2016

The Influence of Student Coaching on Student Success in Developmental Math Courses

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COLLEGE OF EDUCATION

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MA, Alabama State University, 1995

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Doctoral Study Submitted in Partial Fulfillment

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Although many academically underprepared students are able to attend community colleges via open access policies, these students struggle with completing their degrees. At a rural community college in the southeastern United States, students who tested into developmental education courses have struggled more with persistence and completion than have their college-ready counterparts. The purpose of this causal-comparative study was to evaluate the influence that student coaching had on student success in developmental math at this community college. Tinto's dropout theory and Astin's engagement theory provided the theoretical framework for a study of 62 developmental math students who were offered student coaching services during the course. Multiple one-way ANOVAs were performed to determine if student coaching had any influence on the dependent COMPASS test scores based on students' level of participation with the service. Students who participated in 0-2 coaching sessions (n = 32) had statistically significantly lower COMPASS test scores than students who participated in 3 or more coaching sessions (n = 30). None of the demographic characteristics had an effect on coaching participation. An evidence-based project designed to enhance coaching participation is offered to increase student persistence and completion. Implications for positive social change include increased success rates in developmental courses which should lead to increased persistence. Positive social change occurs when students are able to achieve incremental successes in their developmental courses, which could better leverage them to achieve subsequent higher education goals of degree completion and to pursue careers with better salaries associated with higher education completers.

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Dedication

I would like to dedicate this study to the memory of my beloved father, Mack Clinton Biggs. My father was one of my greatest supporters. He always encouraged me to pursue my educational goals. He was present at the beginning and completion of every one of my educational journeys from high school to graduate school. Although he was able to see me complete most of this journey, he passed away just before I completed my doctoral degree. I dedicate the completion of this study to the memory of my father, whose strong resilience and courage to persevere in spite of adversity inspired me throughout this journey. My siblings and I were blessed to have been raised by a man who understood that the true measure of a man should be found in the legacy he leaves behind.

Acknowledgments

I would like to thank my husband, Barry, for all of the support and encouragement he gave me throughout this journey. I would also like to thank my boys, BJ, Brandon, and Bryson, for being so understanding and supportive. I would not have been able to complete this journey without the love and support of my family.

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Section 1: The Problem

In the early 1800s, educational advocates drafted a proposal for the creation of community colleges to lessen the burden on universities to provide general education to high school graduates (Jurgens, 2010). The Morrill Act of 1862 directed institutions to serve the industrial class, which increased societal expectation for public higher education (Gelber, 2011). The revised Morrill Act of 1890 provided funding for the establishment of agricultural and technical colleges with the purpose of promoting educational opportunities for women and minorities (Jurgens, 2010). From their inception, the primary focus of community colleges has been providing access to all students who wish to obtain postsecondary education.

During the early part of the 20th century, sociological factors, economic forces, and technological advancements compelled leaders in the United States to recognize the need for a more highly skilled workforce (Gelber, 2011). With the demand for more skilled workers, higher education became an avenue for students to acquire the skills needed to access new career pathways and to qualify for higher paying jobs. McKillip, Rawls, and Barry (2012) contended that it was the need for more college-educated workers that ultimately strengthened the connection between higher education and high wages. Education has a positive effect on earning potential (Liu, 2011). However, as the overall number of students entering higher education has increased, the level of academic preparedness of the average entrant has declined (Cohen & Kisker, 2010). From 1945 to 1970, college enrollment increased from 2 million to 11 million, while at the same time, scores on the college admission exam, Scholastic Aptitude Test (SAT), declined by 36

points in the math content area and by 14 points in the verbal content area (Cohen & Kisker, 2010). While the decline in academic preparedness of college-bound students has impacted all of higher education, because of open access policy community colleges experienced largest large increase in students lacking adequate academic preparation to complete college-level work.

In the past 2 decades, the focus of community colleges has shifted from an emphasis on student access to an emphasis on student success (O'Banion, 2010). Bahr (2013) argued that community colleges are emphasizing degree attainment and improving college performance. Furthermore, Brock (2010) asserted that while changes in federal policy and public attitudes since the mid-1960s have broadened the scope of access to a variety of underrepresented groups, policy makers and educators need to demonstrate a stronger commitment to students persisting and completing their degrees. The number of students admitted to community college no longer determines institutional success; rather, the number of students who successfully complete their program of study now defines institutional success.

The degree to which the community college sector has embraced this paradigm shift is evidenced by their reactions to President Obama's Graduation Initiative (Matthews, 2010) to increase postsecondary credentialing in the United States. In response to the president's challenge, six national community college agencies signed a pledge to increase the number of degree and certificate attainment to 50% of student enrollees by the year 2020 (O'Banion, 2010). The impact of this commitment is significant as those six national community college agencies represent 1,200 community

colleges, their governing boards, their faculty, and their 11.8 million students (American Association of Community Colleges, 2012). Braggs and Durham (2012) asserted that while President Obama's emphasized higher education completion, his imperative had a more significant impact on community colleges because it redefined success to denote degree completion rather than student access. Furthermore, federal funding formulas for awarding financial aid have been revised to limit student overall eligibility to 12 semesters and to restrict the amount of funding that can be spent on remedial courses (U.S. Department of Education, 2013). Because remedial courses are noncredit courses, they do not count toward a student's designated degree plan and have no credit benefits for degree completion. Bahr (2013) warned that while increasing degree attainment is at the fore of postsecondary education, measuring success solely on completion criteria presents a dilemma for the open access policies of community colleges.

In the following section, I will define the local problem that prompted the focus of the study, which is low course completion rate in developmental math courses. An explanation of how the problem evolves in the local setting and connects to the larger educational setting will be discussed. In addition, a rationale for choosing to study this problem will be presented. Research questions directing the study, a comprehensive literature review, and definitions of special terms associated with the study will be provided.

Definition of the Problem

The administration at the pseudonymous South Community College (SCC), a small, nonprofit community college located in a rural county in the southeastern United

States wished to examine factors that contributed to the low completion rates of the students who were enrolled in developmental math courses. In focus groups and surveys, SCC instructors who taught developmental math course cited “a lack of attendance” as the most significant impacting factor on course completion rates (SCC, 2011). Therefore, the purpose of this study was to examine the factors that affected course completion rates in developmental math courses at SCC.

Providing quality educational services that meet the needs of academically underprepared students was a key component of the mission of SCC. As noted in Table 1, over the past few years, SCC had seen steady increases in the number of students who were entering the college without adequate skills to take college-level courses. Some 73% of the college’s incoming first-year students tested into at least one developmental education course (SCC, 2013). Of the students who enrolled in developmental education courses, less than 58% passed the course upon the first-time enrollment (SCC, 2013). Conversely, over 74% of the college’s students who enrolled in credit-level courses successfully completed their course (SCC, 2013). Considering the disparity in the course completion rates, students who were enrolled in developmental education courses at SCC were significantly less likely to successfully complete their course than those who were enrolled in credit-level courses.

Table 1

SCC Course Completion Rates: Credit-Level Versus Developmental Education Courses

Academic Year	Courses completed by credit-level students (%)	Courses completed by developmental education students (%)
2010 - 2011	73.01%	47.63%
2011 - 2012	74.83%	56.35%
2012 - 2013	74.86%	63.58%
2013 - 2014	76.43%	61.28%
Total (Avg. %)	74.78%	57.21%

Note. SCC Office of Institutional Research Student Data Report 2013-2014 & South Community College Developmental Education Assessment Report 2014.

In addition to SCC developmental education students struggling with overall course completion, students enrolled in developmental math courses also had low completion rates. Fifty-eight percent of developmental education students tested into remedial math, which explained why math courses accounted for one half of all the college's remedial offerings (SCC, 2013). Nationally, 55% of all students entering community colleges needing remediation were referred to developmental math courses (Quint, Jaggars, & Byndloss, 2013). In addition, remedial math students at SCC were 21% less likely to successfully complete their math courses than their counterparts who enrolled in credit-level math courses (SCC, 2013).

The open-admission policy of community colleges has allowed many academically underprepared students the opportunity to access to higher education. Approximately 60% of students who enrolled in community colleges nationally tested into at least one developmental education course (Adams, 2010). However, admitting large numbers of academically underprepared students may present additional challenges

for the community colleges interested in increasing completion rates. Nationally, 72% of all colleges and universities offer developmental math courses, and some 62% of the students classified as academically underprepared are deficient in mathematics (Fike & Fike, 2012). In a national study of 3,476 first-time college students, Fike and Fike (2012) revealed that those who failed their developmental math course were 81.2% less likely to be retained from fall to spring semester than their college-ready counterparts.

Furthermore, according to historical data, similar patterns were taking place at SCC. For example, as noted in Figure 1, there was a 74% fall-to-spring semester retention rate and a 45% fall-to-fall semester retention rate for the average student taking credit-level courses (SCC, 2013). By comparison, remedial students taking developmental education course showed a 63% fall-to-spring semester retention and a 31% fall-to-fall semester retention rate (SCC, 2013). Gallard, Albritton, and Morgan (2010) contended that many developmental students do not persist because they are deterred by the delay they experience in getting to college-level courses.

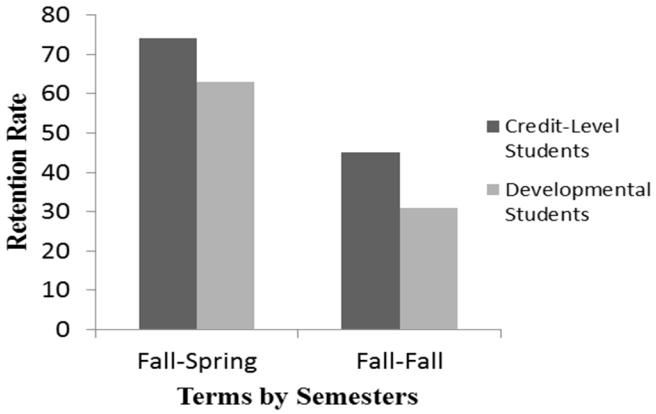

Figure 1. Retentions rate for SCC credit-level & developmental students.

Rationale

All incoming students at SCC who do not meet the minimum required scores on the math section of ACT and SAT college entrance exams are required to take the Computer-Adaptive Placement Assessment and Supportive Services (COMPASS) test. All SCC enrolling students who score less than 24 on the math component of the COMPASS test are placed in the first or second course of developmental math sequence depending on their score. Once placed into the developmental math course, the student, based on his or her COMPASS test scores, is required to complete the developmental course sequence before he or she is allowed to enroll in credit-level math courses.

Evidence of the Problem at the Local Level

The placement test data of entering students and course completion data of students enrolled in developmental math courses at SCC were the primary data sources used to determine that students enrolled in developmental math courses have a low completion rate. While the national statistics related to the number of academically underprepared students entering college was over 60% (Sherwin, 2011), SCC reported higher rates of student underpreparedness. Of the 73% of entering first-year students at SCC who tested into at least one developmental course, approximately 58% were placed into developmental mathematics course (SCC, 2013). Furthermore, slightly more than 51% of these students failed or withdrew from their developmental math course (SCC, 2013).

In addition to high failure rates of students enrolled in the developmental math courses, the number of students who enrolled in developmental math courses at SCC was

disproportionately higher than the number who enrolled in the other developmental disciplines, with developmental English at 38% enrollment and developmental reading at 7% enrollment (SCC, 2013). This enrollment trend was consistent with other community colleges nationally with 55% of all college students being referred to developmental math, 37% being placed into developmental English, and 29% being placed into developmental reading (Quint et al., 2013). Consequently, academically underprepared students experienced greater deficiencies in mathematics than any of the other developmental education disciplines.

Every student who places into remedial courses must complete these prerequisites before they can proceed to credit-level courses. Consequently, students delay their time to enrollment in core general education courses and their time to degree completion because they need additional semesters to complete the developmental studies component. These factors are particularly important for students who rely on federal aid to pay for courses. The U.S. Department of Education (2013) reduced student eligibility for Pell grants from 18 months to 12 months. Additional Pell grant eligibility requirements restrict the number of credit hours that a student can be funded for remedial courses to a total of 30 hours (U.S. Department of Education, 2013). Each time students repeat a developmental course, they jeopardize their financial aid eligibility. This problem has implications for a substantial funding source at the institution.

According to the 2012 Integrated Postsecondary Education Data Feedback Report, 88% of SCC's students received some form of grant aid, and 73% of the students receive federal Pell grant aid (NCES, 2010). Because the majority of the college's

incoming students tested into developmental math courses and most of students' funding base is tied to Pell grants, it was important for the college to explore solutions to the challenges that could negatively impact eligibility for this funding source. Furthermore, McClenney (as cited in Gallard et al., 2010) suggested that if a student does not succeed in the developmental education course, he or she loses the chance to succeed anywhere else in the institution. Hence, if success in the developmental education course is a predictor for persistence, retention, and, ultimately, completion, high course failures in developmental math courses could indicate that the college may face a significant drop in enrollment and funding, as a large percentage of the college's students depend on Pell grants to fund their education.

Evidence of the Problem from the Professional Literature

Community colleges enroll more than one third of the nation's postsecondary students (Crockett, Heffron, & Schneider, 2012). A significant dependence on Pell funding is not unique to the local institution, but is reflected in the Pell dependence in higher education as a whole. In some academic years, as many as 60% of all undergraduates in the United States used Pell grants to finance their education (Robinson & Cheston, 2011). In a study examining the link between Pell grant eligibility and enrollment, Rubin (2011) revealed a 16% increase in enrollment for male students and a 40% increase for female student who were deemed Pell eligible. Students who receive Pell grants are generally less academically prepared and are more likely to score in the bottom of the quartile on college entrance exams than their other college-going counterparts (Robinson & Cheston, 2011).

With the new Pell grant eligibility regulation that reduced the amount of time that students have to complete their course of study and limited the number of credit hours that can be funded for remedial courses, the academically underprepared student may be in jeopardy of losing funding eligibility before completing his or her degree. Similarly, students who test into developmental education are at an increased risk for stopping out or dropping out of college (Topper, 2011). In a comparison between community college students who tested into developmental education courses and their college-ready counterparts, college-ready students experienced a 40% degree completion rate in 8 years, as opposed to a less than 25% degree completion rate for the developmental education student (Collins, 2010). The local institution's experiences with academic underpreparedness and significant dependence on Pell funding can be found throughout higher education. Therefore, the purpose of this study was to evaluate the influence that student coaching had on student success in developmental math, which could have implications for protecting eligibility status of SCC students who receive Pell funding.

Definition of Terms

Academically underprepared: Incoming college students who lack the academic skills needed to successfully complete the rigor of college-level curriculum (Fike & Fike, 2012).

College ready: Students who have demonstrated through placement test or college entrance exams that they possess cognitive ability to successfully complete college-level curriculum without remediation (Bachman, 2013).

College success: A term used as an indicator of student potential to enroll in college-level courses and successfully complete degree or certificate program (U.S. Department of Education, 2012).

Developmental education: Courses or programs that are designed to address academic deficiencies of academically underprepared students and prepare them for the rigor of college-level curriculum (Boylan & Saxon, 2012).

Developmental math: Courses designed to address math skill deficiencies of academically underprepared students and prepare them for the rigor of college-level math curriculum (Asera, 2011; Benken, Ramirez, & Wetendorf, 2015).

Gatekeeper courses: Introductory college-level courses in English and mathematics (Benken et al., 2015; Gilroy, 2010).

Remedial: Resources or instructions designed to enhance academic preparedness by providing academic skills and social support that assist students in adequately performing in college-level work (Boylan & Saxon, 2012).

Retention: The number of students who complete one semester and return to the institution for enrollment in subsequent semesters (Capps, 2012).

SAT: The college entrance exam, formerly called Scholastic Aptitude Test (Cohen & Kisker, 2010).

Student-centered academic coaching: Coaching services designed to help students develop a clear vision of their educational goals and to connect them to those goals through daily skill building activities (Asera, 2011; Bettinger & Baker, 2011; Bettinger, Boatman, & Long, 2013).

Significance of the Study

Community colleges lead the higher education sector in the number of academically underprepared students admitted each year. An estimated 60–63% of all community college entering students are classified as underprepared (Gilroy (2010; Sherwin, 2011). The institution featured in this project study reported that as many 73% of its incoming students were academically underprepared (SCC, 2012). To address the disproportionate number of underprepared students admitted each year as a result of their commitment to open-access, community colleges have established various developmental education programs (Perry & Rosin, 2010). In this study, I focused on students who entered community college lacking the academic skills needed to withstand the rigor of college-level math courses. More specifically, I examined the factors that impacted course completion rates of developmental math students. Some key educational research-based organizations such as Achieving the Dream, the Carnegie Foundation, and Community College Research Center, which focus on developmental mathematics, have indicated that high failure rates in developmental math courses present a significant barrier to completion and academic success at community colleges (Asera, 2011). Hence, it was important to focus on research in developmental math courses at the local setting of higher education.

At the local study site, large numbers of incoming first-year students tested into developmental math courses. The college experienced low course completion rates of students who enrolled in those courses, and gaps in practices, which confirmed the need for this study. Most of the incoming first-year students at the institution were placed in

developmental mathematics courses based on initial testing, and more than half of the students who actually enrolled in developmental math failed the course. While the college tracked the progression of developmental education students through their proposed degree plan, little was known about the factors that impacted the low course completion rates of developmental education students. Academically underprepared students are more at risk of stopping or dropping out than their college-ready counterparts because they are unclear of their goals, struggle in connecting with the academic environment, and often have little academic direction (Wilmer, 2009). In the local setting, the number of students who entered the developmental studies program, the number of students who successfully completed developmental courses, and the number of students who failed or withdrew from the courses was known. However, there was limited understanding about the factors that impacted failure and withdrawal rates in these courses. Davis (2011) suggested that it is important for educators to recognize that nonacademic social forces can have a significant impact on collegiate success and may want to consider a broader approach to facilitating retention.

