


2017

Effect of Summer Bridge Programming on Students' Performance on the Texas Success Initiative Assessment

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Consuela Cooper

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Walden University

2017

Abstract

Effect of Summer Bridge Programming on Students' Performance on the Texas Success
Initiative Assessment

by

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MAE, University of Northern Iowa, 2007

BA, University of Northern Iowa, 2004

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Education

Walden University

May 2017

Abstract

Summer bridge programs (SBPs) have been used as a means of increasing students' college readiness and academic skills. University Southeast implemented a SBP in 2013 for students placing into developmental courses on the Texas Success Initiative Assessment (TSIA). However, researchers have found mixed results when evaluating the effectiveness of SBPs, and at University Southeast, it has not been investigated. The purpose of this quantitative study was to examine the difference in TSIA score gains between first-time-in-college students with developmental-level test scores who attended a three-week SBP and those who did not. Tinto's longitudinal model of student departure guided the study examining how university-provided support may increase a student's skills and abilities before the start of college. The research questions focused on the gain scores on TSIA math, reading, and writing pre- and posttests for first-time-in-college students completing the SBP and a control group not participating in the SBP and taking the TSIA a second time. A total of 769 archived test scores from 2014 and 2015 were analyzed using an independent-samples *t* test. Data analysis found significant gains only in the area of TSIA math, which suggests that college administrators reevaluate the use of SBPs. This study contributes to positive social change because it provides research-based data to administrators of the local SBP and demonstrates the need to explore options that will increase college readiness while ensuring that institutional funds are being used effectively.

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Dedication

This degree is not mine alone, it is dedicated to the many people who pushed me to make it to this point.

To my son, Khire Alexander “The King” Cooper, I pray this serves as an example that with God, anything is possible. I love you more than all the Nerds candy in the world! Hold tight to your dreams, protect them, and never let anyone tell you what you cannot accomplish, they don’t know our God! Thank you for choosing me!

To my family, thank you for setting a tone of expectancy; never letting me be anything less than my potential would allow me to be. I am who I am because of each one of you. To my nieces, nephews, and cousins: You guys are my motivation. Knowing you are watching me pushes me to greatness.

To my Pastor, Rev. Michael E. Coleman and my Antioch Baptist Church family, thank you for being the village that surrounded me with prayers, love, and encouragement.

To my friends (you know who you are), thank you for simply being who you are in my life.

WE MADE IT!

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Chapter 1: Introduction to the Study

Among the top priorities in the state of Texas are making the transition from high school to college seamless and increasing college retention rates for first-time-in-college (FTIC) students (Texas Higher Education Coordinating Board [THECB], 2015). Summer bridge programs (SBPs) are one intervention offered to students who are considered at risk based on their high school performance, assessment scores, or background information such as socioeconomic status (Adams, 2012; Barnett et al., 2012). SBPs are short-term programs created for incoming college freshman these programs vary in outcomes but share the programmatic goal of increasing student preparedness before the start of college including skill building and connecting students to campus resources (Wathington, Pretlow, & Mitchell, 2011). Other SBPs decrease the number of developmental education courses an incoming freshman is required to take by improving her reading, writing, and mathematics skills (Adams, 2012; Barnett et al., 2012; Bir & Myrick, 2015; Raines, 2012; Wathington, Pretlow, & Mitchell, 2011).

The SBP offered by University Southeast (pseudonym) was an alternative to the 16-week developmental course that students would have to pay for. Those who participated and then retested at the college-level bypassed the developmental sequence and moved directly in college-level coursework. Not only was the SBP free, but attendees received financial incentives for participation and completion, including weekly stipends. This study investigated the effect of a three-week SBP on TSIA scores for incoming FTIC students at a four-year public university. The results of this study have implications for positive social change: It reveals another alternative for students in need of

remediation before enrolling in four-year public institutions to increase retention and graduation rates of this population.

This chapter covers the following topics: the background of the study, including a brief discussion on the literature review process and the resulting problem needing exploration are provided. Next, Tinto's 1987/1993 model of longitudinal departure is introduced as the guiding theoretical framework along with how it influenced the research questions and hypothesis, also included in the chapter. Finally, the chapter concludes with an overview of the nature of the study, definitions, assumptions, scope and delimitations, limitations, and the significance of the research.

Background

In October 2000, the THECB approved *Closing the Gaps by 2015*, an improvement plan with four goals designed to increase student success after high school (2014). The plan introduced the new TSIA, which was created to replace four others tools—Compass, Asset, ACCUPLACER, and Texas Higher Education Assessment—as the placement exam. (According to THECB [2012], THEA and ACCUPLACER were the most popular in Texas.) The TSIA was designed to be more informative than these instruments in two ways: it yielded a diagnostic report on the concepts that needed attention, and it used predetermined cutoff scores for placing students in developmental or college-level courses. While the scores cannot be used to deny admission to a university, they ensure enrollment in the proper courses based on skill level. The goal of the TSIA was to create a more individualized approach to placement practices as well as to make the testing process uniform across the state (THECB, 2014). Incoming freshmen

who did not achieve qualifying scores on the SAT, ACT or high school state exams could be required to sit for an assessment before registering for college-level courses (THECB, 2014). A student is placed in developmental education courses based on the student's performance on an institution's selected assessment exam (THECB, 2012). Critics of testing and placement policies argued that scores alone are not accurate predictors of future performance and recommended the use of other factors, such as high school GPA (Madison et al., 2015; Stewart, Doo Hun, & JoHyun, 2015).

One characteristic of SBPs that makes them successful is the amount of attention paid to individual needs, which are important when working with first-generation, low-income, and minority students (McGlynn, 2009). Not knowing how to study, being unfamiliar with campus resources, and feeling lonely were among the reasons for high attrition rates among Black students, and suggest interventions (Boyd, Shueman, McMullan, & Fretz, 1979). In SBPs, students connect with their academic advisor, interact with faculty and staff, and, via upperclassmen, become acquainted with the campus community and academic support centers (McGlynn, 2009; Murphy, Gaughan, Hume, & Moore Jr., 2010). Programs exist for:

- students at predominately White institutions
- pre-engineering students who need remediation in mathematics
- students considered at-risk by their universities due to enrollment characteristics such as race, income, and first generation status
- students at the developmental level in mathematics, reading, or writing who want to place in college-level courses on their entrance placement assessment.

To fully understand SBPs as means of increasing TSIA performance, the background of SBPs as they relate to skill development has been researched. Current literature on testing and placement policies and how they correlate to student retention and degree attainment were reviewed. Studies on developmental education, accelerated developmental education, and college success skills were also vital to shaping the research. Emerging from the literature review was the need for knowledge about student performance and retention after attending an SBP focusing on skill development to increase scores assessments. The TSIA is of interest since it has only been in use for two years and the studies based on it are limited.

Previous studies sought to answer questions about the connection between SBPs and first-year performance (Barnett et al., 2012; Wathington, Pretlow, & Mitchell, 2011). But few have looked at the immediate impact on score performance as it influences course placement (Garcia & Paz, 2009; Kallison & Stader, 2011; Sablan, 2013). Driving this study was the need for data to support, or challenge, the use of SBPs for incoming FTIC students placing into developmental education courses on the TSIA to improve student scores so they may bypass the developmental course sequence and move directly into college-level coursework at the start of the semester. As educators look to decrease the number of students needing developmental education courses and to increase degree attainment, it was necessary to explore alternatives, such as SBPs. Given the disproportionate number of disadvantaged students and students of color who need remediation, it is important to explore options for them (Murphy et al., 2010; Tinto & Sherman, 1974).

Problem Statement

The problem investigated in this study was the percentage of FTIC students who enrolled in college without having achieved college-ready status on the TSIA. The SBP implemented at University Southeast in 2013 was designed to decrease the number of students enrolling in developmental education courses by increasing college readiness. This study measured the effectiveness of the program by examining TSIA scores for program participants. As shown in Table 1, the percentage of FTIC students who required developmental education at the University Southeast is declining but it is still higher than the state average (THECB, 2011).

Table 1

Percentage of “Not College Ready” FTIC Students Enrollment Statewide and at University Southeast

Year	Statewide FTIC Freshmen “Not College Ready”	UT FTIC Freshmen “Not College Ready”
2010	14.0	62.1
2011	14.4	62.4
2012	12.3	54.1
2013	10.5	40.2
2014	10.4	23.9

Purpose of Study

The purpose of this quantitative study was to compare TSIA scores between FTIC students with developmental level test scores who attended a three-week SBP and those who did not attend.

Research Questions and Hypotheses

Four research questions (RQ) guided this research study:

RQ1: Is there a difference in TSIA mathematics gain scores between students who did and did not attend an SBP?

H₀1: There is no significant difference in TSIA mathematics gain scores between students who attended an SBP and those who did not.

H_A1: There is a significant difference in TSIA mathematics gain scores between students who attended an SBP and those who did not.

RQ2: Is there a difference in TSIA reading gain scores between students who did and did not attend an SBP?

H₀2: There is no significant difference in TSIA reading gain scores between students who attended an SBP and those who did not.

H_A2: There is a significant difference in TSIA reading gain scores between students who attended an SBP and those who did not.

RQ3: Is there a difference in TSIA writing gain scores between students who did and did not attend an SBP?

H₀3: There is no significant difference in TSIA writing gain scores between students who attended an SBP and those who did not.

H_A3: There is a significant difference in TSIA writing gain scores between students who attended an SBP and those who did not.

RQ4: Is there a difference in TSIA essay gain scores between students who did and did not attend an SBP?

H₀4: There is no significant difference in TSIA essay gain scores between students who attended an SBP and those who did not.

H_A4: There is a significant difference in TSIA essay gain scores between students who attended an SBP and those who did not.

The independent variable in this study was participation in the SBP with two levels of yes and no. The dependent variable was the gain in scores between two administrations of the TSIA within a three-week period for students in the treatment group who attended the program and retested at its conclusion and students in the control group who retested without treatment.

Theoretical Framework

Tinto's work on student departure, retention, and institutional action provided the theoretical framework for this study. Tinto argued that there are several components to student retention and that institutions must take action? not only to retain students but to close achievement gaps (Tinto, 1987; Tinto, 1987/1993). Institutional action is defined as the implementation of supports designed to increase academic abilities and to bridge the achievement gap between advantaged and disadvantaged students (Tinto, 1987; Tinto & Sherman, 1974). Tinto (1987) contended that institutions must make a commitment to addressing students' academic deficiencies, including those in the core areas of mathematics, reading, and writing, as well as lacking study skills. Tinto concluded that good retention programs integrate students academically and socially and that institutions must allocate resources to programs demonstrating the ability to do so.

Tinto recommended universities make institutional commitments to programs that address issues that may “preclude students from taking college level courses” (Tinto, 1987, p. 14). SBPs are one type of intervention that, according to Tinto’s hypothesis, would increase student retention by increasing academic readiness (Engle & Tinto, 2008; Tinto, 1987; Tinto & Sherman, 1974). This theoretical framework tied closely with the examined SBP, which was designed to reduce the number of developmental education courses a student might be required to take by offering remediation before the start of classes. Tinto’s work supported this study’s research questions by calling for more evaluations of treatment programs that could lead to increased retention (Tinto & Sherman, 1974; Tinto, 1987). Chapter 2 provides a further explanation of Tinto’s work and its use as a theoretical framework that has guided prior studies.

