (WICHE) and the number of students in the class of 2013 who took the SAT Reasoning Test.
<table>
<thead>
<tr>
<th>SAT Score Rank</th>
<th>State</th>
<th>(1) Total SAT Score</th>
<th>(2) Non-Minority Part.</th>
<th>(3) SAT Part. Rate&lt;sup&gt;†&lt;/sup&gt;</th>
<th>(4) Parent's Ed. Level</th>
<th>(5) High School Rank (Top 10%) Rate</th>
<th>(6) High Family Income (&gt; $100,000) Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>North Carolina</td>
<td>1,010</td>
<td>0.64</td>
<td>0.74</td>
<td>0.642</td>
<td>0.16</td>
<td>0.12</td>
</tr>
<tr>
<td>3</td>
<td>North Dakota</td>
<td>1,195</td>
<td>0.85</td>
<td>0.04</td>
<td>0.862</td>
<td>0.48</td>
<td>0.19</td>
</tr>
<tr>
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<td>0.29</td>
<td>0.747</td>
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<td>0.20</td>
</tr>
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<td>12</td>
<td>Oklahoma</td>
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<td>0.07</td>
<td>0.811</td>
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<td>0.19</td>
</tr>
<tr>
<td>27</td>
<td>Oregon</td>
<td>1,054</td>
<td>0.74</td>
<td>0.59</td>
<td>0.645</td>
<td>0.19</td>
<td>0.12</td>
</tr>
<tr>
<td>46</td>
<td>Pennsylvania</td>
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<td>0.75</td>
<td>0.75</td>
<td>0.574</td>
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<td>0.11</td>
</tr>
<tr>
<td>42</td>
<td>Rhode Island</td>
<td>1,008</td>
<td>0.71</td>
<td>0.72</td>
<td>0.667</td>
<td>0.11</td>
<td>0.13</td>
</tr>
<tr>
<td>49</td>
<td>South Carolina</td>
<td>993</td>
<td>0.64</td>
<td>0.64</td>
<td>0.620</td>
<td>0.17</td>
<td>0.11</td>
</tr>
<tr>
<td>6</td>
<td>South Dakota</td>
<td>1,178</td>
<td>0.82</td>
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<td>0.44</td>
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</tr>
<tr>
<td>11</td>
<td>Tennessee</td>
<td>1,135</td>
<td>0.75</td>
<td>0.16</td>
<td>0.820</td>
<td>0.24</td>
<td>0.24</td>
</tr>
<tr>
<td>48</td>
<td>Texas</td>
<td>995</td>
<td>0.49</td>
<td>0.54</td>
<td>0.581</td>
<td>0.17</td>
<td>0.13</td>
</tr>
<tr>
<td>15</td>
<td>Utah</td>
<td>1,123</td>
<td>0.70</td>
<td>0.07</td>
<td>0.837</td>
<td>0.27</td>
<td>0.20</td>
</tr>
<tr>
<td>31</td>
<td>Vermont</td>
<td>1,038</td>
<td>0.80</td>
<td>0.67</td>
<td>0.676</td>
<td>0.14</td>
<td>0.10</td>
</tr>
<tr>
<td>34</td>
<td>Virginia</td>
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<td>0.60</td>
<td>0.73</td>
<td>0.674</td>
<td>0.12</td>
<td>0.17</td>
</tr>
<tr>
<td>25</td>
<td>Washington</td>
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<tr>
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<td>0.20</td>
<td>0.674</td>
<td>0.25</td>
<td>0.14</td>
</tr>
<tr>
<td>4</td>
<td>Wisconsin</td>
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<td>0.25</td>
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<td>21</td>
<td>Wyoming</td>
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<td>0.12</td>
<td>0.758</td>
<td>0.31</td>
<td>0.11</td>
</tr>
</tbody>
</table>

For this study, descriptive statistics, non-parametric techniques, and parametric statistical tests using linear, multiple regression, and correlation analysis were employed. Since scores were aggregated and reported for each state, the participants in this study is (N = 50). Data for all 50 states were reported by the College Board; therefore, a 100% sampling size for this study was implied.

Operational validity pertains to the extent to which a procedure or instrument actually measures what it was designed to measure (O’Sullivan, Rassel, & Berner, 2003). Per the College Board (2013c), because “accuracy of self-reported information has been documented and the college-bound population is relatively stable from year to year, SAT Questionnaire
responses from these students can be considered highly accurate” (p. 12). Thus, the operational validity of the supplied data was found to be high. Additionally, data used for statistical calculations followed prescribed procedures. For example, for non-parametric calculations, data were categorized to eliminate weighted data (percentages).

The dimensions of reliability (i.e., stability, equivalence, and internal consistency) for the data collected and supplied by the College Board were also high. One of the safeguards in reporting data, according to the College Board, is the assurance that “students are counted only once, no matter how often they are tested, and only their latest scores and most recent SAT Questionnaire responses are summarized” (College Board, 2013a, p. 34). Furthermore, the College Board is a nationally recognized testing service responsible for developing reliable testing instruments.

Overall, statistical calculations for this study were considered reliable. However, since specific procedures for studying relationships pertaining to SAT score data varied from researcher to researcher, and since the researcher conducting this pilot study had little experience with empirical studies, the dimension of equivalence was a possible issue. Nonetheless, every effort was made to ensure that the statistical analysis complied with acceptable practices in order to mitigate equivalence issues. Furthermore, correlations between variables to establish internal consistency and relationships were performed to determine “if a measure has extensive random errors due to reliable or heterogeneous items” (O’Sullivan, Rassel, & Berner, 2003, p. 53).

Generalizability pertains to the “degree to which the findings can be generalized from the study sample to the entire population” (Polit & Hungler, 1991, p. 79). Because the study sample encompassed the entire 2013 SAT test-taking population, it implied a high degree of generalizability—that is, that the study’s findings applied to that entire population, inclusive of
the students at ABCTC. In essence, this study was not based on a sample but on an observed view of the entire SAT population.

Microsoft® Office Excel 2013 was used to build the various tables and to execute some of the statistical calculations of the analysis. The Statistical Package for Social Sciences (SPSS®) version 14.0 was used as the main statistical package to calculate statistics and conduct analyses of the collected data.

**Research hypotheses.** The research model encompassed five independent variables and one dependent variable. To empirically test the relationship between the independent variables and the dependent variables, the following five hypotheses were assessed.

*First hypothesis.*

Hypothesis (H₁): The greater the non-minority SAT participation, the higher the SAT scores.

Null hypothesis (H₀): Non-minority participation has no relationship to SAT scores.

*Second hypothesis.*

Hypothesis (H₁): The higher the percentage of SAT participants, the lower the state rankings on the SAT scores.

Null hypothesis (H₀): SAT participant percentage has no relationship to states’ average SAT achievement scores and subsequent SAT state rankings.

*Third hypothesis.*

Hypothesis (H₁): The higher the parent education level, the higher the SAT scores.

Null hypothesis (H₀): Parents’ education level has no relationship to SAT scores.

*Fourth hypothesis.*

Hypothesis (H₁): The higher the high school rank, the higher the SAT scores.
Null hypothesis (H₀): High school rank has no relationship to SAT scores.

**Fifth hypothesis.**

Hypothesis (H₁): The higher the family income, the higher the SAT scores.

Null hypothesis (H₀): Family income has no relationship to SAT scores.

O’Sullivan, Rassel, and Berner (2003) suggested that “accepting a research hypothesis required empirical evidence that the relationship between variables was (1) nonrandom, (2) in the anticipated direction, and (3) sufficiently strong given the sample size” (p. 68). In relation to this study, the intent of choosing appropriate statistical tests was to improve the level of confidence in accepting or rejecting each hypothesis.

**Statistical techniques.** The pilot study employed several statistical techniques to test the relationships between the independent variables and the dependent variable to prove or disprove the hypotheses and ultimately answer the research questions. Quantitative measures (descriptive statistics), such as determining the mean, range, standard deviation, and variance, were performed for each variable.

Chi-square tests were conducted by pairing the dependent variable (SAT scores) with each independent variable to assess statistical significance. Contingency tables were built for each pair, encompassing observed and expected frequencies. Statistical significance, degrees of freedom, Pearson \( r \) (correlation coefficient), and chi-square were calculated. The chi-square tests served as an initial decision point for tentatively accepting or rejecting the null hypotheses (H₀).

Because of the limitations and complexities inherent in non-parametric techniques, tests utilizing linear and multiple regression and correlation methods were conducted. Scatter plots were used to summarize the strength of the relationship between each paired variable (bivariate
data) and to provide a good “visual” of these relationships in order to facilitate interpretation of the correlation coefficient during regression testing. Trend lines were utilized and based on the computer-generated linear regression equation.

A correlation analysis was performed on the variables to determine the level of significance or goodness of fit. Correlations were tested at the significance of either 0.01 or 0.05. Regression methods were employed to determine regression coefficients (unstandardized) and standardized ($\beta$ weights), zero order, part and partial correlations, $R$, $R^2$, adjusted $R^2$, change in $R^2$, and standard error of the estimate. Additionally, 95% confidence intervals for each regression coefficient were reported.

All calculations were conducted at the 95% confidence level. Since the sample size was less than 100% ($N = 50$) and while small in magnitude, a -1.96 to +1.96 accuracy range was deemed acceptable. Following standard convention, a corresponding probability ($p$) of 0.05 or alpha level ($\alpha$) was chosen in light the 95% confidence level. However, most of the calculations strived for a $p < 0.001$ or less to minimize type I errors. Conversely, with a lower $\alpha$ level, the level of $\beta$ errors increased and thus the probability of type II errors increased. The issue of $\beta$ errors was significant in this study as the sample size ($N = 50$) was quite low. This dovetails with the issue of power, which is affected by $\beta$. The lower the $\beta$, the greater the power and the higher likelihood of making the correct decision regarding a null hypothesis. For this study, $\alpha$ and $\beta$ values and the $r$-ratio were reported.

**Research Question 2**

Question two related to the implications of unmet financial needs on students at ABC Technical College. There were two primary data sources for this question: institutional data and student essay data. Institutional data showed that students who left or exited the college did so in
large part because of unmet financial needs. Thus, this information suggested clearly that that
the unmet financial needs of students have direct implications for and ramifications upon their
collegiate retention.

**Institutional data.** Data collection related to the second research question occurred
partly in the form of an assessment—administered by ABCTC and its Office of Institutional
Effectiveness—of the number of students who dropped out of college with an outstanding
balance. Information was gathered through the college data system, Banner, and the researcher
identified the number of students who had been automatically dropped or who had been chosen
to withdraw from classes due to unmet financial need. This information is collected on an exit
form provided to the institution upon the departure of each student. Students can self-signify the
reason for their departure from ABCTC, and one option on the form is listed as “lack of financial
support” (S. Meaden, personal communication, January 9, 2014).

Anticipated data were supported by a study by Kennamer (2011), who reviewed then-
recent literature on student financial aid as a retention tool at community colleges in an effort to
better understand the impact of unpaid financial burdens on students. Enrollment and tuition
data from NCES and IPEDS, and federal direct grant student aid data from the Student Financial
Aid Survey were used to analyze changes from the 2000-2001 academic year to the 2005-2006
academic year. The information showed differences among rural, suburban, and urban
community college types and differences among states with local funding and those with no
significant local funding. Kennamer (2011) found that the 40% increase in tuition and the 2.2
million new students enrolled in the previous five years overwhelmed the very modest increases
in federal direct grant student aid during the same period. This, according to Kennamer, reduced
the ability of student aid to positively affect retention at America's community colleges.
Research question two was designed to examine how financial assistance strategies impacted individual technical college students faced with academic dismissal due to nonpayment. Anticipated data within this context included the cause-and-effect relationship between the scholarship program implemented by the action research team at ABCTC—the application for which consisted of a 500-word essay students would write to request funding to reduce unmet financial need—and student retention numbers. The approach to analysis embedded within this question focused on the retention numbers of students who were previously identified and selected, and had had their unmet financial need funded through this project.

**Student documents.** Scholarship applications consisting of up to 500-word essays were read and analyzed according to impact that the dollars would make upon retention of the student to accentuate the meaning-making process during this study. Documents consulted included notes from the AR team, student academic records, and standardized test scores, which were provided by the Office of Institutional Effectiveness at ABCTC.

The researcher found supporting evidence in Herzog (2008), who estimated the effect of financial aid on freshman retention at a moderately selective, public university using propensity score matching in multi-stage regression analyses. The correlational pattern that emerged from 24 models suggested that lower income students accrue a retention benefit from financial aid, unlike high-income students who do not net the same benefit. Conversely, retention of low-income freshmen was more likely due to academic performance compared to those from high-income backgrounds. This information suggests strongly that there is a direct linkage between unmet financial needs and the retention of college students.
Research Question 3

The third research question focused on ABCTC’s administrative leaders and how they learn and develop individually and collectively when addressing the issue of retention. Data were gathered through AR team self-assessments (which were reported at team meetings) and critical incident interviews conducted at the end of each action research cycle, and written transcripts from each action research team meeting.

AR team meetings. The AR team met on a weekly basis, and the initial meetings were structured to allow the members to introduce themselves and set expectations for the action research process. As the meetings progressed, themes for the team’s time together evolved around data and member activity. These meetings were typically one hour long, with each team member attending over 75% of the meetings on average. All meetings began with a restatement of the study’s purpose and a reminder of the goals, objectives, and outcomes. Team members were encouraged to keep a journal and write about the AR process. This journal was shared with me, the researcher, at the conclusion of our study.

The information from AR team interviews was coded using in vivo, which allowed for meaning and values to contextualize in relation to the transcripts. The critical incident technique, as described by its creator John Flannigan (1954), is a set of procedures for collecting and observing people’s behavior in a way that enables their usefulness in solving practical problems and developing psychological principals. Critical incident interviews represent a proven method of qualitative data analysis that offers a formal and practical approach to collecting information about humans’ behavior and relating its significance to the study in which they are participating (DeMarrais & Lapan, 2004). Table 6 lists the critical incident interview questions used in this study.
Interviews were transcribed, and in vivo coding was employed to synthesize data from the transcriptions. In vivo (Miles, Huberman, Saldaña, 2014) coding is a method of data exploration that codes words or phrases from the participants’ own language in the data records. This seemed an appropriate analytical “fit” for the action research team critical incident interviews.