Many students who tested into developmental math courses experienced difficulty after having enrolled in developmental education math courses. The president and CEO of American Association of Community Colleges (as quoted in O'Banion, 2011), asserted, "Completion is not as embedded in our community college culture as access is. This is something we need to change" (p. 34). Every time a student fails a course, it can affect institutional retention and graduation rates. According to the SCC degree completion data, only 12% of the students completed their degrees or certificate program

within the normal projected completion time (NCES, 2010). Repeating courses extends a student's time to degree completion, which can affect his or her eligibility to receive federal aid. Currently, 84% of the college's first-time degree seeking students receives federal grant aid (NCES, 2010). Given the significant funds that the college generates from federal aid, coupled with the shrinking degree completion rate, exploring possible solutions for the problems experienced by remedial students may assist the local institution in providing quality educational services that support college completion and foster student persistence.

Remedial courses are designed to extend higher education access to students who lack the educational preparation needed to meet the rigor of collegiate-level course work. Theoretically, academic departments create the courses to increase student skill sets in the fundamental areas of math, reading, and English in one to two semesters. The challenges to completion for academically underprepared students are more pronounced in math courses. Although 68% of students pass their development English course and 71% of students pass their developmental reading course nationally, only 30% pass their developmental math course (Bailey, Jeong, & Cho, 2010a). Studying the low completion rate could give the local institution's stakeholders more insight into the kinds of noncognitive factors that impact course completion rates of students enrolled in developmental education courses. In addition, stakeholders may better understand the types of support services that help students address affective factors that present barriers to success in developmental education courses and the impact that student-centered academic coaching or intrusive advising may have on course completion rates in

developmental education math courses. Personal and affective factors may be greater predictors of completion and persistence for academically underprepared students than cognitive factors (Fowler & Boylan, 2010), at the center of this inquiry.

Research Questions and Hypotheses

At SCC, a significant number of students entering the local college tested into developmental math courses, and many of these students failed to complete their developmental math course. However, it was not clear all of the factors that impacted the low developmental math course completion rates. Past interventions designed to increase academic success in developmental math courses at SCC focused on providing services that address cognitive skills such as academic tutoring, summer bridge programs, and accelerated instructional models (SCC, 2014a). In addition, tools such as placement tests have been used to determine cognitive skills needed to assess student preparedness for college-level course work. All of the support resources that the college had provided to developmental math students were focused on addressing cognitive skill deficiencies.

SCC had not examined other factors that may impact student success after students were enrolled in developmental math courses. Some personal and affective factors have a more significant impact of the academic success of academically underprepared students than cognitive factors (Boylan, 2009; Engle & Tinto 2008). Hence, this study was designed to explore the following guiding research question: Does the success rate of students who participated in a student coaching program differ from the success rate in those who did not while enrolled in developmental math courses?

In addition to the guiding research question, I addressed the following subquestions and tested the following hypotheses:

RQ_1: Did students who took the developmental math course show significant gains in their COMPASS test scores?

RQ_2: Did coached students experience improved COMPASS test scores in mathematics above and beyond classmates who did not participate or participated minimally in the student coaching program?

RQ_3: Were personal characteristics—such as gender and age— associated with length of student coaching program participation in sessions attended?

The goal of this study was to determine if providing student coaching services increased the academic success of students enrolled in developmental math courses by testing the following hypotheses.

$H_0$1: Students who took the developmental math course did not improve significantly based on their COMPASS test scores in mathematics.

$H_1$1: Students who took the developmental math course improved significantly based on their COMPASS test scores in mathematics.

$H_0$2a: There is no statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program combined with students who participated only one time and (b) students who participated in two or more coaching sessions.

$H_1$2a: There is a statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching

program combined with students who participated only one time and (b) students who participated in two or more coaching sessions.

$H_0$2b: There is no statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program combined with students who participated only one or two times and (b) students who participated in three or more coaching sessions.

$H_1$2b: There is a statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program combined with students who participated only one or two times and (b) students who participated in three or more coaching sessions.

$H_0$2c: There is no statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program, (b) students who participated in one or two student coaching sessions, and (c) students who participated in three or more coaching sessions.

$H_1$2c: There is a statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program, (b) students who participated in one or two student coaching sessions, and (c) students who participated in three or more coaching sessions.

$H_0$3: There is no difference in personal demographics—such as gender and age—on length of student coaching program participation based on number of coaching sessions attended.

$H_1$3: There is a difference in personal demographics—such as gender and age—on length of student coaching program participation based on number of coaching sessions attended.

Review of the Literature

The 21st century is a time marked by challenge and opportunity for community colleges. Community colleges are reported as the fastest growing sector of higher education, with an estimated six million people in the United States currently attending (Grundmann, 2013). While there are record numbers of students entering the doors of community colleges, some 60% of them have been classified as academically underprepared (Adams, 2010). In that light, new and innovative approaches are being tested for improving student success. In this literature review, I present evidence on the need for increasing academic achievement in the developmental education programs and possible solutions related to completion and persistence among developmental education students.

The literature review for this study included texts and articles on the barriers to persistence and completion for underprepared students in higher education. The literature references included in this section consist of a review of books, conference papers, applicable websites, and peer-reviewed articles obtained from academic research databases such as Education Research Complete, EBSCOhost, Google Scholar, ERIC, and ProQuest. The following keywords were used to search for the study content: *developmental education, remedial courses, developmental programs, underprepared students, higher education and barrier to persistence, completion rates in community*

colleges, student coaching, mentoring programs, affective factors, first generation college students, developmental math courses and programs, completion in gate-keeper courses, and *developmental math course completion rates.*

A Call to Action on Improving Completion Rates

Remedial education has been a part of higher education since the 1840s (Handel & Williams, 2011). However, in recent years, developmental education has received increased attention, especially since President Obama made increasing the country's postsecondary credentialing a key focus of his education agenda. Retention and completion remain primary concerns for students who test into developmental courses. The longer a student remains in a developmental sequence, the longer it takes that student to progress to degree completion. Boylan and Saxon (2012) reported that while two million college students are placed in developmental education courses each year, fewer than 25% of those students earn their associate degree. Furthermore, the NELS (as cited in Adams, 2010) reported that fewer than 25% of the students who begin their collegiate journey in developmental education courses earn a bachelor's degree in 8 years. Price and Roberts (2009) asserted that while academic underpreparedness may begin as an individual problem for the student in the form of failed courses and academic probation, it translates to an institutional and community problem in the form of dwindling retention, plummeting completion rates, and a low skilled workforce.

Some of the institutional concerns that are driving community colleges to embrace a completion-centered paradigm shift have been fueled by the national debate for policy makers to connect state and federal funding to completion benchmarks. In

response to the global demand for a more skilled workforce, the U.S. Department of Education has developed the Completion Agenda Tool Kit to serve as guidelines for colleges and universities as they attempt to address this challenge. Some of the recommendations have been for institutions to embrace performance-based funding (U.S. Department of Education, 2012). The Completion Agenda advocated that policy makers connect state and federal funding to program and degree completions. Community colleges are encouraged to shift their focus from providing access to ensuring completion (U.S. Department of Education, 2012).

Colleges and universities have begun to push accountability as a central educational concern within their academic departments. Phelps, Durham, and Wills (2011) noted that performance-based accountability legislation designed to raise the level of educational attainment is becoming increasingly popular at the state level. Hermes (2012) suggested that lawmakers are using performance-based funding as an incentive for colleges and universities to increase credentialing efforts to a level that supports labor market demands and boosts economic development. According to the American Association of State Colleges and Universities (as cited in Hermes, 2012), 17 states have either adopted performance-based funding models or are considering implementing such models. The lawmakers require that funding be contingent on institutional success and institutional success that is defined by completion benchmarks. However, Callaway (2012) cautioned that in order for the performance-based model to have a positive impact, educators would need to not view it as punitive but rather should view it as a way for colleges to make data-based decisions that boost student success. Shin (2010) suggested

that basing performance measures on milestones such as completion of precollege courses, completion a college-level gatekeeper course, or completion of career readiness assessments are more effective performance indicators than focusing only on degree or program completions. Furthermore, Shin asserted that milestones could more efficiently be integrated in the institution's operational process, as milestone tracking would emphasize moving the process of student success along a continuum rather than focusing on a final outcome of degree completion.

In addition to the state emphasis on connecting funding allocations to completion, federal funding sources have been revised to encourage students and institutions to emphasize completion. The new federal Pell grant regulation not only limits the number of developmental education courses that students can take to 30 hours; the regulation limits the number of semester students are eligible to receive funding to complete a degree to 12 semesters (U.S. Department of Education, 2013). Without factoring in any time to repeat failed courses, developmental education students are challenged to complete their academic goals within the allotted time due to the normal delay in enrolling in credit-level courses. Therefore, repeating failed courses further challenges developmental education students' ability to complete by jeopardizing their financial aid eligibility status. The research on state and federal performance-based funding models are relevant to the study problem because it helps to establish community colleges' need to focus on providing solutions to completion and persistence problems for developmental education students. With the rising number of students entering community colleges in need of remedial education and the economic challenges facing many institutions today,

colleges may need to devote resources to the discovery of solutions to issues that present barriers to completion and persistence for developmental education students.

In addition to funding-based accountability pressures, community colleges are also receiving pressure from policy makers to address the country's workforce crisis. Pretlow and Wathington (2011) suggested that the emergence of a global economy has placed more of a demand on higher education to produce skilled workers, which translates to a demand for more graduates. According to the U.S. Department of Labor (as cited in Price & Roberts, 2009), 22 of the 30 fastest growing occupations will require a minimum of a vocational degree or an associated degree. Currently, states face the challenge of developing programs that will prepare the workforce with the skills needed to meet these demands. Grundman (2013) reported that President Obama identified community colleges as a partner in preparing the 21st-century workforce and in achieving his goal of making the United States the most educated country in the world by 2020.

The recent economic downturn in the United States has played a role in the current workforce crisis. As a result of the country's 2007-2008 recession, community colleges experienced an increase in the number of displaced workers seeking educational training for new careers (Kenner & Weinerman, 2011). Many of these displaced workers test into developmental education courses. It is important to align educational policies with economic outcomes that meet the needs of the individuals and communities that are facing these challenges (Phelps, Durham, & Wills, 2011). Price and Roberts (2009) asserted that improving developmental education in community colleges is a component

of the national solution to enhance the skills and credentials of the workers who will be required to meet the needs of the future labor market.

Improving Academic Success in Developmental Education

In the context of examining the connection between the academically underprepared student and the low skilled workforce, it is vital to consider the broader implications for the low completion rates of academically underprepared students. Whitmore (as cited in McGlynn, 2013) suggested that the achievement gap amongst U.S. students presents a barrier to long-term economic success in that it impedes their ability to compete in the future global job market and global education. The increased demand on developmental education is the result, in part, of the significant number of high school students who graduate lacking requisite skills needed to perform college-level work (Cooper, 2011). According to a U.S. Department of Education (as cited in Hollis, 2009) survey of high school seniors, as many 96% of high school graduates lack advance math proficiency skills. SAT's College and Career Readiness ("SAT Report," 2012) report revealed that only 43% of SAT exam takers scored at a level of academic preparedness indicating a high likelihood of college success. In an ACT study (cited in McGlynn, 2013) also designed to assess college readiness skills of high school seniors, fewer than 46% of high school graduates met the college readiness benchmark in math. For those high school students who would be classified as first generation, only 22% met the college-ready benchmark (Cooper, 2011). Large number of high school graduates demonstrating marginal college readiness and math skills leading to large numbers of incoming first-year students needing remediation before taking college-level math

presents a problem for higher education. Passing college-level mathematics is a core requirement for degree completion.

As noted above, more students test into remedial math than any other subject in developmental education (Boylan, 2011). The NCES (as cited in Fike & Fike, 2012) reported that 62% of students who are classified as academically underprepared are also deficient in mathematics. Howard and Whitaker (2011) reported stated that, nationwide, up to 75% of first-year students entering community colleges needed remediation in mathematics. In addition, academically underprepared students tend to struggle to complete math courses than any other remedial subject area. While seven out of 10 students successfully complete their reading and writing developmental courses (Bailey et al., 2010a), only three out of 10 students complete their developmental math courses (Bailey, 2009). Also, only a handful of the students who test into the lower levels of developmental mathematics actually persist to college-level mathematics (Boylan, 2011).

It is important for colleges to examine developmental education students' entire journey through the program to understand the factors that could negatively impact retention and course completion rates. Most college students are enrolled in different levels of developmental education courses based on their performance on placement tests (Bailey, Jeong, & Cho, 2010b). Depending on a student's demonstrated proficiency, he or she may be referred to three or more sequence developmental courses designed to prepare them for the first college-level course in a particular subject area. Bailey et al. (2010b) examined the relationship between referral to developmental education and the actual enrollment, and they tracked the students as they progressed through the sequence. Then,

Bailey et al. (2010b) analyzed the points at which the student exited the developmental sequence and the demographic and institutional characteristics that may be related to the student progression in the developmental sequence. The Achieving the Dream organization (as cited in Bailey et al., 2010a) reported that as few as one fifth of students who test into the lowest level of developmental mathematics actually completed their sequence. Gillroy (2010) reported that only 10% of students actually completed the developmental math sequence. These studies related to developmental course sequence have implications regarding the groups of students who are at risk for failing to complete a developmental education course. Students who began at the lowest level of the developmental sequence where most at risk for stopping or dropping out.

Placement test scores alone are not sufficient data to determine if a student should be placed in remedial courses or where the student should be placed. Testing should be used in conjunction with multiple variables as a part of an integrated counseling and advising approach to placing students in the appropriate level of remediation (Morante, 20120). Effective placement practices should incorporate more than a single assessment test (Armstrong, 1994; Marwick, 2004; Shelton & Brown, 2010). Morante (2012) suggested that colleges may want to examine the number of students who change their schedules after placement in developmental courses. A high number of schedule changes could imply a broken placement system. Bailey et al. (2013) suggested that although a group of students may share the same low placement test score, they could be facing different problems. Hence, in order to build an academic infrastructure that supports and

promotes completion, it is important to consider all variables to ensure that students are placed in the appropriate level of remediation.

Much of the debate over the validity of using placement tests alone to determine student success in credit-level course stemmed from the mixed results of students' high school performance and college entry placements. For example, at one university the mean GPA of entering students was 3.0. Yet many students were still being placed in remedial math courses (Shelton & Brown, 2010). Shelton and Brown (2010) suggested that institutions should consider factors beyond academic preparation, such as motivation and school quality in order to get an accurate picture of the factors that impact student performance on placement test and student success in developmental education course.

Possible Solutions to the Academic Skills Deficit

Although the lack of academic skills contributes to increased attrition rates, additional factors impact student success. One reason that colleges and universities are experiencing lower completion rates is because students do not know key information about how to succeed in the academic environment (Bettinger & Baker, 2011). Traditionally, it has been the academic advisor's responsibility to convey information to the student that was pertinent for academic success. In the prescriptive form of academic advising, the advisor tells the advisee what he or she needs to do (Sullivan-Vance, 2008). On the other hand, in the developmental form of academic advising, the advisor asks the student more reflective questions to guide the student into focusing on what he or she is doing and why he or she is doing it (Sullivan-Vance, 2008). The developmental advising approach coaches the student into taking ownership for his or her success by helping him

or her to focus on his or her own values and to determine how those values relate to his or her academic goals (Sullivan-Vance, 2008).

Student-centered academic coaching expands the developmental advising model by helping students to navigate personal issues that can impede their ability to achieve their academic goals. More specifically, student-centered academic coaching assumes a mentoring role to help students bridge the informational gaps and navigate personal challenges that can interfere with their academic achievement (Bettinger & Baker, 2011). Students are more likely to persist during the treatment stage and are more likely to be enrolled in their academic institution 1 year after the treatment stage has ended (Bettinger & Baker, 2011).

Early intervention for developmental education students has residual benefits for the individual student, the institution, and society (Gillard et al., 2011). The Center for Community College Student Engagement (2010) stated, "Research shows that the more actively engaged students are, the more likely they are to learn, to persist in college, and to attain their academic goals" (p. 7). Talbert (2012) asserted that a student's institutional commitment increases when he or she develops relationships with fellow students, faculty, and staff. These relationships help to establish a sense of belonging, making it more comfortable for students to progress through the academic process. Furthermore, Bettinger and Baker (2011) supported student coaching concepts, which was the theoretical framework for this study. Both Tinto's dropout model (1975) and Astin's involvement theory (1984) support the practical engagement processes that are unique to student-centered academic coaching, demonstrating that an increase in student

engagement led to an increase in student success. Bettinger and Baker found that student success was linked to course completion and persistence.

Theoretical Framework

Tinto's (1975) dropout theory and Astin's (1986) involvement theory provided the theoretical framework for the study. The student-centered academic coaching concept engages the student on four levels, including (a) promoting student engagement with instructors, (b) promoting student engagement with support services within the institution, (c) promoting student engagement with external partnerships within the community, and (d) ultimately promoting the student personal engagement in his or her own life and academic development. Tinto's classic model emphasized that a student's integration in both the social and academic systems of the institution serve as predictors of persistence (Shepler & Woosley, 2012). A number of researchers have used the constructs espoused in Tinto's model as predictors of persistence for a various groups of students ranging from first-year college students to students with disabilities (Crede & Niehorter, 2012; Feldt, Grahm, & Dew, 2011; Karp, Hughes, & O'Gara, 2008; Shepler & Woosley, 2012). Students' potential to succeed increases when expectations are high, and they receive the necessary support to rise to those expectations (Center for Community College Student Engagement, 2010). The student-centered academic coaching concept incorporates engagement practices that are espoused in Astin's involvement theory and Tinto's dropout model.