Nature of the Study

This quantitative, quasi-experimental design used a nonequivalent (pre- and posttest) control group to compare two groups of incoming, FTIC students during the summer before the start of their freshman year. These students had the option of participating in the three-week SBP after placing into developmental reading, writing, or mathematics on the TSIA; thus, they were not randomly selected to be part of the sample or control group. Students from both the treatment and control group took the TSIA independently upon being informed by University Southeast that it was required for admission. Students in the treatment group attended the three-week program and retested at its conclusion, while students in the control group retested without treatment.

Quantitative analysis was due to the positive results associated with data-based decision making in higher education (Kuh, Kinzie, Schuh, & Whitt, 2011). Using archived data served as an “unobtrusive measure” (Frankfort-Nachmias & Nachmias, 2008, p. 287). Using data collected by the campus registrar and the Office of Institutional Research addressed the issue of researcher bias (see Chapter 3).

The independent variable for the study was the three-week SBP completed by the treatment group. There were two components to the SBP: (a) an intensive subject-related curriculum and (b) exposure to lessons on success skills for college. Although there are two program components, college success skills and content courses in reading, writing, and mathematics, the SBP is considered as one variable since all students attended college success skills and at least one content course as part of the treatment.

The dependent variable for the study was the student’s TSIA results. For this study, the archived score reports from the treatment and control groups tested during the summers of 2014 and 2015 and enrolling at University Southeast that fall were analyzed.

Definitions

Developmental education or remedial courses: Non-college credit-bearing courses required for students not testing at the college-level during the assessment and placement process; designed to increase skill level (Hodara & Jaggars, 2014).

Retention/Retention rate: The percentage of students registering from semester to the next until graduation (Cabrera, Miner, & Milem, 2013).

Summer Bridge Program at University Southeast: A three-week intervention for incoming FTIC students who have placed into developmental math, reading, or writing

on the TSIA. Participants receive interventions with the goal of testing at the college level at the conclusion of the program.

Texas Success Initiative Assessment (TSIA): Dependent Variable. A placement assessment created by College Board to measure college readiness through three multiple-choice tests (mathematics, reading, and writing) and a written essay. This assessment is used within in the state of Texas replacing the Asset, Accuplacer, Compass, and the Texas Higher Education Assessment (THEA) (Texas Higher Education Coordinating Board, 2014).

Assumptions

In this study, the following five assumptions were made:

1. Students put forth their best effort in the program and on the TSIA.
2. Staff instructing the SBP courses understood that the goal of the program was to prepare students to retest on the TSIA.
3. All initial TSIA's took place in an approved testing facility, and proctors ensured academic integrity in the administration of the tests and handling of the score reports.
4. Students in the control group will not have participated in any other type of intervention program prior to retesting.
5. All archived data collected from University Southeast was accurate and no scores were missing.

Scope and Delimitations

All incoming FTIC students with TSIA scores in the developmental range were invited to participate in the three-week program. The SBP comprised mathematics, reading, and writing content courses, taught by current university instructors. For the college success skills course, which was taken by all SBP participants, university personnel and students served as instructors. Course curriculums developed by university faculty were designed to increase skill levels in the reading, writing, and mathematics. The college success course was designed to improve students' study skills, note-taking abilities, test-taking abilities, and to increase their understanding of university policies and resources.

Although University Southeast implemented the SBP in 2013, the Compass was taken by FTIC students that first year. Any students not completing the entire program were not included in the sample, nor were any scores that did not fall within the developmental score range. Adult basic education scores (the level below developmental education) were eliminated because three weeks may not be enough time to address their deficiencies in mathematics, reading, and writing.

Limitations

The study was subject to three limitations. First, because students were not obligated to participate in the SBP, the sample size of the treatment group made it impossible to conduct random sampling. Second, to increase students' interest in the SBP, they received the program materials, a "College Success Kit," and between \$295 and \$352 for completing the program; but there was no way to discern whether students

participated for financial or educational reasons. Another weakness of this study was the lack of articles and data on the reliability and validity of the TSIA as a placement tool. The final weakness was the assumption that students in the control group would not have been exposed to any types of interventions to help them before retesting on the TSIA; students from the control group could have used the free resources available online.

Significance

The results of this study are significant for academic advisors, college deans, and academic affairs administrators seeking alternatives to enrolling underprepared students into 16-week developmental education courses. While a student may graduate from high school and gain full admission to an institution, they may not test at a level demonstrating they are ready for college level academic coursework. Colleges cannot turn admitted students away based on TSIA scores, so there must be systems in place to assist these students in gaining the necessary skills to be successful as freshmen. This study will show if SBPs are one way of adequately addressing this need. Based on results of the study, implications and recommendations can be made that may be used to support the development of policies impacting students needing remediation upon college acceptance.

This study may underscore how critical it is that developmental education options be explored for each student [in need of remediation], knowing that those who require it are less likely to graduate. The goal of educators, administrators, and policymakers should be to eliminate the need for developmental education. Until that happens, studies

such as this are necessary to help determine if a particular SBP can help students graduate from college.

Summary

This chapter introduced the concept of SBPs and institutions implement their use to remediate students and introduce them to the college culture. Due to the mixed results on the effectiveness of SBPs and the lack of information on programming for students taking the TSIA, there is a need for further investigation. The purpose of this quantitative study was to examine the difference in TSIA score gains between FTIC students with developmental level test scores that attended a three-week SBP and those who did not. Tinto's longitudinal model of student departure guided the study examining how a university-provided support may be used to increase a student's skills before the start of college. The four research for this study focus on math, reading, writing, and essay gain scores between pre- and post-tests on the TSIA for students who participated in the SBP and a control group not participating and taking the TSIA a second time. It is hypothesized that students receiving the SBP treatment will have gain scores that are statistically significant when compared to the students not attending the SBP. The study is relevant from a social change perspective, that is, when looking at the number of students who need remediation when granted admission to college. The goal of this study was to produce data that administrators could use to justify SBPs for students who placed at the developmental level on the TSIA.

In the following chapter, Tinto's writings on student retention are discussed in detail along with the provision of examples of the theory's application in SPBs. Also

included is an explanation of how the theory, and its assumptions, supported the research.

A literature review expanding on SBPs, assessments and placement, developmental education, and college success skills provide deeper insight into the need for the study.

By the end of Chapter 2, the reader will understand how the selected theory and current literature related to the research questions, the need for, and relevance of the proposed study.

Chapter 2: Literature Review

Introduction

In 2012, 23% of colleges and universities in the United States implemented SBPs as a means of remediating students placed in developmental education courses (Adams, 2012). However, there is a lack of data on the effect of SBP attendance on TSIA scores received after receiving treatment. A majority of the current data on SBP participation focused on GPA, first-semester coursework, and student retention. Existing data is discrepant when looking at the effect of SBP participation on first-semester coursework and student retention: both favorable and disadvantageous results are shown (Adams, 2012; Johnson-Weeks & Superville, 2014; Barnett et al., 2012; Kallison & Stader, 2012).

The purpose of this study was to determine if there is any difference between posttest TSIA scores of FTIC students placing into developmental courses and participating in an SBP and scores of students who took the TSIA more than once without attending the SBP.

The three areas addressed in the research, and therefore explored as part of the literature review, were placement exams, developmental education, and college success skills. Studying these areas helped explain the problem that generated the research questions. The literature review covers the following topics: the need for a research study on SBPs, assessments, and academic performance; how Tinto's theory of student retention formed the theoretical foundation of this study; the results of studies on SBPs, assessments, placement exams, developmental education, and college success skills.

Literature Search Strategy

Thoreau and Google Scholar, through the Walden University and University of Houston-Downtown libraries, were used for the literature review. The following search terms were used: *summer bridge programs, freshmen retention, college placement exams, assessment and placement, college success skills, Vincent Tinto, student retention, and developmental education*. Peer-reviewed journal articles and dissertations published between 2010 and 2015 were examined. Works associated with students attending public, four-year universities were explored to address the issues of assessment, placement, and developmental education.

Theoretical Foundation

Tinto's works on dropout in higher education, student retention, and institutional action are based on two theories: (a) Tinto used Durkheim's 1961 theory of suicide to theorize about students dropping out in higher education; if students feel disconnected from university society, or fail integrate themselves and develop affiliations, they will be more likely to break ties from the college (Tinto & Cullen, 1973, p. 37); (b) Tinto used the theory of cost-benefit analysis to theorize that students may withdraw when they perceive alternative uses of their time or energy outweighing the benefits of college (Tinto & Cullen, 1973, p. 39).

In developing a departure model, Tinto and Cullen (1973) described dropping out of college as a process based on the interactions between the student and the institution (p. 41). Tinto's 1987/1993 longitudinal model of departure examined how the combination of pre-entry attributes, goals, commitments, institutional experiences and

integration into the university influenced a student's decision to drop out (Tinto, 1987/1993, p. 112). As previously noted, retention programs with the best results are those that integrate students both academically and socially, while having a university-wide commitment to retention from both student affairs professionals and university faculty (Tinto, 1987). In this study, the skill and ability of FTIC students are explored along with the use of SBPs as a means to increase retention.

Through a series of empirical studies, Ryan and Glenn (2002) sought to make data-based decisions allowing for better allocation of resources for first-year retention programs. Tinto's longitudinal model of student departure was the guiding framework, and based on the results, the researchers concluded the institution should increase the focus on academic competencies and their influence on a student's decision to depart. Based on the results, Ryan and Glenn (2002) noted the need for programs to assist students in developing the knowledge and skills necessary to meet the demands of college existed not only for students conditionally admitted but for those granted full admission as well. After creating and implementing the Academic Development Program, an SBP for conditionally admitted students, the institution saw an increase in retention of this group of 29-46%. However, the results were statistically insignificant which led to the addition of a Supplemental Instruction (SI) program embedded into the fall classes (p. 313). Adding SI resulted in a significant increase in student retention, from the baseline five-year average of 29-60%, demonstrating the need for long-term programming to improve academic competencies rather than a one-time experience (p. 314). This study creates a gap which the proposed research seeks to fill with the research

question asking if participation in an SBP has an immediate impact on students' assessment performance.

Davig and Spain (2003) used Tinto's model of persistence to evaluate summer orientation programming and found that topics on university integration and developing social networks were most important influencing retention. Researchers concluded that exposure to study skills had a statistically significant impact on re-enrollment, ranking second to financial issues (p. 311). After surveying a sample of 189 students who re-enrolled after the first semester, and 26 who did not, researchers found that students who did not re-enroll were more likely to cite the importance of study skills programming in an orientation program as a factor influencing readiness (pp. 309-310). Student feedback on the value of a study skills component provided a foundation for my study which explored whether a program incorporating study skills impacts student's assessment scores when compared to a group not exposed to this skillset before to retesting.