Table 6

*Critical Incident Technique (CIT) Questions and Sub-Questions for AR Members*

<table>
<thead>
<tr>
<th>CIT Question</th>
<th>Sub-Questions</th>
</tr>
</thead>
</table>
| 1. What is the most significant learning experience about students that you had within your role as a change agent concerning unmet financial need at ABCTC? | - What led up to it?  
- What was your role?  
- What happened? Actions that you took?  
- Actions that you did not take?  
- Describe your thoughts and feelings?  
- What was the outcome?  
- So what? |
| 2. What is the most significant learning experience about yourself that you had within your role as a change agent concerning unmet financial need at ABCTC? | - What led up to it?  
- What was your role?  
- What happened? Actions that you took?  
- Actions that you did not take?  
- Describe your thoughts and feelings?  
- What was the outcome?  
- So what? |

I began the coding process by using broad, color coded themes that were reoccurring in the transcripts from the AR team. The color of blue was used to code question one “What is the most significant learning experience about students that you had within your role as a change agent concerning unmet financial need at ABCTC?” The color orange was used to code broad
themes of question two “What is the most significant learning experience about yourself that you had within your role as a change agent concerning unmet financial need at ABCTC?”

Merriam (2009) states that “the analysis of data involved identifying reoccurring patterns that characterize data” (p. 23). Continuing the coding process, broad categories were assigned to the highlighted text from the transcripts of each meeting. Categorization of data happened by placing the corresponding data in the column that represented the theme of that data. For example, all data associated with mistrust was placed in the column labeled mistrust. A master list of categories and subcategories were identified and used to create the coding scheme as depicted below.

Table 7

*Master Code Book*

<table>
<thead>
<tr>
<th>Code</th>
<th>Theme</th>
<th>SUBCODE</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>LRN</td>
<td>Learning</td>
<td>TRS</td>
<td>Transformational</td>
</tr>
<tr>
<td>FEL</td>
<td>Feelings</td>
<td>MIS</td>
<td>Mistrust</td>
</tr>
<tr>
<td>BIA</td>
<td>Bias</td>
<td>UND</td>
<td>Understanding</td>
</tr>
<tr>
<td>COL</td>
<td>Collaboration</td>
<td>FUN</td>
<td>Development</td>
</tr>
<tr>
<td>MIS</td>
<td>Mistrust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANG</td>
<td>Anger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CON</td>
<td>Confusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REG</td>
<td>Regret</td>
<td>REF</td>
<td>Reforming</td>
</tr>
<tr>
<td>KNO</td>
<td>Knowledge</td>
<td>ASG</td>
<td>Assessing</td>
</tr>
</tbody>
</table>
Information gathered from this process allowed me to study the participants within the AR team and gain insights into the process from a data management perspective. Coding also allowed me to group information across three various contexts and relate meaning-making themes to the data. Coding, including in vivo, allows the researcher to obtain an inside look at the conversations and attach meaning to the dialogue that was being shared between and among members of the group. This was particularly helpful when examining in detail the AR team as part of this research process.

**Trustworthiness of the Data**

Data trustworthiness is of primary importance to any study. All research is susceptible to any number of factors which, while extraneous to the concerns of the research, could invalidate the findings (Seliger & Shohamy, 1989); thus, controlling possible factors that threaten the validity of the research is a primary responsibility of every good researcher. For research questions one and two of this AR case study, the pre- and post-data and analyses were provided by the Office of Institutional Effectiveness at ABCTC. Systems such as Banner and Omnipoint were utilized to manage the institutional data. Banner-generated data had high validity and reliability due to the system’s data connection to ABCTC’s academic software. Numbers and information gathered through Banner were checked for validity by the academic departments and by the Office of Institutional Effectiveness.

The amount of qualitative data collected for question three was quite overwhelming. Trustworthiness concerns were shielded by the self-reporting feature of the majority of the content. The coding process revealed some areas of concern with respect to research and coding bias (which are addressed in the Researcher Subjectivity section of this chapter). Triangulation was also present within the data at this stage. Cohen and Manion (2000) defined triangulation as
an attempt to map out, or explain more fully, the richness and complexity of human behavior by studying it from more than one viewpoint. The action research team participated in triangulation at two integral points of the action research cycle: during the informal learning phase and the reflection phase.

Member checking was also used to create trustworthiness in the data from the action research team. It is important to use member checking in qualitative research due to the amount of interpretation such studies involve. Without allowing participants to validate the accuracy of their findings, one-sidedness would become a major concern. Since the most important issue in evaluating the rigor of qualitative research is trustworthiness, member checks are critical to minimizing distortion. Creswell (1998) stated that member checks represent a useful function in research, especially when there are questions about the adequacy of understanding due to limited time of exposure—as was found in this action research study. Member checking, which was completed at the end of cycle three, also provided an opportunity to understand and determine what the action team members intended to achieve through their actions. It gave them the ability to correct errors and challenge what they perceived as wrong interpretations during the reflection phase. Member checking also allowed individuals to volunteer additional information and insights that may have been stimulated during the playback process. It also provided AR team members the opportunity to assess the adequacy of data, analyze preliminary results, and confirm particular aspects of the data.

**Researcher Subjectivity**

A researcher must know his or her own self when entering into an action research project. This holds true especially within the context of surveys and data collection. So often,
researchers bring forth states of unknown or unconscious bias to the process of administering surveys and collecting data that might have an effect on the validity of the data that is gathered.

As the primary researcher within this study, I needed to remain vigilant during all stages of data collection, keeping an awareness of potential bias and exclusionary factors at the forefront of my work and the work of the AR team. For instances, biases favoring traditional or non-adult learner might have come into play. The term retention, widely used among higher education professionals, does not have a single definition; it is often defined by the context in which the institution works and the professional who has oversight of the process. Within the AR team, there were individuals who looked at nontraditional learners in very different ways; in the context of this research, the four-year university system defines this type of learner in a way that differs vastly from the two-year technical college system and the private college system.

The classification of students as degree-seeking emerged as a subjectivity issue as well. Within the two-year technical college system, there is an academic contingent that focuses on degree completion and traditional studies and another focused more on continuing education. Both sets of students are degree-seeking in the purest definition of the term; yet the four-year university system does not recognize these continuing-education seekers as being on a degree path. This created a primary conflict within the definition of a term that was essential to the overall scope and breadth of this study.

As with surveys, participant interviews carry risks of bias and compromised data validity. The sample set (i.e., the action research team) that was chosen for this particular study had a vested interest in the outcomes of data findings in that some of them were educational seekers within colleges and universities. The threat of human error existed within the methodology as well, with numerous opportunities for transcription and coding errors within Tinto’s (1975)
measures. Thus, in interviewing individuals, I had to remain cognizant of biases that I may have brought to the data—biases that may have been brought forth unconsciously or unknowingly and that needed to be exposed and scrutinized prior to the data collection to ensure non-bias.

A major area of researcher subjectivity was the mere fact that the action research team and I evaluated and analyzed the information obtained from the survey. Epistemologically, I learned to check my personal bias as well as vet notions that the research team might have brought forth and unconsciously placed within the data sets. This was accomplished through coding or tallying responses and even through the definition and analysis of the datasets.

**Limitations of the Study**

Yin (2009) stated that different methods of data collection and empirical analysis have their own unique advantages and disadvantages. One major limitation of this study was represented by the AR team and student samples. The case study relied heavily on the AR team members and their positionality at ABCTC. Each brought his or her own set of skills and “knowing” to the data analysis “table.” For the student sample, only those who met certain criteria were able to participate in cycle two of the study. Role-duality and researcher bias were other potential limitations of this study. When leading action research within one’s own organization, ethical, political, and power threats might arise. Researcher bias was at the forefront of the study with regard to misconceptions and preconceived notions concerning data, analysis, and the study at large; thus, my own researcher bias being addressed via member checking throughout the AR process.
Many of the AR team members compared the action research case study process to a kind of yearlong board game or sporting event, complete with highlights and lowlights. Using the game metaphor, this chapter details the origins of the research problem, entering the system of study, the development of the action research process to address the problem, and the evaluation of that process.

**Context: The ABCTC Playing Field**

As noted earlier, the context of this AR project was ABCTC, a two-year technical college located in a suburb of a major metropolitan area in the southeastern U.S. Since opening its doors as the ABC Area Technical School in 1984, the college has added numerous programs, undergone two name changes, expanded its facilities, and seen significant growth in enrollment. At the time of this study, ABCTC held the highest retention rate in the state among two-year technical colleges; however, college personnel feared that due to changing state appropriations, ABCTC would see a decrease in funding in the upcoming fiscal years. Adding to concerns about student retention at ABCTC was the fact that the institution serves a large and diverse student population. As Brint and Karabel (1989) observed, two-year institutions disproportionately serve students from groups that are historically underrepresented in higher education. Once these students enter college, it can be difficult to keep them enrolled due to a multitude of issues and barriers they face.
Origins of the Game

The impetus for this action research case study was the state of Georgia’s decision in 2015 to use student retention as a criterion for determining state budget appropriations for colleges and universities. With this game-changing policy, ABCTC saw an opportunity to engage in an action research initiative that would lead to the creation of diverse and sustainable retention programs, resulting ultimately in a larger allocation from the state of Georgia.

The president of ABCTC initiated the project. Upon meeting with her during my first week as a new staff member at ABCTC, she asked about the potential to use my professional skillset to help the college make a critical examination of student retention. She feared that since ABCTC held the highest retention rate at the time, numbers would inevitably trend downward, culminating in an eventual decrease in state funding. She brought together six staff members representing various divisions and departments at ABCTC that played a pivotal role in student retention.

Those present at the meeting were already involved in student retention at some level, though these efforts were less formalized and more grassroots at the time. The focus of the meeting was to address the challenges posed by student retention as a result of the change in the appropriation formula used by the state of Georgia. This meeting and subsequent gatherings of the group—which evolved into the AR team meetings—initially focused on enlisting the expertise of institutional leaders in an effort to retain more students at ABCTC.

As a result of these meetings, several key players emerged in the context of the action research study. The AR team consisted of six individuals, each representing an ABCTC office that played an integral role in the retention of students at ABCTC (see Chapter 1, Table 1).
**Action Research Team**

The six individuals comprising the AR team held differing opinions and vastly different outlooks on the student retention experiment. Even so, they came together and formalized efforts to address the unmet financial needs of students at ABCTC. The dynamics of the group and how the team members interacted with and reacted to the environment around them became an important part of this case study story.

The process of collaborative inquiry piqued my interest as a method for working with this group to find a potential solution to unmet financial needs at ABCTC. At the time, I served as a fundraiser within the advancement department at ABCTC, a position that would lend itself to seeing positive steps forward with regard to acquiring nontraditional (i.e., non-state) funding.

In the beginning stages, the decision to take on this project collaboratively was met with staunch skepticism from the participants. One AR team member stated, “There is no way that we six can change student retention on this campus. We can’t change anything.” Another member insisted, “We will never get this institution to believe that students don’t have enough money to go to a two-year technical college.” This marked the start of cycle one, at which point the team gathered statistical data to better understand the unmet financial needs of students at ABCTC.

**The Recruits**

As part of the AR process to establish a mechanism for helping students reduce or eliminate unmet financial needs, ABCTC students were able to apply for funding through a scholarship opportunity offered through the foundation at the college. The basic criteria and standards for the scholarship were set by the AR team. Students could apply for a maximum of $500 per semester for up to two semesters to help offset their unmet financial needs. These
dollars were to be applied exclusively to academic-related expenses associated with their initially chosen program of study at ABCTC. The funding criteria required students to have completed no fewer than 12 credit hours within their chosen program and have a minimum 2.75 GPA and an entrance SAT score of 1100 or lower, which allowed for a statistical data tie-in with research question one. While ABCTC considered students with SAT scores lower than 1100 as “at-risk” admittees, this factor closely correlated with the findings of the pilot study. The AR team members felt that if they had a numbers-driven dataset, they could show a more academic approach (i.e., regarding SAT performance) to the AR project.

Students seeking a diploma or degree were eligible for this scholarship opportunity, but those seeking a program certificate or certification were deemed ineligible due to the nature, scope, and academic rigor, or lack thereof, of such programs, and to certification program compliance issues that do not meet or exceed SACS accreditation standards. The program was focused on meeting the unmet financial needs of qualifying students by adhering to Tinto’s (1975) theory of departure.

**The Case Story: Playing the Game**

When examining issues surrounding unmet financial needs at ABCTC, the AR committee, as well as the institutional leadership, pondered two underlying questions: Was there a linkage among socioeconomic factors, as informed by Tinto (1975), to standardized test scores? Could the AR team prove these linkages with concrete data? In hopes of gathering relevant data to respond to these initial questions, the AR committee decided to investigate the relationship between SAT scores and socioeconomic factors that might play a role in the unmet financial needs of students.
For both the group and me, learning was an essential part of the AR process. We exhibited various types of learning throughout the process; however, the most crucial was informal learning. For the purpose of this study, informal learning was defined as that which “may occur in institutions, but it is not typically classroom-based or highly structured, and control of learning rests primarily in the hands of the learner” (Marsick & Watkins, 2001, p. 25). Through this action research process, the AR team hoped to comprehend, diagnose, and exploit this type of learning throughout the planning and intervention processes. In an effort to assist in the learning process of the AR team, I provided the members with a statement of inquiry and guiding questions that needed to be answered. Tasked as such, the team utilized the three AR cyclical process of “plan, act, observe, and reflect” (Stringer, 2007, p. 8) in exploring issues surrounding student retention and unmet financial burdens at ABCTC. In a series of informal learning projects, the action research team sought to understand existing data, collect data through existing institutional avenues, formulate an intervention based on that data, execute the intervention, and evaluate the results of the plan of action.

**Entering the System: Pre-Game Action**

The AR team met monthly to begin the process of sifting through the institutional data as it related to student retention at ABCTC—a process which lasted 16 months. The preliminary meetings consisted of grounding the group in the action research process and methodology, with which they were unfamiliar at the time. Signatures for consent forms for this study were also collected within the first month of meetings. Visitors from various departments (such as student recruitment, student records, and academic success) attended subsequent meetings to allow AR team members to develop a more holistic comprehension of retention issues at ABCTC. Each month, for one hour per month, team members sat around a conference room table at ABCTC.
striving to fully understand and develop an intervention program with regard to retention. Struggles unfolded around grasping the idea of retention and how it could be effected through the committee’s action.

**Options for action: Possible interventions.** The action research team at ABCTC met various times to discuss possible steps that would be appropriate, purposeful, and systemic for ABCTC and the technical college system of Georgia in order to meet the unmet financial needs of students. Three options were discussed and explored by the action research team, each funded from a different source and each differing according to criteria for implementation and distribution.

**Option 1: The tornado.** The first option, better known by the action research team as “the tornado,” was a plan that would have solved several of the financial woes of students at the college but ultimately would have cut a path to destruction and despair among the ranks at ABCTC. The tornado called for various departments to sustain significant budget cuts in order to help fund an aggressive plan to meet the unmet financial needs of students at ABCTC through a scholarship program. The college itself would be the primary funding source for this plan, which would call on two-thirds of all departments at ABCTC to accept budget reductions within the given fiscal year.