Tinto (1975) asserted that student dropout or withdrawal is the result of a multi-dimensional process between the institution and the individual student. Personal factors

such as family background, individual characteristics, and prior educational experiences influence students' expectation/motivation in the academic environment and affect how students interact with the college setting (Tinto, 1975). Kenner and Weinerman (2011) examined extraneous life factors that impact the academic success in developmental courses. In light of these personal factors, Tinto contended that individual integration into the college environment is the primary predictor of a student's continuance in college. Furthermore, Tinto suggested that student interaction with the academic environment fosters a greater commitment from the student to the goal to complete.

Astin's (1986) student involvement theory built on Tinto's (1975) dropout model focusing on how student engagement with the academic environment impacts academic achievement. In involvement theory, Astin (1986) asserted, "The greater the student's involvement in college, the greater will be the amount of student learning and personal development" (p. 528). The level of student involvement is determined by the amount of energy that the student invests in the entire college experience (Astin, 1986). Astin's involvement theory formed the basis for studies that focused on examining factors that impact persistence. Sparkman, Maulding, and Roberts (2012) relied on Astin's involvement theory to determine that social engagement was the most significant predictor of persistence in their study that focused on the impact of noncognitive factors on persistence. Similarly, Dalton and Crosby (2014) affirmed Astin's and Tinto's theories by showing that first-year college students who developed close relationships with the institutional culture learned to engage more effectively with their academic responsibilities. Consequently, the students more like to persist to their sophomore year.

In addition, Astin's theory of involvement was the conceptual framework that both Tinto's dropout model and Astin's theory of involvement suggested that an increase in student engagement in the academic environment will lead to an increase in the quantity and quality of academic success experienced by students. While it is evident that the lack of academic skills contributes to increased attrition rates, there is still more to be discovered about additional factors that affect student success.

Although 68% of the students in SCC are aged 18 to 24 years, they lead lifestyles that are characteristic of nontraditional students (SCC, 2012). For example, 40% of the students commute more than 25 miles one-way, more than 50% of the students are employed either part-time or full-time, and more than 70% have at least one dependent (SCC, 2012). Nontraditional students who test into developmental education courses not only bring the challenges of their academic deficiencies to the classroom; they also bring their life experiences as they transition from one phase to another. The placement test used to assess incoming student's college readiness skills only assesses the student's cognitive skills at the time the test is given. Because the test focuses on cognitive deficiencies, it implies that the lack of academic preparation is the major contributor to the lack of academic success in college-level courses. However, Fowler and Boylan (2010) suggested, "Affective and personal factors become increasingly important for students with weak academic skill" (p. 3). Bloom (as cited in Fowler & Boylan, 2010) asserted that affective factors such as attitude, motivation, and self-confidence, and personal factors related to finances, transportation, or work and family issues can account for as much as 25% of a student's academic success. Furthermore, Boylan (2009)

contended that giving attention to student's affective skills is particularly important for students who have weak cognitive skills. Currently, SCC has invested few resources into providing support\ services, such as student-centered academic or developmental advising, that are specifically designed to address affective and personal challenges.

Implications for Student Success

Challenges for academically underprepared often begin before they enter college. Solutions to those challenges can be as complex as the problems themselves. College readiness assessments from both ACT (McGlynn, 2013) and the SAT ("SAT Reports," 2010) revealed that a disproportionate number of graduating seniors do not have academic preparation needed to be successful in college-level courses. According two major studies conducted by the U. S. Department of Education (2012), high school rigor is the number one predictor of college success. Considering that only 30% of the developmental education students will complete their remedial math sequence (Bailey, 2010) and less than 25% of students who start their academic career in developmental education courses will earn a degree in 8 years (Collins, 2010), it developmental education students struggle with course completion and persistence more than their college-ready counterparts.

Just as cognitive assessments are important to ensure adequate placement in developmental courses, the measurement of affective factors such as motivation, willingness to seek help, or willingness to expend effort on academic tasks are equally as important to student success (Boylan, 2009). A comprehensive approach to addressing factors that present barriers to completion should address both cognitive and affective

impediments. This study can potentially help institutional leaders develop supportive resources that improve and support completion for academically underprepared students. If the students' academic challenges were the by-product of noncognitive factors, students would need to be connected to appropriate interventions such as developmental advising or student-centered academic coaching. Furthermore, studying this problem provided insight to the current issue in higher education of providing access with an approach that supports and facilitates completion. By intentionally incorporating student support services into coursework, the college can bypass some of the barriers that keep students from using these services (Center for Community College Engagement, 2010). Access-centered support serves the purpose of getting students in the door, but support that facilitates completion helps to ensure that the student will remain enrolled until academic goals are realized.

Summary

In recent years improving academic success and increasing postsecondary degree attainment has become a significant focus for policy makers and educational leaders. Successful completion of college level mathematics is a requirement for degree completion, regardless of collegiate major. A disproportionate number of entering students test into developmental math courses, and students must successfully complete the developmental prerequisite to enroll in college-level math courses. As such, increasing course completion rates in developmental math courses is essential for increasing degree attainment. Therefore, the goal of this study was to examine factors that affect success rates in developmental math courses in order to produce benefits for

both the individual student and institution. Section 2 presents the research design and methodology that I used to collect and analyze data relative to the study.

Section 2: The Methodology

Introduction

The purpose of this causal-comparative study was to determine whether participating in the student coaching program at SCC influenced success in developmental education courses. For the purpose of this study, academic success was delimited to standardized test scores in mathematics. The results of the study may support justification for funding to be allocated to expand the quantity and variety of student support services that SCC provides to its developmental math students. The objective of this study was to determine whether students who participated in the student coaching program had better academic success in their developmental math course than students who did not participate in the coaching program.

A quantitative approach was used to examine the impact that the student coaching program had on the academic success of developmental education math students at SCC. A causal-comparative research design was applied to the study. Lodico, Spaulding, and Voegtle (2010) stated, "Causal-comparative research involves comparing groups to see if some independent variable has caused a change in a dependent variable" (p. 209). In addition, researchers use a causal-comparative design to determine if a preexisting condition or past experience made a difference in an outcome for two groups (Lodico et al., 2010). The conditions of causal-comparative research include the following: (a) two independent groups with one dependent variable, (b) participant selection from pre-existing groups based on their past experience, and (c) a statistical test to estimate the effects of extraneous variables on the dependent variable (Lodico et al., 2010).

Research Design and Approach

Justification for the Design

A causal-comparative research design was appropriate because the study parameters met the conditions of the design. In this study, students enrolled in developmental math courses at SCC were compared to see if the independent variable (student coaching) caused a change in the dependent variable (academic achievement). I examined two groups of students (coached and noncoached developmental math students) to see if a past experience (coaching experience) had an effect on student achievement. At SCC, developmental math students were required to take a postassessment (COMPASS test) at the end of the course to document any improvements gained during the course. For the purposes of this study, academic achievement was evaluated in the context of a student's performance on the COMPASS posttest and was examined to answer the guiding research questions.

Research Questions

In this study, I addressed the overarching research question: Does the success rate of students who participated in a student coaching program differ from the success rate in those who did not while enrolled in developmental math courses? The following research questions were developed in order to explore the overarching question.

RQ_1: Did students who took the developmental math course show significant gains in their COMPASS test scores?

RQ_2: Did coached students experience improved COMPASS test scores in mathematics above and beyond classmates who did not participate or participated minimally in the student coaching program?

RQ_3: Were personal characteristics—such as gender and age— associated with length of student coaching program participation in sessions attended?

Hypotheses

In causal-comparative research, the hypothesis expresses the expected causal relationship that exists between the independent variable (student coaching) and the dependent variable (COMPASS scores; Lodico et al., 2010). In addition, it is important to delineate the two independent groups being compared. Group 1 consisted of developmental math students who participated in a student coaching program. The second group consisted of developmental math students who did not participate in student coaching services. Hence, the following hypotheses guided the study:

$H_0$1: Students who took the developmental math course did not improve significantly based on their COMPASS test scores in mathematics.

$H_1$1: Students who took the developmental math course improved significantly based on their COMPASS test scores in mathematics.

$H_0$2a: There is no statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program combined with students who participated only one time and (b) students who participated in two or more coaching sessions.

$H_1$2a: There is a statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program combined with students who participated only one time and (b) students who participated in two or more coaching sessions.

$H_0$2b: There is no statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program combined with students who participated only one or two times and (b) students who participated in three or more coaching sessions.

$H_1$2b: There is a statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program combined with students who participated only one or two times and (b) students who participated in three or more coaching sessions.

$H_0$2c: There is no statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program, (b) students who participated in one or two student coaching sessions, and (c) students who participated in three or more coaching sessions.

$H_1$2c: There is a statistically significant difference in COMPASS posttest mathematics scores between students who (a) did not participate in the student coaching program, (b) students who participated in one or two student coaching sessions, and (c) students who participated in three or more coaching sessions.

$H_0$3: There is no difference in personal demographics—such as gender and age—on length of student coaching program participation based on number of coaching sessions attended.

$H_1$3: There is a difference in personal demographics—such as gender and age—on length of student coaching program participation based on number of coaching sessions attended.

The student coaching program was implemented at SCC to help improve the overall success of its students. However, the extent to which this program influenced student success in developmental math courses had never been examined. The college's administrators were interested in examining the efficacy of SCC's student coaching program to determine whether participating in student coaching services improved student success in developmental math courses. It is appropriate to use a causal-comparative research design in the following cases: (a) when the researcher is trying to determine if an independent variable caused a change in a dependent variable, (b) when variables cannot be manipulated because the research experiences have previously occurred, and (c) when a past experience is believed to have had a significant effect on an individual's latter behavior (Lodico et al., 2010). All three prerequisites for causal-comparative designs existed in the program being studied at SCC

Appropriateness of the Design

I used the causal-comparative design because the local problem met the conditions that were appropriate for the design. A causal-comparative research design is used to address research questions where the variables cannot be manipulated

experimentally because they focus on experiences that have already occurred prior to the initiation of the study (Lodico et al., 2010). The student coaching program had already been implemented; thus, I sought to determine if participating in a student coaching program influenced the academic performance of students enrolled in developmental math courses.

Setting and Sample

Study Population

The setting for this study was a small, nonprofit community college located in a rural area in a southeastern state. The college provided academic programs that prepare students for transfer to 4-year institutions, as well as technical programs that provide training for careers in business and industry trades. The college served approximately 2,000 students and was located in an economically depressed area that was experiencing unemployment rates that exceeded 16.9% (SCC, 2013). Most of the students attending the college came from low socioeconomic backgrounds and were classified as first-generation college students. The demographics of the student population consisted of 68% female, 76% African American, 22% European American, 1% Hispanic American, and 1% Asian American (NCES, 2012). Sixty-eight percent of the students in the featured institution were of traditional college age, between 18 and 24 years of age (SCC, 2012). Consequently, most of the college's student population received federal Pell grant aid. The 2012 Integrated Postsecondary Education Data Feedback Report revealed that 88% of the college's students received some form of grant aid, and 73% of the students received Federal Pell Grant aid (NCES, 2012).

Many of SCC incoming students test into at least one developmental education course. Approximately 515 of SCC's 2000 students were enrolled in developmental education courses. The study involved a subgroup of the college's entire population; a subgroup defined by students who were enrolled in SCC's developmental math courses. Sixty-two students were enrolled in developmental math during this study.

Sampling Method

Causal-comparative research topics are generally based on past or preexisting experiences. Therefore, participants in causal-comparative research models belong to groups that have the same past or preexisting experiences (Lodico et al., 2010). The study was based on the experiences of SCC students who were enrolled in developmental math courses in the spring semester of 2014. Hence, I examined historical data that SCC collected to evaluate student performance. Students in the study belonged to the same group as defined by their enrollment in a developmental math class and the equal opportunity they had to participate in a student coaching program. Census sampling strategy was used. The entire realistic population is examined by the researcher in census sampling (Lodico et al., 2010). The population of students used for this study was drawn from the SCC developmental math student population and included students who were enrolled in SCC's second sequence of developmental math courses ($N = 62$).

Sample Size

Historical data that SCC collected to evaluate student performance were examined. Census sampling is frequently used when researchers are attempting to obtain data from their own institution (Lodico et al., 2010). All students who enrolled in the

second sequence of developmental math at SCC were provided an opportunity to participate in the college's student coaching program. Hence, the census sample that was formed was based on the two criteria: (a) all SCC students enrolled in the second sequence course of developmental math and (b) all SCC students invited to participate in student coaching program produced a realistic population that represented a census sample.

The sample size consisted of 62 students from population of SCC students enrolled in the second sequence developmental math and who also completed the post-COMPASS assessment in the fall semester of 2014. Of the 62 participants sampled, 31 (50%) participated in three or more coaching sessions, 10 (16.1%) participated in fewer than three coaching sessions, and 21 (33.9%) did not participate in the coaching program at all. Also, of the 62 sample participants, 22.6% (14) were male and 77.4% (48) were female; 72.6% (45 participants) were categorized as traditional students (between the ages of 18–24), and 27.4% (17 participants) were nontraditional (between the ages of 25–58).

Considering that participants in causal-comparative research are already assigned to preexisting groups based on past experiences, it is important to incorporate selection procedures that control extraneous factors (Lodico et al., 2010). To control such factors of the varying math skills levels, the study participants were selected on the basis of their enrollment criteria for the second sequence of developmental math (MTH098). Because all MTH098 students must meet appropriate placement score requirements on COMPASS to enroll in the course, all of the participants in the study, both the coached

and the noncoached students, had comparable beginning math skills. Power analysis was used to determine and appropriated sample size for group comparison (Creswell, 2009). A minimum sample size of 35 was set for the study based on the following power analysis criteria: statistical level of significance was set at $p = 0.05$, power criterion set at 0.80, and the effect size was set at 0.70 (Creswell, 2009).

Participant Eligibility Criteria

SCC offers two courses in developmental mathematics: (a) MTH090 Basic Mathematics and (b) MTH098 Pre-Algebra. Students are placed in the first or second course based on their COMPASS test scores. The study sample only included SCC students who were enrolled in the second developmental math course (MTH098). The eligibility criteria for participation in the study, therefore, included either of the following minimum skills criteria: (a) successful completion of the first developmental math course (MTH090) or (b) demonstrating adequate placement test scores on the COMPASS test to be enrolled in the second course (MTH098). Students earning the following COMPASS placement scores are placed in MTH098: numerical skills component of 38–46 points, and algebra skills between 0 and 27 points (SCC, 2014b).

Instrumentation and Materials

The ACT COMPASS test served as the primary research instrument for this study. The ACT test is a reliable and valid measure of mathematics skills and is widely used for math placement in higher education (ACT, 2014a). Approximately 46% of community colleges use the ACT COMPASS testing instrument for placement into developmental education (Hughes & Scott-Clayton, 2011). In addition, in the state where

SCC is located, the ACT COMPASS, a computer-adaptive college placement instrument, is mandated by the college's state governing board. The test is used to evaluate incoming first-year students' skills in reading, writing skills, writing essay, math, and English as a second language (ACT, 2013). For the purpose of this study, only the math component of the COMPASS placement test was used.

Concepts Measured by Instrument

The purpose of the COMPASS Mathematics placement test is to direct students to the appropriate level of standard college or developmental math courses on the basis of their mathematics skill achievement (ACT, 2014a). The placement component of the COMPASS Mathematics test is used to assess students' skills at the time the test is given in the following five areas: (a) numerical skills/pre-algebra, (b) algebra (elementary and intermediate algebra, and coordinate geometry), (c) college algebra, (d) trigonometry, and (e) plane geometry (ACT, 2014a). Students are required to demonstrate their skills as they are tested, including reading and understanding math terms; applying definitions, algorithms, theorems, and properties; and interpreting data (ACT, 2014a). Also, the test measures student skills on three cognitive levels:

- Knowledge and skills: requires students to solve test items by performing a sequences of basic operations.
- Direct application: requires students to demonstrate their ability to apply a sequence of basic operations to real-world situations.

- Understanding concepts: requires students to demonstrate depth of understanding in one or more major concept areas based on new or novel settings (ACT, 2014a).

For the purposes of this study, student success was examined in the context of actual changes in cognitive skills from the time the student began the developmental math course to the time they completed the course.

Calculation of COMPASS Scores and Their Meaning

Because the study was limited to examining student performance in the second sequence of developmental mathematics (MTH 098), only the Numeric Skills/Pre-Algebra and General Algebra content areas of the COMPASS Mathematics test results were used in this study. The Numeric Skills/Pre-Algebra test items range from basic arithmetic operations (fractions, decimals, and integers) to concepts needed to identify as prerequisites for a first-level algebra course (exponents, absolute values, and percentages; ACT, 2014a). The Numeric Skills/Pre-Algebra test contains 14 content areas with a specific percentage weight applied to each category to total 100%.

The General Algebra placement test is used to assess student skills in three algebra content areas with percentage weights in each area totaling 100%. The areas assessed, with weights, include (a) elementary algebra (60%), (b) intermediate algebra (17%), and (c) coordinate geometry (23%; ACT, 2014a). Students begin the test at the Numeric Skills/Pre-Algebra level and are routed to the General Algebra test if they score high on the Numeric Skills/Pre-Algebra test, but score low on the General Algebra test. This test-based protocol is designed to bracket the students' current level of competency

in algebra-based concepts and place them appropriately in math studies. In order to be placed in the MTH 098 course, students must achieve between 38–46 on the numerical skills component, and they must achieve between 36–100 on the Pre-Algebra component of the test (WCCS, 2014).