Tinto's work on student departure has been widely used in research on SBPs and persistence, as well as in looking at how incoming factors impact retention (Davig & Spain, 2003; Ryan & Glenn, 2002; Stewart, Doo Hun, & JoHyun, 2005). The reputability of Tinto's work, along with its focus on factors influencing student departure, makes this an appropriate theory for the study. The assumption of Tinto's (1987/1993) model, reasoning that a student's skills and abilities impact their progression through college, related directly to the proposed study which evaluated an SBP designed to improve student's skills in reading, writing, and math before to the start of the academic year. This study used Tinto's model of longitudinal departure as a foundation to determine if SBPs

are an effective method of increasing students incoming skillset by comparing the difference in TSIA score gains between FTIC students with developmental level test scores that attended a three-week SBP and those who do not.

Literature Review

Summer Bridge Programs

College Readiness and Skill Development. Methods used by SBPs seeking to increase college readiness include introducing students to the rigor of the college classroom and connecting students with departmental offices and individuals to build relationships across campus (Strayhorn, 2011). Strayhorn (2011) studied longitudinal data gathered from a previously federally funded study to measure the effects of SBP participation on students' academic self-efficacy, sense of belonging, academic skills, and social skills. He further went on to measure the relationship between those four factors, high school academic performance, and background characteristics on first semester grades. Strayhorn used a multilayered theoretical approach, based on four assumptions found in Perna and Thomas (2008), which stated multiple theories are necessary to understand the myriad, complex factors impacting first-year retention and success which are, first, influenced by background (p. 146). Fifty-five incoming freshmen at a highly selective, predominately white institution (PWI) enrolled in a five-week SBP were surveyed three times: before the start of the program, at the conclusion, and at the end of the first semester. The Summer Institute Survey created for the purpose of the study was used to measure student responses (p. 148). While paired sample *t* test analysis indicated increases in all four areas (academic self-efficacy, sense of belonging, academic

skills, and social skills), statistically significant gains were only seen in academic self-efficacy and academic skills. Linear regression analysis resulted in a positive correlation between first semester GPA and self-efficacy, sense of belonging, academic skills, social skills, high school performance, and background traits. Strayhorn (2011) concluded by noting that while SBPs may have a positive impact on students' first-semester achievement, it is necessary to acknowledge the importance of past performance as an indicator of future behavior (p. 153).

In conjunction with the goal of having all students enter college with adequate competencies enabling them to succeed academically, SBPs can also be used to increase students' knowledge in a subject as a means of preparing them for their academic major (Raines, 2012). In response to data showing low completion rates amongst STEM (science, technology, engineering, and mathematics) majors starting below the college ready threshold, Raines (2012) conducted a longitudinal study to answer questions about the effectiveness of SBPs in assisting students with mathematics deficiencies. The program studied was designed to increase student's preparedness for pre-calculus via instruction, peer tutoring, and individualized learning plans. Thirty-five students participated in the 10-day program, and My Math Test was given on the first and last days of the program to track growth. ACT scores and pre-calculus grades were also analyzed to determine what correlation, if any, existed between program participation, scores, and grades. Results found that program participants increased their pre-to-posttest scores and that those with higher posttest scores demonstrated stronger performance in college pre-calculus (Raines, 2012, p. 27). The two setbacks of the study noted by the

author are the short length (one semester) and lack of a control group for comparison. This lack of a control group points to a need for further studies to determine if gains resulted from program participation or chance alone.

The 2007 Texas SBP Project was created to determine the impact of summer interventions on college readiness measured by students' performance on either the Compass, ACCUPLACER, Asset, or THEA (Kallison & Stader, 2012). The 782 participants were in the 11th and 12th grades and scored above the necessary threshold for graduation on the TAKS (Texas Assessment of Knowledge & Skills) exam but below the college readiness standards set by the State of Texas. Seven community colleges and seven public institutions partnered with local high schools to host the programs which averaged four weeks in length. Significant gains in reading and writing were seen at one community college and one public university. Each institution reporting significant gains used different approaches to the curriculum; one group of students completed a developmental course as part of the program, and the other focused on exam preparation. Due to the variations in each of the programs, it was challenging for the researchers to ascertain which components correlate to the gains pointing to a need for further studies on SPBs and their correlation to college readiness and placement exams (Kallison & Stader, 2012).

Bir and Myrick (2015) sought to look at the impact of an SBP created for African-American students by examining at the Creating Higher Expectations for Educational Readiness (CHEER) program at a Historically Black College and University (HBCU). As with the previously discussed studies, the goal was to compare CHEER participants to

their peers who did not enroll in the SBP. After analyzing data for 402 CHEER students to 1489 non-CHEER students, data analysis found students participating in the CHEER program were found to have higher GPAs, retention and graduation rates than their counterparts. While this study looks solely at African-American students, the results show SBPs may be beneficial for students of color while pointing to the need for further research into program benefits for this population.

Citing the inconsistency in the results of previous studies, Johnson-Weeks and Superville (2014) sought to answer four research questions relating to participation in the Summer Academy Program, an SBP at a Texas HBCU. The questions sought out statistically significant differences in college GPA, mathematics, and English scores, and background factors between the SBP and non-participants (pp. 2-3). The guiding conceptual frameworks focused on student transitions and developmental education. The most notable is Karp and Hughes' 2008 conceptual model for credit-based transitional programs because of its hypothesis that participation in a well-crafted program equates to matriculation. A control group and treatment group of $n = 202$ with data analysis including frequency tables, descriptive statistics, F tests for homogeneity of variances, two-population t tests, multiple regression, and analysis of variance (ANOVA) for regression (Johnson-Weeks & Superville, 2014, p. 6). Results revealed the only area of significant difference was when looking at students' background factors and past academic performance in high school between the control and treatment groups. There were no statistical differences between GPA, Mathematics (Algebra), or English grades for those who participated in the program and those who do not. The lack of significant

differences between the two groups points to the need for further research into SBPs to justify their existence.

Credit Attainment. In the summer of 2009, eight colleges in the State of Texas participated in hosting SBPs aimed at students placing in developmental reading, writing, and mathematics courses based on assessment scores (Barnett et al., 2012; Wathington et al., 2011). The programs ranged in length from four to six weeks, with students attending between three to six hours each day for four or five days a week with an opportunity to earn a \$400 stipend at the time of completion. After being recruited and meeting program qualifications, participants were randomly assigned to either the treatment or control group. The control group did not participate in the developmental SBP. However, members were provided information on all available campus support services. The goal of the developmental SBP experiment was to decrease the number of students needing developmental education courses upon college enrollment, as well as increasing retention rates among this population. Along with receiving instruction in the subject areas of reading, writing, and mathematics, students also took part in college success courses or workshops providing them with the soft skills needed to transition into college (Wathington, Pretlow, & Barnett, 2016). Presented below are the results of three follow-up studies.

Wathington, Pretlow, and Mitchell (2011) sought to answer questions about the design and implementation of SBPs as well as early effects on the following student outcomes: college course enrollment, attempted and earned credits, and college persistence. The mixed-methods study used *t* tests and chi-square tests to compare

outcomes between the two groups, observations, and focus groups comprised of students and faculty, to answer questions regarding the day-to-day programming. Results found that there was no significant difference in the number of credit hours attempted between the experimental and control groups; however, there was a difference in the types of credits students enrolled into (i.e., developmental versus college-level coursework). Program participants enrolled in an average of 6.1 college-level and 2.9 developmental credit hours while students in the control group enrolled in 5.4 college-level and 3.5 credit developmental credit hours.

Program participants agreed to be tracked for a total of two years, and in 2012 the National Center for Postsecondary Research released a report on students' persistence, credit attainment, and progression through their prescribed developmental sequence (Barnett et al., 2012, p. 2). The goal of the study was to determine if program participation resulted in a significant difference in the previously stated outcomes between the experimental and control groups. Initial results were significant for the developmental SBP with the differences seemingly tapering off over each semester. As previously reported, there were no significant differences in the number of credit hours attempted between the experimental and control groups, nor in the persistence between the two groups after the two-year follow-up. The main area of impact was seen in the completion of college-level mathematics and writing with program participants passing at a higher rate than students in the control group; however, at the time of follow-up (two years), there were no statistically significant differences in performance between the two groups (p. iii).

Wathington, Pretlow, and Barnett (2016) conducted another follow-up study on the impact of the 2009 SBP project on participant's persistence, credit accumulation, and college-level course completion (p. 154). After gathering transcript data from the college sites, the THECB, and the National Student Clearinghouse, researchers looked for differences between the treatment and control groups. Results showed program participation did not have a significant impact on persistence over the two-year follow-up period nor were there any differences in credits attempted or accumulated between the two groups. The only area of course completion showing significant differences between treatment and control groups was college mathematics. Researchers conclude that SBPs can improve outcomes for students placing into developmental education but note that overall program predictions may have been "too ambitious" (p. 172).

Retention and Graduation. Since 1969 the University of Arizona has served over 13,000 students via their six-week, residential, New Start Summer Program (NSSP). While this program is open to all incoming freshmen, most participants are first-generation, low-income, and minority students (Cabrera, Miner, & Milem, 2013). The theoretical framework for the study is based on the concept of constraint and opportunity which are "interrelated concepts that describe a student's structure of opportunity or lack thereof" (p. 484) as written in O'Connor's 2002 article on factors impacting college completion for Black women. The challenge and cause for this research study were the lack of longitudinal data comparing program participants to those opting not to enroll in NSSP documenting program effectiveness. Two research questions guided the study and focused on first-year retention and GPA for NSSP participants compared to those

choosing not to enroll in the program. When looking at background characteristics for both groups, results indicated that high school GPA was the greatest predictor of how a student would perform in college, not program participation.

Murphy et al., (2010) found that at predominately white institutions SBPs could be a vital factor in increasing underrepresented minority graduation rates. Since 1981, Georgia Tech has offered the Challenge Program for incoming freshmen. The program's initial purpose was remediation before the start of classes; however, in 1990 the focus shifted to support and integration into the campus community. Tinto's 1975 article on student retention as a means of moving students to graduation, served as the theoretical foundation for this SBP and study. During the five-week program, students took non-credit courses in calculus, chemistry, computer sciences, and English composition with expectations like those they will face in the college classroom including punctuality and assignment completion. Students were linked with upperclassmen who served as "challenge coaches" (p.74) to provide support and guidance not only during the program but throughout the first year of college. To determine the program's impact on graduation, after controlling for demographic and academic characteristics, researchers tracked student matriculating between 1990 and 2000 until the year 2005, comparing graduation rates to eligible, but non-participating, students. Data analysis indicated that income, race, and high school performance positively correlated to graduation, but that program participants were more likely to graduate than those choosing not to access the Challenge Program. Researchers concluded that the pre-college investment in underrepresented minority students could produce positive results.

Evaluation of Summer Bridge Programs. After conducting an in-depth study of previously offered SBPs, Sablan (2013) highlighted the need for stronger evaluations of program effectiveness. Despite finding adequate data on the immediate impact of SBP as seen through posttest assessment scores, first-semester credit attainment, and first-year retention, findings were mixed as the studies employed a variety research questions exploring GPA, credit attainment, and retention, methods, and lengths. Sablan (2013) found a need for more longitudinal studies, a need for more studies with participants assigned to experiment and control groups, and more comparative studies to determine the actual impact of summer programs on student success.