This option asked that the college develop a plan of action that would release 1.1 million dollars, previously encumbered by various departments at ABCTC, to be utilized in a college-wide scholarship program. The program, to be implemented by the action research team and funded through various line-item budget cuts, called for students who had acquired at least 50 credit hours within their chosen program to receive financial assistance in order to complete their degree, diploma, or course of study. Further criteria included being in “good standing” with the
college both academically and financially at the time of application. Students would submit a scholarship application through the existing scholarship application portal at ABCTC. Those applications would then be funneled to the action research team for review and approval or denial.

Not surprisingly, this plan was not a popular option among college personnel, including action team committee members. Working within already tight budget restrictions, various groups and departments on campus saw this plan’s call for significant additional cuts as prohibitive, if not punitive; thus, the option was eventually abandoned due to the projected outcomes and ramifications across campus. The plan also contained a flaw that was perceived by the action research team members as insurmountable and impractical. Since students applying for scholarship dollars would be doing so from a needs-based perspective, they most likely would not have been in good financial standing at the time of application; therefore, the program would have disqualified the very students whom the action research team was ultimately trying to assist.

**Option 2: The grant.** The action research team also discussed the option of applying for a local, state, or federal grant that would ultimately provide full or partil funding for a scholarship program targeting students with unmet financial need. The criteria for the proposed scholarship fund was simple: A student must have a minimum of 50 credit hours and be close to completion of his or her current course of study. This, unfortunately, was where the simplicity ended.

Most grants come with criteria and restrictions that, in this case, would’ve placed much of the process out of the hands of the action research team. There were many grants that met the benchmarks for the program to assist students with unmet financial need; however, the action
research team felt they needed to have more oversight, input, and control over how the financial assistance dollars were administered and evaluated. In addition, the grants that were considered as funding sources for the scholarship program defined retention very broadly—that is, any student who completed a college degree of any kind would be considered a retained student by grant standards.

Option 3: The foundation. As a third option, the action research team proposed that the scholarship be administered by the foundation of ABCTC. Through the foundation’s fundraising efforts, the scholarship monies would be solicited and obtained from an outside, third-party donor. This option would include a considerable amount of diligence and effort by the college’s development department to secure donor willing to fund such an opportunity.

Ultimately, this option became the most viable plan with respect to the overall funding objectives of the action research committee. The AR team set forth certain application criteria, in hopes of attracting a major contributor to this project. Such criteria included the requirement that students, at the time of application, would have completed a minimum of 50 credit hours in their initially chosen field of study and were seeking a degree or diploma. Students who were seeking a certificate or certification at ABCTC would not be eligible for this program due to the narrower scope and nature of the certificate program. Certificate programs at ABCTC do not meet or maintain state or federal academic rigor scales as established by the Southern Association of Colleges accreditation board. Certificate-seeking students are also not included in the retention model set forth by the state. Successful student applicants at ABCTC would also be required to have obtained a minimum of a 2.75 GPA and be in good academic standing with the college. Students would also have to write a 500-word essay describing their specific unmet financial need and how the scholarship help achieve their collegiate goals and objectives. The
The committee ultimately decided to pursue option three for its intervention plan, but before the scholarship program could proceed, the AR team needed to secure funding for it. Therefore, the intervention proposal was presented to the ABCTC foundation in hopes of soliciting a donor, or donors, who would fund the project at a minimum of $100,000. This amount was based on the AR team’s analysis of data (provided by the Office of Institutional Effectiveness) showing that the current unmet financial needs of students at ABCTC totaled, on average, less than $500 per student. This correlated with Tinto’s (1975) theory of staying power for students, which states that debt is linked primarily to socioeconomic factors and, specifically, to the entering SAT scores of admitted students. A donor emerged who wished to fund the project as part of a much larger donation to the ABCTC foundation, and an action plan was drafted stating that students who were currently enrolled at ABCTC would be eligible for a scholarship program hosted by the Office of Advancement (i.e., the foundation) at ABCTC.

The intervention focused on solving complex problems, which changed as problem-solving advanced, and examined these problems from the point of view of people who were actors in their own lives. Changes in values, behavior, leadership, and desire to help others are all part of the actor’s theory of action, which draws an important distinction between an individual’s espoused theory and his or her theory-in-use. Typically, interaction with others is necessary to identify the conflict between these theories.

The timeframe for the actual intervention at ABCTC occurred as two cycles. Cycle one represented the initial phase of implementation of the action research project. Action research team members worked with the foundation office and identified students who met the criteria of
unmet financial need for scholarship eligibility. The action research team selected students and allocated approximately $50,000 of the $100,000 budget to scholarship recipients during cycle two, which consisted of two rounds.

**Cycle One: Kick Off**

Concurrent with securing funding for the scholarship program, the AR team developed the criteria for students to apply for assistance to reduce unmet financial need. In setting the criteria, the AR committee, guided by Tinto’s (1975) theory of departure, determined that it wanted to look at several socioeconomic variables associated with students at ABCTC. The variables that were tested are described in the following section.

**Research Variables**

Research questions addressed the following potential variables:

1. **Total SAT score (TOT_SAT).** The total SAT score is a dependent variable and represented the heart of the study. To define this principle measure, verbal and math scores for each state were added together to determine the total SAT score for a state. The resulting scores ranged from a minimum of 400 to a maximum of 1600. The College Board (2013a) emphasized that “if a student took a test more than once, the most recent score is used” (p. 1). The national mean total score on the SAT in 2013 was 1028.

2. **Non-minority participation (NON_MINOR).** The College Board requests that each SAT test taker identify his or her race or ethnicity, and the data collected are reported by categories (e.g., “American Indian or Alaskan Native”). Minority participation in the SAT program is a key socioeconomic indicator. As such, this independent
variable is calculated by subtracting the total number of White participants from the total student participation and reported as a percentage (decimal format).

(3) *SAT participation rate (PART_RATE).* This was reported as a percentage (decimal format) and captured the proportion of high school graduates in a state who took the SAT Reasoning Test\(^\text{TM}\). This independent variable was supplied by the College Board and is based on the projection of high school graduates in 2005 by the Western Interstate Commission for Higher Education (WICHE) and the number of students in the class of 2013 who took the SAT Reasoning Test\(^\text{TM}\). As emphasized by the College Board (2013c), “students are counted once no matter how often they tested” (p. 31). The national participation rate for the SAT in 2005 was 40%.

(4) *Parent’s education level (ED_LVL).* This independent variable was reported as a percentage (decimal format) based on the parent’s level of education as reported by the student on the SAT Questionnaire (formerly known as the Student Descriptive Questionnaire) and recorded by the College Board. The median highest level of parental education was a bachelor’s degree (College Board, 2013b).

(5) *Top 10 percent high school rank—rate (TOP_TEN_RATE).* This was reported as the number of respondents indicating on the SAT Questionnaire that their high school rank was in the top 10%. This independent variable was produced as a percentage (decimal format) and was calculated for each state by dividing the number of students in the top 10% by the number of SAT participants.

(6) *High family income (>\$100,000) rate (H_INC_PER).* This was reported as the number of respondents indicating on the SAT Questionnaire that their parents’ income was greater than \$100,000 annually. Family income is another important
socioeconomic factor related to the unmet financial need of students at ABCTC. This independent variable was produced as a percentage (decimal format) and was calculated for each state by dividing the number of responses indicating a family income greater than $100,000 by the number of SAT participants.

It was determined that the SAT score would serve as a threshold in the scholarship application process. The AR committee saw the linkage between income and standardized test scores as a potential leverage point to facilitate campus-wide buy-in for a scholarship program.

**Cycle Two: The Two Halves of the Game**

Cycle two consisted of two rounds of scholarship awards. Round one, the scholarship application process, served as the first action phase for the group and functioned as a test of the agreed upon actions and the recorded outcomes from cycle one. During round two, the AR team assessed whether the actions conformed to the original ideas from round one. Figure 3 depicts the intervention plan as it related to cycle two.
Figure 5. Intervention plan for cycle two.

Scholarship Applications

The AR team ranked the essay portions of the scholarship application on a 1 to 5 scale, with consideration given to an “impact factor”—that is, how much of an effect the scholarship dollars would have on students’ academic progress or completion. Table 8 depicts the coding system used by the AR committee in making decisions about scholarship awards.
### Table 8

**Numerical Coding System Used by the AR Committee**

<table>
<thead>
<tr>
<th>Numerical Rank</th>
<th>Reason/Rational</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The impact of dollars awarded on unmet financial need would be minimal.</td>
</tr>
<tr>
<td>2</td>
<td>The impact of dollars awarded would help retain the student but for an unidentified period of time.</td>
</tr>
<tr>
<td>3</td>
<td>The impact of dollars awarded would allow for student continuation for less than one academic year.</td>
</tr>
<tr>
<td>4</td>
<td>The impact of dollars awarded would allow for student continuation for more than one academic year.</td>
</tr>
<tr>
<td>5</td>
<td>The impact of dollars awarded on unmet financial need would be significant. The money would greatly help retain or graduate the student.</td>
</tr>
</tbody>
</table>

During the initial phase of the scholarship application process, over 2,000 applications were acquired through the foundation office at ABCTC. The application consisted of generic questions, along with a 500-word essay in which students described how a scholarship would help offset their unmet financial needs. The AR team reviewed applications by dispersing them equally among committee members. Each member ranked and scored essays based on the following criteria: the amount of need stated, current student status, academic standing, and ranked impact of the essay.

The AR team members had lengthy and spirited discussions about each scholarship application and, more specifically, about the ranking system. Team members expressed their personal opinions in what turned into a battle for dollars. AR team members became personally attached to their assigned scholarship applications, and rightfully so: The stories told by students were powerful and moving on a variety of levels. For example, one student wrote:
I am applying for this scholarship due to my current economic situation. I am a single mother of three small children, all under 7. I am attempting to return to college to not only better my life by acquiring a skill set for economic gain but also to show my children that education is for anyone, even a single mom. My 6-year-old daughter came up to me while writing this essay and asked me if she would one day go to college. I told her yes, and with your help and financial assistance, I am helping ensure that happens for her. Your dollars not only help me but helps my entire family.

Another student noted:

The first person in my family to attempt to receive a college education, the money that would come from this scholarship would go to buy one simple thing, a book. See, I have money to buy most everything that is needed for my college this semester. I have worked and saved and loaned dollars to my max, however, a $100 science book stands between me and graduation. I never thought books would be so expensive, and I can’t learn without this book. In fact, my teacher won’t let me attend class without it.

And in another powerful statement, one student wrote:

At 55, I never thought I would be back in college. I have two bachelor degrees, one in math and the other in history, yet I could not find a job with either. Today’s world mandates that students have a specified skill set. We are mandated not only to have the theory and knowledge but also be able to apply it and use it. ABCTC shows students how to take what they have learned and turn it into a job. The money that I am asking for would allow me, a 55-year-old, two-degree student, to acquire this skill set and get a job.

Not surprisingly, many of these students’s essays received high impact scores; however, the committee organized and prioritized the applications in an overall ranking order. Many of
the committee members expressed the wish that there were unlimited dollars to help all of the
student applicants.

Table 9

*Timeframe for Intervention: Round One*

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Desired Outcome</th>
<th>Connection to Problem</th>
<th>Theoretical Framework</th>
<th>Timeframe</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action research team to award dollars for unmet financial need</td>
<td>Positively affect student retention at ABCTC</td>
<td>Attempting to retain more students at ABCTC</td>
<td>Tinto (1975)</td>
<td>3 to 6 months</td>
<td>Retention numbers</td>
</tr>
</tbody>
</table>

Round one of the intervention produced 1,453 scholarship applications from students at ABCTC seeking assistance for unmet financial need. These scholarship applications were collected via the ABCTC foundation office and evaluated and awarded by the AR committee based on the essay that was included in the application. Three hundred eighty-three scholarships totaling $50,000 were awarded to student applicants. Of this number, 377 students were retained at ABCTC.

Round two served as the second action phase in which co-researchers reflected on their experiences and the data collected in round one. The committee reframed some of its original ideas and amended inquiry procedures based on findings or reflections about results. The AR committee wanted to help more students in round two than they were able to assist in round one. Special consideration was given to students who requested less financial support than the committee felt could have an impact upon retention rates at ABCTC.

In this second round of cycle two, the co-researchers—that is, ABCTC personnel, the action research group, and the sponsor—decided to move forward with the AR team approach as
it stood. However, a concerted effort to assist a greater number of students was made in round two. Cycle two primarily involved presentational knowing or developing new ways of acting. Ideally, this would lead back to propositional knowing if the action group or ABCTC decided to begin a new cycle.

The student scholarship applications were accepted in the same manner as in round one, with over 2,400 applications submitted in round two. Five hundred forty-six scholarships were awarded, consuming the remainder of the $100,000. Of this number, a total of 473 students were retained from these efforts. The AR team found that by the beginning of the second application round, students, faculty, and staff members had become aware of the initiative and were telling students about this opportunity to acquire funding for their unmet financial needs. One story shared in a student essay was particularly impactful:

My essay will probably look different than others. I am not asking for money to go to ABCTC for books, tuition or even fees. I am asking for $123.23 to pay my electric bill this month… For a single father for two young boys, it can often be difficult to maintain a lifestyle and go to school. I was laid off from my job last week and took out a loan; however, it wasn’t enough to cover all of my bills this month. This money would not only allow my power to stay on; however, it would allow me to stay in school at ABCTC.

Table 10 summarizes the timeframe for round two of the intervention phase.
### Table 10

**Timeframe for Intervention: Round Two**

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Desired Outcome</th>
<th>Connection to Problem</th>
<th>Theoretical Framework</th>
<th>Timeframe</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action research team to award dollars for unmet financial need</td>
<td>Gather information from Round 1 and implement changes for Round 2</td>
<td>Attempting to retain more students at ABCTC</td>
<td>Tinto (1975)</td>
<td>3 to 6 months</td>
<td>Retention numbers</td>
</tr>
</tbody>
</table>

### Cycle Three: The Field Goal

Applying Tuckman’s (1965) team dynamics model—comprising the stages of “forming, storming, norming and performing”—in the context of the team meeting environment yielded insights into the group’s engagement and performance.

**Forming and Storming**

Just as Tuckman (1965) maintained, the atmosphere during the first meetings of the AR team was filled with excitement, politeness, and positivity. This, however, gave way quickly to the storming phase of Tuckman’s model. The AR team members represented different levels of authority at ABCTC. Initially, this created barriers to openness within the group, as lower ranking members felt judged and intimidated by their ABCTC superiors. This issue was recognized by Cindy Lou, the vice president of student affairs and the most senior member of the AR team. At the second team meeting, she addressed this issue and reassured members:

> It is my firm understanding that we are all here to accomplish a common goal in retaining students for this institution. I would never want any of you to think that your job or functions are being judged or taken into consideration in any other way than wanting to
help a problem that we have at this college. We are trying to solve a problem, and that is just it. I am not here to hide in the shadows and go back and tell the administration what you are or are not doing. Simply, I am here to work with you, to get just as dirty as you do, and I will defend you to the very end. If we commit to working together, I promise we will do amazing things through this process.