Reliability and Validity

The ACT COMPASS instrument is a valid measure of current mathematics skills (Hughes & Scott-Clayton, 2011). Throughout the state, the instrument is used for math placement because of its demonstrated performance in predicting student success in math. Higher scores on COMPASS test are generally followed by higher grades in the appropriately placed math course (Hughes & Scott-Clayton, 2011). The reliability of a testing instrument is established by the consistency of the scores (Lodico et al, 2010). The Numerical Skills/Pre-Algebra and General Algebra components of the ACT COMPASS test have demonstrated good evidence of reliability that range from 0.85 to 0.90 (ACT, 2014a). According to Lodico et al. (2010), the closer the reliability coefficient is to +1.00, the higher the reliability of the instrument. Hence, the coefficient scores indicate that the ACT COMPASS testing instrument is generally reliable. In a study examining students' perception of the placement process at a southwestern community college, 72% of the students stated that they had been accurately placed (Goeller, 2013).

The validity of an instrument focuses on ensuring that the instrument accurately measures what it is designed to measure (Lodico et al, 2010). The ACT COMPASS test focuses on establishing content validity based on two criteria. ACT content validity criteria include (a) the test measures skills students need to be successful in a specific

course and (b) higher scores on the COMPASS test are likely to be followed up by higher levels of performance in the specific course (ACT, 2014a). A study of 1,694 intermediate algebra students at an urban Ohio state college showed COMPASS algebra placement scores correlated well with student success in intermediate college courses. Donovan and Wheland (2008) reported the cutoff placement scores of the COMPASS algebra test were an accurate predictor that students were more likely to succeed in the college-level math courses than to fail at the urban Ohio state college. In addition, a review of 10 schools revealed that 59-66% of students who were placed into credit level math courses using the ACT COMPASS instrument for placement earned a B or better and 73–84% of students earned a C or better (Hughes & Scott-Clayton, 2011). South Community College uses the ACT COMPASS test to determine college math skills of students at the time the test is given. Hence, it was an appropriate instrument for determining whether students' math skills have improved during the time the student was in the course.

Process to Complete Instrument

The ACT COMPASS test is administered in a computer-based platform and assessed three areas of cognitive intricacy to ensure variety and complexity of the content and test items: (a) basic skills, (b) application, and (c) analysis (ACT, 2014a). The test is not timed. At SCC, students were initially administered the test for math placement at the college. Then, for students enrolled in the second developmental math course (MTH098), the ACT COMPASS test was administered again during the last week of the semester, after students completed the major requirements of the course.

Because ACT COMPASS is a computerized adaptive test, which includes several hundred different math problems, there are no hard copies of the test. Below are sample questions that may appear on the Numerical/Pre-Algebra sections of the test (ACT, 2014b).

1. $54 - 6 \div 2 + 6 = ?$

2. The lowest temperature on a winter morning was –8°F. Later that same day the temperature reached a high of 24°F. By how many degrees Fahrenheit did the temperature increase?

3. If $\left(\frac{3}{4}-\frac{2}{3}\right)+\left(\frac{1}{2}+\frac{1}{3}\right)$ is calculated and the answer to the simplest terms, what is the denominator of the resulting fraction?

4. $\frac{1}{2}+\left(\frac{2}{3}\div\frac{3}{4}\right)-\left(\frac{4}{5}\times\frac{5}{6}\right)=?$

5. Mr. Brown went shopping to buy meat for his annual office picnic. He bought 7 pounds of hamburger, 17.85 pounds of chicken, and 6 pounds of steak. How many pounds of meat did Mr. Brown buy? (ACT, 2014b).

Raw Data Availability and Explanation of Data

Raw data are data that have been collected and not processed to interpret any meaning. In addition, raw data can show or summarize a student's performance on particular measures and scales (Lodico et al, 2010). In this study ACT COMPASS test scores served as the raw data that were used to document student achievement in the developmental math course. The raw data for this study are provided in Appendix B.

Student-coaching was the independent variable, and student success was the dependent variable in the study. Student-coaching data that indicated which students received student-coaching services included the frequency and type of coaching engagement experienced by the coached students. These data served as the independent

variable. The data were categorized on the basis of the frequency of coaching engagement (participants who did not attend any sessions, participants who attended fewer than three sessions, and students who attended three or more sessions). Student success was examined in the context of the student performance on the ACT COMPASS test. Hence, the ACT COMPASS test scores were the data used to measure the dependent variable of student success.

Data Collection and Analysis

After approval was obtained from Walden University's Institutional Review Board (IRB approval #02-13-15-0278127), permission to use archival data for the study was requested and received from the president of SCC (see Appendix C). Once access to data was granted, class rosters were collected from all the second level developmental math classes (MTH098) that were taught in the spring semester of 2014. COMPASS math placement scores of the students that appeared on the class rosters and were used to place the student in the appropriate math course were recorded. Coaching rosters and coaching records were then retrieved from the facilitators of the student-coaching program. To reduce the potential for researcher bias and adhere to the highest standards of the ethical treatment of human participants, participation in the student-coaching program was voluntary. Even after the students enrolled in the program and were contacted by the coach, students were given the chance to opt out of the individual coaching sessions. All students were counted in the study, and the data were separated into three main categories (students who did not participate in coaching program at all, those students who attended fewer than three coaching sessions, and students who

attended three or more sessions). Lastly, post COMPASS assessment scores were obtained from the instructors who taught the course. Hence, only historical data were used in the study.

Class rosters were used to identify the participant pool. From the participant pool, coaching roster participation data were used to separate the participants into three levels on the independent variable: (a) nonparticipation in student-coaching sessions, (b) participation in one or two student-coaching sessions, and (c) participation in three or more student-coaching sessions. The beginning course COMPASS scores and course exit COMPASS scores of the participants were used to determine if the independent variable (student-coaching) had a significant influence on the dependent variable (COMPASS test scores).

Descriptive and inferential statistics were used in the data analysis phase of the study. Descriptive statistical analyses include various methods used to summarize data, to describe data in ways that are meaningful to the study, and to help the researcher identify emerging patterns in the data (Lodico et al, 2010). Planned descriptive methods for this study included means, ranges, and standard deviations. The basic function of the inferential process is to test the null hypothesis (Lodico et al, 2010). SPSS version 17 was used to code and tabulate COMPASS scores. Table 2 provides a summary of the data and statistical tests that were used to analyze the collected data.

Table 2

Hypotheses, Related Variables, and Statistical Analyses

Hypothesis	Independent variable	Dependent variable	Dependent variable type	Statistical test
1	Developmental math course	Posttest COMPASS math score	Interval	*t* test
2	Student-coaching (0 & 1 sessions vs 2 or more sessions attended)	Posttest COMPASS math score	Interval	ANOVA
3	Student-coaching (0, 1, or 2 sessions vs 3 or more sessions attended)	Posttest COMPASS math score	Interval	ANOVA
4	Student-coaching (0 vs. 1 or 2 vs. 3 or more sessions attended)	Posttest COMPASS math score	Interval	ANOVA
5	Gender & age	Length of coaching participation	Interval	ANOVA

A one-way paired *t* test was used to evaluate whether student participation in the developmental math course made a significant difference in the mean pretest and posttest COMPASS scores. Next a one-way ANOVA was used to evaluate the mean mathematics COMPASS scores based on student participation in various levels of coaching. By convention, a probability level (*p* value) of 0.05 was set to reject the null hypotheses and establish that the differences in the participant performances on the COMPASS tests were due to the independent variable treatment (student-coaching). The analyses, results, and an explanation of findings are presented in the Data Analyses

Section, below. The findings will be used to make recommendations regarding supplemental support resources for developmental education to the instructional and student support divisions of the college (see Appendix A).

Assumptions, Limitations, Scope, and Delimitations

This study was a causal-comparative study and used a combination of archived placement assessment data and post-MTH098 math course performance data maintained on the SCC database. In order to enroll in the second developmental math course (MTH098), students must demonstrate that they have met the prerequisite for the course by demonstrating adequate skills on the COMPASS placement test or in the previous developmental course. Therefore, I assumed that all students enrolled in the second course are nearly equal in terms of the basic math skills. Furthermore, I assumed that because successful completion of credit-level math courses remains an essential requirement for degree completion for all SCC programs, increasing student success in developmental math courses will continue to be a priority for SCC, hence, further ensuring the relevance of the study.

Limitations

The limitations of the study are related to the sample size. Because the study was conducted at a small community college and focused only on one course in the developmental math sequence, the sample size was 62 community college students. Also, because students were invited to participate in the student-coaching program, additional limitations were placed on the size of control and intervention group. Furthermore, additional confounding variables, such as motivation or previous experiences with

mentoring concepts, could have presented additional limitations and impacted a student's receptiveness to student-coaching interventions. In addition, I focused on evaluating student success by examining performance on the computer-adaptive COMPASS test. Variables that impact test performance at the time the test was administered, such as test anxiety, lack of understanding about the technology of the computer-based platform, motivation, or other stressors could have affected academic success and could not be controlled by me. Nevertheless, the COMPASS test is a widely used standardized test with design and administration features intended to keep testing error to a minimum.

Scope of the Study

The study explored the extent to which student-coaching programs influenced student success in developmental math courses. The scope of the research spanned from an investigative look at the history of the performance of developmental math students at SCC, to an exploratory look at the resources that may have impacted the academic performance of students. The variables of the study were student-coaching program participation (independent variable) and student success as measured by COMPASS scores (dependent variable).

Delimitations

The study was delimited to students enrolled in developmental math courses at SCC and to students who were invited to participate in the SCC student-coaching program while they were enrolled in the second sequence course of developmental math (MTH098) in the spring semester of 2014. The study was quantitative and delimited only to historical data collected and stored by SCC.

Protection of Participants' Rights

Practices for protecting participants' rights, protecting participants from harm, and ensuring participant confidentiality are ethical requirements for human science research (Lodico et al, 2010). South Community College obtained written consent from each participant who agreed to participate in its student-coaching program. These data were related to educational test scores that were already commonly reported. Consent to collect these data was obtained from SCC's president. Therefore, participant consent forms were unnecessary. The data were collected, reported, and archived in a way that did not reveal participants' identity. To ensure the protection of student identity, data were coded using the last four digits of the student's SCC student number. The study used only data related to educational tests that were routinely being reported, and the participants' identities were not disclosed in the study. Finally, the actual name of the college was not used in the study to further ensure that participant identity would be protected.

Data Analysis Results

The data selected for the initial analysis were the level of student-coaching and COMPASS posttest scores in mathematics. The level of coaching category with the most students was the uncoached group, with 22 students. The next largest category was the three coaching session group, containing 19 students. The remaining level of coaching categories had relatively few students, ranging from only one student who completed 11 coaching sessions to six students who completed only one coaching session. The

descriptive statistics for the independent (level of coaching) and dependent (posttest COMPASS math scores) variables are provided in Table 3.

Table 3

Descriptive Statistics for Participants ($N = 62$)

Number of students	Number coaching sessions	Minimum posttest score	Maximum posttest score	Mean posttest score	*SD*
22	0	20	118	56.09	34.03
4	1	32	107	79.00	32.73
6	2	29	110	53.17	34.78
19	3	32	212	76.19	33.25
5	4	52	118	75.40	26.78
2	5	27	57	42.00	21.21
3	6	70	106	82.67	20.32
1	11	109	109	109.92	N/A
Total					
62	N/A	20	212	66.92	33.34

RQ1: COMPASS Test Scores Based on Developmental Math Participation

A paired samples *t* test was used to determine if there was a significant difference in pretest and posttest COMPASS scores of students based on participation in the developmental math course without regard to coaching participation. This test assumes that the difference scores are normally distributed and that they are independent of each other. The assumption of normal distribution was evaluated and determined to be satisfactory using a quantile-quantile (Q-Q) plot of the pretest and posttest COMPASS scores.

The rationale for testing this hypothesis is that if no significant difference between pretest and posttest COMPASS scores could be detected based on course participation alone, it may be unreasonable to expect any significant differences based on coaching participation. As expected, amongst all study participants ($N = 62$) who took the math course, there was a statistically significant mean difference (22.4 test points) between the pretest and posttest scores, $t(61) = 5.60$, $p < 0.05$, and the null hypothesis was rejected. Cohen's d of 0.71 was computed by dividing the mean difference by the standard deviation thus indicating a moderate to high effect size and further supporting the strength of the conclusion (Creswell, 2012). The results of the t test are summarized in Table 4.

Table 4

Comparison of Participants Pre- and Post-COMPASS Math Scores ($N = 62$)

Paired Samples Test

Variable	*M*	*SD*	*SEM*	*t*	*df*	Sig.
COMPASS Scores	22.435	31.551	4.007	5.599	61	0.000

RQ2: Comparison of COMPASS Test Scores Based on Level of Coaching

Multiple hypotheses (H2-H4) were evaluated to address RQ2: Whether students improved their COMPASS posttest scores in mathematics based on level of coaching.

Null Hypothesis 2. The second null hypothesis stated that there would be no significant difference in COMPASS test scores between students who were minimally coached (0-1 coaching sessions) and students who were coached two or more times. A one-way ANOVA was used to test Hypothesis 2, which predicted that there would be a

statistically significant difference in COMPASS posttest mathematics scores of students who were not coached or coached one time compared to those who were coached two or more times. The one-way ANOVA was a suitable statistical test because the following three assumptions were met: (a) the mean scores were normally distributed, (b) variances in the scores were the same, and (c) the test scores were independent (Martin & Bridgmon, 2012). The assumption of the equality of variances was evaluated and satisfied based on the Levene's test, which produced a p value > 0.05, ($p = 0.144$). A Shapiro-Wilk's test where $p = 0.191$ ($p > .05$) and visual review of their histogram and normal Q-Q plots showed that the COMPASS scores were somewhat normally distributed for both groups of students. The coached group skewness (.09) reflected very little positive skew, while the minimally coached group skewness measured (.52), indicating more positive skew with a longer left-side tail. The kurtosis measures of -.48 for the minimally group and -.76 for the coached group indicated flatter as opposed to more peaked distribution curves for both groups (Doane & Seward, 2011; Razali & Wah, 2011).

A one-way ANOVA was run to compare posttest COMPASS scores of students who were not coached combined with students who were coached only one time ($n = 26$) to students who were coached two or more times ($n = 36$). The minimally coached students scored lower ($M = 59.62$, $SD = 34.24$) than the students who received more coaching ($M = 72.19$, $SD = 32.12$), but the difference was not statistically significant, $F(1, 60) = 2.19$, $p = 0.144$. The null hypothesis that there would be no statistically

significant difference between these two groups could not be rejected based on this ANOVA test result

Null Hypothesis 3. The third null hypothesis stated that there would be no significant difference between minimally coached students (0-2 coaching sessions) and students who were coach three or more times. The one-way ANOVA test was appropriate to test this hypothesis because each of the assumptions was met. The assumption of equality of variances was evaluated and satisfied based on the Levene's test, which produced a p value > 0.05, ($p = 0.368$). A Shapiro-Wilk's test where $p = 0.196$ ($p > .05$) and visual review of their histogram and normal Q-Q plots showed that the COMPASS scores were somewhat normally distributed for both groups. The skewness measure for both groups was equal at .37, indicating a longer left-side tail for both distribution curves. The kurtosis measures of -.37 for the minimally coached group and -1.21 for the coached group indicated flatter as opposed to more peaked distribution curves for both groups (Doane & Seward, 2011; Razali & Wah, 2011).

A one-way ANOVA was run to compare posttest COMPASS scores of students who were not coached combined with students who were coached one to two times (n = 32) to students who were coached three or more times (n = 30). The minimally coached students scored lower (M = 58.41, SD = 33.81) than the students who received more coaching (M = 76.00, SD = 30.84), and the difference was statistically significant, $F(1, 60) = 4.56$, $p = 0.037$. The null hypothesis that there would be no statistically significant difference between these two groups was rejected. The students who were coached three

or more times performed significantly better on the COMPASS posttest than the group of students who were coached 0 to 2 times.

Null Hypothesis 4. The fourth null hypothesis was evaluated with the one-way ANOVA test that compared posttest COMPASS scores of students who were not coached (n = 22), students who were coached one or two times (n = 10), and students who were coached three or more times (n = 30). The one-way ANOVA test was appropriate to test the hypothesis because the assumptions of normal distribution, equal variances, and score independence were met. The assumption of the equality of variances was evaluated and satisfied based on the Levene's test which produced a p value > 0.05, (p = 0.622). A review of the histogram and normal Q-Q plots showed that the COMPASS scores were normally distributed for all levels of coaching engagement (not coached, coached one or two times, and coached three or more times), with a skewness of 0.520 and a kurtosis of -0.479 for the group, a skewness of 0.112 and a kurtosis of -0.870 for the group coached one or two times, and a skewness of 0.372 and a kurtosis of -1.214 for the group coached three or more times.

The one way ANOVA test revealed that of the three groups, the group that was not coached scored lowest (M = 56.09, SD = 34.03), the group that was coached one or two times scored slightly higher (M = 63.50, SD = 34.52), and the group who was coached 3 or more times scored the highest (M = 76.00, SD = 30.84), and the difference was not statistically significant, $F(1, 60) = 2.44$, $p = 0.096$. The null hypothesis that there would be no statistically significant difference between these three groups, therefore, could not be rejected.

RQ3: Coaching Participation Based on Demographic Factors

I developed the third research question in an attempt to identify personal characteristics that might influence a student's participation in coaching. The two characteristics selected for analysis included age and gender.