The definition of success within SBPs can vary the between the students attending the program and the faculty and staff working to facilitate the program (McCurrie, 2010). To define what success looks like in an SBP, McCurrie (2010) conducted a qualitative study interviewing students enrolled in an SBP, the writing instructors teaching these individuals, and the student affairs professionals charged with program development. Writing instructors felt success was based on students becoming engaged with the college experience from a holistic standpoint, with students gaining the capability to use multiple strategies to read and comprehend texts, as well as developing the ability to write substantial papers. Student affairs professionals' views of success centered on Tinto's 1997 findings on academic and social integration a means of increasing retention through the development of a sense of connectedness. Success for the student affairs staff also focused on students becoming academically ready for college and decreasing the number of students needing to enroll in developmental education courses. The interviewed

writing instructors indicated a necessary element for increasing student's levels of college readiness is a curriculum that engages the students and connects their lives with the educational practices of formulating ideas and developing them for the postsecondary context (McCurrie, 2010). For students, success was more than retention and graduation; it was "happiness and satisfaction" (p. 45) which came from knowledge attained, the development of critical thinking skills, and stronger self-efficacy as a college student.

Garcia and Paz (2009) studied four SBPs to see how the various programs were structured and how administrators determined whether these programs were successful in meeting the intended objectives. The researchers looked at the work of Stufflebeam and Gardner to frame the study. Stufflebeam's work looks at the congruence between performance and objectives, while Gardner calls for a comprehensive assessment framework which defines goals and objectives, data collection tools and techniques, and comparative analysis based on pre-established standards. Results showed only one of the four institutions practiced proper evaluation when measured against the theoretical frameworks using focus groups, ongoing data collection, and collecting data both of students' academic performance and social involvement to provide a holistic view of the factors affecting students after program participation (Garcia & Paz, 2009). This finding indicates that there is a need for more institutions to be more strategic in program evaluation to justify their continued existence.

Assessments & Placement Exams

In a two-part study, researchers administered a 40 question, college mathematics placement test to 1572 Arkansas high school seniors (Madison et al., 2015). College

mathematics performance of 319 of those participants was then tracked to determine how their current high school placement related to performance, how the placement scores correlated to ACT scores, and how the placement scores related to performance after college enrollment (Madison et al., p. 132). Results indicated a majority of the students were not college-ready based on assessment scores, and that an ACT score of 22 was equivalent to being college ready. Most notable are the results of the 319 students, which showed a positive correlation between performance on the Algebra placement exam and performance in college Algebra. The researchers also noted that looking at ACT and placement exam scores together is a stronger predictor than looking at one score alone. To understand how students are assessed and placed into developmental mathematics at the community college, Melguizo, Kosiewicz, Prather, and Bos (2014) conducted a mixed-methods case study. Researchers gathered data from websites, placement criteria documents, evaluation of student transcripts, and interviews with faculty and administrators at nine campuses in the Los Angeles Community College District. The four research questions looked at placement policies, processes, and outcomes. Quantitative analysis found the longer the sequence of developmental education courses a student required, the less likely they were to enroll. Forty-five percent of students placed five levels below transfer-level mathematics never registered compared to 18% for those only one-level below (Melguizo et al., p. 714). One issue found with the use of multiple assessments (across the nine campuses) was that students could potentially receive different results and thus different placement outcomes. To address the lack of

uniformity, the State of California implemented a state-wide testing system to determine college readiness in mathematics and English.

Denny, Nelson, Zhao (2012) conducted a study of a newly- created mathematics placement policy at Mercer University. The practice placed students based on a combination of SAT score and high school GPA via a formula called the Mathematics Index, also known as a student's MDIX (pp. 178-179). The new policy was developed to address the concern related to how students were placed into developmental intermediate algebra, developmental pre-calculus, and college-level calculus. The study compared the intermediate algebra, pre-calculus, and calculus grades of students placed solely on SATM scores during 1997-2002 to those registered into college mathematics under the new MDIX during the years of 2003-2009. Statistics revealed a significant increase in pass rates and decrease number of withdrawals among students placed using their MDIX score compared to those students placed based on SATM scores alone. African-American students displayed the most significant gains in pass rates, increasing from 62.9% to 78.4% in pre-calculus (Denny et al., p. 182). Results of the study added to the body of research demonstrating why mathematics placement should consider past performance as a predictor of future success rather than relying on test scores alone.

Medhanie, Dupuis, LeBeau, Harwell, and Post (2012) conducted a study examining to what extent, if any, the ACCUPLACER predicts student enrollment and performance in college mathematics beyond ACT scores. The purpose of the research was to add to the body of existing knowledge on the validity of the ACT and ACCUPLACER in placing students in college algebra. ACCUPLACER college-level

mathematics scores, ACT mathematics scores, which college-level mathematics students completed, and the final grades received were collected from transcripts on 1,305 students from 20 institutions in Minnesota (Medhanie et al., p. 339). When looking for statistically significant linear relationships, it was found that ACT scores were a significant predictor of future performance while ACCUPLACER college-level mathematics scores were not. These results add to the debate on the effectiveness and reliability of the ACCUPLACER in placing students into mathematics upon college enrollment.

To capture instructor perceptions of why students are required to enroll into and do not complete, developmental mathematics at the college-level Zientek, Schneider, and Onwuegbuzie (2014) surveyed 89 faculty members and found 17 underlying themes that appear to hinder student success (p. 67). The purpose of their study was to address the lack of data available on faculty perceptions; this was done using two open-ended questions. Participants responded as to why they feel students place into developmental education courses and what prevents them from being successful (p. 70). The foundation for the research were previous writings on situational and dispositional factors that hinder student success. Emerging themes hindering student success were classified as situational factors, dispositional factors, academic behaviors and work habits, and other. Situational factors were described as life circumstances and the dispositional factors as mathematics anxiety and self-efficacy (Zientek, Schneider, & Onwuegbuzie, 2014, p. 69). The seventeen underlying themes were: family or work responsibilities, motivation, confidence, anxiety, attitude towards persistence, attitude in general, attitude related to

interest in college, not being prepared, willingness to seek help, taking responsibility for one's education, study skills, performance expectations, time management, education background, and college instructor.

Orange and Ramalho (2013) looked at alternative measures of college readiness for Hispanic and African-American students with their hypothesis that students with low self-efficacy would use fewer self-regulatory behaviors than students with high self-efficacy (p. 59). They based this hypothesis on previous research in self-regulation and previous findings that African-Americans and Hispanics tended to demonstrate lower levels of self-efficacy. Bandura (1997) defined self-efficacy as "one's belief about how well he or she can successfully complete a task" (p. 3). Self-regulatory behavior is defined as "a student's willingness and ability to effectively manage or direct their learning" (p. 56). The study used 63 student's results on the Learning and Study Strategies Inventory (LASSI) and the Self-Regulation Inventory for High School (SRI-HS) and analyzed scores using the Kruskal-Wallis non-parametric statistical procedure. Results showed that African-American and Hispanic students with lower self-efficacy demonstrated lower self-regulatory scores thus exhibiting a need for developmental education. Researchers drew the conclusion that self-efficacy and self-regulatory behaviors can be useful in predicting which students will acknowledge their need for, and seek out, assistance versus those who will not. The article lacked longitudinal data as it did not track the students into their first year of college.

Venezia, Bracco, and Nodine (2010) conducted 28 focus groups with 257 students and 12 college counselors at five California community college campuses in the Bay

Area, Central California, and Southern California. The goal of this study was to gain insight into student views of preparedness for college, information provided in high school on college placement exams, and attitudes towards being placed in a developmental course (Venezia et al.). Results of surveys on student perceptions of the assessment and placement process were classified into four categories: preparation for the community college coursework and placement assessment, lack of information about the process, issues with counseling/academic advising, and post-assessment interpretation confusion resulting from miscommunication among peers and inconsistency between campuses. Notable recommendations made from the study were the need for collaboration among sites regarding the development of testing cut-scores and timely communication to students required to test on the content and use of the assessments.

Goeller (2013) surveyed 82 traditional and non-traditional students to gain insight into their perception of the developmental mathematics placement process. Three themes emerged from the mixed methods study: the need for better communication, the need to encourage students to take responsibility for their choices and learning, and students' desire to be heard (Goeller, 2013, p. 29). The four research questions were based on Tinto's 1987 publication on the interactionist model of student retention. Goeller (2013) related emerging themes on the lack of communication about the requirement to take a placement exam and ways in which the content thereof ties to the interactionist model in that the university properly communicating testing policies to students could, potentially, increase their retention. The evolving theme regarding a lack of communication resulted from a mere 25% of respondents stating they knew they would

be required to take a mathematics placement exam. Data analysis of student responses regarding their resulting course registration following the examination found that 72% of the surveyed students felt they were placed into the correct mathematics course; however, they also felt they could have completed the course at an accelerated rate (2013, p. 28).

In response to students facing a “vague moving target” (THECB, 2014) about what college readiness looks like in the State of Texas due to the use of varying college placement exams, the state developed the Texas Success Initiative Assessment. This placement exam was designed to be a stronger indicator of skill level than the four previously accepted assessments (ACCUPLACER, COMPASS, Texas Higher Education Assessment, and Asset) due to the addition of the several components including a pre-assessment was added to give students an understanding of the exam. Diagnostic results allow students and advisors to view what areas of each subject need attention. Implementation of the new policy requires TSIA scores be evaluated along with one, or more, of four additional measurements before registering students for a holistic advising approach. These factors are high school GPA and class ranking, previous academic coursework, non-cognitive factors (i.e., self-efficacy, attitude, time management, etc.), and family-life issues (p. 33). Before sitting for the TSIA, all students must complete the TSI Pre-Assessment Activity (PAA) which allows students to gain an understanding of the test, how results will be used and assessment content.

Developmental Education

To gain insight into the outcomes of retention, completion rates, and GPA differences between students in developmental and college-level courses at a community

college a two-year study was conducted with data on 7,898 students from three sites across three states (Bremer et al., 2013, p. 154). Two research questions guided the study and data analysis used both regression and logistic regressions. Researchers sought to determine the impact of enrollment into developmental reading, writing, and mathematics on FTIC freshmen. Findings showed financial aid plays a substantial role in retention and that students receiving grants and loans were more likely to be retained than those that do not (2013, p. 172). Those students utilizing the assistance of tutoring services were found to have higher rates of retention and higher GPAs. When looking at overall performance, results indicated that the higher the student's mathematics level, the more likely they were to be successful academically. As found in previous studies, those enrolling in developmental courses were less likely to graduate over a two-year period because they do not earn credits for the developmental sequence, extending the time necessary for program completion.