**Norming and Performing**

From that point forward, the group came together around its common cause and worked as equal participants in the group. Without Ms. Lou’s reassurances, the team would not have developed as it did. The team’s shared understanding and comradery were sustained throughout the entire AR process, and they continue today; in fact, the team is one of the closest groups of school staff members that currently exist at ABCTC today. The members continue to eat lunch together on a weekly basis and participate in after-hours activities together outside of ABCTC. Reflecting the team members’ closeness, one participant shared the following:

It is an odd thing. At first, I didn’t think that we would be a close group. We started out at very different places in both our professional and personal outlooks on the retention of students at ABCTC. This process, through the anger and joy, has brought us together as a group. It has helped me see that, although we can have different outlooks and viewpoints on things, we were brought together and acted in ways that benefited everyone. I really do have a deep respect and feel honored to have friends out of this group. I think that, because of what we have been through, our friendships may last a lifetime.

Noel, Levitz, and Saluri (1985) outlined 10 basic steps for implementing a campus-wide retention effort: decide to act, create need, identify supporters, assemble a start-up committee,
formalize efforts, display data, begin implementation, establish priorities for action, gain top-level support, and assess impact. The ABCTC action research team followed these steps. More importantly, it created an atmosphere of support for the faculty, staff, and AR committee. This became evident when numerous faculty and staff voiced an interest in the AR program by requesting updates about the group’s findings.

**Coaching the Game**

Facilitating a team focused primarily on action research was one of the most difficult and rewarding tasks I have undertaken to date. Indeed, although my overarching task as a researcher was to help others learn, the AR process became one of my greatest learning experiences. The journey allowed for me to inhabit places of uncertainty with regard to leading a group, namely a group of change agents. Though ABCTC was welcoming and supportive, a tension existed throughout the process. The tension was not always negative; however, when managed correctly, it often helped the AR group maintain a sense of drive and common ground. Learning to temper expectations through action research was the primary learning that I, as the “coach,” experienced. One AR team member noted:

We are just out to change the world and the world of ABCTC doesn’t like change. I have worked here for several years and let me tell you, change is not good! Everyone at this institution loves changes…until you go to change them! See, there is a certain glamor and glitz associated with any change that is offered, but when it occurs, it is often messy and complicated. No one ever tells you about the messiness…We only sell folks on the glitz and glamor of change.

Being an AR coach does not simply involve sitting on the sidelines and calling in plays. The researcher must enter into the action with the players and be willing to get “messy.” Action
is a pregnant term that is oversold and undervalued in higher education. Those willing to put forth the effort to help action and change occur in a sustainable and substantial way were not found in great number at ABCTC in the beginning stages of this study.

What Does Tomorrow Hold?: The Post-Game and Beyond

Coghlan and Brannick (2004) stated that a central theme of the development of actionable knowledge is the “evaluation of the intended and unintended outcomes to decide whether the original construct was appropriate, whether the actions were appropriate, and what actions feed into the next cycle of constructing, planning and acting” (p. 10).

Evaluating Action

Although the exit, critical incident interviews marked a final step in the action research process, the longer term impact of this study has become evident. One AR team member, reported that the AR group has introduced the process of action research to ABCTC’s Office of Institutional Effectiveness, which is now creating action plans and conducting business utilizing the action research model. This project also spurred both intentional and unintentional learning at the organizational, group, and individual levels in empowering individuals to work together for a greater common good and to consider preexisting biases.

Sustainability

The goals of this project were to advance systemic organizational learning and change and to develop best practices for addressing unmet financial needs of students at a two-year technical college using data generated and analyzed through the action research process. Although this study has not yet shifted to a national or international platform on which other educational entities may build their programs or mechanisms, information has been presented to local and regional audiences concerning the data and action research process that validates the
study, its findings, and ABCTC’s push for systematic change. ABCTC engaged the donor for a second time in the beginning of 2015 and has successfully funded a second effort of scholarship retention for unmet financial need. As of this writing, ABCTC had entered into a national search in hopes of finding a retention coordinator to spearhead these efforts at the college.

**Summary**

The action research committee investigated the relationship between standardized test scores and socioeconomic factors in order to establish clear criteria for students applying for assistance to reduce unmet financial need. Tinto (1975) stated that students often drop out of college due to socioeconomic factors such as debt; however, the AR team wanted a stronger, more defined and provable relationship between the two factors. The AR committee also learned much about the students at ABCTC. Each student essay provided a candid snapshot of the very essence of the financial struggles the individual faced while attempting to obtain a degree in higher education. The better part of two years was spent playing the “game of retention” at ABCTC while developing, implementing, and evaluating two cycles of a scholarship program for students geared toward reducing unmet financial need. The results indicated that addressing student unmet financial need through a scholarship program had positive impacts upon retention at ABCTC, spurring the college and its donor to continue the program. While anger, compassion, and sympathy were all prevalent at the table among AR team members, a better understanding of students and their struggles, and a transformative learning experience for the AR team members, prevailed.
The purpose of this action research case study was to understand and address the effects that unmet financial burdens have upon the retention of first-year students at a two-year technical college. Three research questions guided this study:

1. Is there a relationship among socioeconomic factors and SAT scores that could help explain why students enter college with an unmet financial need?
2. How do financial assistance strategies impact individual technical college students faced with academic dismissal due to nonpayment?
3. How do college leaders learn and develop (both individually and collectively) through an action research process designed to address the issue of retention?

This chapter presents findings from the unmet financial need scholarship applications, group meetings, and critical incident interviews conducted with the action research team members. Data were augmented with systematic researcher notes. Findings for research question one are derived from analysis of secondary data. Responses for research question two and three are organized by the categories and subcategories that emerged from a qualitative analysis of the multiple data sets.

**Relationship Between Socioeconomic Factors and SAT Scores**

Research question one asked if there was a relationship among standardized test scores (i.e., SAT scores) and the socioeconomic factors that Tinto (1975) identified as part of his theory of departure. This question was important in that it served as a baseline for the AR interventions
providing a dataset and standardized threshold that could be directly linked to the unmet financial need of students with regard to the socioeconomic factors considered by Tinto. Enrollment and tuition data from NCES, IPEDS, and federal direct grant student aid data from the IPEDS Student Financial Aid Survey were used to analyze changes from 2009-2010 to 2012-13. This information was used to reveal differences among rural, suburban, and urban community college students, as well as the differences among states with and without local funding. A key finding was that the 40% increase in tuition and the 2.2 million new students enrolled in the previous five years overwhelmed the very modest increases in federal direct grant student aid provided over the same period, inhibiting the ability of student aid to positively impact retention at U.S. community colleges.

The calculated mean SAT score for all states in 2013 was 1079. The national mean score for the SAT in 2005 was 1028, a difference of 51 points. Understandably, there were concerns by the AR team over the difference in scores; however, the scope of the study encompassed only state SAT results and rankings. Since scores are aggregated and reported for each state, the “participants” in this study were individual states, thus explaining the differences in SAT mean scores. Statistical analyses revealed that:

- the mean for total calculated SAT scores was 1079. Iowa reported the highest average SAT score at 1204. South Carolina and Georgia reported the lowest average SAT scores at 993.
- the mean for non-minority participation was 67%. Montana and North Dakota reported the highest rates at 85%. Hawaii reported the lowest rate at 14%.
- the mean for SAT participation was 40%. New York reported the highest rate at 92%. Mississippi reported the lowest rate at 4%.
the mean for parent education levels was 72%. Minnesota reported the highest rate at 87%. Indiana reported the lowest rate at 57%.

the mean for SAT participants claiming to be in the top 10 percent of their class was 23%. North Dakota reported the highest rate at 48%. Colorado, Montana, and Tennessee reported the lowest rates at 10%.

the mean for family income greater than $100,000 was 17%. Illinois reported the highest rate at 29%. Maine reported the lowest rate at 9%.

Chi-Square Calculations

The data were categorized to eliminate weighted data (percentages) and to facilitate the use of non-parametric analysis, such as chi-square. The dependent variable was parsed into three categories based on the range of SAT scores, with quartiles and quintiles established as the independent variables. In most cases, the minimum frequency threshold rules for chi-square calculations were followed. In those cases in which the degrees of freedom were high and the chi-square value significant, categories were collapsed, and the chi-square value was recalculated, resulting in negligible differences. Therefore, the minimum frequency threshold rules were relaxed in those cases.

Non-Minority Participation

According to the calculations, state SAT scores were not related to non-minority SAT participant rates ($\chi^2 = 4.174$, $df = 6$, $p < .05$). Thus, the null hypothesis that non-minority participation has no relationship to SAT scores was tentatively accepted. Additionally, the data appeared to be independent, and a correlation appeared not to exist. Cramer's phi or Pearson’s $r$ ($r = 0.0417$ or $r^2 = 0.2043$) showed that approximately 20% of state SAT scores can be explained
by state SAT participation rates. This further supported the confidence of the hypothesis that race and ethnicity do not affect and are not related to SAT score achievement.

**SAT Participant Percentage**

According to the calculations, state SAT scores were related to states’ SAT participation rates ($\chi^2 = 41.725, df = 6, p < .05$). Thus, the null hypothesis that SAT participation has no relationship to SAT scores and subsequent SAT state rankings was tentatively rejected. Additionally, the data appeared not to be independent, and a relationship or correlation appeared to exist. Cramer's phi or Pearson’s $r$ ($r = 0.6459$ or $r^2 = 0.417$) showed that approximately 42% of state SAT scores could be explained by state SAT participation rates. This further supported the confidence of the hypothesis that other factors, such as socioeconomic indicators, may affect or are related to SAT score achievement.

**Parent Education Levels**

According to the calculations, state SAT scores were related to parent education levels ($\chi^2 = 33.284, df = 4, p < .05$). Thus, the null hypothesis that parents’ education levels have no relationship to SAT scores was tentatively rejected. Additionally, the data appeared not to be independent, and a relationship or correlation appears to exist. Cramer's phi or Pearson’s $r$ ($r = 0.5769$ or $r^2 = 0.332$) demonstrated that approximately 33% of state SAT scores could be explained by the level of parent education. This further supported the confidence of the hypothesis that socioeconomic indicators may affect or are related to SAT score achievement.

**High School Rank**

According to the calculations, state SAT scores were related to participants who reported belonging to the top 10 percent of their high school rankings ($\chi^2 = 44.052, df = 8, p < .05$). Thus, the null hypothesis that high school rank has no relationship to SAT scores was tentatively
rejected. Additionally, the data appeared not to be independent, and a correlation appeared to exist. Cramer's phi or Pearson's r ($r = 0.4405$ or $r^2 = 0.6637$) showed that approximately 66% of state SAT scores could be explained by SAT participants belonging to the top 10 percent of their high school rankings. This further supported the hypothesis that socioeconomic indicators may affect or be related to SAT score achievement.

**High Family Income**

According to the calculations, state SAT scores were related to high family income greater than $100,000 ($\chi^2 = 24.034$, $df = 4$, $p < .05$). Thus, the null hypothesis that family income has no relationship to SAT scores was tentatively rejected. Additionally, the data appeared not to be independent, and a correlation appeared to exist. Cramer's phi or Pearson's r ($r = 0.480$ or $r^2 = 0.6933$) showed that approximately 69% of state SAT scores could be explained by SAT participants with a high family income greater than $100,000$. This further supported the hypothesis that socioeconomic indicators may affect or be related to SAT score achievement.

As indicated in the preceding section outlining chi-square calculations, four of the five independent variables tested appeared to have a relationship with the dependent variable. Overall, the results suggested a linear relationship among the independent variables—SAT participation rate, parent education levels, high school rank, and high family income—to the dependent variable which was SAT score achievement. To substantiate this inference, linear/multiple regression and correlation analyses were conducted to determine the strength of the relationship between the independent and dependent variables.

**Linear Regression Calculations**

The results of the chi-square calculations revealed tentative decisions regarding the correlations between state SAT scores and the five independent variables. The null hypothesis
for non-minority participation was tentatively accepted whereas the null hypothesis for SAT participation, parent education levels, high school rank, and high family income were tentatively rejected. Because the results of the chi-square tests yielded tentative results and were based on pairing single variables (dependent to independent) to ascertain relationships, additional testing utilizing multivariate techniques were conducted. In this testing phase of the study, linear/multiple regression and correlation methods were employed.

**Scatterplot Analysis**

The next step in examining relationships among variables was to perform correlation and regression analyses. As an interim step, a scatterplot was created for each of the five independent variables paired with the dependent variable; this was necessary to facilitate the use of a linear model to summarize the relationship between each paired variable. Each scatterplot (see Figures 4 through 9) indicated the $R^2$ value and the regression equation. With the exception of the scatterplot of non-minority participation, each scatterplot indicated a relative linear relationship between SAT scores and the measured variable (though some outliers existed). This visual indication provided enough substantive evidence to proceed to the next step of the analysis. Figure 9 shows a matrix scatterplot of all variables and represents these relationships graphically. As shown in Figure 6, parent education levels appeared to have a semblance of a linear relationship to all the variables (except for non-minority participation), whereas non-minority participation appears not to have had a relationship to any variable. To validate this assumption, a correlation analysis was conducted.

**Correlation Analysis**

A bivariate correlation analysis was conducted on the variables, including Pearson correlations ($r$) and two-tailed tests of significance. As expected, the results followed the
inferences suggested from the chi-square calculations and the scatterplot analysis. The correlation between SAT scores and non-minority participation was modest at best, with $r = 0.41, p < 0.01$. Neither the chi-square tests nor the scatterplot analysis evidenced a relationship between SAT scores and non-minority participation. For the other four variables, indicators of dependency and correlation emerged during the chi-square test, and this held true for the bivariate correlation analysis. The correlation between SAT scores and SAT participation was significant (although a negative correlation), $r = -0.862, p < 0.01$; SAT scores and parent education levels was significant, $r = 0.947, p < 0.01$; SAT scores and high school rank was significant, $r = 0.864, p < 0.01$; and SAT scores and high family income was significant, $r = 0.819, p < 0.01$. 
Figure 6. Scatterplot of state scores and non-minority participation rates.

Figure 7. Scatterplot of state scores and participation rates.
Figure 8. Scatterplot of state scores and parent’s education level.

Figure 9. Scatterplot of state scores and top 10% high school rank.
**Figure 10.** Scatterplot of state scores and high family income.

**Figure 11.** Matrix scatterplot showing correlation and trend: All variables.
**Multiple Regression**

A multiple regression analysis was conducted of all five independent variables to evaluate how well the independent variables measured predicted SAT scores. The regression results indicated that all five independent variables (predictors) were significantly related to SAT score, $R^2 = 0.943$, adjusted $R^2 = 0.936$, $F = 145.2$.