Null Hypothesis 5-1: Age. The first demographic variable examined was age. The descriptive statistics for the four age groups analyzed are provided in Table 5.

Table 5

The Age Characteristics of Coaching Participation

Age by Range	Mean	Std. Deviation	*N*
(17-23)	1.16	.928	45
(24-29)	1.00	.816	4
(30-39)	1.29	.951	7
(>40)	1.17	.983	6
Total	1.16	.909	62

A univariate ANOVA was conducted to evaluate coaching participation (dependent variable) between four groups based on age (independent variable). The number of coaching sessions participated in was not significant based on the age of the participants, $F(2, 58) = 0.082$, $p = 0.969$, and partial eta squared = 0.004. The results of the ANOVA may have been adversely influenced, however, by the relative inequality in distribution between the four groups. The youngest age group ($n = 45$) contained many more participants than the other three groups. With relatively few students in the second, third, and forth age groups compared to the first, the chances of making a Type II error (failing to reject the null hypothesis when it is true) increases. However, the assumption of homogeneity of variances was evaluated and satisfied based on the Levene's test,

which produced a p value > 0.05, ($p = 0.258$), meaning the variances of the sample were essentially the same.

Null Hypothesis 5-2: Gender. The second demographic variable examined for differentiating coaching participation was gender (n =48 female; n = 14 male participants). The descriptive statistics for the gender groups analyzed are provided in Table 6.

Table 6

The Gender Characteristics of Coaching Participation

Gender	*n*	Mean	*SD*
Female	48	2.27	2.111
Male	14	1.67	2.205
Total	62	2.13	2.131

A univariate ANOVA was conducted to evaluate the difference in coaching participation based on gender. The results showed that there was no significant difference in the coaching participation between the two groups; $F(1, 60) = 0.940$, $p = 0.336$, and the null hypothesis that there is no difference in the length of student coaching participation based on gender could not be rejected. The results of the ANOVA may have been adversely influenced, however, by the relative inequality in distribution between the two gender groups. Considering this difference between the groups, the chances of making a Type II error (failing to reject the null hypothesis when it is true) increases because the assumption of homogeneity of variance can be affected by very unequal sample sizes (Triola, 2012). However, the homogeneity of variances assumption was satisfied based on the Levene's test, which produced a p value > 0.05, ($p = 0.663$),

meaning the variances were the same. The skewness measure for the female group was -.52 and .32 for the male group, indicating that the female group was moderately skewed and the male group was approximately symmetric (Doane & Seward, 2011). The kurtosis measures of -1.54 for the female group and -1.98 for the male group indicated flatter as opposed to more peaked distribution curves for both groups (Doane & Seward, 2011; Razali & Wah, 2011).

Conclusion

This study was prompted by the low completion rates in SCC's developmental math courses. Focused group and survey results from SCC faculty cited "lack of attendance" as the most significant impacting factor on completion rates in the developmental math courses (SCC, 2011). The literature review conducted in Section 1 suggested that personal challenges and affective factors can adversely impact student success in the classroom, especially for academically underprepared students (Boylan, 2009; Boylan & Fowler, 2010; Boylan & Saxon, 2012). Astin's (1984) involvement theory and Tinto's (1975) dropout model provided the conceptual framework. Both theories suggest that students who participate more in the institutional environment experience greater academic success than those who do not. The student coaching program at SCC support these two theories by providing strategies that help students address affective and personal challenges, encourage student participation in the institutional activities, and strengthen students' connection to the institutional environment (Bettinger & Baker, 2011; Bettinger et al., 2013).

The purpose of the study was to see if, based on SCC archival data, participation in the student coaching program influenced the academic success of students enrolled in developmental math courses. For the purpose of this study academic success was evaluated on the basis of student performance on the mathematics COMPASS test. In addition, student coaching data were examined to find differences in the participation in student coaching activities based on student gender and age groups.

The study supported the third hypothesis, which stated that there was a significant difference COMPASS test scores between minimally coached students (0-2 coaching sessions) and students who were coached three or more times. Neither the age nor gender demographic indicators showed statistically differentiated coaching participation. In sum, the finding that students who participated at higher levels in the coaching activities experienced higher COMPASS test scores than those students who participated minimally supported the continuation of the coaching program. Furthermore, since the differences in COMPASS test scores were associated with the level of coaching participation, students should be actively encouraged to participate more in the coaching activities. Additional research will be needed to further explore community college completion and how to assist underprepared students. In Section 3 I introduce and discuss a project that emerged based on the findings reported in Section 2 and the problem as discussed in Section 1.

Section 3: The Project

Introduction

The purpose of this quantitative study was to examine the impact of a student coaching program on student success for developmental math students. Student success was determined by the students' academic performance on a post-COMPASS assessment and the impact of the coaching program intervention as evaluated on the basis of the level of coaching engagement the students participated in while enrolled in the course. Section 3 begins with a brief description of the project that was developed based on the findings detailed in Section 2 of the study. The project description is followed by the rationale for choosing the project genre, a literature review related to faculty and administrators' roles in student engagement initiatives that support student success, and a discussion about the implications of the project. In addition, a plan to evaluate the effectiveness of the project will also be presented.

Description and Goals

The primary goal of this project is to assist SCC in strengthening its student coaching infrastructure by encouraging interdepartmental collaborations for the purpose of increasing student engagement in various aspects of the student coaching activities. The project presented in Appendix A is a 3-day professional development training workshop for faculty, administrators, and student coaches that includes (a) discussions on the design and the impact of current coaching model, (b) interactive sessions designed to promote development of best practices based on lessons learned, and (c) planning sessions on developing an implementation plan for increasing student engagement

coaching activities through team efforts stemming from the interdepartmental collaborations.

In Section 1, the problem identified for this study was the low completion rates of students enrolled in developmental math courses at SCC. A review of course completion data suggested that developmental math students at SCC experienced significantly less academic success than their counterparts who were enrolled in college-level courses. Various student success initiatives had been implemented at the college to address the disparity in the academic performance of the developmental education students, including t adopting a student coaching program designed to address the affective and personal factors that present barriers to student success. The study was designed to evaluate the impact of the coaching activities on the academic success of developmental math students.

In Section 2, I reported a significant difference in the success of the developmental math students who participated in the student coaching program as opposed to those students who did not participate in the program. The project genre chosen for this study needed to help facilitate efforts to strengthen and increase the current coaching activities. Therefore, a professional development project was developed to ensure that key stakeholders such as student coaches, faculty, and administrators are notified about the impact of the current coaching initiative on student success, informed about the factors that contributed to that success, and aware of the potential role they play in strengthening and scaling up these success efforts so SCC can have an even greater impact on more developmental education students.

To support the overall goal of strengthening the current coaching infrastructure, the project design will include (a) increasing awareness of the problem of completion and persistence for developmental education students, (b) facilitating awareness of the impact that coaching has on addressing factors that present barriers to developmental students, and (c) encouraging collaborative efforts between the stakeholders who are responsible for creating an environment that supports student success. To help facilitate these goals, the 3-day professional development workshop will engage participants in interactive sessions involving discussion of affective and personal factors that impede academic success for developmental math students, discussions on how the current coaching activities have attempted to address those factors, an examination of student responses to the coaching efforts, testimonials of students who were coached, and reflections from coaches who facilitated the coaching efforts

Rationale

The project was chosen based on the analysis of the quantitative data that were collected from students who participated in student coaching activities while enrolled in the developmental math course. The data were examined in light of the literature review on factors that impact academic success of underprepared students. According to the literature review, the level of student engagement with institutional activities can have a positive impact on a student's academic success; this is particularly important for underprepared students (Axelson & Flick, 2011; Korobova & Starobin, 2015; Walker, 2014). Therefore, I decided to focus the project on providing professional development to stakeholders who have the resources and authority to establish an environment that

promotes, supports, and encourages student engagement as the project data indicated that the level of engagement in the coaching activities had a positive impact on the academic success of developmental math students.

According to the findings, increased engagement produced increase success in the student performance in the course. In this study, I evaluated the student performance post-COMPASS assessments based on the students' level of participation in a student coaching program. While there were sporadic increases in the post-COMPASS assessment stores at each level of coaching, I found a significant difference in student performance was revealed in students who participated in three or more of the student coaching sessions. In the data from students who did not participated in the coaching sessions or those who minimally participated, I found no significant difference in their academic performance.

Because my research facilitated a better understanding of the factors that impacted the coaching effectiveness (three or more coaching sessions), it was appropriate to focus my project development efforts on a professional development initiative designed to assist stakeholders in providing a platform supportive of increasing student participation in the coaching activities. The project addresses the problem of low academic success of developmental math students by providing support to strengthen and increase the positive impact of the coaching initiative. I anticipate that this project can help SCC improve the efficiency of the coaching services they provide and increase the number of students to whom they can provide these services. In addition, an important

aspect of the project is the facilitation of the collaborative dialogue about one of SCC's largest incoming populations: developmental and underprepared students.

Review of the Literature

The purpose of this literature review was to examine current research on factors that positively impact academic success for underprepared students. In the literature review, I focused on discovering change initiatives that support the research finding. A variety of studies were reviewed based on a search of the following keywords: *developmental education students, underprepared students, change initiatives in higher education, early alert initiatives for college students, engagement and student success, student engagement, faculty professional development, inter-departmental collaborations in higher education, developmental and intrusive advising,* and *student support.* The research articles chosen for this review included peer-reviewed articles and journals obtained from several academic research databases such as Education Research Complete, EBSCOhost, Google Scholar, ERIC, and ProQuest.

Student Engagement

The more students participated in the coaching services, the better the academic outcome they experienced. Because fewer than half of the students in the program participated in the coaching activities three or more times, it was appropriate to focus on strategies that could increase coaching participation. A significant amount of research has been conducted to examine how the level of student engagement in the academic environment impacts the student's overall academic experiences (Axelson & Flick, 2011; Korobova & Starobin, 2015; Walker, 2014). In studies of first-year undergraduate

students, engaged students were more likely to be more intrinsically motivated (Groves, Sellars, Smith, & Barber, 2015) and were also more likely to experience greater levels of academic success than their less engaged counterparts (Chan & Wang, 2016). Students who are more integrated in the collegiate culture and environment are more likely to be retained and persist to degree completion (Wyatt, 2011). Additionally, students who feel more academically capable and connected to their institution are more likely stay enrolled (Bettinger et al., 2013). Furthermore, students commented that their relationships with their teachers and mentors contributed significantly to their confidence in their ability to complete college work or programs (Bruch & Reynolds, 2012).

Three factors that encourage and promote student engagement are (a) interactions with their instructor, (b) peer relationships and interactions centered around their studies, and (c) an institutional commitment to provide student support services that adapt to the students' changing needs (Groves et al., 2015). Solomonides (2012) asserted that engaging students on multiple levels fosters a sense of belonging and encourages interactions in both formal and informal aspects of student life. Groves et al. (2015) noted that although a number of factors can be used to encourage student engagement, student relationships with their instructors are the most important contributing factor. Coaching programs, therefore, will be more effective when they include these salient factors for engaging students to increase student success. Quality interactions with faculty may also be an important factor for engaging students.

In a study of a pilot program at a community college designed to increase faculty/student interactions by engaging faculty in an advising initiative, students who

participated in the program attained higher overall GPAs and were retained at a higher rate than those students who did not participate in the program (Rayan, 2013). Additionally, in a study of an e-Sponsor mentoring program designed to support developmental education students, participants attributed the improved success they experienced in their coursework to the study strategies and time management tools recommended by their mentors (Hodges, Payne, Dietz, & Hajovsky, 2014). Traditionally SCC student coaches have served as mentors who assist students in navigating the collegiate environment, and SCC faculty have served as academic advisors to students. Connecting the advising skills of faculty and the mentoring skills of the student coaches may provide a more comprehensive approach to engaging students and increasing student success.

Effects of Early Alert Initiatives

Just as increasing student participation in support services has shown to have a positive impact on student success, connecting students to those services early has also shown to promote student success. students who were identified as at-risk of failure early and received personalized feedback from instructional staff connected with tutorial services at much higher rate than their counterparts who were not contacted (Cai, Lewis, & Higdon, 2015). First-year physics students who participated in an early intervention initiative developed to help struggling students showed a 0.17 increase in their GPA, while those students who did not participate showed no increase in their GPA (Wright, McKay, Hershock, Miller, & Tritz, 2014). Similarly, campus-wide early alert initiatives that incorporate collaboration with faculty and advisors positively impact students

success and enhance communication among students, instructors, and advisors (Faulconer, Geissler, Majews, & Trifilo, 2013). Connecting with students early in the semester has been a priority of the SCC student coaching program. Partnering with faculty to incorporate early alert initiatives in the coaching program may be an effective strategy to increase student participation in coaching activities and student success in their courses.

Some studies of early intervention initiatives have shown promising results for increasing students' persistence and completion (Burkholder et al., 2013; Dunn, Hains, & Epps, 2013; Schreiner, Noel, Anderson, & Cantwell, 2011). Bosco (2012) suggested that implementing early interventions to address the challenges that at-risk students face can be an effective method for promoting persistence and increasing completion. Tampke (2012) found that early alert initiatives enabled faculty members to identify students who showed warning signs of academic trouble and connected them to student success counselors that resulted in 70% of the referred students persisting to the next semester. Finchum (2015) contended that instructors play a role in the academic journey of struggling students because they are in a strategic position to identify potential threats to student success. Furthermore, early alert initiatives have allowed colleges to reach out to struggling students before it is too late to for those students to recover lost ground (Capps, 2012) and have afforded instructors the opportunity to facilitate a comprehensive response to students' academic challenge (Finchum, 2015). Hence, early assessment and intervention may be effective methods for engaging students in positive behaviors that

promote student success and encourage increased participation in student success initiatives, such as student coaching programs.

Importance of Professional Development

Because faculty can have significant influence on student connection with and engagement in the institutional culture (Hagenauer & Volet, 2014; Kuhn et al., 2015; Roorda, Koomen, Split, & Oort, 2011), it is appropriate for SCC to incorporate faculty in collaborative efforts for the purpose of increasing student participation in the coaching activities. Williamson, Goosen, and Gonzalez (2014) asserted that it is impossible for institutions to build a culture that focuses on student engagement by including only student service department personnel. Faculty need to be aware of the importance of increasing student engagement, the impact they can have on encouraging student participation, the characteristics of the population of students that the institution serves, and the external factors that present barriers that impede student success. Walker (2014) asserted that due to limited understanding of student background, faculty sometimes project low expectations for students; this is especially true of students from low socioeconomic backgrounds. Scheduling periodic professional development sessions can give faculty members the tools they need to respond to the changing needs of the students, institutional demands, and the individual faculty member (Hadian & Sly, 2014). Therefore, professional development can help facilitate the knowledge that faculty need to encourage and support student engagement with an expectation of increasing student achievement. Institutions may also want to incorporate professional development activities for the administrators who are responsible for supervising change initiatives.

In addition to the need to provide professional development for faculty, it is equally important for administrative personnel to receive training. In a study of midlevel administrators' perspectives on their experiences with transitional leadership initiatives, participants stated that they felt that the lack of job-specific professional development training impeded their effectiveness in the position (Smith, Rollins, & Smith, 2012). In another study evaluating the professional development needs of administrative staff, department chairs cited working with faculty and administration, managing change, and personal development as some of the most challenging aspects of their job (Schwinghammer et al., 2012). Sirkis (2011) asserted that because some academic administrators receive little to no administrative training prior to assuming their position it can be challenging for them to effectively spearhead change initiatives. Hence, a professional development model that engages both faculty and administrative staff can present a more comprehensive approach to addressing the problem. Cultures of collaboration where there is a focus on solving problems as being consistent with increases student engagement and success.

Culture of Collaboration and Change Management

In order to expand and increase student participation in coaching activities, it is important for SCC to explore collaborative strategies that involve including faculty in the coaching activities with the other student support staff, Such efforts will be an important change for the way that the coaching program at SCC currently operates. Hadian and Sly (2014) emphasized that to build the collective capacity of institutional change efforts, collaboration must become embedded in the customary practice of the institution.

Creating a culture of collaboration between faculty and student services allows the staff to contribute their unique knowledge to maximize impact on student success and facilitates a better understanding of how to support students (Williamson et al., 2014). The Executive Director of the National Academic Advising Association (NACADA; as cited in Harborth, 2015) noted that changes in student demographics in higher education has expanded advising toward a more holistic approach to include components that support both student development and student learning. Engaging faculty in the coaching aspect of student support give faculty and student coaches opportunities to gain more insight into the development and the learning components of the students' higher education journey.

Managing change efforts can present challenges for institutions. However, because implementing broad based institutional change can lead to improvements in students' success (Mayer et al., 2014), institutions may be willing to undertake the challenge. Caruth (2013) commented that just as administrators have embraced change as a normal part of organizational culture, they must also accept the fact that resistance to change is unavoidable. However, understanding key components about of the change process and incorporating communication practices that encourage open dialogue can help increase the success of the change efforts (Barrett, 2012; Thomson, 2013). Given the challenges that can accompany change efforts, institutional leaders should engage stakeholders in the planning process early and often.

Project Description

The findings of this study indicated that student coaching can be an effective intervention that leads to improvements in student success for underprepared students who participate in coaching activities at adequate levels. Including faculty in the student outreach aspect of the student coaching process for the purpose of increasing student participation in the coaching activities is the goal of this project. The focus of the project activities is to raise awareness of both faculty and administration about the student-coaching program and its impact on student success.