To add to the knowledge available on how students perceive their placement and experience with developmental education courses, Koch, Slate, and Moore conducted a phenomenological study with three students enrolled in a community college developmental sequence. The theoretical framework guiding this study was Bandura's 1993 publication on self-efficacy and its association to how students "feel, think, motivate themselves, and behave" (Koch, Slate, & Moore, 2012, p. 68). The researchers drew a parallel between Bandura's self-efficacy theory and developmental education and argued that placement and performance correlated with a student's self-perception, motivation, and attitude. Participant's interview responses were assessed through the use

of constant comparison analysis and classical content analysis. Five major themes and two subthemes emerged relating to student views on their placement: affective perception, academic perception, resources, perceived benefit, and behavior with the subthemes of student and teacher (p. 72). Overall, students were initially unhappy with the placement into developmental courses, feeling that their high school credentials should suffice; however, as students progressed in the classes, views shifted and became more favorable as they understood why they were in the course and began comprehending material they had not in previous attempts at the subject. Together, these themes supported the theoretical framework that the more confident a student feels about their abilities, and with proper supports, they do not see developmental education as an issue or something they cannot accomplish, but rather a stepping stone to reaching college-level coursework.

The State of Texas implemented several Developmental Educational Demonstration Projects (DEDPs) with the goal of increasing the success rates of students required to take developmental education courses upon enrollment (Booth et al., 2014). Researchers conducted a two-year, mixed methods study of 120 students and 186 community college faculty/staff, along with 50 students, and 48 faculty/staff from four-year universities. Four themes emerged associated with increased rates of success: curriculum design and instruction, faculty and staff support, structures supporting learning, and policy issues. Data analysis found growth in success rates of historically underprepared students at five of the nine participating sites when comparing the first year of implementation to the second year of the DEDPs implementation (p. 4).

Curriculum design and instructional strategies included accelerated curriculums to reduce the amount of time to completion and alternative learning strategies. Faculty and staff support included putting faculty in place that specializes in developmental education and providing professional development throughout the semester for instructors. Structures supporting student learning included a holistic approach to skill building, placing students in learning communities, and monitoring student academic behaviors (not completing assignments, attendance issues, etc.) through early warning systems. Also, some sites implemented the use of SBPs to give students early access to the campus including remediation and assessment preparation.

Accelerated Developmental Education Programs. Jaggars, Hondara, Cho, and Xu (2015) conducted research across three accelerated developmental education programs to look for statistical differences in both short and long term successes among students with varying levels of preparedness. The “Fast Start” program at the Community College of Denver restructured the institution’s three developmental mathematics courses to shorten the sequence to two semesters (pp. 7-8). Chabot Community College in California offered students placed into developmental English the option of taking the courses in a combined accelerated format (p. 9). Students placed into developmental English at the Community College of Baltimore College were given the option of enrolling directly into the college-level course provided they co-enroll in an Accelerated Learning Program (ALP) course; the ALP curriculum was designed to reinforce and supplement the lessons from the college-level English class (pp. 9-10). A control group of students who also tested at the developmental level but did not enroll in an accelerated

option was created at each campus for assessment purposes. Linear regression and logistic regression were used to measure credit accrual and course performance over a three-year period for students in the three programs with an overall finding that students in the accelerated programs attained more credits and completed gatekeeper courses at a higher rate than students in the control groups. Implications for practice include the recommendation for more institutions to implement accelerated developmental education programs for students to move them out of the developmental courses and into courses that will earn them college-level credits at a faster rate. This acceleration was recommended because these types of programs allow students to move out of the developmental sequence sooner potentially leading to the attainment of more college-level credits.

Many institutions are unable to implement the Accelerated Learning Program (ALP) model due to the cost association, making acceleration in the form of shorter sequences a more attractive option (Hondara & Jaggars, 2014). In a study with students placed into the lowest level of developmental education, Hondara and Jaggars (2014) sought to provide data on the accelerated model's ability to increase the number of students accessing college-level courses and course performance upon enrolling in college-level mathematics and English. The researchers also explored the long-term impact of completing an accelerated developmental education sequence on credit and degree attainment. Data was gathered from City University New York (CUNY) community colleges on students enrolling in developmental English between Fall 2001 and Fall 2007 and those in developmental mathematics during Fall 2004 and Fall 2007.

Data was collected for enrolling cohort for a minimum of three years; students enrolling Fall 2001 to 2005 were tracked for five years to determine the effect on Associate and Bachelor degree attainment. Data analysis found that students having enrolled in the accelerated writing option were 9.7 percentage points more likely to enroll in college-level English with the percentage being statistically significant at the 1% level. Statistical significance was seen in mathematics as well with students being 3.5 percentage points more likely to enroll in college mathematics than control group participants and three percentage points more likely to pass (p. 265). Despite the higher enrollment rates in college English, there was a statistically significant difference in pass rates between the students in the accelerated option and those not with students from the accelerated model being 2.5 percentage points less likely to pass (p. 267). These results indicate that increased enrollment in college-level English courses does not necessarily equate to increased pass rates.

Seeking to add to the body of literature on the outcome effects of developmental education, Bahr (2010) conducted a study on the impact of the depth (degree of deficiency) and breadth (number of areas deficient in) of a student's needs and the impact of remediation (p. 179). There were four hypotheses related to the depth and breadth of a student's remediation. Bahr sought to determine if going through a developmental sequence places students at risk of not obtaining a two- or four-year degree. The study looked at students in English remediation only, students in mathematics remediation only, and then comparing both groups to those testing directly into college-level coursework in the same areas. After an analysis of 68,884 FTIC freshmen transcripts

from the California Community College System over a six-year period, initial results found that those students who were deficient in one area of study were more likely to have multiple developmental course placements (p. 182). There was a positive correlation between breadth and depth showing that the lower the level of a students' placement the more likely they were to place into the developmental range in more than one course. Regarding the hypotheses, results indicated there was no significant difference in degree attainment between students placing into developmental courses and those not, regardless of the length of the developmental sequence.

Rodgers, Posler, and Tribble (2011) used a quasi-experimental design for their research study on an optional Rapid Review course developed for students scoring four points below the score necessary to place into college mathematics. The Rapid Review course was a three-week, self-paced course held in an open lab format with an instructor available to answer any student questions. Students had the option of enrolling in the program with the goal of re-testing into college-level intermediate algebra upon completion. For those enrolling, the course began during the fourth week of classes allowing them to complete their developmental and college mathematics in one semester. Forty-six students that completed Rapid Review and intermediate algebra during Fall 2008 and were compared to 130 students enrolling directly into intermediate algebra during the same semester looking for statistical differences in completion with a C or better (p. 256). Intermediate algebra completion overall was also analyzed, comparing rates before and after program implementation. Results found that students completing intermediate algebra after enrolling in the three-week Rapid Review course had higher

pass rates that those placing directly into college algebra with 60.87% compared to 45.38% passing. (p. 256). Further analysis of all students with scores qualifying for Rapid Review showed that since the program's inception a higher percentage of students completed their developmental and college- level sequence.

College Success Skills

First-year seminars, also known as student success courses, and success coaches are two potential methods of increasing student retention studied by Gardner and Shelton (Allen & Lester, Jr., 2012). Using their research as a framework, a College Success Course, with a College Success Coach serving as a resource outside the classroom, was put in place at a community college in Georgia. The goal was connecting students with their academic program and increasing engagement as a means of addressing retention issues. The College Survival Skills course covered topics including, time management, note-taking, and study skills; the Success Coach was charged with meeting with students regarding academic goals and progress (p. 10). Using an eight- question pre-and posttest, Likert scale survey, 82 students responded to their knowledge of resources within their program and their understanding of how mathematics related to their major; increases were seen in all eight areas (pp. 10-11). Comparison of semester retention between students enrolled in College Survival Skills while taking developmental or college- level mathematics, and those who did not take the College Survival Skills course alongside their mathematics, found higher rates of retention for the students in the success skills course. A similar analysis of GPAs for students taking the institution's Mathematics 0098 found those in College Survival Skills with a 2.54 GPA ($n = 97$) and those not with a

2.49 ($n = 81$) (p. 12). One limitation of Allen and Lester's (2012) study was the lack of analysis to determine if the differences in retention and GPA favoring College Survival Skills students, was statistically significant or not.

To evaluate the impact of a one-unit orientation course on student's perceptions of preparedness, Ewing-Cooper, and Parker (2013) conducted pre- and posttest surveys of students enrolled in the course as part of their graduation requirements within the School of Family and Consumer Sciences at a four-year institution. The orientation course, designed by academic advisors and faculty, focused on course registration, communication skills, problem-solving, and campus resources, etc. (Ewing-Cooper & Parker, 2013, p. 3). A total of 132 enrolled students completed the pretest during the first week and posttest during the final week of the course which consisted of eight questions on a five-point Likert scale; t tests were used to determine the degree of significance (p. 3). A statistically significant increase occurred in the areas of participant's career knowledge as it related to the academic major, student's confidence in their resumes, confidence with professional communication, and knowledge of campus resources (p. 3). The researchers concluded the study by speaking to the need for further research that examines the impact of the orientation course on student retention and graduation.

Martinez, Kelsey, and Brown (2011) conducted a mixed-methods study of students enrolled in a college success course along with the six counselors who taught the course. Data collection included face-to-face interviews with instructors, results of students pre- and post-assessment on the college version of the Emotional Skills Assessment Process (ESAP), and final exam responses which asked open-ended

questions about student's perceptions of the course (p. 4). Findings indicated that both students and counselors found the course to be beneficial. Students found the areas of time management, note-taking, awareness of campus resources, career exploration, learning style, and goal-setting as being the most useful in assisting with developing college study skills (p. 5). When ESAP results for the experimental and control group were analyzed using one-way variance analysis ANOVA, there was not enough difference in mean scores for the findings to be classified as significant. However, there were compelling differences when looking at assertion among the two groups. Unfortunately, the researchers did not provide detail as to what that means in action (p. 6). It is important to note that 93.8% of the population for the study was Hispanic as the researchers have highlighted the growing need for interventions to increase retention and graduation rates for students of color (Martinez, et al.).

Wernersbach, Crowley, Bates, and Rosenthal (2014) conducted a research study on the relationship between a study skills course and academic self-efficacy. The study sought what differences, if any, existed in self-efficacy growth between an experimental group completing Strategies for Academic Success and those enrolled in General Psychology. The goal of the data analysis was to look at the ability of academic self-efficacy and GPA to serve as a predictor of retention (Wernersbach, et al., 2014, p. 15). The researchers cited Bandura's work on self-efficacy as a motivator that can impact student academic performance and retention (2014, p. 15) and used three assessments as measurements of self-efficacy. The total population for the study was 237 FTIC students, 111 enrolled in the Strategies for Academic Success course and 126 in General

Psychology. All participants completed the Motivated Strategies for Learning Questionnaire (MSLQ), College Self-Efficacy Inventory (CSEI), and the LASSI pre- and posttests (2014, pp. 15-16). At the start of the semester, students in the control group (taking general psychology) had higher levels of self-efficacy on the initial pretest; posttest results were statistically significant for growth for the underprepared student group moving them to levels of self-efficacy equal to, or above, the control group (2014, pp. 19-20). When using logistic regression to predict retention based on self-efficacy and GPA, there was no significant difference as retention levels were similar for both groups (2014, p. 20). One limitation of the study was that the experimental group was mainly non-traditional students addressing the need for more research on traditional-aged college students (Wernersbach et al., 2014, p. 23).