However, Green and Salkind (2005) suggested that regression equations with “$B$ weights” are “not useful for understanding the relative importance of the predictors. Weights are more interpretable if the independent and dependent variables are standardized” (p. 290). Thus, the “beta standardized coefficients” improved the understanding of the relative importance of the predictors and were expressed as standard or $z$ scores for each variable and were written as predictor equations. O’Sullivan, Rassel, and Berner (2003) highlighted the relevance of $z$ scores in that “standard scores express the values in terms of units of the standard deviation” (p. 344).

**Non-Linear Regression Calculations**

In an effort to narrow the characterization of the relationships between the dependent variable and the five independent variables, various trendline forms were examined: (a) linear, (b) logarithmic, (c) polynomial (order 2), (d) polynomial (order 3), (e) power, and (f) exponential.

**Trendline Analysis**

As expected, the highest $R^2$ values were obtained using other relationship forms since a linear equation did not return a value of $R^2 = 1$. The best fit, though not mathematically perfect, was produced through the use of a polynomial (order 3) equation formula. However, the increase was moderately discernible for the independent variables “non-minority participation” and “SAT participation,” whereas the other independent variables showed miniscule increases. Minority participation using a linear form returned an $R^2$ value of 0.167 and a polynomial (order
3) $R^2$ of 0.2233 for an increase of 0.056. Using a polynomial (order 3) form, SAT participation yielded an $R^2$ value of 0.8314 and a linear $R^2$ value of 0.742, an increase of 0.0894 (see Table 10). Thus, a polynomial (order 3) equation formula appears to be the best fit. However, more testing using higher order relationships should be conducted to identify a formula for achieving a closer one-to-one relationship.
Table 11

*Trendline Relationships*

<table>
<thead>
<tr>
<th></th>
<th>Non-Minority Participation Rate</th>
<th>SAT Participation</th>
<th>Parent’s Education Level</th>
<th>Top Ten Percent High School Rank—Rate</th>
<th>High Family Income &gt; $100,000—Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Linear</strong></td>
<td>(y = 207.71x + 938.15)</td>
<td>(y = -190.2x + 1154.4)</td>
<td>(y = 641.88x + 617.73)</td>
<td>(y = 522.05x + 883.04)</td>
<td>(y = 1054.7x + 899.09)</td>
</tr>
<tr>
<td>(R^2 = 0.167)</td>
<td>(R^2 = 0.742)</td>
<td>(R^2 = 0.8976)</td>
<td></td>
<td>(R^2 = 0.7371)</td>
<td>(R^2 = 0.6703)</td>
</tr>
<tr>
<td><strong>Logarithmic</strong></td>
<td>(y = 87.118\ln(x) + 1115.4)</td>
<td>(y = -57.466\ln(x) + 1000.7)</td>
<td>(y = 456.06\ln(x) + 1233.9)</td>
<td>(y = 196.24\ln(x) + 1279.5)</td>
<td>(y = 177.15\ln(x) + 1400.3)</td>
</tr>
<tr>
<td>(R^2 = 0.1331)</td>
<td>(R^2 = 0.8146)</td>
<td>(R^2 = 0.8836)</td>
<td></td>
<td>(R^2 = 0.737)</td>
<td>(R^2 = 0.6442)</td>
</tr>
<tr>
<td><strong>Polynomial (order 2)</strong></td>
<td>(y = 82.61x^2 + 112.89x + 963.05)</td>
<td>(y = 358.46x^2 + 496.95x + 1187.3)</td>
<td>(y = 1098x^2 - 948.06x + 1182.7)</td>
<td>(y = -457.93x^2 + 883.98x + 817.15)</td>
<td>(y = 515.79x^2 + 865.43x + 915)</td>
</tr>
<tr>
<td>(R^2 = 0.1686)</td>
<td>(R^2 = 0.8307)</td>
<td>(R^2 = 0.9112)</td>
<td></td>
<td>(R^2 = 0.7415)</td>
<td>(R^2 = 0.6707)</td>
</tr>
<tr>
<td><strong>Polynomial (order 3)</strong></td>
<td>(y = -2840.1x^3 + 4553x^2 - 1960.6x + 1211.2)</td>
<td>(y = -135.31x^3 + 547.4x^2 - 567.44x + 1192.3)</td>
<td>(y = -5316.1x^3 + 12532x^2 - 9065.7x + 3085.4)</td>
<td>(y = -9382.5x^3 + 11045x^2 - 3623.4x + 1377.8)</td>
<td>(y = -58964x^3 + 33665x^2 - 5018.8x + 1243)</td>
</tr>
<tr>
<td>(R^2 = 0.2233)</td>
<td>(R^2 = 0.8314)</td>
<td>(R^2 = 0.9133)</td>
<td></td>
<td>(R^2 = 0.7563)</td>
<td>(R^2 = 0.6875)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>(y = 1114x^{0.081})</td>
<td>(y = 1002.2x^{-0.0528})</td>
<td>(y = 1242.2x^{0.42})</td>
<td>(y = 1295.6x^{0.1808})</td>
<td>(y = 1446.5x^{0.1627})</td>
</tr>
<tr>
<td>(R^2 = 0.1365)</td>
<td>(R^2 = 0.8167)</td>
<td>(R^2 = 0.8901)</td>
<td></td>
<td>(R^2 = 0.7429)</td>
<td>(R^2 = 0.645)</td>
</tr>
<tr>
<td><strong>Exponential</strong></td>
<td>(y = 944.95e^{0.1929x})</td>
<td>(y = 1154.5e^{-0.1753x})</td>
<td>(y = 704.48e^{0.5907x})</td>
<td>(y = 899.3e^{0.4804x})</td>
<td>(y = 913.23e^{0.9669x})</td>
</tr>
<tr>
<td>(R^2 = 0.171)</td>
<td>(R^2 = 0.7488)</td>
<td>(R^2 = 0.9026)</td>
<td></td>
<td>(R^2 = 0.7411)</td>
<td>(R^2 = 0.669)</td>
</tr>
</tbody>
</table>
Figure 12 depicts the polynomial (order 3) equation formula for the SAT participation rate. Rates ranging from 0.10 to 0.90 (input-x) were tested and produced the corresponding SAT score as an output.

![Polynomial formula for SAT participation rate.](image)

**Summary of Findings for Research Question 1**

The purpose of this part of the AR study was to determine if there was a relationship between selected College Board reported statistical and socioeconomic indicators on SAT test results with state rankings that could result in two-year technical college students requesting or needing a greater amount of financial assistance. Five hypotheses were posited to explain the relationship of factors that affect or contribute to a student’s SAT score and resulting state SAT score averages and rankings.
First Hypothesis

The first hypothesis tested the relationship between race or ethnicity and SAT score achievement. The null hypothesis stated that “non-minority participation had no relationship to SAT scores.” The chi-square calculation was considerably lower than the critical value, thus supporting the null hypothesis. Although dependency and linearity between non-minority participation (independent variable) and SAT scores (dependent variable) were not established, linear regression techniques were applied to verify a non-association. The scatterplot analysis indicated non-linearity, and the Pearson correlation supported this indication with an $r$ value of 0.409 ($p < 0.01$), indicating that less than 17% of the variation in SAT scores was explained by non-minority participation. Additionally, of the five independent variables examined during this study, non-minority participation had the least effect on SAT score achievement. Multiple regression testing for this variable also produced the lowest $\beta$ weight of all the variables, with a value of 0.016. Thus, the proposed first hypothesis could not be substantiated, and the null hypothesis was held to be true: Race or ethnicity had no impact on SAT score achievement.

Second Hypothesis

The second hypothesis held that there was an inverse relationship between the SAT participation rate and state-reported average SAT achievement scores. The null hypothesis tested was that SAT participant percentage has no relationship to states’ average SAT achievement score and subsequent SAT state rankings. The null hypothesis was tentatively rejected as a result of chi-square calculations since the outcome was considerably higher than the critical value. Further statistical testing via linear regression methods was conducted to evaluate the strength of the linkage between SAT participation rate (independent variable) and SAT scores (dependent variable). The scatterplot analysis suggested a negative linear relationship,
and the Pearson correlation supported this indication with an $r$ value of -0.861 ($p < 0.01$), indicating that 74% of the variation in SAT scores was explained by SAT participation rates. In relation to state-reported SAT scores, this translated to the supposition that “the higher the participation rate, the lower the score” or “the lower the participation rate, the higher the score.” Furthermore, multiple regression testing for this variable produced a modest $\beta$ weight value of 0.130. Thus, the proposed second hypothesis was substantiated, and the null hypothesis was deemed false: Participation rate did have an impact on states’ average SAT scores.

**Third Hypothesis**

The third hypothesis held that there is a relationship between a participant’s parent education levels and SAT score achievement. The null hypothesis that parent education levels have no relationship to SAT scores was initially tested using chi-square calculations and was tentatively accepted. The chi-square value was considerably greater than the critical value, and a relationship between education level and SAT scores was established. The level of association was examined using linear regression testing between parent education levels (independent variable) and SAT scores (dependent variable). The scatterplot analysis revealed the strongest linear relationship of all the independent variables, and the Pearson correlation supported this linkage with an $r$ value of 0.947 ($p < 0.01$), indicating that nearly 90% of the variation in SAT scores was explained by a parent’s education level. Additionally, multiple regression testing for this variable produced the highest $\beta$ weight (0.509) of all the variables tested. Thus, the proposed third hypothesis was substantiated, and the null hypothesis was deemed false: Participant’s parent education levels impacted SAT score achievement.
Fourth Hypothesis

The fourth hypothesis posited that there is a relationship between a student’s high school rank and SAT score achievement. The null hypothesis associated with this theory suggested that high school rank has no relationship to SAT scores. The null hypothesis was tentatively rejected as a result of chi-square calculations since the outcome was considerably higher than the critical value. Further statistical testing via linear regression methods was conducted to evaluate the strength of the linkage between those participants reporting to be in the top 10 percent of their high school class (independent variable) and SAT scores (dependent variable). The scatterplot analysis indicated a relative linear relationship, and the Pearson correlation supported this indication with an $r$ value of 0.864 ($p < 0.01$), indicating that nearly 75% of the variation in SAT scores was explained by SAT participation rates. Multiple regression testing for this variable produced the second highest $\beta$ weight (0.434) of the five variables tested. Thus, the fourth hypothesis was substantiated, and the null hypothesis was deemed false: High school rank had an impact on states’ average SAT scores.

Fifth Hypothesis

The fifth hypothesis maintained that there was a relationship between a family’s median income level and SAT score achievement; conversely, the null hypothesis held that family income has no relationship to SAT scores. Chi-square calculations were conducted resulting in a value that was modestly higher than the critical value, and therefore the null hypothesis was tentatively rejected. Because the relationship between a family’s median income level (independent variable) and SAT scores (dependent variable) was established, the strength of association was examined using linear regression testing. The scatterplot analysis revealed a somewhat relative linear relationship, and the Pearson correlation supported this finding by
producing an $r$ value of 0.819 ($p < 0.01$), indicating that 67% of the variation in SAT scores was explained by a family’s high income. Multiple regression testing for this variable produced the third highest $\beta$ weight of 0.233 of all the variables—a moderately strong value. Thus, the proposed fifth hypothesis was substantiated and the null hypothesis rejected: Family income level had an impact on SAT scores. Cycle one found that race and ethnicity has no relation among socioeconomic scores related to standardized test achievement, however, high school rank, participation in the SAT test and family income were all found to have an impact on SAT scores.

**Re-Analysis of Data in Reference to ABCTC**

Data gathered in response to research question one were re-assessed and evaluated in reference to student data at ABCTC. The AR committee met and discussed the results of the findings of the hypotheses and how they related to Tinto’s (1975) theory of departure, with specific reference to the debt section of his theory. The group had lengthy discussions about struggles to correlate the data to a common theme that could be utilized for systematic and systemic change for ABCTC and other institutions of higher education.

The AR team decided that a common thread they could follow was that of standardized test scores. SAT or ACT scores comprised a thematic and systematized point of interest at ABCTC and others colleges and universities. The AR team looked deeply into the issue of student financial resources, or family income, as they were reported by the College Board in reference to standardized test scores. It was evident by the data provided that there was a relationship among these factors: As family income increased, so did standardized test scores (see Figure 10).
Team members decided to implement a threshold score of 1100 on the SAT (or ACT equivalent) as criteria for the scholarship application in cycle 2, rounds 1 and 2, of the intervention. As stated earlier, the College Board data were generalizable among all students with a standardized test score. At ABCTC, 99% of students had a standardized test score upon entering college. Based on the aforementioned criteria, 100% of students who wished to participate in the scholarship program to offset unmet financial need in hopes of affecting retention rates at ABCTC would have an 1100 or below composite score.

**Financial Assistance Intervention and Retention**

Research question two was designed to explore how financial assistance strategies impact individual technical college students faced with academic dismissal for nonpayment. In responding to this question, the research focused on the retention numbers of students who had been previously identified and selected, and who had had their unmet financial need funded through the interventions of this project. ABCTC institutional data showed that students who had exited the college had done so largely because of unmet financial needs. In fact, nearly 2,000 students had left ABCTC annually since 2012 for this reason—a staggering number that continues to grow exponentially according institution representatives (S. Meaden, personal communication, August 14, 2013). This information framed the primary assumption of this study—that the unmet financial needs of students have direct, negative effects on their collegiate tenure. To assess the impact of the intervention, data from cycles one and two were considered and were provided by the Office of Institutional Effectiveness at ABCTC as well as the AR team in the form of committee reports.

Cycle two began with data collection related to research question two in the form of an assessment of the number of students who were dropping out of college with an outstanding
balance with ABCTC. This information was provided by the college’s Office of Institutional Effectiveness. Using Banner and the college’s data system, data were gathered relating to the number of students who had been dropped from the college or who had chosen to end their academic pursuit due to unmet financial need. This information was captured on an exit form completed by students upon departure. Students could self-signify as to the cause of their departure from ABCTC, and one option was “lack of financial support.”