After completing the project, I will give a copy of this study to stakeholders at SCC. I will meet with the vice president of instruction and the dean of students to discuss the project and revise the implementation plan based on their input and feedback. I will also present to the college president's cabinet and solicit feedback for improvement. Necessary revisions to the project will be made based on feedback from the executive level administration on the president's cabinet. After appropriate approvals to implement the project have been secured, a 3-day interactive workshop will be conducted with faculty and mid-level administrators within the instructional and student services departments.

The 3-day workshop will consist of presentations from instructional administrators, student coaching program coordinators, student service administrators, and student testimonials. The first day of the workshop will focus on raising awareness about the challenges academically underprepared students face. On Day 2 of the workshop the presentation will provide an overview of SCC's current student-coaching

program, as well as a description of the results of the research study that was conducted to examine the impact of SCC's student-coaching program. The final day of the workshop will focus on developing collaborative strategies for developmental education faculty and student coaching staff to work together to promote greater student participation in coaching activities.

The workshop information will be communicated in presentation slides, lectures from guest presenters in the instructional, student services, and student-coaching departments, and videotaped testimonials from current and former student participants in the coaching program. The workshop participants will be given an opportunity to reflect on the content as it is being disseminated through focused group discussions and inter-departmental collaborative sessions incorporated within workshop schedule. Participants will express their understanding of the factors that present barriers to student success for SCC's underprepared population, differentiate their role in developing strategies to address those barriers, and communicate the challenges they face in providing support to this population of students. In addition, they will discuss resources to utilize to promote greater participation in the coaching program and share thoughts and concerns about possible program implementations.

Potential Resources and Existing Supports

Minimal resources will be needed for the implementation of the project. A meeting space, copies of the presentation slides, a laptop computer, a projector, a remote control pointer clicker for the presenter to advance the slides, and a clicker audience response system will be needed to conduct the workshop. Recommended supplies that

would require financial resources include the following: refreshments, snacks, lunch, and door-prize incentives. Potential existing support for the project are extensive knowledgebase of the current student coaching staff to serve as copresenters in the project, the college's existing technology infrastructure-is already equipped with interactive resources to accommodate engaging presentations, and the existing mandatory participation requirement for faculty and staff to engage in a specific number professional development activities each year.

Potential Barriers to the Project

Some potential barriers to the project include lack of buy-in from faculty, approval from executive leadership, allocation of funds, resistance to the collaboration process by faculty and the coaching staff, and apathetic attitudes toward professional development initiatives. To address the potential for lack of buy-in from faculty and apathetic attitudes for professional development initiatives, I plan to infuse student testimonials about the impact that student coaching has had on their lives at the beginning of the training and at key increments throughout the training process. In a study on the effectiveness of a collaborative professional development initiative between three universities it was reported that testimonials from individuals who occupied a role in the initiative provided useful insight in the experiences of the participants (Sparks, Saw, & Davies, 2014). The purpose of providing a presentation to executive leaders in the president's cabinet and meeting with the executive leaders in instruction and student services is to increase the potential for obtaining approval from the executive leadership and to ensure adequate funds are allocated to support the project. Lastly, to encourage a

climate of collaboration I plan to invite both the vice president of instruction and the dean of students to present a model detailing how both departments work together to accomplish the goal of increasing student engagement in coaching activities.

Proposal for Implementation and Timetable

The implementation of the project could take 4 to 6 months. The most significant determinate of the time line is obtaining permission to present proposal to the president's cabinet meeting. The written project plan will be distributed to the stakeholders and the meeting scheduled with the executive administrators in the student services and instructional departments shortly after my project study has been approved. The next step will be the presentation to the president's cabinet; after which a request will be submitted to conduct the professional development with faculty and staff. Once approval to present is obtained, training meetings to discuss the scope and expectations of the workshop will be held with coaching staff members and administrators who will serve as presenters for various aspects of the project. Assuming approval from the college, a training date that coincides with the official professional development schedule will be selected.

Roles and Responsibilities of Student and Others

My role as the project researcher will include developing the training materials, facilitating all aspects of the workshop activities, and coordinating with the other staff that will be co-presenters. The student testimonials that were mentioned earlier will be obtained from video presentations from the coaching staff archives and resources. Hence, no students will be attending or participating in the workshop activities. However, students will be involved in the coaching activities, assuming the college and faculty

implement the concepts proposed in the training. Faculty will be responsible for assisting the coaching staff in identifying at-risk students and helping to connect them to student coaching services early in the academic process. Student coaches will be responsible for collaborating with faculty to proactively monitor student progress and to actively seek opportunities to physically connect with student during times that coincide with students' class meeting schedules. Administrators are responsible for providing an environment that promotes collaboration within and between departments.

Project Evaluation Plan

The professional development training project will focus on introducing participants and key stake holders to the various aspects of the coaching concept as well as sharing with participants the multiple factors that can impact the coaching process. Because each day of the project will focus on different aspects, formative evaluations will be conducted at each phase. An outcome-based summative design will be used to evaluate the project. An outcome-based evaluation is applicable in situations in which the organization desires to attempt to determine if they are implementing the appropriate activities to address the needs of its patrons (Zinovieff, 2011). Furthermore, Zinovieff (2011) defined outcomes as those concepts and behaviors that can be noted as benefits to the patrons and then translated into enhanced learning such as knowledge, perceptions and attitudes, or skills.

The formative evaluation plan will be ongoing and will include individual evaluations of each of the individual daily sessions and overall evaluation of the entire professional development training**.** Surveys designed to determine participant perceptions

of the content covered in each session will be administered and evaluated each day. The results of each daily session will be used to inform and direct the focus group discussion sessions that will be conducted in the next day's training session. Also, on the final day participants will be asked to take a summative assessment to evaluate the effectiveness of the overall training. Copies of both the formative and summative surveys are located in Appendix A in Table A1 and Table A2. Results from the comprehensive evaluation of the overall training will be used to inform and direct the type of additional resources and follow up training that will be used to support faculty and administrators as they proceed with implementing the collaborative student coaching initiative. All surveys will be developed and administered in Survey Monkey. The individual daily sessions and the overall summative assessment will include the following questions:

Daily Formative Assessment

1. List three things you learned as a result of participating in this training session.
2. What two activities you participated in do you believe increased your capacity to engage in dialogue about student coaching within your department and with other departments?
3. What one thing discussed today's training that would you like to learn more about?

Summative Assessment

1. Of all the information that was presented, what is the single most important learning component that impacted your perception of the students we serve on our campus?
2. Of all the information presented, what is the single most important learning you feel will assist you in increasing the level of in-class and out of class interactions you have with your students?

The surveys were designed to gain perceptions from the following key stakeholders who participate in the training: faculty who teach developmental math courses, student coaching staff who coach developmental students, and administrators who supervise both the student support and instructional departments.

Project Implications

Local Community

The extent to which the student connects with the institutional culture has been shown to be directly related to the level of success the student experiences during their tenure at the institution (Comeaux, Snyder, Speer, & Taustine, 2014; Hu, 2011; Korobova & Starobin, 2015). This project is designed to bring awareness to this fact, equip faculty with skills needed to facilitate greater levels of engagement with students, and to encourage collaborations with the faculty and student coaching divisions to facilitate a culture of continuous improvements in this area. Since there are indications from the findings of my study and from literature which support the notion that increased engagement in institutional culture leads to increased levels of academic success, this

project has potential to affect the learning environment for students which will ultimately impact social change.

The implications for social change include enhanced faculty and student relationships, increased student connection with the collegiate environment, improved strategies for faculty to establish initial rapport with students and maintain productive relationships with students throughout the course, and expanded institutional capacity to provide out-of-class support for students. A particularly significant social change for this project could include programs that focus more strategically on interventions that connect underprepared students the academic support they need to successfully navigate the demands of college level curricula early and often. The intervention should lead to increased academic success of underprepared students, which translate to lower rates of attrition. Higher level of persistence and completions are a win-win for both the student and the institution. Better enrollment and retention rates translate into higher levels of state funding appropriations and higher levels of revenue generation. The project will create a better platform for collaborative dialogue to take place between instructors and administrators, and should produce stronger advocates for student success. Increasing student success should raise the overall morale and shape a more positive organizational culture for the institution.

Ultimately, students are afforded the opportunity to raise their standard of living as they complete courses and programs that give them the skills to meet the employment needs of the local economy (Nica, 2012; Romele, 2012). Increasing a student's earning potential impacts the standard of living they can afford to provide for their families. In

addition, helping underprepared students model academic success within their families can potentially inspire other members of their family to embark on an educational journey themselves.

Shaping a more skilled work force can improve the overall quality and standard of living of the community as whole (Nica, 2012; Carlson, Novak, McChesney, Green, & Hood, 2013). Communities that have more skilled workforce have greater potential to attract new business and industry. In addition, a stronger educational infrastructure with proven capacity to promote student success gives local leaders the resources they need to address current and future needs within their community.

Far-Reaching Implications

In the larger educational context, there is increased focus on student success. Many states, including as Tennessee, Texas, Florida, and North Carolina, have already adopted some form of performance-based funding models and most the private and public grant funding based their award system on who can produce the most student success in the shortest amount of time. Considering these factors, it is incumbent upon institutions to focus efforts on developing a comprehensive model for address all barriers to student success. This project has the potential to have far reaching impact, therefore, on the educational environment at SCC as well as the state in the governing system in which SCC operates.

In the state where SCC is located there are several state funded initiatives that target student groups with characteristics that are similar to the same affective and personal factors that present challenges to underprepared students. Some of these student

groups include dual enrollment students, displaced workers, underwaged workers, and students who are high school drop-outs. Each of these student groups typically have cognitive, affective, and personal factors that can present barriers to success if not adequately address. The findings and the potential impact of the project can help institutions across the state better leverage the resources and assist them in providing an environment that supports and promotes student success.

Conclusion

In this quantitative study I examined the impact that a coaching program had on the academic success of developmental math students. The success of 62 students, as measured by COMPASS test math scores, was evaluated based on the level of coaching they participated in while enrolled in the developmental math course. Using the method of evaluation, I examined the factors that impact the success rate of the coaching program. The goal of the project was to raise awareness of the factors that impact success and increase training participants' confidence in their ability to be a significant contributor of those success factors. In Section 4, I discuss the strengths and limitations of the project study, share my reflections as a scholar, and explore possibilities for future research.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

In this section, I will reflect on the project from a scholarly perspective, discuss the strengths and limitations of the project, make recommendations to address the study limitations, and elaborate on possible future research directions. The strength of this study is its potential to enhance the academic success of developmental students through more effective student coaching programs. A significant amount of research in the field related to the how cognitive factors impact academic success for underprepared students. However, little attention has been given to examining the impact of providing services like student coaching to help students address affective factors, such as attitude, motivation, and self-confidence and personal factors related to finances, transportation, or work. Although Astin (1984) and Tinto (1975) presented theories about factors that impact dropout rates and increase students' potential to persist in college, there is limited research available about how interventions such as student coaching programs have been implemented to address those factors. Some researchers (Boylan, 2009; Boylan & Fowler, 2010; Boylan & Saxon, 2012) contended that for underprepared students, weak affective skills can be more detrimental to student success than cognitive factors. Furthermore, Bettinger and Baker (2011) found that a student coaching program designed to address students' weak affective skills and personal factors showed a significant improvement in student success. Because the student coaching program at SCC was designed to address affective and personal factors, the project allows faculty who traditionally only address cognitive factors in students to see how alternative affective

factors that occur outside of the classroom can impact the cognitive learning that takes place in the classroom.

Another strength of the project is that the local setting of the study, SCC, had a student demographic that fits the profile of students who would most likely need services that address affective factors. Most incoming SCC students are classified as underprepared and face external challenges due to limited financial resources. The SCC leaders recognized the need and had already begun to provide additional services. Therefore, sharing the results of the findings in the project implementation phase will likely be welcomed by the participants. Because the training participants will view student underpreparedness as a pervasive institutional problem, a sense of urgency may already exist at various levels.

The strengths of the project can provide a basis for acquiring buy-in from administrators and faculty. However, the following limitations should be considered: a lack of willingness from faculty to accept the evidence presented, faculty failure to see the relevance of the potential impact that individual faculty could have on the coach program, or the participants' lack of ability to see the impact that coaching activities have had on student success. In the following section, I will recommend alternative approaches to addressing these limitations.

Recommendations for Alternative Approaches

A potential limitation of the project to address the problem could occur if the faculty participants are not willing to accept the evidence from the study. According to the study results, the students who participated in the coaching activities at higher levels

experienced better academic success than the students who did not participate or participated at minimal levels. The project provides some options to engage faculty in assisting the coaching staff in connecting students to coaching activities. If the faculty does not perceive the positive impact that their contribution could have on the coaching process, it could decrease the effectiveness of the project. Other limitations could include a lack of time for faculty to attend the workshops and participate in follow-up collaborative meetings with the student coaching staff.

Faculty may see the student coaching intervention as limited success for an isolated number of students. To refute any lack of acceptance of coaching effectiveness, the coaching program impact could be strengthened by allowing students to engage in the focus group discussions during the training sessions. To address the concern that faculty may not have time to attend the training, I recommend that the workshops be scheduled in between semester end and start dates to ensure that faculty will not have class scheduling conflicts.

Scholarship, Project Development, and Leadership and Personal Change

Scholarship

In this scholarly process, I have grown to understand the factors that present barriers to completion and persistence for developmental students. I also discovered the extent to which the issue of persistence and low academic success for this population of students has affected the higher education landscape. Furthermore, I have been enlightened about how addressing affective factors that impede the academic progress is as important as addressing cognitive factors for underprepared students.

This process has forced me to focus my research and write responses in a way that would be acceptable to the audience that will be participating in the training component of the study. Having to write and submit my content for review helped me to examine my work in the context of how others would view the research study and its findings. In addition, my ability to gather relevant content and synthesize information has improved.

Lastly, I learned that the ability to persist regardless of external distractions is the key to successfully completing the scholarly process. Scholarship is a journey in and of itself. This project study emerged from several different versions since its inception. Each revision has improved the quality of scholarly product. I have learned the importance of iteration, reflection, and the collaborative process for the production of scholarship through research.

Project Development

I learned that project development is a process and not an event. Each time I submitted a document, I felt as if I had just completed a major event. Upon receipt of the feedback from my chair, I was quickly reminded that it was an iterative process of continuous reflections and revisions. I learned that project development does not work well in isolation. I learned to be appreciative of the feedback that I received from my colleagues who reviewed my work because this feedback resulted in a more polished and scholarly product, as well as a more polished and scholarly researcher.

Leadership and Change

I learned that leaders who desire to impact change must first be willing to change themselves. It is difficult to lead a group in a change initiative if a person has not been

willing to submit and engage in the process of change. There is a difference between engaging in discussion about the theory of change and engaging in the practice of change. Before I started this process, I believed that I was open to the opinions and perspectives of others. However, as I progressed through this journey, I saw that I needed to expand my scope of inclusion of others' perspectives. I learned that leaders who expect to impact change must consider the perspective of others and engage in collaborative exchange for the greater good of all.

Reflection on Importance of the Work

The level of research that I had to conduct to complete the required literature reviews in Sections 1 and Section 3 has increased my ability to make evidence-based conclusions. I have grown in my ability to objectively examine different perspectives of scholarly discussions. As a result of conducting this project study, I am not as likely to make decisions or come to conclusions without examining all aspects of the concept. As a scholar, I learned that I have to work hard to stay focused and not allow the demand of other responsibilities to distract me from the focus of my scholarly work.

I learned that as a practitioner, I am happy to engage with aspects of the project for which I am passionate. For example, I enjoyed writing about the research and conducting the literature reviews because I was able to gather relevant information about the problem. I have a passionate connection to exploring strategies that have positively impacted the academic success of developmental education students. However, in those aspects that I do not find as interesting like methodology and data analysis, I tended to be less enthusiastic about approaching those aspects of the scholarly process. So I learned

that I have to find creative ways to stay motivated to consistently engage in the entire process.

I learned that as a project developer, I needed to focus my efforts so that the scope of the project remained at a level that could be effectively implemented. Because there was a significant amount of information gained from the research, it was a challenge to determine the most important information to communicate to the stakeholders. However, the research findings helped me to narrow my focus by emphasizing the component that showed the most positive impact of the student coaching successes. Ultimately, I think the project that I developed is of adequate length and scope with attainable goals and objectives and has the potential for positively impacting student achievement and success, as well as the organizational culture of the college.

Implications, Applications, and Directions for Future Research

Nationally, the numbers of academically underprepared students entering community colleges are high (Quint et al., 2013; Sherwin, 2011). The number of incoming first-year students who test into developmental courses at SCC surpasses the national average. This population of students struggle much more than do their college-ready counterparts. Both cognitive and affective factors are the culprits of these students' struggles. While cognitive interventions for underprepared students have been implemented, few interventions have been developed to address affective factors. In this study, I examined one intervention, student coaching, that was designed to address affective factors that impede academic progress of underprepared students. I found that developmental math students who engaged in coaching activities three or more times

while enrolled in the course experienced greater academic success than those students who did not.

The project study has potential to impact social change in the local setting at SCC and beyond. I found that not only can student coaching interventions can be a resource that the institution can use to address affective and personal barriers to student success, but it can also be predictor of the interventions' success. This information gives the institutions some indication of what to focus their efforts on. The potential for social change at the local level resides in the professional development efforts and allocation of resources that the institution invests to increase the amount and frequency in which they make these services available to their students. Social change impact can reach beyond the institution as it shares it success stories at local, state, and national conferences. The student coaching and professional development training model can be duplicated at other institutions across higher education institutions.