Looking for the relationship between life-skills, high school GPA, SAT score, and college academic achievement, Currie, Pisarik, Ginter, Glauser, Hayes, and Smit (2012) conducted a study with students at a four-public institution with the median age of the 133 participants being 19.4 (2012, p. 158). This quantitative study was based on Brooks (1984) taxonomy of four life-skills categories:

1. Interpersonal communication/human relations
2. Problem-solving/decision-making
3. Physical fitness/health maintenance
4. Identity development/purpose in life (Currie et al., 2012, pp. 157-158).

Participants completed the Life Skills Development Inventory-College Form, which measures levels of mastery of each of the four life-skills areas. To examine the

relationships between the four life-skill areas of high school GPA, SAT scores, and cumulative college GPA hierarchical multiple regression was used. Pearson product-moment correlation analysis was run to examine the relationship between each of the four life-skills areas and cumulative college GPA. Data analysis found scores on each of the four life-skills areas positively correlated with participants' cumulative GPA with life-skills accounting for a 9.4% variance in cumulative GPA (2012, p. 160). Physical fitness/health maintenance, SAT scores, and high school GPA were found to have a statistically significant impact on college academic performance while the other three life-skills areas were not found to have a significant impact. The researchers concluded that the impact physical fitness and health maintenance has on college GPA can be tied to how students handle stress and perform academically pointing to the benefit of college success courses aiding in the development of life-skills.

Summary

Current literature emphasized the importance of accuracy when placing students into developmental education courses due to the impact placement can have on retention and time to completion (Denny, Nelson, & Zhao, 2010; Medhanie, Dupuis, LeBeau, Harwell, 2012). Accelerating remediation is one method being used to decrease the amount of time it takes students to access college-level courses (Bahr, 2010; Jaggars et al., 2015). Another new trend is the use of college success courses and coaches to assist students in gaining additional skills to be successful in the college classroom (Allen & Lester, Jr., 2012). Research has also shown the need for evaluation of these programs to determine the most efficient options for remediating students as there are more students

needing assistance via SBPs and accelerated options than taking advantage of them, partly due to funding costs (Adams, 2012).

Results of the literature review found that the faster a student moves through his or her developmental sequence, the more likely they will be to obtain their degree (Bremer et al., 2013, p. 154). This movement can occur with the assistance of an SBP or through the acceleration of the developmental sequence; nonetheless, this progression hinges on assessment performance and accurate placement (Medhanie et al., 2012). As new assessments are being created and used to place students into developmental education courses, there is a need for evaluation of programs designed to assist students in score improvement. Due to the variation in results across studies on SBPs, the arguments for and against assessment and placement policies, the successes documented through accelerated programs, and the student benefits of exposure to college success skills, there is a need for further evaluation. The proposed study to determine if the SBP offered by University Southeast is the most efficient way of increasing performance on the TSIA.

In Chapter 3, details on the research study, the sample, the intervention SBP, and data collection and analysis are explained, as well as any existing threats to validity impacting the research.

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to compare TSIA scores between FTIC students with developmental level test scores who attended a three-week SBP and those who did not attend. In this chapter, the following topics are covered: the research design used to test the hypothesis and the rationale for its selection, the population, sample, instrumentation, how the variables were operationalized, and the selected SBP intervention; the data analysis plan, ethical considerations, and the threats to both external and internal validity.

Research Design and Rationale

Quantitative analysis using an independent sample, two-tailed, *t* test was used to compare gains between students TSIA scores in the treatment and control groups. The three-week SBP was the independent variable; the dependent variables were the TSIA scores. The TSIA was implemented for students who enrolled in Fall 2014; to answer the research question, the archived data from the Fall 2014 and 2015 FTIC students were analyzed.

Using a quantitative approach was consistent with the literature review which claimed that hard data was the best approach for investigating the relationship between the effect of SBPs and TSIA gain scores. Quantitative data may be used in higher education to optimize the allocation of resources, improve services, demonstrate effectiveness, and lower the cost of education—all of which align with the purpose of the study (Bichsel, 2012).

Any student who was required to take the TSIA during the college admissions process and who was placed in developmental education courses had the option of participating in the selected SBP or choosing to retest on their own. Two factors guided the decision to examine this SBP. The first factor was that it was the only option available to students who did not want to enroll in developmental education courses at University Southeast. The second factor was the need for research on the use of SBPs to increase students' performance on the recently implemented TSIA. Research exists on the use of SBPs and previously used assessments, but limited research exists on the new TSIA. In sum, a study on the overall effectiveness of an SBP on TSIA scores was conducted. These initial results could generate research studies that would take a more detailed look at the facets of the SBP.

Methodology

Population

The population of this study was 1,216 FTIC freshmen who enrolled at University Southeast and were required to take the TSIA for the Fall 2014 and Fall 2015 academic years. Any student required to take the TSIA could test at any state-approved testing center and submit their official score to the registrar so the scores can be attached to their student file. Students placing below the college level threshold had the option of enrolling in the 16-week developmental education course, participating in the SBP, or retaking the assessment. For students participating in the SBP, the test was administered a second time at the research site after the three-week summer session.

Sample

As archival data were used, the sample were all available data from FTIC students placing into developmental reading, writing, or mathematics on the TSIA and attempting to place into college level by taking the assessment a second time before the start of classes. Before testing, students took the state mandated TSI PAA, and were made aware of requirements, expectations, and purpose of the exam. Any student submitting developmental level TSIA scores to the Registrar was invited to participate in the SBP. Students opting to enroll in the three-week program became part of the treatment group and those choosing to test a second time without attending the university provided program classified into the control group. Before scores were analyzed, any student score falling below the TSIA Developmental Education and into the Adult Basic Education threshold in reading, math, writing, and essay were removed to ensure results, recommendations, and implications refer solely to students in the developmental education sequence. Also, any student not completing the program scores were removed from the listing of SBP participants by University Southeast.

Each time a FTIC student submits TSIA scores, by testing at University Southeast or via an official sealed transcript from another testing site, the Registrar updates the student's record. Institutional Review Board (IRB) approval from Walden University was first required to obtain archived student TSIA scores from University Southeast. Upon receiving approval 08-12-16-0309779 from Walden University to conduct the study, approval number 51-16 was granted from University Southeast's Committee for the Protection of Human Subjects (see Appendix B). Official reports, such as those needed

for this study, were provided by the University's Office of General Counsel after receipt of all IRB approval documentation. A written request for information was submitted to General Counsel seeking TSIA math, reading, writing, and Essay scores for all students required to sit for the test for enrollment for the Falls of 2014 and 2015 with identifiers for those participating in the SBP intervention without any student information included.

G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) was used to calculate the sample size, $N = 88$, for the treatment and control group for a total $N = 176$ for the study. Inputs used to determine the needed sample were a medium effect size of $d = .50$, $\alpha = 0.05$, and 80% power. There were more students available when looking at enrollment statistics; however, only students submitting two sets of scores were included in the study sample. The resulting total sample of archived FTIC TSIA scores for the study was math $N = 202$ for the treatment and control groups; $N = 215$ for reading, $N = 188$ for writing and for essay, $N = 164$ for both the control and treatment groups.

Table 2

Archived Data Study Sample

	Treatment	Control	Total sample
Math	57	145	202
Reading	46	169	215
Writing	47	141	188
Essay	50	114	164

Instrumentation and Operationalization

The TSIA measures college readiness in the areas of mathematics, reading, and writing and is used for college placement purposes for students who have not achieved

pre-determined SAT, ACT, or statewide testing scores as determined by the THECB (College Board, 2014). Questions on the TSIA align with the Texas College and Career Readiness Standards and are multiple-choice for mathematics, reading, and writing and written responses for the essay component. College Board created the TSIA after consultations with the THECB in 2012. The TSIA is offered at any approved testing location which includes high schools, community colleges, and four-year institutions and is administered in a testing center by trained proctors. Before the implementation of the TSIA, College Board worked to ensure the exam underwent a thorough fairness review and empirical analysis to ensure reliability and validity of results (College Board, 2014). College Board used the conditional standard error of measurement to determine the “variation of estimated scores given the true score”; the confidence interval of reliability for TSIA scores is 68% (College Board, personal communication, February 14, 2017). For validity, the Texas College Career and Readiness Standard were used as the baseline for measurement with a 99% alignment (College Board, personal communication, February 14, 2017).

The administration began for all students required to test for the Fall 2013 semester and after. College Board, founded in 1900, is a board-governed non-profit made up of approximately 6,000 member institutions and entities. College Board administers other college readiness assessments including the SAT, PSAT, Advanced Placement, ACCUPLACER, and College Level Examination Program. College Board was selected after a request for proposals seeking a developer and is quite similar to the previously

used ACCUPLACER and qualifies students into one of three areas: college ready, developmental, adult basic education.

The three-week SPB held at University Southeast as a part of a five-year Title V Hispanic-Serving Institution grant. University Southeast obtained the grant with the mission of increasing retention and graduation rates in support of the institutional strategic plan. Students attended college success skills for 60 minutes each morning and then moved into their content courses for 90 minutes each. Participants received weekly cash stipends ranging from \$45 to \$52 and a final payment at the program's conclusion ranging from \$250 to \$300; amounts varied between the two years being studied as adjustments were made to ensure sufficient funding existed for the duration of the grant. Participants also received free TSIA re-testing and a backpack filled with items needed for the program, including a binder with the program curriculum, pens, pencils, thesaurus, a flash drive, and a calculator.

Staff in the university's Office of Student Transition and Retention Program facilitated the SBP. These same individuals created the college success course curriculum, with the assistance of trained Honor's program student tutors, and team-taught the class during the program. Faculty from the institution's mathematics and English departments and the English Learning Institute serve as paid instructors for the mathematics, reading, and writing courses. Faculty from the Department of Urban Education, the English Department, and mathematics were compensated through the grant to create the curriculum for the reading, writing, and mathematics courses.

Each area of the exam (mathematics, reading, and writing) starts with twenty multiple-choice questions set at the college-level. If a student does not satisfactorily answer those, he or she moves into a diagnostic sequence which is prescriptive by identifying a student's deficiencies. For the writing component, there is both the multiple-choice component (MC) and an essay which the system grades on a scale of 1-8. Table 3 shows college-level, developmental education, and adult basic education cut-off scores. These same score ranges are used for data analysis as well. Scores were recorded by the University Registrar and uploaded to the student's file within the information system using students assigned identification number.

Table 3

TSIA Score Ranges

Subject	College level	Developmental education	Adult basic education
Mathematics	350-390	336-349	335 or below
Reading	351-390	342-350	341 or below
Writing and essay	$E \geq 5$ and any MC; or $E \geq 4$ and MC ≥ 363	$E \leq 5$ and MC 350-362; or $E \leq 4$ and MC ≥ 363	$E \leq 4$ and MC ≤ 349

Data Analysis Plan

IBM SPSS independent sample, two-tailed, t test, will be used for data analysis of TSIA scores falling into the developmental education level, to answer the four research questions and test the relating hypotheses. The archived data set was provided by University Southeast's General Counsel after being collected by the Registrar. Thus, the

file was assumed to be accurate with all data entered correctly. To ensure there are no missing scores the Excel spreadsheet data file was screened to ensure a pre- and posttest TSIA score exists for each in the treatment and control group. A frequency test was conducted in SPSS to test for normality among variables and to detect existing outliers. To ensure the analysis addressed FTIC students placing into developmental education and retesting on the TSIA, any score falling below the developmental range was eliminated. Therefore, the minimum score in each subject area was the same for all students in the treatment and control groups. If any outliers existed, it would be for posttest scores only and is not considered an issue because a student's knowledge and skills could increase allowing for higher scores on the second test administration.