Table 12 presents retention data based on self-reported unmet financial need rates at ABCTC for the 2011-2013 academic years. The AR committee and ABCTC focused on the 30.51% of students who had not been retained due to unmet financial reasons and who met the criteria set forth by the AR team for applying scholarship dollars under the intervention plan. The data in Table 12 were collected through a review of graduation rates, re-enrollment contracts, or exit questionnaires from the institution. During this data collection, questions arose among the AR team members about admission standards with respect to correlations that might be made between standardized admission scores and the unmet financial need of students. The committee, along with ABCTC, wanted to determine if students, upon admission to the institution, would be flagged for unmet financial need based on SAT scores.
Table 12

**ABCTC Student Retention, 2011-2013**

<table>
<thead>
<tr>
<th>Race</th>
<th>Yes*</th>
<th>No**</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian/Alaskan Native</td>
<td>63.64%</td>
<td>36.36%</td>
</tr>
<tr>
<td>Asian</td>
<td>71.66%</td>
<td>28.34%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>67.63%</td>
<td>32.37%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>68.21%</td>
<td>31.79%</td>
</tr>
<tr>
<td>Nat. Hawaiian/Other Pacific Is</td>
<td>68.49%</td>
<td>31.51%</td>
</tr>
<tr>
<td>Nonresident Alien</td>
<td>50.00%</td>
<td>50.00%</td>
</tr>
<tr>
<td>Two or more races</td>
<td>67.73%</td>
<td>32.27%</td>
</tr>
<tr>
<td>Unknown</td>
<td>64.07%</td>
<td>35.93%</td>
</tr>
<tr>
<td>White</td>
<td>71.37%</td>
<td>28.63%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>69.49%</td>
<td>30.51%</td>
</tr>
</tbody>
</table>

*Yes = Graduated or enrolled in subsequent term (either quarter or semester)

**No = Did not re-enroll or graduate in subsequent term due to unmet financial need

Support in the literature was found in Herzog’s (2008) study, which estimated the effect of financial aid on freshman retention at a moderately selective public university using propensity score matching in multi-stage regression analyses. The pattern that emerged from 24 models suggested that low SAT-scoring and low-income students accrue a retention benefit from financial aid, unlike high SAT-scoring and high-income students. Conversely, retention of high SAT-scoring and high-income freshmen, Herzog posited, is more likely due to academic performance compared to low-income students with low SAT scores. This information indicates there is a direct link between unmet financial needs and the retention of college students.
The action that resulted from the data analysis for this part of AR research question two was manifested in the allocation of scholarship funds awarded by the AR team to help offset the unmet financial needs of students at ABCTC. Table 13 shows the class status of the students receiving the scholarships, the number of awards per group, the amount awarded per individual, the number of students retained through round one of the intervention, and the total dollar amount awarded in this round. The classification of students in Table 13 had no bearing on the intervention or plan. It was a simplistic way for the AR team to delineate data.

Table 13

*Cycle Two, Round One Data*

<table>
<thead>
<tr>
<th>Status of ABCTC Student</th>
<th>Number of Awards</th>
<th>Amount</th>
<th>Retained</th>
<th>Total Dollar Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>118</td>
<td>$100</td>
<td>118</td>
<td>$11,800</td>
</tr>
<tr>
<td>Sophomore</td>
<td>98</td>
<td>$100</td>
<td>96</td>
<td>$9,800</td>
</tr>
<tr>
<td>Junior</td>
<td>103</td>
<td>$150</td>
<td>102</td>
<td>$15,450</td>
</tr>
<tr>
<td>Seniors</td>
<td>64</td>
<td>$200</td>
<td>61</td>
<td>$12,800</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>383</strong></td>
<td>---</td>
<td><strong>377</strong></td>
<td><strong>$49,850</strong></td>
</tr>
</tbody>
</table>

After the first semester of the intervention plan in 2014, the AR committee analyzed the data from round one of cycle two. While the team members found that the intervention had been effective, they wanted to be in a position to help retain more students for the college. This second award-intervention took around five months to complete and occurred during the fall semester of 2014 at ABCTC. Group members had lengthy discussions about the quantity of students during the final stages of the round-one intervention. One committee member noted:
While what we have done is good work, it is important to know that we need to be able to impact a larger number of students here at ABCTC. If we retain two or three hundred students, will anyone really care? We have almost two thousand students who are leaving, walking out of the doors of our college and not returning to get their degree. These are folks who could get jobs and be productive members of an economic driving force in our area if given the chance. We must try to reach more students even if it means giving out fewer dollars. We have to impact more students in the next round.

The AR team decided to attempt to offer more scholarships, with potentially less money given per award, in hopes of retaining a greater number of students. This change was made between rounds one and two of cycle two as part of the restructuring of the intervention plan. Table 14 shows the data from the second round of scholarship awards. Again, the classification of students in Table 14 had no bearing on the intervention or plan. It was a simplistic way for the AR team to delineate data.
### Table 14

**Cycle Two, Round Two Data**

<table>
<thead>
<tr>
<th>Status of ABCTC Student</th>
<th>Number of Awards</th>
<th>Amount</th>
<th>Retained</th>
<th>Total Dollar Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>131</td>
<td>$6550</td>
<td>101</td>
<td>$50</td>
</tr>
<tr>
<td>Freshman</td>
<td>21</td>
<td>$2100</td>
<td>21</td>
<td>$100</td>
</tr>
<tr>
<td>Sophomore</td>
<td>94</td>
<td>$4700</td>
<td>94</td>
<td>$50</td>
</tr>
<tr>
<td>Sophomore</td>
<td>34</td>
<td>$3400</td>
<td>33</td>
<td>$100</td>
</tr>
<tr>
<td>Sophomore</td>
<td>27</td>
<td>$5400</td>
<td>20</td>
<td>$200</td>
</tr>
<tr>
<td>Junior</td>
<td>76</td>
<td>$3800</td>
<td>64</td>
<td>$50</td>
</tr>
<tr>
<td>Junior</td>
<td>22</td>
<td>$2200</td>
<td>22</td>
<td>$100</td>
</tr>
<tr>
<td>Junior</td>
<td>19</td>
<td>$3800</td>
<td>15</td>
<td>$200</td>
</tr>
<tr>
<td>Junior</td>
<td>9</td>
<td>$3150</td>
<td>9</td>
<td>$350</td>
</tr>
<tr>
<td>Senior</td>
<td>75</td>
<td>$3750</td>
<td>54</td>
<td>$50</td>
</tr>
<tr>
<td>Senior</td>
<td>21</td>
<td>$2100</td>
<td>20</td>
<td>$100</td>
</tr>
<tr>
<td>Senior</td>
<td>3</td>
<td>$900</td>
<td>3</td>
<td>$300</td>
</tr>
<tr>
<td>Senior</td>
<td>2</td>
<td>$800</td>
<td>2</td>
<td>$400</td>
</tr>
<tr>
<td>Senior</td>
<td>15</td>
<td>$7500</td>
<td>15</td>
<td>$500</td>
</tr>
<tr>
<td>Total</td>
<td>546</td>
<td>---</td>
<td>473</td>
<td>$50,150</td>
</tr>
</tbody>
</table>

### Student Essays

The student scholarship essays provided compelling data with respect to awarding scholarship monies. As noted earlier, students were asked to submit a 500-word essay to elaborate and explain why they felt they were qualified candidates for the scholarship program.

The following are three examples of student scholarship essays, pre-intervention, that were given a score of 4 or higher on the impact scale by AR team members:
Student A.

It is with reservation that I submit my application for financial assistance through the unmet financial need scholarship program. I have never applied for additional dollars to attend school, but at this point in my life it is necessary for me to obtain money from outside resources to continue my education. I am a proud single mom of three young children (ages 2, 5, 9) that struggles each week to make ends meet. I have always been a productive member of society, volunteering at local organizations for the less fortunate. When my husband died last year, I became the “less fortunate.” I never thought that it could happen to my kids and my family, but it did. I always pay my bills first and my kids come in a very close second. We certainly do not waste any money; however, I try to provide a fun-filled activity based life for them. Having only one income, I attend school when there is money, which isn’t often as of late. I have attended four classes to obtain a degree in the paramedic field and hopefully the nursing industry at a later date. This scholarship would allow for a type of “jump-start” for me to regularly attend classes and eventually provide for my family with a degree that would allow me to make more money. My reservation is that there are certainly more “less fortunate” people than me; however, it is my firm promise to perpetuate the “good deed.” My hope is to be able to provide a scholarship to students one day, just as I hope that you are about to provide me.

Student B.

Applying for a scholarship is always an intricate process. Do I meet the criteria? Am I worthy of the money? These are all questions left up to someone at [ABCTC] but it is my hope that I can be awarded $500 to continue my education at ABCTC. I am a former military officer who is looking for a second chance at life. I have been deployed overseas
for seven years and returned to the U.S. last year. My decision to come back to school and obtain a two year degree wasn’t an easy one. I have major health complications from my years of service and was left paralyzed on the left side of my body due to an I.E.D. I am going back to school to obtain a degree in science. I eventually want to work with the U.S. military and perpetuate a better, more effective care system for our veterans. Yes, a science degree is far from where I need to be, but it puts me on the path. I have exhausted all of my scholarship opportunities and this is one of my last resorts to stay in school. I have 12 credit hours left to obtain my degree. This scholarship would help me finish a passion and life calling.

**Student C.**

I am the first person out of six generations to attend any type of higher educational experience. This scholarship would allow me to break a cycle of life for not only myself and my family, but my future family and those to come after me. Many people have told me that an 18 year old African American kid from Lithonia has no business going to school with hopes and aspirations of becoming a teacher. People all around me my entire life have question[ed] why I want to help others learn when I struggle with learning myself. I know the feeling of when you actually learn new information. So often, the materials that we cover in my classes at ABCTC are reminders of pre-obtained knowledge for many of my fellow students. For me, it is often the first time that I have ever heard the information. It is amazing that a kid like me wants to learn, yes, but I do! I want to help others learn also! My background doesn’t lend itself to success: a poor family, historically uneducated and blue color workers, but isn’t that what education is about? To better yourself and your family? The money here would help me purchase
much needed supplies and pay for one class that I have left. Without this money, I will have to take a semester off and save up the money needed to take my final course. It would help me beyond measure to achieve my dream of becoming a teacher.

**Summary of Findings for Research Question 2**

With 929 students receiving financial assistance for unmet financial needs (i.e., in cycle two, rounds one and two), a retention rate of 91% was achieved after the program was implemented and carried out, with retention being defined as a student who remained at ABCTC for the subsequent semester. This retention rate was a strong indication that the scholarship program intervention, targeting ABCTC students with unmet financial need, did indeed result in increased retention of this vulnerable group. With a loss of only 9% of the program participants, ABCTC saw a remarkable retention of students who did participate. However, less of an individual impact was made in round two, with fewer dollars awarded to more students with unmet financial need. At the end of round two, twenty students were randomly selected and asked to give insight of how the interventions positively or negatively affected them in regards to the scholarship award to give the committee some sense of how things were going. Each student signed an IRB form for consent. One student stated post intervention:

I received $500 from the program during my first semester here. This money allowed for me to stay in school for the remainder of my program. I am a nursing student, and the classes had changed that I needed to take to obtain my degree. Being a returning adult student, the HOPE scholarship was not an option for me. This money truly allowed me to stay in school and get my degree.

A second student stated:
I was awarded $50 for the second semester scholarship. While the $50 was greatly appreciated, I needed much more than that to truly see a difference. Don’t get me wrong, any little bit helps, however, if you all are wanting to meet the unmet financial needs of students, for some of us, $50 just isn’t enough.

Such statements were trends in the student debriefings. Students in round one felt very impacted by the dollars and the difference that it made upon their unmet financial need, while in round two, students were less impacted due to the shift in efforts to retain more students making for awards of amounts less than those in round one. This data showed that, while the AR team wanted to impact more students at ABCTC and did help to increase retention rates, the individual impact on students was degraded by the lesser dollar amounts awarded during round two.

**Individual and Organizational Learning**

Research question three asked, how do college leaders learn and develop individually and collectively through an action research process when addressing the issue of student retention? As I began the process of analyzing data from the action research team—which comprised college leaders and administrators—my initial idea was to deductively code the large amount of data acquired. Shortly after the start of the process, it became evident that so much had been gleaned by the AR team and college leadership concerning the unmet financial needs of students. So, I began the process of in-vivo coding to manage the sheer amount of data.

An important part of transformative learning (Mezirow 1991) was for individuals to change their frames of reference by critically reflecting on their assumptions and beliefs and consciously making and implementing plans that bring about new ways of defining their worlds. This happened within two respects with regard to the AR team in individual learning and relational learning.
Transformative Learning

Action research team learning occurred at a macro level in three ways. Team members entered into a three-part cyclical process in which individual learning occurred. Each person entered into the system and began an assessment of his or her own biases and predispositions as they related to students and unmet financial need. From this stage, AR team members moved to the engagement phase in which they advocated for individual students whose essays each team member had read and ranked. During this process, a transformative and relational learning process occurred in which team members learned of biases that had been previously unknown to them.

Meaning was developed through reflection. Mezirow (1991) stated that “reflection involves a critique of assumptions to determine whether the belief, often acquired through cultural assimilation in childhood, remains functional for us as adults” (p. 223). Mezirow discussed the process by which individuals “reflect on the content of the problem, the process of problem-solving, or the premise of the problem.” Through this reflection, one is able to understand one’s self and one’s learning better. Merizow also proposed that there are four ways of learning: “refining or elaborating our meaning schemes, learning new meaning schemes, transforming meaning schemes, and transforming meaning perspectives.” Figure 13 depicts the learning cycle that took place within the AR team.
Significant shifts occurred in the learning of AR team members. The following are two pre- and post-intervention statements made by AR team members about what they learned and how the AR process was a transformative learning experience for them. (See Appendix A for the guide used during AR team interviews.)

**Jim.**

[Pre-intervention statement:] These students have the world at their fingertips and absolutely nothing to show for it. It is amazing that these kids don’t have any money to come to school. Why would they apply and accept a spot in a class if they don’t have the financial resources to make it happen? It truly amazes me that they think we are just going to roll over and take a hit financially so that they can get an education. It isn’t like they are paying for a Harvard degree, I mean, for God’s sake, we are a two year technical
college focused on real life skills. Sure, we teach theory but that’s not what we are about. We are cheaper and more accessible than most of colleges and provided ample opportunity for these kids to get into our doors. Now, you are all asking us to find money to make it easier. I just ain’t buying this yet.

[Post-intervention statement:] Well don’t I feel dumb! Here I was actually mad with these kids because I didn’t realize what they were actually facing in college today. ABCTC does a great job with college counseling and helping students once they are here, but what about the baggage that they bring? Every student that comes in our doors has a suitcase full of history and part of that history is financial struggles. Struggles that are not necessary related to their own mis-doing or behavior. Often it is a facet of the life they live and were given.

Greg.

[Pre-intervention statement:] Yea, but why should I care about keeping students when we are already at the top of the list! It is amazing to me that these kids come into this school and expect a handout these days. This is what our government and society has done to students. They expect everything for free and college isn’t free and it shouldn’t be free. This is a great example of a teaching opportunity for our kids. Teach them that not all things in life come free and easy. It is ridiculous to think that college could be as easy as applying for free money, which we provide out of areas that are already struggling. This group could be the laughing stock of ABCTC.