Institutions of higher education have a responsibility to meet their students where they are and to provide an environment that encourages and equips them with the resources they need to reach their highest potential. A part of that commitment to help students reach their potential will require institutional leaders to address the comprehensive needs of all students. There should be established processes to examine and identify factors that impede student success, followed up by interventions designed to address those factors. Based on the findings of the study, the institution had developed an intervention to address a problem in way that leads to improved student success. There coaching intervention and the professional development initiative can be scaled up and

duplicated in departments other than the developmental education department at the local institution and at other institutions within the state community college system. This process of research and finding discovery can be applied to other initiatives across the local setting. The research focus of this study was limited to examining the impact of coaching on developmental math students. However, some directions for future research could include examining the impact of student coaching initiatives on other populations of students who typically struggle with persistence, such as nursing students, first-generation students, African American males, and students from low socioeconomic backgrounds.

Conclusion

As I reflect on the process of this project, I realized that I gained developmental insight about the process of research. The motivation for this study was based on a desire to find resources that would increase the academic success of underprepared students. While success for developmental students is not automatic and sometimes can be challenging, it is rewarding to know that assisting this student population is possible. Although underprepared students may require more resources than their college-ready counterparts, student success translates the same for both groups: improved academic performance, increased persistence rates, and greater levels of completion. These outcomes are prized by higher education institutions.

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Appendix A: The Project

Professional Development Training Plan

Project Title	Coaching Up Student Success		
Date	Fall 2016		
Department	Student Coaching Department		
Contact:	Role	Email	Phone
Tammie Briggs	Project Developer	tbriggs@scc.com	555-1212
Version #	Date	Comments	
1.0	09-01-16	Draft #1	

1. Project Introduction

The goal of this professional development training is to assist South Community College in strengthening its student coaching infrastructure by coordinating inter-departmental collaborative efforts between Student Coaching and Instructional Departments for the purpose of increasing student participation in student coaching activities. The purpose of this training is to guide developmental education faculty and student coaching staff in initiating dialogue about the unique characteristics of SCC students and in developing planning strategies to address those characteristics that sometimes present barriers to academic success.

2. Training Scope

2.1 Training Objectives

2.1.1 Participants will gain a better understanding of the challenges facing SCC under prepared student and of how affective factors that present barriers to academic success for developmental or underprepared students at SCC

2.1.2 Participants will acquire knowledge of how SCC currently addresses those factors through student coaching and examine best practices learned from its current coaching initiative

2.1.3 Participants will apply knowledge of best practices to develop collaborative strategies for developmental education faculty and student coaching staff to work together to promote greater student participation in student coaching activities

3. Roles and Responsibilities

The table below is list of training participants and the roles each are expected to assume during the training process. The responsibilities of training participants may evolve as additional iterative drafts of the training model are revised and updated.

Roles	Responsibilities
Project Developer	Develop Training Materials Schedule Training Time & Securing Venue Invite and Coordinate Guest Presenters & Moderators Secure Student Testimonials Develop Evaluation Instruments Collaborate with Administration to Secure Funding Obtain Approval to for Developmental Faculty/Coaching Staff to Attend Training
Guest Presenters	Coaching Staff and Student: Share program participant perspectives and testimonials
Moderators	Facilitate Focus Group Discussion Sessions
Participants	Attend Training and Participate in Focus Group Discussion Implement Project Concept

4. Project Timeline

The training activities will be facilitated over a three day training period. The project curriculum will focus on the various aspects of the student coaching concept based on the below timeline:

Day	Curriculum Focus
Day 1	SCC Student Demographics: Challenges of Under Preparedness
Day 2	SCC Student Coaching Initiative: Opportunities to Succeed
Day 3	Collaboration Strategies: Leverage Resources To Amp Up Efforts

5. Materials & Budget

5.1 Training Materials and Supplies

- Projector, Laptop, Clicker Audience Responder devices, presentation slides handout & Smartphone
- Snacks & Beverage Refreshments and Lunch Meals

5.2 Budget

- There will be no funds expended for the technology based materials as they are a part of the institutions inventory
- Cost of the consumable items will determined after the number participants who will attend the training has been identified
- There is no cost associated with presenters as they are all affiliated with the institution

Professional Development 3-Day Training Schedule

SCC Student Demographics: Challenges of Under Preparedness (Day 1)	
Training Objective: Participants will gain a better understanding of how affective factors that present barriers to academic success for developmental or underprepared students at SCC	
8:00 am - 8:15 am	Registration & Breakfast Refreshments
8:15 am - 8:30 am	Welcome & Introductions
8:30 am – 8:45 am	Training Overview
8:45 am – 9:00 am	Knowledge Assessment Exercise: "Look …Who's Coming to Dinner?"
9:00 am – 10:15 am	**"Tell The Numbers Story":** Local & National Data Related To Academic Challenges facing Underprepared Students **Presentation Platform:** Presenter & Presentation Slides
10:15 am – 11:00 am	**"Now That You Know, What Do You Think?"** Participant reflections about the data and perspectives on the institutional impact. **Presentation Platform:** Moderator lead Focus Group Discussions
11:00am – 11:15 am	Break
11:15 am – 12:30 pm	**"Why Is This A Problem?"**
12:30 pm – 1:45 pm	**Lunch & Learn** Participants will be seated at lunch tables based on their specific job responsibilities Participants will engage in discussions about how the information shared impacts their specific role at the College
1:45 pm – 3:15 pm	Literature & Research Related To Under Prepared Students
3:15 pm - 3:30 pm	Break
3:35 pm - 4:00 pm	Next Day Previews & Survey Evaluations

SCC Student Coaching Initiative: Opportunities to Succeed (Day 2)	
Training Objective: Participants will acquire knowledge of how SCC currently addresses affective factors that impeded student success through student coaching and will examine best practices learned from its current coaching initiative	
8:00 am - 8:15 am	Breakfast Refreshments
8:15 am - 8:30 am	Welcome
8:30 am – 8:45 am	Day 2: Training Overview
8:45 am – 9:00 am	Review of Key Information From Day 1
9:00 am – 10:15 am	**Description & Results of Study Conducted on the impact of student Coaching Academic Success of SCC Developmental Math Students**
10:15 am – 11:00 am	**"What Are Your Thoughts About the Research Study"** Participant reflections about the results shared and it potential for institutional impact. **Presentation Platform:** Moderator lead Focus Group Discussions
11:00am – 11:15 am	Break
11:15 am – 12:30 pm	**Overview of The Coaching Program at SCC**

	Presentation Platform: Guest Presenter SCC Lead Student Coach Coordinator
12:30 pm – 1:45 pm	**Lunch & Learn** Participants will be seated at lunch tables consisting of various members from different departments Participants will engage in discussions about how the information shared impacts their specific role at the College Participants will hear testimonials from students who are currently receiving student coaching services at SCC
1:45 pm – 3:00 pm	More Coaching Program at SCC
3:15 pm - 3:30 pm	Break
3:45 pm - 4:00 pm	Next Day Previews

Collaboration Strategies: Leverage Resources To Amp Up Efforts (Day 3)	
Training Objective: Participants will apply knowledge of best practices to develop collaborative strategies for developmental education faculty and student coaching staff to work together to promote greater student participation in student coaching activities	
8:00 am - 8:15 am	Breakfast Refreshments
8:15 am - 8:30 am	Welcome
8:30 am – 8:45 am	Day 3: Training Overview
8:45 am – 9:00 am	Review of Key Information From Day 2
9:00 am – 10:00 am	Presentation on the Connection Between Student Engagement and Academic Success
10:00 am – 10:45 am	Presentation on the Role Faculty and Staff Play in connecting Students to Collegiate Environment
10:45 am – 11:15 am	**"What Are Your Thoughts About the Role You Play in Increasing Student Engagement in SCC Culture?"** Participant reflections about the results shared and it potential for institutional impact. **Presentation Platform:** Moderator lead Focus Group Discussions
11:00am – 11:15 am	Break
11:15 am – 12:30 pm	**Presentation on Inter-Departmental Collaborative Strategies**
12:30 pm – 1:45 pm	**Lunch & Learn** Participants will be seated at lunch tables consisting of various members from different departments Participants will engage in discussions about how the information shared impacts their specific role at the College Participants will hear testimonials from students who are currently receiving student coaching services at SCC
1:45 pm – 3:30 pm	**Participants will engage in planning sessions designed to develop strategies that can implemented at SCC where by faculty and student coaches work together to connect students to coaching activities early and often**
3:15 pm - 3:30 pm	Break
3:30 pm - 4:00 pm	Next Steps & Discussion of Implementation Plan

6. Formative and Summative Assessments

Table A1

Professional Development Formative Assessment

Student Coaching Faculty Development Workshop
Day:_____ Session:_____
List three takeaways you learned as a result of participating in this training session. 1. 2. 3.
What two activities in which you participated do you believe increased your capacity to engage in dialogue about student coaching within your department and with other departments? 1. 2.
What one idea discussed today's training that would you like to learn more about?

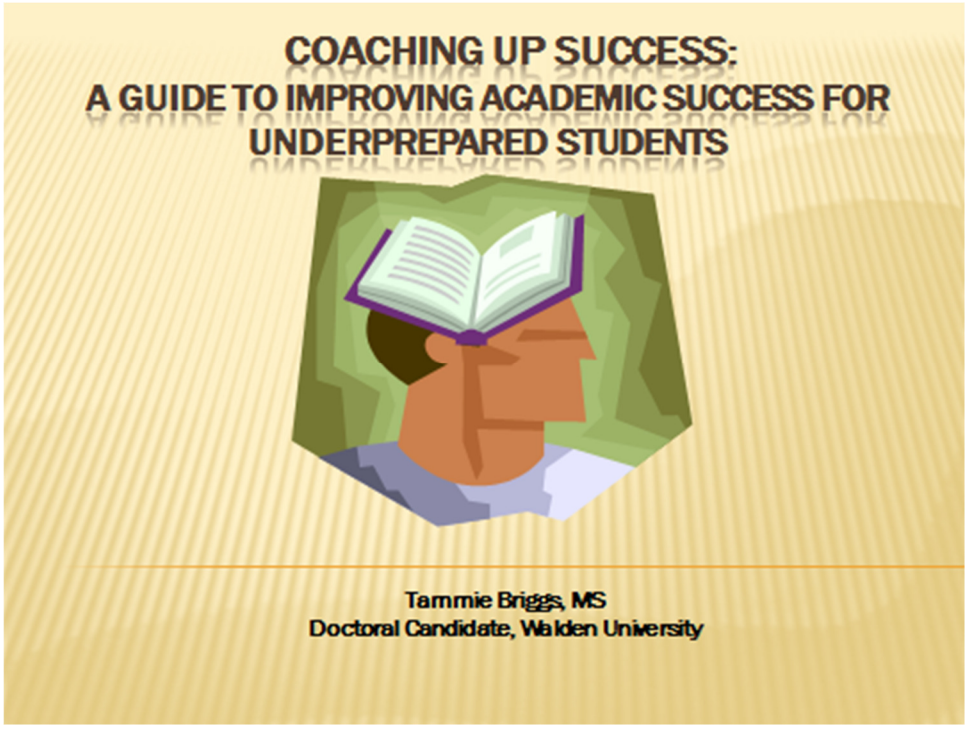
Table A2

Professional Development Summative Assessment

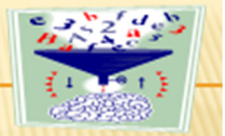
Student Coaching Faculty Development Workshop
Day:_____ Session:_____

Of all the information that was presented, what is the single most important learning component that impacted your perception of the students we serve on our campus?
Of all the information presented, what is the single most important learning you feel will assist you in increasing the level of in-class and out of class interactions you have with your students?

7. Professional Development Training Slides



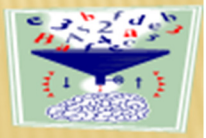
INTRODUCTION



- Training Goal:
  - The goal of this professional development training is to assist South Community College in strengthening its student coaching infrastructure by coordinating inter-departmental collaborative efforts between Student Coaching and Instructional Departments for the purpose of increasing student participation in student coaching activities. The purpose of this training is to guide developmental education faculty and student coaching staff in initiating dialogue about the unique characteristics of SCC students and in developing planning strategies to address those characteristics that sometimes present barriers to academic success.
- Target Audience:
  - Developmental Education Faculty
  - Student Coaching Staff
  - Administrators

3 DAY TRAINING OVERVIEW

- **Day 1 : SCC Student Demographics: Challenges of Under Preparedness**
  - Telling the Numbers Story
  - Why is This a Problem?
  - Literature & Research Related to the Problem
- **Day 2: SCC Student Coaching Initiative: Opportunities to Succeed**
  - Research Conducted on SCC Student Coaching & Developmental Math Students
  - Explanation of SCC Student Coaching Program
- **Day 3: Collaboration Strategies: Leverage Resources To Amp Up Efforts**
  - Student Success Research Studies
  - Factors that Encourage and Promote Student Success
  - **lkIkjkIkIk**

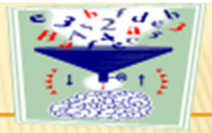


Day 1 : SCC Students Demographics:
Challenges of Under Preparedness

Training Objective: (Day 1)

Participants will gain a better understanding of the challenges facing SCC under prepared student and of how affective factors that present barriers to academic success for developmental or underprepared students at SCC

DAY 1
RAISING AWARENESS
INTERACTIVE CLICKER ACTIVITY

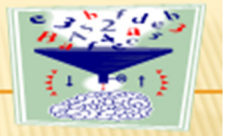


- 1. What Percentage of SCC students Test into at least one developmental educations course?
  a) 35% b) 92% c) 60 % d) 73%
- 2. Which developmental subject matter experiences the highest enrollment?
  a) Math b) English c) Reading
- 3. What is the rate at which SCC developmental students pass their developmental class the first time?
  a) Below30% b) 50% c) 75% o

TELLING THE NUMBERS STORY

- **Local Problem**
  - Low Completions Rates in developmental math courses at South Community College (SCC)
  - 73% of SCC incoming freshmen test into one developmental education course; 58% of those incoming freshmen test into developmental math
  - 51% of developmental math students fail or withdraw from their course
  - Survey of South College developmental math instructors cited "lack of attendance" as a significant impacting factor on course completion
- **Interesting Facts About SCC Students**
  - Approximately 2000 students
  - 68% students traditional age (18-24 yrs old)
  - Non-traditional lifestyles (40% commute over 25 miles; over 50% work part time or full time jobs; 70% have at least one dependent

DATA STORY CONTINUED.....



- **Connection of Local Problem to Larger Education Setting**
  - Nationally 60% incoming community college students test into at least one developmental education course
  - 55% of all entering students community college student needing remediation are referred to developmental math
  - A nation study of first time college students revealed that students who failed their developmental math course was 81% less likely to persist from fall to spring
  - A comparative look at the national data indicates that the challenges of persistence and course completion facing developmental education students at SCC are consistent with the challenges facing the larger educational setting.

DATA STORY CONTINUED.....

- Evidence that the problem exist at SCC
  - SCC students testing into remedial math is much higher than other remedial disciplines (58% developmental math)
  - At SCC students who fail their developmental math course are 73% less likely to persist from fall to spring
  - SCC developmental math students are 21% less likely to complete their course than their college-ready counterparts

WHY IS THIS A PROBLEM?.....

- Why the problem needs to be addressed
  - Impact on Pell Grant eligibility status (90% of SCC students depend on grant funding)
  - Pell Grant regulations limit number remedial course to 30 hours
  - Pell Grant eligibility is limited to 12 semesters
  - Extending time in developmental sequence can present threat to eligibility and lead to decrease in major funding source for SCC

SIGNIFICANCE OF ADDRESSING THE PROBLEM.....

- **Connection to broader research in higher education scope**
  - High failure rates in developmental math present barriers to completion(Asera, 2011).
  - Nationally 68% of students pass their development English course; 71% of students pass their developmental reading course; 30% pass their developmental math course (Bailey, 2009).
- **Potential to address gaps in practice at SCC**
  - SCC tracks passage/failure rates in developmental courses
  - No research regarding factors that impact the course completion rates
- **Potential Implications for a Significant Funding Source**
  - 84% of SCC students receive Pell Grant funding
  - Pell Grant Limitations (12 semesters, 30 hrs of remediaton)

REVIEW OF LITERATURE

- **Literature Addressing the Problem**
  - Large number under-prepared student entering community colleges – 60% (Adams, 2010)
  - Fewer than 25% of the students that begin their collegiate journey in developmental education courses earn a Bachelor's degree in eight years (Adams, 2010)
  - More students are deficient in math than any other subject- (Boylan, 2011); (Fike & Fike, 2012); (Howard & Whitaker, 2011)
- **Literature Addressing the Implications of the Problem**
  - Implications to shift to performance-based funding (U.S. Department of Education, 2011);(Phelps, Durham and Wills, 2011); (Hermes, 2012).
  - Impact of repeating courses on Pell Grant Funding (U.S. Department of Education, 2013);
  - Impact of low completion on work force training (Pretlow & Wathington, 2011); (Prince & Roberts, 2009); (Grundmann, 2013).
- **Literature Addressing Possible Solutions**
  - Examine efficiency of placement procedures used to determine students entering skill set - (Morante, 2012); (Shelton & Brown, 2010); (Marwick, 2004); (Armstrong, 1994)
  - Examining impact of affective factors on student success – (Boylan, 2009); (Fowler & Boylan, 2010)
  - Student Centered Academic Coaching - (Bettinger & Baker, 2011); (Sullivan-Vance, 2008);

REVIEW OF LITERATURE

Theoretical Framework

- **Tinto's Model of a Dropout**
  - Contends that a student's integration in both the social and academic systems of the institution serve as predictors of persistence (Shepler & Woosley, 2012)
  - Tinto's model used in previous studies ranging from "first-year experiences" to studies on "students with disabilities -(Crede & Niehorter, 2012; Dew, Feldt, & Grahm, 2011; Hughes, Karp, & O'Gara, 2008; Shepler & Woosley, 2012;)
- **Austin's Theory of Engagement**
  - Asserts that the increased student involvement in college leads to an increase in student learning and personal development – (Austin, 1986)
  - Studies on first year college students utilized Austin's Theory of Engagement to conclude that social integration was a significant predictor of persistance – (Burke and Barrette, 2009);
- **Connection of Theoretical Framework to Study**
  - Student centered academic counseling engages the student on the following levels: (a) promotes student engagement with instructors, (b) promotes student engagement with support services within the institution, (c) promotes student engagement with external partnerships within the community, and (d) ultimately promotes the student personal engagement in his or her own life and academic development.