The four research questions were:

RQ1: Is there a difference in TSIA mathematics gain scores between students who did and did not attend an SBP?

H₀1: There is no significant difference in TSIA mathematics gain scores between students who attended an SBP and those who did not.

H_A1: There is a significant difference in TSIA mathematics gain scores between students who attended an SBP and those who did not.

RQ2: Is there a difference in TSIA reading gain scores between students who did and did not attend an SBP?

H₀2: There is no significant difference in TSIA reading gain scores between students who attended an SBP and those who did not.

HA2: There is a significant difference in TSIA reading gain scores between students who attended an SBP and those who did not.

RQ3: Is there a difference in TSIA writing gain scores between students who did and did not attend an SBP?

Ho3: There is no significant difference in TSIA writing gain scores between students who attended an SBP and those who did not.

HA3: There is a significant difference in TSIA writing gain scores between students who attended an SBP and those who did not.

RQ4: Is there a difference in TSIA essay gain scores between students who did and did not attend an SBP?

H_o4: There is no significant difference in TSIA essay gain scores between students who attended an SBP and those who did not.

H_A4: There is a significant difference in TSIA essay gain scores between students who attended an SBP and those who did not.

Archived data collected from University Southeast had any information that could personally identify a student removed, leaving only the pre- and posttest TSIA scores for students in the control and treatment groups classified by a “yes” or “no.” This quasi-experimental design used a non-equivalent (pre-test and post-test) control-group design, appearing below, with both groups taking the TSIA independently, Group A receiving the treatment, and both groups taking the TSIA again.

Group A	O-----X-----O
Group B	O-----O

To answer the questions and determine if the null hypothesis should be accepted or rejected, TSIA gain means between the treatment group identified by yes and the control group, labeled no, were compared looking for significant differences.

Threats to Validity

Results of this study will not be used to make predictions extending beyond the time frame during which the study took place and only speak to the two years of which data are derived. Also, recommendations resulting from this study apply to students falling into the developmental range upon college enrollment and not those testing above or below. Scores for students falling below the developmental education score threshold in TSIA math, reading, and writing were removed from the received archived data set.

A total of 128 pre- and posttest TSIA treatment group scores were received and 1,088 for the control group. Compensatory demoralization and rivalry were addressed through the fact that students had the option of being in the treatment or control group, and at the time of their recruitment to the SBP were not informed about this proposed research study to feel any sense of obligation. While participants in both groups are familiar with the TSIA, the questions change for each administration eliminating any risk of students knowing what questions to anticipate. A threat to internal validity was potential participant mortality throughout the SBP for any student deciding not to complete the program; however, the financial incentive attached to program completion may have resolved this concern. The monetary incentive could also negatively impact participation, with students attending solely for the financial disbursements and not putting forth their best effort on the assessment. SBP participants received program

supplies, a weekly stipend ranging from \$45 to \$52 and a final award ranging from \$250 to \$300 upon program completion; the amounts were decreased the second year for budgetary purposes. To account for preexisting differences which may have motivated students to participate (for example students from low-income backgrounds) gain scores were measured assuming all students wanted to increase their TSIA scores to avoid developmental education courses.

Ethical Procedures

IRB approval 08-12-16-0309779 was granted from Walden University, followed by the completion of the IRB application process to obtain approval 51-16 from University Southeast's CPHS. After obtaining IRB approval, a request was submitted to the University General Counsel for a data set containing TSIA pre- and posttest math, reading, writing and essay scores for FTIC students completing the SBP and those not participating for summers 2014 and 2015. Adhering to the Family Education Rights Privacy Act (FERPA) students were assigned the identifier "yes" or "no" for SBP participation with all other personal identifying information removed. Students had the option of withdrawing from the SBP at any time and were not in any way penalized by the researcher for doing so. Participants in the SBP received incentives, as written into the grant, as a means of creating interest in the program. Funds were presented as a means of compensating students who may have missed work, and to assist with costs associated with attending such as parking and lunch. Due to this compensation provided as part of the program, it should not raise any ethical concerns in the results of the study.

The principal ethical concern addressed was my past employment as a coordinator for the SBP; however, the use of archival data prohibited researcher influence and cautions were taken in the discussion of results. Data will be stored under an anonymous file name on a password-protected computer that only the researcher has access to, and will be held for five years as required by the Walden University Institutional Review Board (2015). The deletion of the file will occur after.

Summary

The purpose of this quantitative study was to compare TSIA scores between FTIC students with developmental level test scores who attended a three-week SBP and those who did not attend. Any student enrolling at University Southeast required to take the TSIA was included in the population. The resulting sample included only students with scores placing at the developmental level either participating in the SBP or not. Students in the control group must have tested two times to have been included in the sample; students in the treatment group tested a second time as part of the SBP. The independent variable was the three-week SBP, and TSIA scores were the dependent variable. Archived data from Fall 2014 and Fall 2015 were analyzed using an independent sample, two-tailed *t* test to compare posttest gain scores for the treatment and control groups. Ethical concerns including the researchers past employment with Southeast University, incentives, and compensatory demoralization and rivalry were addressed, and IRB approval from both Walden University and University Southeast was obtained before any data was collected. In Chapter 4, data collection, analysis, and results of the proposed study are discussed.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to compare TSIA scores between FTIC students with developmental level test scores who attended a three-week SBP and those who did not attend. The research questions focused on the gain scores on TSIA math, reading, and writing pre- and posttests for FTIC students completing the SBP and a control group not participating in the SBP and taking the TSIA a second time. This chapter describes the results of the SPSS analysis.

Data Collection

All FTIC students admitted to University Southeast during the Fall 2014 and Fall 2015 semesters who were required to take one or more parts of the TSIA were invited to enroll in the intervention SBP. Therefore, they were part of the initial population. Students completing the program and retesting after receiving treatment—and any student who tested a second time without the university-provided intervention—were included in the sample that was analyzed. Data were collected from the archive in November 2016; the use of archived data allowed for all scores requested to be included without worry about individual response rates. The received data file included all FTIC students who tested twice during the summers of 2014 and 2015. Each TSIA subject score was provided (on a separate spreadsheet) with pre- and posttest scores listed for each student on the spreadsheet along with the SBP enrollment classification as “yes” for the treatment group and “no” for the control group.

The collection of archived data occurred as planned. During Fall 2014 and Fall 2015, 1,216 students had to take either the math, reading or writing portion of the TSIA or some combination of the three. Before analyzing the data, any score that did not fall in the developmental education range for each subject was removed. As a result, 769 students were sampled. Students placing in Adult Basic Education may have attended the SBP, but they were excluded from the sample, making it representative of students placing only in developmental education courses. Implementation of the SBP, administration of the TSIA, nor the collection of the results by University Southeast caused any deviation in the study nor challenged any interpretation of the results. There were no adverse events. Because the only scores used ranged between developmental and college level, no outliers needed to be removed from the sample. Table 4 illustrates the breakdown of the analyzed TSIA scores on math, reading, writing, and the essay.

Table 4

Archived Data Study Sample

	Treatment	Control	Total sample
Math	57	145	202
Reading	46	169	215
Writing	47	141	188
Essay	50	114	164

The discrepancy in the number of students taking the writing and the essay portion is attributed to the scoring being based on an either/or format. It requires a student to achieve a certain score on the essay to be college level, regardless of her or his writing score. For example, a student could score achieve a score of developmental on the

multiple-choice questions and college level on the essay and be placed into (college level) Composition I. However, if that same student scored college level on the multiple-choice but not the essay, then that student would be required to complete the essay portion again.

Results

Although no hypothesis about pre-TSIA scores was made. Pre-TSIA scores for the treatment and control groups were examined to determine what differences, if any, existed before the intervention. This analysis was done using an independent sample, two-tailed, t test, using SPSS. Pre-TSIA math, reading, writing, and essay means for students in the control and treatment groups we compared. See Table 5 for the results.

Table 5

Differences in Treatment and Control Group pre-TSIA Score Means

TSI Subject	Treatment	Control	T	df	P
	M (SD)	M (SD)			
TSI Math	344.02 (5.36)	344.94 (4.69)	-1.21	200	.230
TSI Reading	345.89 (2.55)	347.56 (4.36)	-2.33	213	.021
TSI Writing	356.91 (3.76)	357.43 (4.26)	-0.73	186	.465
TSI Essay	4.04 (0.20)	4.11 (0.41)	1.08	162	.170

Note. The initial TSIA reading score means were statistically significant.

Initial TSIA reading score means were higher for the control group; this difference, -1.56, was significant $t(213) = 0.02$. Had there been differences in all areas before the intervention, further analysis into the students' backgrounds such as GPA, high

school attended, or socioeconomic status would have been necessary to determine if any of those factors may have influenced a student's decision to complete the program or not.

An independent sample, t test, analyzed pre-and post-TSIA reading, math, writing, and essay mean gains for students in the control and treatment groups. The results of the data analysis testing the four research questions are presented in Table 6.

Table 6

Mean Gains for TSIA Reading, Math, Writing, and Essay Scores for Control and Treatment Groups

	Treatment	Control			
TSI Subject	M (SD)	M (SD)	t	df	p
TSI Math	8.00 (8.59)	4.78 (6.05)	2.60	78.86	0.01
TSI Reading	5.52 (7.15)	6.33 (7.98)	-0.62	213	0.53
TSI Writing	3.17 (6.56)	4.19 (6.60)	-0.92	186	0.36
TSI Essay	0.64 (0.72)	0.41 (0.88)	1.60	162	0.11

Note. Post- TSIA Math gains between the treatment and control group were significant.

Based on the t test analysis of TSIA math score gains between two administrations of the test for students who attended an SBP and those who did not, the null hypothesis is rejected, and the alternative accepted that there is a difference in mean score gains between the two groups. However, based on the analysis in the other three TSIA areas of reading, writing, and essay the gain score differences were not significant. Thus, the null hypotheses are accepted that there is no significant difference in TSIA reading, writing, or essay for students who attended the SBP and those who did not.

Summary

Despite there being a statistically significant difference in pretest reading scores, data analysis found that participation in an SBP only significantly impact FTIC student performance on the TSIA math and not in the other three areas of reading, writing, and essay. Based on these findings, University Southeast must consider if it is worthwhile to continue hosting the program each summer or if other alternatives should be considered.

In Chapter 5, the findings are further interpreted and the recommendations and implications of the study are given.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to compare TSIA scores between FTIC students with developmental level test scores who attended a three-week SBP and those who did not attend. Quantitative analysis using an independent sample, two-tailed, *t* test compared gains between student's TSIA scores in the treatment and control groups. This study was conducted to measure the effectiveness of the SBP hosted by University Southeast to decrease the number of incoming first-year students required to take developmental education courses based on TSIA scores. It was important to determine whether (a) this program was meeting its goal of increasing students' subject knowledge given the barrier that development education courses can cause for many students and (b) guaranteeing funds allocated for SBPs was the best investment. Data analysis found significant differences only in the TSIA math gain scores between students participating in the three-week SBP and students in a control group where none attended the program.