[Post-intervention statement:] This group is an important part of ABCTC. We have a real issue of retention here at this college. Retention in the sense that we can only go down. We currently have around 60% of our student that are retained and that is
currently the highest in the state. With the budget appropriations going to a formula that reflect our efforts in retention, we must do more. It is imperative that this committee come together and develop a plan of action to help this college keep students. We are currently on the top in retention but being there does nothing for us unless we make concerted efforts to move forward.

**Relational Learning**

Mistrust and anger were predominant themes that arose during the first action research team meetings and relational learning. A few of the AR team members were relentless in their judgment of ABCTC students, their current financial state, and the cause of the unmet financial need. Some team members felt that students at ABCTC had “squandered” the scholarship dollars, including HOPE funds, on frivolous items and pursuits throughout their college tenure and had simply run out of financial assistance due to money mismanagement. Many of the committee members were unaware of ABCTC’s dynamic and ever-changing curriculum map, which often keeps students in school for an additional semester or year longer than anticipated due to changing demands in the field of study that require additional or supplemental courses. Table 15 reflects this data.
Table 15

Cycle Three Data

<table>
<thead>
<tr>
<th>Theme</th>
<th>Data Excerpt</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger</td>
<td>“Students today are not as financially responsible as those in the past.”</td>
<td>Misinformed about students’ financial state</td>
</tr>
<tr>
<td>Mistrust</td>
<td>“If we give students money, they will not spend it on school like we intend for them to do.”</td>
<td>Misinformed about students’ financial state</td>
</tr>
<tr>
<td>Mistrust</td>
<td>“What makes these dollars different from the ones already squandered?”</td>
<td>Distrust of the students’ financial aptitude</td>
</tr>
<tr>
<td>Mistrust</td>
<td>“How do we know that the college won’t take money out of our budget to do this?”</td>
<td>Trust issues with the college</td>
</tr>
<tr>
<td>Confusion</td>
<td>“What does us giving them additional funds really mean?”</td>
<td>Confused about the meaning and implications of “unmet financial need”</td>
</tr>
<tr>
<td>Regret</td>
<td>“I feel bad for thinking that students simply squandered their money.”</td>
<td>Transformative understanding of issues related to unmet financial need.</td>
</tr>
</tbody>
</table>

On a broader scale, the mistrust felt by AR team members was directed toward ABCTC as an institution as well as toward the students. In one instance, when conversation turned to financial assistance to students, a comment was made that ABCTC might simply pull money from the AR team member’s departmental budget to accomplish the goal of meeting the unmet financial needs of the students. Distrust was further evident in a conversation among AR team members concerning the actions and thought processes of ABCTC regarding budgets and adjustments for monetary benefits. Members of the AR team also felt distrustful when it came to allowing students to acquire additional financial resources from the institution. Once common question posed by team members was, “What makes these dollars different from the ones that were already squandered?” One AR team member noted:
Why should we give these students anything extra? I mean, they come to college in a day and time that there are multiple resources at their disposal. When I went to college, we paid for everything and had few handouts from the government or even the college. It seems to me that students today are wasteful people who often seem to take for granted what they are given.

Another stated:

I am just plain mad that I might have to give up money that could be used to purchase things that makes students’ life easier in response to unmet financial need! Didn’t these students know the cost of college when they signed up to attend? It is astounding to me that we would recognize now that students have a need that we previously didn’t know about. I won’t give up any portion of my budget to let students stay in college. It is not what that money is for.

The second major theme that emerged during the coding process related to confusion experienced by AR team members. One member’s questions about how exactly “unmet financial burdens” were defined and how the project could reduce those burdens through supplemental funding evidenced a general, group-wide confusion about funding mechanisms. During cycle three, an in-depth discussion took place about what the definition of unmet financial needs, how they affected students, and how they affected ABCTC as a whole. One team member said:

What exactly is an unmet financial need? We seem to be living in a place of theoretical dreams with respect to this whole issue. If we want college administrators and faculty and staff to buy into this whole deal, we have to be prepared to prove things with data. College administrators and faculty respond to data, and specifically numbers. If we
continue to live up in the clouds then no one will be willing to join us. Flying high is a great thing, unless you are the only one up there.

During conversations among the AR team members, confusion about the importance of retaining more students was also evident, especially as it related to the 2015 budget cycle for technical colleges within the state. While ABCTC held the highest retention rate within the technical college system at the time of this study, college administrators still felt it was vitally important to increase that rate due to the state’s revised, retention-dependent budget formula. Yet, one team member commented:

Why should we even care about keeping students? I mean, come on, we have grown so much as a college and that seems to continue each year. We don’t seem to be hurting for kids to come through the doors! In fact, we have a waiting list for programs such as nursing and areas in IT and healthcare. I understand that retention is important, but why the push now?

The last prevalent theme that grew out of the AR team’s final meetings was a feeling of regret. Once AR team members fully understood the context of unmet financial needs and how it directly affects students, ABCTC, and the technical college system as a whole, they ultimately felt they had wrongly or unjustly judged students and their financial situations. This regret was evident in several comments by the team members such as the following:

Well don’t I feel dumb! Here I was actually mad with these kids because I didn’t realize what they were actually facing in college today. ABCTC does a great job with college counseling and helping students once they are here, but what about the baggage that they bring? Every student that comes in our doors has a suitcase full of history and part of that
history is financial struggles. Struggles that are not necessary related to their own mis-doing or behavior. Often it is a facet of the life they live and were given.

Another noted:

Guys, this really sucks that we had to go through all this just to realize that students are real people with real financial problems that plague their academic endeavors at all levels. I mean, I know that sometimes I struggle financially and why in the world we think that our students are exempt from those same struggles? It is amazing what I have realized about our students and the regret that I have for not knowing it sooner. I wish all of our college administrators and faculty could experience that feeling.

**Summary of Findings for Research Question 3**

Data indicated that the AR committee evolved from positions of mistrust of students with unmet financial need in the beginning stages of this process to positions indicating deeper understanding of and appreciation for student debt issues. Their thoughts and assumptions about the status of students shifted demonstrably through the action research case study process. One AR committee member noted during the exit interview:

I was flat out wrong about our students. I came into this process thinking that students were wasteful bastards who were always asking for a handout and a free ride. I have realized, through action research and being part of this team that the game is constantly changing for students, both here at ABCTC and nationally. We are constantly, as academic entities, changing the landscape to make it more challenging for students to efficiently graduate from college without a massive amount of debt. Students at a two-year technical college should not leave with massive amounts of education debt. We are about workforce development.
ABCTC gained valuable learning from this study as well. The president of the college hopes to foster a campus culture of understanding through an initiative whereby professional development opportunities are available focusing on the unmet financial needs of students at ABCTC. Upon completion of this study, ABCTC developed a “retention specialist” position that would oversee the continuation of the scholarship program or a similar mechanism. The donor for this scholarship program was re-engaged and committed to continuing the program for two additional years, with subsequent years becoming a match donation scenario. The college would match any donation, dollar for dollar, of the donor with institutional dollars to ensure program sustainability after the two additional years. Also, through this action research case study, the institution has also obtained evidence-based information about the current state of its students’ unmet financial needs and about existing biases of and potential professional development opportunities for faculty and staff. Upon a? last check, ABCTC has announced two professional development opportunities that center around student unmet financial need. These programs are slated to occur within the 2016 calendar year.
CHAPTER 6
SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The purpose of this action research case study was to understand and address the effects that unmet financial burdens have upon the retention of first-year students at a two-year technical college. The research questions guiding this study were:

(1) Is there a statistical correlation among socioeconomic factors and SAT performance that could result in students entering college with an unmet financial need?

(2) How do financial assistance strategies impact individual technical college students faced with academic dismissal for nonpayment?

(3) How do college leaders learn and develop both individually and collectively through an action research process designed to address the issue of retention?

This chapter summarizes the case study, draws conclusions from the findings, and presents implications of the overall project.

Study Summary

This case study focused on a two-year technical college’s efforts to increase student retention in order to meet changing state technical system demands and changing state appropriations, which added retention as a funding criterion. Using a cooperative inquiry approach, the researcher formed an action research team consisting of five college leaders representing various departments and divisions on campus. Each member had a different level of responsibility within the institution; thus the team comprised different layers of experience and perspective. The team worked collaboratively for 16 months assisting in the development of
intervention programs, sharing information and critical incidents related to retention issues, evaluating scholarship qualifications, dispersing scholarship dollars, and planning for the dissemination of findings that emerged from the programs.

My decade-long tenure as a higher education professional catalyzed my interest in helping ABCTC address the challenge of retaining students faced with unmet financial needs. The overall intent of this collaborative research effort was to help ABCTC not only retain students at a higher rate, but also to change the culture of the college, which had never considered students’ need-based issues on an institution-wide scale.

This action research case study used quantitative and qualitative methods, including correlation and critical incident technique interviews, to gather data to help answer the research questions. One function of the study was to determine if there was a relationship between socioeconomic factors, retention, and unmet financial needs of students at ABCTC, as identified by Tinto (1975). The College Board reported that four out of five statistical and socioeconomic indicators were found to affect SAT score results, impacting state rankings. Overall, the quantitative methods employed in this study demonstrated that the findings were unlikely to have occurred by chance. Specifically, the results suggested that participants from educated families correlated well with higher SAT scores. For those participants in the top 10% of their high school class, SAT scores were more likely to scale higher than those of students with lower academic standings. Participants from families with higher incomes also scored higher on the SAT than those from lower income families. The SAT participation rate examined in this research was consistent with previous studies, showing that the latter statistical indicators affected state mean scores and corresponding state rankings. The race or ethnicity of
participants, however, showed little predictive impact on SAT score results, unlike income, which showed a high probability of being a predictive agent.

Another function of the study was to identify students at risk of leaving school due to unmet financial need by developing, implementing, and evaluating a program to help retain them. The program was designed to advance the institution’s mission of producing work-ready students who will ultimately benefit the local and national economy by becoming productive, working citizens. Data from two rounds of scholarship awards based on short-term financial need showed that this scholarship award intervention program had a positive effect on the students who participated, their families, and ABCTC as a whole, as measured in part by the 91% retention rate of student participants.

The final function of this study was to learn how college leaders and the action research team members developed personally and professionally with regard to issues of student retention. Findings indicated that AR members underwent a transformative learning experience resulting in a deeper knowledge of and sensitivity to students and their unmet financial needs. ABCTC, institution, as well, went through learning that resulted in a sustained scholarship program, a retention officer, and planned professional development for others on the topic of retention.

**Conclusions and Discussion**

Two conclusions were drawn from the findings of the study. These conclusions addressed socioeconomic factors as they related to standardized test scores; programs of scholarship that served to reduce unmet financial needs; and transformative learning of the AR team and the college administration concerning student retention factors. The conclusions are discussed in this section relative to the literature.
Conclusion 1: Socioeconomic Factors Are Closely Related to Student Retention and Should Be Considered Critical Factors Regarding the Unmet Financial Needs of Students

As a basis for decision making and as a rational for data-based student need, college leaders sought a demonstrable relationship between Tinto’s (1975) socioeconomic indicators and standard test scores. A major finding associated with the first research question revealed that there are distinct and direct correlations between socioeconomic factors and standardized test scores, particularly in relation to family income. This finding was consistent for both state and national standards. The strength of the correlation was particularly strong and, since the conclusion of the study, has become an important standard for assessing potential applicants for the scholarship program. This finding was generated through statistical calculations, allowing the AR team to place a stipulation of standardized test scores on the scholarship application as a result.

Powell and Steelman (1996) researched the dilemma of using raw data to determine if socioeconomic factors were related to standardized test scores. This action research case study placed parameters on Powell and Steelman’s findings in testing raw data. Findings from this study indicated a statistical correlation between SAT scores that those socioeconomic factors that were present in the raw data pool.

In its 2013 Total Group Report, the College Board contended that relationships between test scores and other factors such as educational background, gender, racial or ethnic background, parental education, and household income are intricate and codependent. These factors do “not directly affect test performance; rather, they are linked with educational capabilities both on tests such as the SAT Reasoning Test and in schoolwork” (College Board, 2013, p. 5). This study’s findings support that, while all socioeconomic factors are present and
do not directly affect test performance, there is a direct relationship between reported family income levels, SAT scores, and the unmet financial needs of students who were part of this study at ABCTC.

**Conclusion 2: A Scholarship Program or Mechanism Put in Place By an Institution of Higher Education, Based on Socioeconomic Factors and Related to Standardized Test Scores, Can Have a Positive Effect on the Student Retention Rate**

The scholarship program that was developed to offset the unmet financial needs of students at ABCTC resulted in the retention of 91% of student participants. Students who participated in the study were retained at a higher rate than those who did not participate. This led to the conclusion that unmet financial needs represent a real and prevalent issue for students at ABCTC. This knowledge could lead to a paradigm shift for ABCTC and other college institutions whereby preconceived or unrealistic notions about students’ financial reality could be adjusted and a culture of understanding and compassion adopted to accept and address the true nature of student finances.

Kennamer (2011) reviewed then-recent literature on student financial aid as a retention tool at community colleges to better understand the role of unpaid financial burdens among students. The current study supported Kennamer’s findings in that states, such as Georgia, with lackluster funding available for two-year technical college students could potentially maintain their budgets if local funding sources and mechanisms were available to support the unmet financial needs of students trying to earn a degree from an institution of higher education in the state. Menifield (2012) examined lottery scholarship data to help determine factors that affect scholarship retention and graduation and found that a financial support system, inclusive of state and federal support, had a positive effect on the retention of college students.
In addition to supporting the findings of the aforementioned authors, this study suggested that localized or specialized funding mechanisms outside the realm of state and federal dollars could potentially and more effectively provide gap funding to students with unmet financial needs. An early intervention criterion emerged from this study when socioeconomic factors, such as income, were correlated among standardized test scores. The threshold of a standardized test score range could be utilized to inform systemic and sustainable programs in institutions of higher education to offset students’ unmet financial needs and, ultimately, retain more students at the school.

**Conclusion 3: Transformative and Relational Learning of College Leaders Can Occur Through an Action Research Process Related to Student’s Unmet Financial Needs**

College leaders and AR team members in this study developed a greater understanding and appreciation for students with unmet financial needs. Each member experienced a transformative learning experience in which his or her own opinions and cultural biases were challenged and shifted due to participation in the action research study. Specifically, they gained a deeper respect for students and a greater understanding of the need for supplemental funding for students with financial difficulties. Findings related to the third research question showed that participants, both individually and collectively, developed an appreciation for each other, the students who were affected, and the action research process itself.

Tyson (2012) utilized interviews with faculty, administrators, staff, and students at four-year college programs to uncover the relationship among undergraduate student financial well-being, retention, and timely degree completion. This relationship, however, was not a priority of collegiate administrators at the beginning of this study. While college leaders acknowledged that academics and financial well-being were two important factors, little in fact had been done to
ensure the latter at ABCTC. This study offered a vehicle for professional growth and development for staff members that placed equal emphasis on the financial well-being and academic success of students.