IMPLICATIONS

- Challenges of academically underprepared students start long before they come to college
- Implications that assessment of how affective factor impact academic success is just as import and cognitive assessment.
- Implications that institutions may need to consider providing supportive resources that address cognitive and affective factors for academically underprepared

Day 2: SCC STUDENT COACHING INITIATIVE
OPPORTUNITIES TO SUCCEED

Training Objective: (Day 2)

Participants will acquire knowledge of how SCC currently addresses those factors through student coaching and examine best practices learned from its current coaching initiative

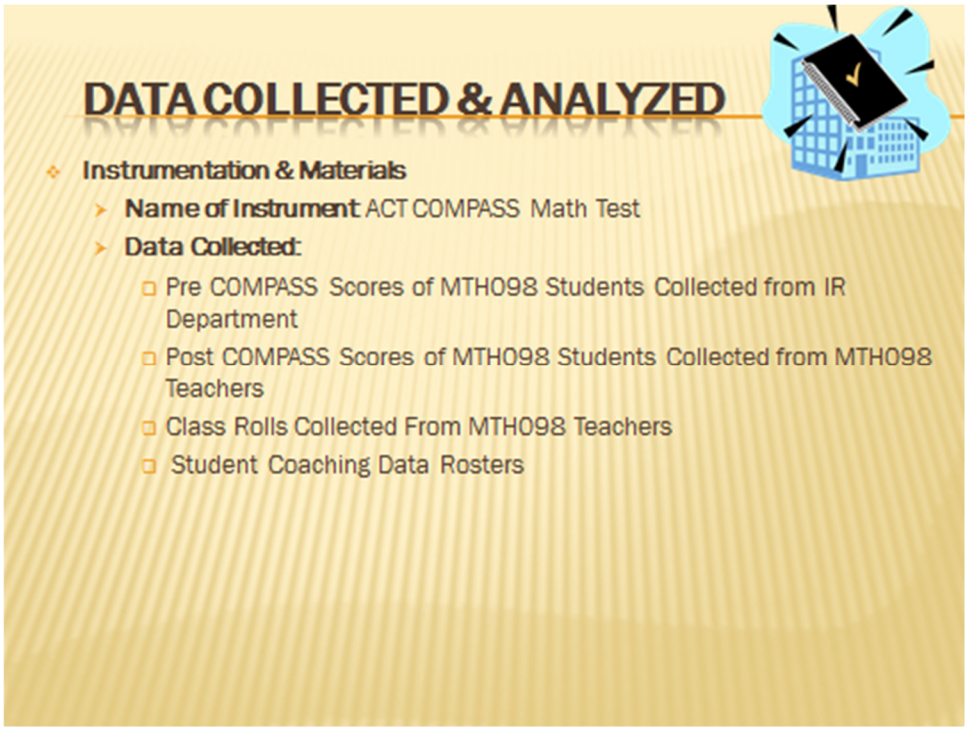
RESEARCH STUDY AT SCC

STUDY OBJECTIVE:

The purpose of the study was to see if there was any difference in the academic success of developmental math students who participated in the coaching program while

enrolled in developmental math course and students who did not participate. For the purpose of this study academic success was evaluated on the basis of student performance on COMPASS test


RESEARCH DESIGN DETAILS
Description Research Design
Causal-comparative research design
Setting & Sample
Population - Entire population of developmental math students at SCC
Sample – Students enrolled in MTH098 (N=62) Enrolled Spring 2014
Criteria for Study Participants -
Students enrolled in second sequence developmental math course (MTH098)
Enrollment based on successful completion of 1st sequence course for developmental math
Enrollment based on Placement score on COMPASS test- numerical skills component (38 – 46 points) and algebra skills (0 - 27 points) (SCC, 2014b).


DATA COLLECTED & ANALYZED
Instrumentation & Materials
Name of Instrument: ACT COMPASS Math Test
Data Collected:
Pre COMPASS Scores of MTH098 Students Collected from IR Department
Post COMPASS Scores of MTH098 Students Collected from MTH098 Teachers
Class Rolls Collected From MTH098 Teachers
Student Coaching Data Rosters

DATA COLLECTED

Table 2

Descriptive Statistics for Participants (N=62)

COMPASS math scores) variables are provided in Table 2.

Number of students	Number coaching sessions	Minimum posttest score	Maximum posttest score	Mean posttest score	SD
22	0	20	118	56.09	34.03
4	1	32	107	79.00	32.73
6	2	29	110	53.17	34.78
19	3	32	212	76.19	33.25
5	4	52	118	75.40	26.78
2	5	27	57	42.00	21.21
3	6	70	106	82.67	20.32
1	11	109	109	109.92	N/A
Total					
62	N/A/	20	121	66.92	33.34

DATA ANALYSIS DESIGN

- **Data Analysis**
  - Descriptive and inferential statistics was used to analyze the data
  - One-way analysis of variance (ANOVA) statistical test and paired *t* test was used to evaluate the mean mathematics COMPASS scores for the levels of coaching. A probability level (p value) of 0.05 will be set to reject the null hypotheses, if appropriate, and establish that the differences in the participant performances on the COMPASS tests were due to the independent variable treatments (student coaching)

Table 1

Hypotheses, Related Variables, and Statistical Analysis

Hypothesis	Independent variable	Dependent variable	Dependent variable type	Statistical test
1	Developmental Math Course	Posttest COMPASS Math Score	Interval	*t* test
2	Student-coaching (0 & 1 sessions vs 2 or more sessions attended)	Posttest COMPASS Math Score	Interval	ANOVA
3	Student-coaching (0, 1, or 2 sessions vs 3 or more sessions attended)	Posttest COMPASS Math Score	Interval	ANOVA
4	Student-coaching (0 vs 1 or 2 vs 3 or more sessions attended)	Posttest COMPASS Math Score	Interval	ANOVA
5	Gender, student type, age	Length of coaching participation	Interval	ANOVA

STUDY RESULTS

For the purpose of this study academic success was evaluated on the basis of student performance on COMPASS test. Based on the results of the statistical analysis there is some indication that the student-coaching intervention did have an impact on academic success for those students who were coached 3 or more times. None of the demographic indicators examined, however, statistically differentiated coaching participation.'

SCC STUDENT COACHING PROGRAM

- Coaching Program Overview
  - Coaching Staff & Organizational Structure
  - Lead Coach Role
  - Support Coach Role
  - Students Currently Being Served

SCC STUDENT COACHING PROGRAM

- Elements of Coaching
  - Role & Responsibilities of Coaches
  - Role & Responsibilities of Student
  - Factors Coaches Address in Coaching Session
  - What Does Coaching Sessions Look L

SCC STUDENT COACHING PROGRAM

- Coaching Components
  - Coaching Meeting Structure
  - Coach – Student Dialogue
  - Mock Practice Coaching Demonstration

SCC STUDENT COACHING PROGRAM

- Coaching Tools
  - Data Collection & Usage
  - Discussion Models
  - Lead Coach Mentoring

Day 3: COLLABORATION STRATEGIES: LEVERAGE RESOURCES TO AMP UP EFFORTS

Training Objective: (Day 3)

Participants will apply knowledge of best practices to develop collaborative strategies for developmental education faculty and student coaching staff to work together to promote greater student participation in student coaching activities

STUDENT ENGAGEMENT AND STUDENT SUCCESS

- Student Success Research Studies
  - Developmental Education Students
    (Bettinger, Boatman, & Long, 2013)
    (Bruch & Reynolds, 2012)
  - First Year Undergraduate Students
    (Groves, Sellars, Smith, & Barker, 2015)
    (Ryan, 2013)
  - Students of Color (Wyatt, 2011)

STUDENT ENGAGEMENT AND STUDENT SUCCESS

- Factors that Encourage and Promote Student Success
  - Interactions with their instructor in and out of class
  - Peer relationships and interactions centered around their studies,
  - Institutional commitment to provide student support services that adapt to the students' changing needs
  - Engaging students on multiple levels fosters a sense of belonging and encourages interactions in both formal and informal aspects of student life (Solomonides, 2012)
  - Groves et al., (2015) asserted that although a number of factors can be utilized to encourage student engagement, student relationship with their instructors appear to be the most important contributing factor.

COLLABORATIVE STRATEGIES – FACULTY & STUDENT COACHES

- Strategies to Promote Participation in Student Coaching Program
  - Early Alert Notifications from Faculty to Student Coaches
  - Coaching Program blitz presentations in classrooms
  - Student Success Team

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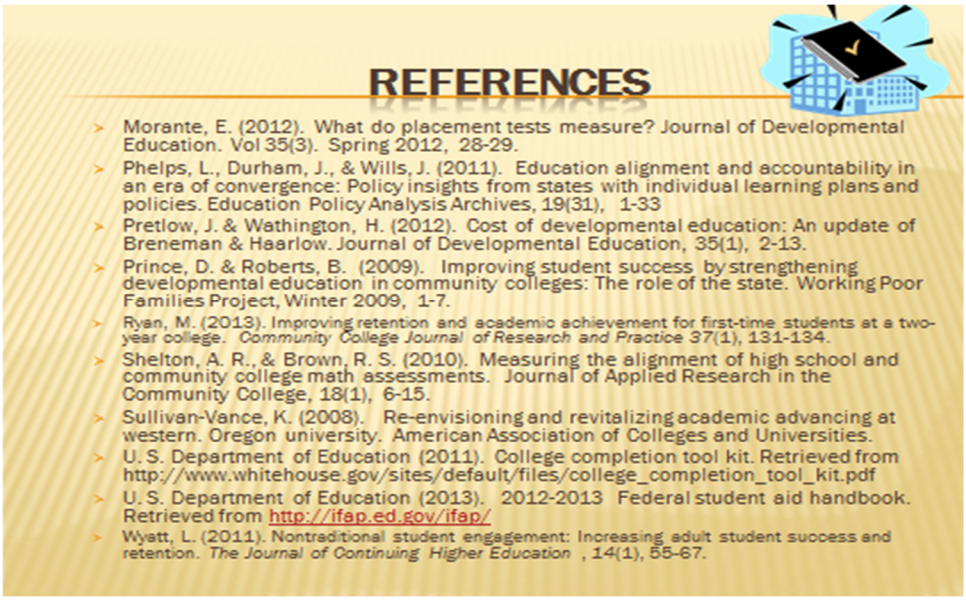

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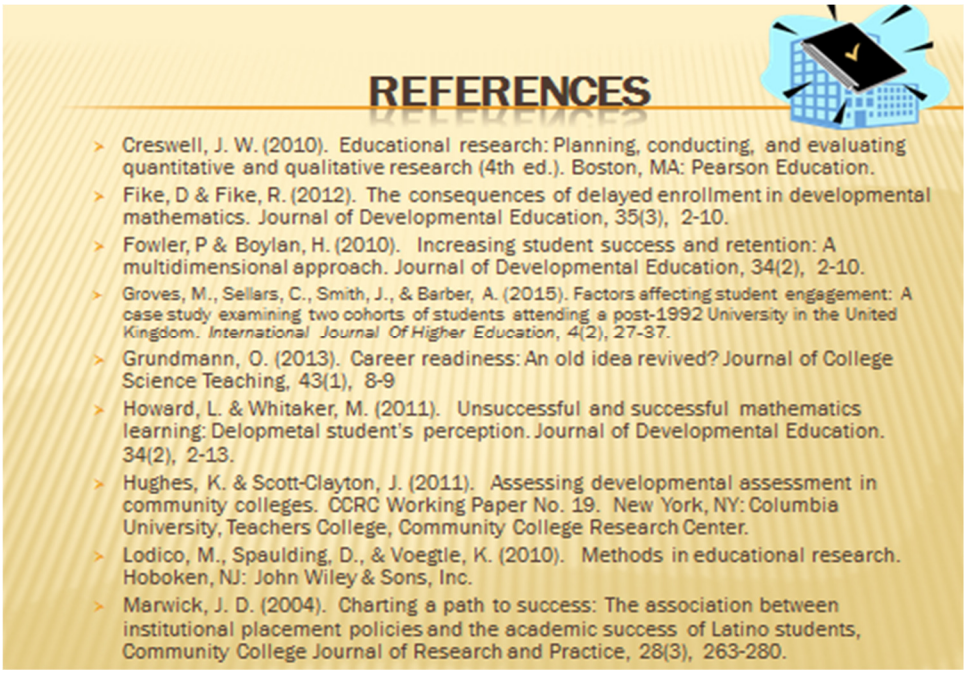

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Appendix B: Study Raw Data

Participant Code	Student Not Coached	Pre-Compass Test Scores	Post Compass Test Scores	Difference Scores	Age	Enrollment Status	Gender	Gender Code	Coaching Sessions
6001		69	121	52	18	Full-time	M	1	3
1474		111	120	9	19	Full-time	F	0	3
4763		32	114	82	19	Not reg	F	0	3
4405		56	52	-4	23	Full-time	F		4
1831		35	100	65	20	Full-time	F	0	3
4332	X	35	110	75	20	Full-time	F	0	0
5288		78	110	32	55	Half-time	F	0	2
4578		46	121	75	20	Full-time	F	0	3
5204	X	57	115	58	19	Not reg	F	0	0
5052		19	61	42	19	Half-time	F	0	3
4321		69	118	49	18	Full-time	F	0	4
3004	X	27	63	36	22	Full-time	M	1	0
4654		33	103	70	19	Full-time	M	1	3
2126		61	111	50	20	Full-time	F	0	3
9834	X	89	77	-12	19	Half-time	M	1	0
7369		68	70	2	19	Full-time	M	1	3
9054		44	82	38	28	Not reg	F	0	2
4383	X	63	73	10	25	Not reg	F	0	0
1395		62	84	22	26	Not reg	F	0	1
4776	X	69	118	49	19	Not reg	F	0	0
1305	X	31	47	16	19	Half-time	F	0	0
9038		47	64	17	39	Half-time	F	0	3
5219		64	72	8	54	Half-time	F	0	6
3021		67	70	3	51	Not reg	M	1	6
1447		42	93	51	21	Not reg	M	1	1
2536		31	66	35	20	Full-time	F	0	3
5611		48	85	37	26	Not reg	F	0	4
3242		34	107	73	20	Full-time	M	1	1
8754		33	61	28	20	Full-time	F	0	4
1638		33	98	65	20	Half-time	F	0	3
1315		49	109	60	38	Half-time	F	0	11
1906	X	71	61	-10	20	Not reg	F	0	0
9796		35	61	26	22	Not reg	F	0	4
6945	X	53	102	49	20	Half-time	F	0	0
4790		22	106	84	20	Full-time	M	1	6
6557	X	32	102	70	34	Half-time	F	0	0
7662		61	32	-29	20	Full-time	F	0	2
7210		30	34	4	20	Full-time	F	0	3
7505		25	34	9	46	Half-time	F	0	3
4526		63	29	-34	18	Half-time	F	0	2
3076		20	27	7	19	Full-time	F	0	5
6467	X	67	32	-35	19	Full-time	F	0	0
5439		58	57	-1	19	Full-time	F	0	5
4667	X	48	28	-20	19	Full-time	F	0	0
4283	X	25	26	1	47	Full-time	M	1	0
2074	X	32	61	29	22	Full-time	F	0	0
4924		32	32	0	19	Full-time	F	0	3
6056	X	26	20	-6	58	Half-time	F	0	0
7052	X	31	26	-5	21	Full-time	F	0	0
2719	X	29	35	6	22	NOT REG	M	1	0
6960		26	32	6	20	Full-time	F	0	1
3237	X	27	28	1	20	NOT REG	F	0	0
1505	X	30	26	-4	32	Full-time	F	0	0
1321	X	69	30	-39	19	Full-time	M	1	0
1676		33	51	18	17	Full-time	F	0	3
7336		32	33	1	20		F	0	3
8618	X	25	28	3	20		M	1	0
6235		32	84	52	39		F	0	3
4920		20	45	25	32		F	0	3
3122	X	24	26	2	20		M	1	0
9498		30	34	4	31		F	0	2
6960		48	32	-16	20		F	0	2

Appendix C: Permission Collect Raw Data

[redacted] COMMUNITY COLLEGE [redacted]

[redacted]

November 22, 2014

Tammie Briggs

[redacted]

Dr. Mrs. Briggs:

I am in receipt of your letter requesting permission to conduct a study of developmental math students at [redacted]. I understand the value of researching factors that impact student success, especially those that are intended to support academically underprepared students. I would be highly interested in learning the impact that student coaching services are having on developmental edu[redacted]am happy to grant approval for you to conduct your stu[redacted]*ching on Student Success in Developmental Math Course*[redacted]a. In addition, I give you permission to collect, analyze, [redacted] for students who were enrolled in developmental educa[redacted]e, student type, ACT COMPASS Math Scores, and student coaching session data.

Sincerely,

[redacted]

[redacted]