Interpretation of the Findings

Results of this study were expected to add to the body of research on the effectiveness of SBPs and to confirm the need for more evaluations of the efficiency of the program (Johnson-Weeks & Superville, 2014; Sablan, 2013). Unfortunately, the current study added to the confusion Sablan spoke of by having a treatment group that was smaller than the control group and that did not follow students beyond the SBP to assess long-term benefits. The scope of the study was to measure TSIA gains, but SBP participants and program instructors might still consider the University Southeast

program to have been successful, depending on their personal definition of success as noted by McCurrie; program administrators, program instructors, and students may all define success differently (2010). For example, if students experienced “happiness and satisfaction” (p. 45) after attending the SBP at University Southeast, the program could be considered a success, despite the lack of significance in the mean gain scores between those attending the program and those who did not attend. The evaluation of the SBP at University Southeast could have strengthened the available research by following the method recommended by Garcia and Paz (2009), that is, using focus groups and collecting data that measured students’ holistic growth over an extended period.

While not measured in the study, students attending the SBP at University Southeast had the opportunity to connect with students, faculty, and staff along with taking courses to increase their academic skills. Had an approach been used that included students’ incoming GPA, such as that employed by Strayhorn (2011), the results might have varied and revealed a relationship between high school performance and TSIA scores. Had the study been extended into the students’ first semester at University Southeast, self-efficacy, belonging, academic, and social skills could have been measured for differences between the treatment and control group. These differences could either have supported or challenged Strayhorn’s findings for SBPs. The gains in TSIA math support the results of Raines’ 2012 study of $N = 35$ students attending a 10-day SBP created for students in the STEM major. Although there was no control group with Raines study, from a social change perspective, any growth is celebrated if it helps students overcome the developmental education barrier.

Previous studies have found that attending SBPs are not resulting in the gains anticipated when looking at first-year GPA, retention, and credits earned (Barnett et al., 2012; Wathington, Pretlow, & Mitchell, 2011; Wathington, Pretlow & Barnett, 2016). These results are of critical importance when evaluating them alongside the study conducted of archived data from the SBP at University Southeast as both studies took place in the State of Texas. As administrators and policy makers within the state discuss the future of SBPs, they must acknowledge that neither short- nor long-term performance standards are being met at significant rates that would support the programs continuing to operate under their current structure. The SBPs held in the summer of 2009 were longer in length than that of University Southeast; however, the previous studies used random assignment to place students into the treatment and control groups. Both programs provided students with financial incentives upon program completion that could have contributed to the lack of significant gains in neither TSIA performance nor credit attainment due to motivation being monetary rather than educational. It could be argued that the significant difference in TSIA math posttest scores for students in the treatment group at University Southeast support the findings of the evaluation of the 2009 SBPs in that a higher number of program participants completing college-level mathematics than their peers. However, students in the treatment and control groups at University Southeast would need to be tracked through the first year for an accurate comparison to be made.

In the context of Tinto's model of longitudinal departure (1983/1997), it could be argued that SBPs are not the most efficient method of increasing student's skills in TSIA reading, writing, and essay. The offering of the program does demonstrate the university

commitment, as stated by Tinto; however, the commitment had no significance influence on TSIA performance in any area other than mathematics. This conclusion arises after looking at the time and cost necessary to host the program and analysis showing no statistically significant gains between the control and treatment groups. Tinto is an advocate of programming designed to increase students' skills and abilities as a means of increasing retention; however, the SBP studied did not make a significant difference in posttest performance. Therefore, the program's future must be discussed among campus administration.

When evaluated alongside the 2002 study conducted by Ryan and Glenn, results of the research at University Southeast are quite similar in that initial program goals were accomplished. However, results were not significant enough to justify keeping the curriculum as it stands. In both situations, administrators must agree on benchmarks when determining what success looks like and what changes must be implemented to increase the likelihood of accomplishing program goals. To draw accurate conclusions between the use of Tinto's model of longitudinal departure and the SBP at University Southeast it will be necessary for campus administration to determine what program elements, if any, should be changed. The institution must also conduct follow-up studies on the treatment and control groups to determine if any differences between the two become significant during and after the first year of enrollment.

Limitations of the Study

It does not appear that program incentives attracted many students to the SBP; however, one could argue that gains were not statistically significant due to students

participating in the program for financial purposes only. Students having the option to complete the program, versus it being an enrollment requirement, could be the cause for the low program enrollment over the two years when comparing the sample group size to that of the control. It could be argued that students in the control group used free online resources before taking the TSIA posttest which may account for the lack of significant differences in reading, writing, and essay. The lack of literature available on the TSIA had no impact on the study but rather adds to the recommendations that are offered for future research.

Recommendations

While the scope of the study has been met, it would have been ideal to follow students in the treatment and the control groups to the point of graduation to determine long-term program impacts. Having data for the two years the TSIA has been in existence and focusing solely on developmental education level courses, allows for generalizations to be made about that population of students only. Following students through the completion of the first year could allow for stronger program evaluation by looking at first-year GPAs, retention, and credit attainment. For further research, it is recommended that this study is expanded to follow students throughout their entire academic career. Analyzing first-year credit achievement, GPA, retention, and the number of years it takes students from the control and treatment groups to graduate, stronger conclusions on program effectiveness may be reached. Similar studies are needed at other institutions to investigate whether results witnessed by University Southeast will be the same or different on other campuses across the state.

Further exploration is also needed to determine the impact of the college success skills course on student performance beyond the TSIA and scope of this study. It is important to conduct further exploration into whether early exposure to college success skills had any impact on participants' future academic performance (Allen & Lester Jr., 2012; Ewing-Cooper & Parker, 2013; Martinez et al., 2011). Research studies are also needed to determine if the diagnostic component of the TSIA contributed to the control group achieving gains like the treatment group (THECB, 2014). One could hypothesize students used the information provided as a resource to know what areas to review before retesting without university offered intervention. It would also be beneficial to inquire if students in the control group used online study resources before retesting that contributed to posttest gains.

An exploration into the motivation, drive, or grit, of students in the control and treatment groups, could also be measured to determine if there is any difference in motivation between the two groups, especially since financial incentives were provided to program participants. Grit was not explored in the literature review; however, after results showing differences in the Reading pretest scores, it may be worthwhile to examine the correlation between a student's drive, demonstrated through participation in the SBP, and TSIA performance (Hochanagel & Finamore, 2015). Looking at motivation would provide insight into whether students were attracted to the SBP for financial or educational gain. It could be hypothesized that students demonstrating higher levels of grit would be more likely to enroll in the SBP. This data may be of assistance when determining whether incentives or needed to attract students to the SBP or not.

Implications

As a recommendation, University Southeast should implement an accelerated developmental education program that would allow students to fulfill their course requirement during the time that would have been spent in the SBP. Previous studies have found accelerated models to be a useful method of moving students through their prescribed (developmental education) sequence (Jaggars et al., 2015; Rodgers et al., 2011). By hosting the actual developmental course in the summer versus a bridge program, University Southeast could charge students the cost of tuition instead of having to offer students financial incentives and spending money; it may be possible for students to use financial aid to cover the cost of the course. The accelerated developmental education model would also ensure that students are receiving some sort remediation, especially for those who achieved college-level courses solely by guessing and not based on actual skill level.

This study could impact social change on an institutional level by offering data on the impact, or lack thereof, of a three-week summer intervention on TSIA performance. University Southeast invests several hundred dollars into each student, along with paying faculty to teach, and based on the results can now explore other ways of allocating those resources. Rather than offering three-week sessions, institutions could consider 1-week programs, an increase in the use of Supplemental Instruction, or partnership programs with feeder high schools to work with students during their junior and senior years of high school. With a large number of incoming students requiring remediation, results of

this study show that the monies invested can be used in ways that will reach more students each year.

I would also recommend that University Southeast use multiple factors to determine course placement other than TSIA scores. As noted by The THECB (2014) institutions should not use TSIA scores as the sole determining factor when placing students. Results of this study have shown that there are students capable of moving from the developmental range to college level without the university provided intervention. Academic advisors should meet with students placing into developmental education coursework individually rather than placing them based on a number without considering other factors. During this time, advisors could assess if the student should enroll in the 16-week developmental course or if there are other high impact practices available to assist the student alongside placement directly into the college level course. These high impact practices could include taking a first-year seminar or participating in a learning community (Association of American Colleges & Universities, n.d.). It is important for university administration understand that interventions that worked for one type of assessment, or student need, may not be successful when applied to another realm. Successes that occurred through SBPs for students taking the ACT, COMPASS or THEA may not translate to the TSIA as the exam structure is different from previous assessments.

This study impacts social change on the individual level by providing students with information on SBPs that will allow them to make an informed decision before program enrollment. Students can go into the program with an understanding that the

skills they may gain through participation may not be of immediate impact on the TSIA. Knowing that SBPs are not necessarily the strongest option for TSIA performance assistance, families that may not be able to access these types of programs (due to scheduling or mobility constraints) can be hopeful in knowing that they are not placing themselves at a further deficit. There are free resources available online which students may use to prepare better for the TSIA by answering practice questions allowing them to gain an understanding of what to expect on the exam. It may be a more efficient use of time and resources for University Southeast to encourage students to access those resources, especially if challenges prevent them from attending the SBP. Finally, on an individual level, this study reminds higher education faculty, staff, and administrators that we must look beyond a score or transcript and get to know the student, their needs, goals, strengths, and weaknesses before placing them into any college classes. As higher education professionals we must work to ensure we are meeting the needs of the individual versus judging them based on metrics.

On a societal and policy level, this study has implications for social change by demonstrating the need for greater efforts between the high schools and colleges to bridge the gap between what students must know to graduate from high school and succeed in the college classroom. The students in this study met the requirements necessary to receive their high school diploma, only to learn they are not college ready. Knowing this, high school teachers and administrators should begin to engage in dialect with college professors on the competencies and skills students are lacking coming from high school. From a legislative perspective, funding must be allocated to allow

partnerships between high schools and colleges to flourish in ways that increase students' academic skills and abilities.

Summary

After conducting data analysis on pre-and post-TSIA scores, results found a significant difference in mean gains in Math for students participating in the SBP. However, participation in the SBP did not have a statistically significant impact on gains between the control and treatment groups in the areas of reading, writing, and essay. While the results may be surprising when evaluated using Tinto's longitudinal model of institutional departure, they do align with previous research finding mixed short and long-term results of SBPs. With the costs spent on SBPs, along with the time students invest, institutions must ensure the benefits outweigh the costs, which is questionable based on this study and previous research. Along with evaluating the effectiveness of SPBs, university administrators may want to consider other factors not included in this study including long-term program benefits, student perceptions of exposure to college success skills, and how individual grit can impact assessment performance. Whether institutions choose summer bridge programming or accelerated developmental education courses, it is important that on-going program evaluation and data analysis occur to increase the likelihood of graduation of all students regardless of incoming skill levels.

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