Saltiel (2011) used a quasi-experimental design to examine the effects of unmet financial needs on academic outcomes among a cohort of employed community college commuter students. Saltiel focused on a subgroup of students classified as “low-income” and “working poor,” terms used to describe individuals who are economically disadvantaged. This case study found that a pre-existing bias is often present among college administrators and leaders about students and their current financial state. The study was able to transform the learning process for faculty, staff, and administrators at ABCTC.

Critical incident interviews with AR team members represented the primary mean for capturing their opinions—an important source of qualitative data for this study. Essential to promoting adult development is the practice of fostering transformative learning. Fostering transformative learning includes the most significant learning in adulthood, that of communicative learning. “Communicative learning involves identifying problematic ideas, values, beliefs, and feelings, critically examining the assumptions upon which they are based, testing their justification through rational discourse and making decisions predicated upon the resulting consensus” (Mezirow 1991, p. 58). The interviews and collaborative analytical process served as opportunities for educators to evaluate their own leadership principles and styles. The collective experience also served as a type of professional development opportunity for the AR team members. The actions associated with the study also led to transformative learning experiences for the college as a whole. Broad organizational learning was facilitated through the position and power of the AR team members—individually and as a group—and key
stakeholders. Table 16 reflects this study’s findings and how they concur with the current body of literature.
Table 16

Revisit of the Literature

<table>
<thead>
<tr>
<th>Author</th>
<th>Summary</th>
<th>Concurrence with Case Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kennamer (2011)</td>
<td>Reviewed recent literature on student financial aid as a retention tool at community colleges to better understand the role of unpaid financial burdens upon students.</td>
<td>Concurs and Extends: Informs and supports the findings of Kennamer (2011). Georgia, a state with lackluster funding available for two-year technical college students, the state could potentially benefit from reduced need from students for state funding if local funding sources and mechanisms were available to support the unmet financial needs of students trying to earn a degree from an institution of higher education in the state.</td>
</tr>
<tr>
<td>Menifield (2012)</td>
<td>Examined lottery scholarship data to determine factors that might affect scholarship retention and graduation.</td>
<td>Concurs: Supports those findings and also proposes that localized or specialized funding mechanisms outside the realm of state and federal dollars could potentially and more effectively serve as gap funding for unmet financial needs.</td>
</tr>
<tr>
<td>Powell &amp; Steelman (1996)</td>
<td>Explored state ranking of SAT scores through an analysis of raw data.</td>
<td>Concurs and Extends: Placed parameters on findings with regard to ABCTC and tested raw data.</td>
</tr>
<tr>
<td>Saltiel (2011)</td>
<td>Examined the effects of unmet financial needs on academic outcomes among a cohort of employed community college commuter students.</td>
<td>Concurs: Found that a pre-existing bias is often present among college administrators and leaders regarding students and their current financial state.</td>
</tr>
<tr>
<td>Author</td>
<td>Summary</td>
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<tr>
<td>Tyson (2012)</td>
<td>Interviewed faculty, administrators, staff, and students at four-year college programs and revealed the impact of undergraduate student financial well-being on retention and timely degree completion among students.</td>
<td>Concurs: Offered a mechanism of professional growth and development for staff members that placed equal emphasis on the financial well-being and academic success of students.</td>
</tr>
<tr>
<td>College Board (2013)</td>
<td>Report contended that relationships between test scores and other factors such as educational background, gender, racial/ethnic background, parental education, and household income are intricate and codependent. These factors do “not directly affect test performance; rather, they are linked with educational capabilities both on tests such as the SAT Reasoning Test and in schoolwork” (College Board, 2013, p. 5).</td>
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</table>

**Implications for Theory**

This study, in the context of unmet financial need, relied heavily on the research around Tinto’s (1975) theory of departure. Tinto suggested that students often leave college and are un-retained due to academic or socioeconomic factors that are related to unmet financial needs.

Tinto’s definition of academic integration, as it relates to retention, was based on the following components: grade/mark performance, personal development, enjoyment of subjects taught, enjoyment of subjects studied, identifying with academic norms/values, or identifying with one’s role as a student (pp. 12-19). This case study adds to Tinto’s theory by broadening the understanding of debt to include unmet financial needs of students. Although Tinto maintained that academic integration is important for the retention of students, this study found that academic history, academic performance, and meeting financial needs played an integral role in
retention as well. Figure 11 illustrates Tinto’s theory of departure as well as the model that guided this study.

Figure 14. Tinto additive model.
Implications and Recommendations for Practice and Policy

The results of this study have implications for both policy and practice in formal institutions of higher education like ABCTC. These implications are outlined below and organized progressively.

For Individuals

Personal reflection was a key component of the action research process in this study and should be considered for the planning, development, and implementation of similar programs at other institutions of higher education. According to Anderson and Herr (2005), the overarching goal of the inquiry process is to develop and transform individual participants while also improving practices. Through reflective inquiry and critical incident interviews, individuals participating in this research process gained a new, higher level perspective of the role of college leaders, the action research team, and the organizational system of ABCTC.

Participants noted the impacts of the reflective process on their daily practices. While reflecting on their experiences, team members reported that the action research process often required them to stop and evaluate their activities and professional roles—unfamiliar territory for many of the educational administrators at ABCTC. Critical reflection on what went right and what went wrong based on their own efforts and the group’s efforts provided a welcome and unique awareness of the impacts and outcomes of each action taken during the study. It also introduced them to an inquiry process that allowed them to delve deeper into their own reflections on their day-to-day activities. This in turn allowed members to utilize their meaning-making skillset to inform and supplement their efforts.

This study served to develop practical organizational training mechanisms and to enhance awareness of staff and faculty members at a two-year technical college. In the beginning stages
of the research, action research team members reported that they held misconceptions of students and their current financial state with regard to unmet financial needs. Thus, professional development initiatives that shed light and focus on these issues should be considered for similar initiatives in the future.

College staff, especially seasoned personnel, often lose focus on the common, everyday concerns of students. With so many strict state, federal, and educational guidelines to follow, instructors often teach a class without knowing anything about the individuals they are instructing—an alarming state of affairs considering the expectation that faculty impart life-changing knowledge on their students. Education should be a two-way street, with teachers getting to know students and students getting to know teachers on a more basic, human level. Educators should be required to know their students in ways that allow for a symbiotic relationship that supports and encourages faculty and student success strategies.

For Organizations

Oftentimes, the only source of knowledge is experience.

—Albert Einstein

If the AR team members had not participated in this process, they might not have gained the skillset and knowledge they achieved through the action research process. The findings from this study will help to inform existing programs while providing a foundation of knowledge for future or developing practices. Research in the area of unmet financial need could be used to support organizational development and strategies at institutions of higher education. It is important that key college leaders and administrators maintain an informed awareness of the daily struggles and issues often faced by the financially struggling student. Developing programs that allow for the kinds of transformative learning experiences exemplified in this
study would generate a new and refreshing awareness of students and their needs regarding financial stability at various levels.

Developing specific policies and procedures that support action research or collaborative inquiry within the organization could highlight the valuable experiences, perspectives, and insights of those who are addressing issues “on the ground.” This could reveal significant knowledge that might, in turn, serve to ignite change in future best practices and development of policies. Organizational and institutional support for such mechanisms and activities that develop the aforementioned skillsets should be considered viable and vibrant opportunities.

Findings from this study have national and local implications related to addressing the unmet financial needs of students through program development, policies and procedures, staff development, and leadership and organizational development at various levels within any organization.

The data suggested a relationship between academic, social, and socioeconomic needs of the student, leading to the formation and implementation of the scholarship initiative by the action research team at ABCTC. Applying this study’s data would aid other two-year institutions in their respective investigations of retention-based issues and initiatives.

Organizational policies and procedures that dictate activities and support for reducing unmet financial need should be reevaluated and examined more closely, and support for programs with such objectives should be intensified. Practical, alternative, and creative methods need to be identified to launch projects that address unmet financial need and that are funded by the sponsoring institution. Establishing clear organizational roles and support systems will provide a foundation for emerging theories around unmet financial need in future programs and organizations.
Future Research

Although an increasing amount of public policy and adult and higher education discourse is focusing on unmet financial need and the retention of students at community-college and university campuses, few programs currently exist that actively assist these students. This study has contributed to the extant literature, but more study and work in the area is needed. The following three areas of future research should be considered and explored.

The pilot study demonstrated that more research and understanding are needed in decoding SAT scores in relation to public education policy decisions and socioeconomic factors. Given that politicians and the media oftentimes exploit state rankings without regard to quantification, future research should focus on state SAT results to determine scalable standards to avoid unlike comparisons or comparing apples to oranges.

A particular area of future research relates to the broadening of study participants. This study sought to identify the parameters of the unmet financial need of students while navigating the opposition of college leaders who did not fully comprehend the need for and strategies of such a study. Future work should call for institutions to establish programs that seriously examine the issue of unmet financial needs of students—a prevalent issue that exists within most institutions of higher education, not only two-year technical colleges. Future studies could train their focus on the support structures and frameworks needed for action research committees to influence internal and external sponsors as well as stakeholders. Attention to college status and academic standings may introduce additional factors to future studies that center primarily on students with 12 or fewer credit hours at two-year technical colleges.

Additionally, future research should explore the transformational learning processes of college leaders at the institutional level. In this study, most of the participating educational
leaders held misconceptions about the terminologies, reasons, and rationales surrounding the unmet financial needs of students. Furthermore, college administrators lacked the knowledge to understand that the effects of unmet financial needs played a pivotal (and negative) role in the retention of students. Future efforts should focus on educating the educators about the intricate relationship between unmet financial need and college student retention.

Lastly, this study’s findings opened several opportunities to answer future research questions, specifically about how socioeconomic factors correlate with unmet financial needs and student retention. For instance, what factors might hinder the institutional adoption of knowledge produced in the process of addressing the unmet financial needs of students? Would college educators and leaders participate in a formalized effort to impact unmet financial needs on a state or national scale? What effects do the state-imposed funding criteria discussed in this study have on the goals and outcomes associated with meeting the retention requirements of an institution of higher education? These questions—and more—should be considered for future research.

**Extra Point: It’s Good**

This study identified, implemented, and evaluated strategies leveraged by an action research team to navigate and address the unmet financial needs of students at a two-year technical college in hopes of increasing the student retention rate. It showed a correlation among standardized test scores and unmet financial needs of students, thereby providing a data-based rational for a scholarship application process. Two cycles of the administration of such a scholarship award program resulted in increased student retention. The data and insights gained through this project adds to the existing body of knowledge as well as foregrounding the urgent need for substantial changes in policy and procedures.
Beyond these outcomes was the startling change in the change agents. Through the study’s AR process with its critical incidents and reflections on data and non-data based practices provided a foundation for action research team members and the college leadership to explore the relationships and learnings they were uncovering as a result of their experience with students burdened by unmet financial needs. These challenging explorations sparked more intense interest among the team members in issuing calls to action, which in turn influenced co-workers, friends, and colleagues. One team member noted:

I get it now! I can’t judge the book by its cover anymore. Students bring such a dynamic and interesting story with them to college. Our students today face more challenges and bumps than most would have encountered in a lifetime 20 years ago. We often sit back and think that we have the same old student, but we do not. An ever-changing world and the dynamics of paying for college changes at an exponential rate these days. I am so glad that I was able to be part of a change that, I feel, will by systemic to our college.
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APPENDIX A

INTERVIEW GUIDE

[Participants received a copy of this interview guide with the questions prior to the interview and were asked to consider the questions and make some notes in advance.]

Thank you so much for being a part of the Tech Effect: Retention of First Year Students at ABCTC. The purpose of this action research case study is to understand and address the effects that unmet financial burdens have upon the retention of first-year students at a two-year technical college. Adding to the urgency and concern of this issue is that beginning in 2015, the higher education funding formula will change in the state of Georgia such that retention will become a funding criterion. ABCTC is home to a vast array of adult learning, ranging in age from 14 to 88 years old. Education seekers from various stages in life are seeking opportunity at ABCTC. Currently, ABCTC retains approximately sixty percent of its student population in a given two year timeframe. As such, this institution has the highest student retention record within the Technical College System of Georgia. Nevertheless, the ABCTC administration monitors this information as a potential prelude of a decrease in budget from the state level. This study also seeks to inform higher education retention models and frameworks and provide a data set and an undergirding of knowledge about students and system change for other institutions to consider

**Focus Question:** How do colleges’ leaders learn and develop individually and collectively through an action research process when addressing the issue of retention will be the question that we are exploring today.

This interview will take between 60-90 minutes and I will be audio-recording the interview for analysis. I may get back in touch with you if I need clarification on anything that you share during the interview.

To protect your confidentiality, I will be assigning you a pseudonym for the analysis. No individually identifying information will be used when reporting the results from this interview or the overall study.

If at any time you are not comfortable with answering a question or need clarification, please just let me know. If you would like to withdraw from the study completely, you can ask to have all of the information that can be identified as yours removed from the study, or destroyed.

1. Explain confidentiality, sign consent forms, and answer questions about forms.
2. Ask participant if they agree to be audio-recorded.
3. Begin interview. I’m here today to collect stories of how college leaders learn and develop individually and collectively through an action research process when addressing the issue of retention.

Questions:

- To begin, please tell me a little bit of background about your interest in retention at ABCTC.
- Next, I’d like you to draw a timeline of your experiences over the course of your participation on Action Research Team with key turning points, times when you felt that something happened that made you, or your thought process as an administrator on retention evolve significantly.
- Please now tell me some stories about specific turning points during the evolution of this program when you’ve felt like you personally had to learn your way through.
  - I’d like you to share 2 stories about times when you really learned a lot and it was a positive experience for you, and 1 story about a learning experience that was particularly challenging.
  - As you tell me the story, think about a play. Please describe:
    - The setting
    - The context, and any background I should know
    - The characters involved
    - The “crisis”
    - What happened
    - How things turned out
- Final question: Is there anything else you would like to tell me or that I should know about times when you’ve learned a lot in your journey toward retention at ABCTC?
- Wrap-up and answer any participant questions.
- Conclusion and thank you: This concludes our interview. Thank you so much for sharing your stories and time with me. I will be in touch with you in the next few months to share some of the emerging overall themes from all of the interviews and to ask for your feedback on those themes. The feedback process should take about 15 minutes of your time.

Probes:

1. Who did the experience happen to? If there were other people involved, who were they?
2. What was the situation that led up to that?
3. Exactly what happened?
4. How did the problem turn out?
5. What were your thoughts and feelings about the incident – what was going through your mind?
6. What made this incident significant?
7. Since then, has your attitude towards the incident changed?