

THE RELATIONSHIP OF SCORES ON THE PERSONAL BACKGROUND
PREPARATION SURVEY AND FIRST SEMESTER EDUCATIONAL OUTCOMES
FOR STUDENTS AT A HEALTH SCIENCE COMMUNITY COLLEGE

by
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Abstract

Background: Graduation rates at community colleges who serve nontraditional and diverse student populations have remained critically low for many decades. Research studies have cited cognitive factors, such as a low level of academic preparation, as well as non-cognitive factors, such as a lack of money or family obligations, as causes for student failure and dropout. Early identification of students with medium or high-risk factors could help improve their graduation rates and ultimately reduce the shortages in many health care professions. **Purpose:** The purpose of this study was to measure the effectiveness of the Personal Background Preparation Survey (PBPS) in identifying at-risk students during their first semester in a health science program at a community college. The study answered the following research question, “What is the effectiveness of the PBPS in identifying at-risk students during their first semester at a community college?” **Methods:** This study used archival data collected during 2010 – 2015 under a grant between two southwestern U.S schools. The correlational design analyzed the predictor PBPS total risk scores that assessed the newly enrolled students’ initial risk levels, the presence versus absence of interventions, ethnicity, and gender using correlational design analyses. Correlation statistics using Spearman’s Rho were completed to determine if any correlation existed between the student’s risk level and their educational outcome. In addition, to further examine the data, chi-square analyses were done for educational outcomes based on the semester. **Results:** There were more women (78.8%) than men (21.2%) in the dataset. The most common racial/ethnic groups were Hispanic (29.2%), Black-African American (21.4%), and Asian (19.1%). The risk level for the students ranged from 1-10 (2.9%) to 41-50

(0.2%) with a median risk level of $Mdn = 25.50$. Eighty-one percent of the sample had positive educational outcomes, with another 10.7% being considered at risk, and the final 8.7% of the students had attrition. The Spearman correlation between the student's risk level and their educational outcome showed a slight positive correlation ($r_s = .10$; $p < .05$) and accounted for 1.0% of the shared variance between the two variables. Further evaluation using chi-square analysis between semesters and educational outcomes showed a statistically significant association between the students' semester and their educational outcomes, $\chi^2(2) = 389.95$, $p = .001$. The association was moderate (Cramer's $V = .49$). Conclusion: The results of the study suggest that the self-report used by this urban community college does identify at-risk students in Other Racial/Ethnic Groups Only subsamples while other groups were slightly positive to weak. The study also revealed that as far as nonintervention versus intervention semesters, the rate of success of the intervention increased respectively by semesters and later semesters grouped together. If it is an academic institution's wish to improve retention rates regarding at-risk students, they should begin a prescription plan that provides students the tools they need to foster an environment that leads to success.

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Chapter I

Introduction

We must be intentional, proactive, and intrusive. We cannot leave the education of our students to chance. To be serious about retention, institutions would recognize that the roots of attrition lie not only in their students and the situations they face but also in the very character of the educational settings, now assumed to be natural to higher education, in which they ask students to learn.

Vincent Tinto

Nearly one-half of students entering community colleges and one-fourth (28.5%) of students entering four-year universities leave school at the end of the first year (Tinto, 1993). The 1982 report, *A Nation at Risk*, set the foundation for strengthening the curriculum in high schools to prepare students for college and work (U.S. Department of Education, 1983). American College Testing (ACT) conducted national surveys that yielded data from 305 community colleges, revealing that first year to second-year retention rates mean average around 50%. Completion rates reported by community colleges were low, with a mean of around 20% to 30% (ACT, 2012). The discrepancy among entering students lies in, among other factors, college readiness. Minimal to no preparation could lead to student failure during the first year in college; therefore, it is imperative to identify these students early and provide support with resources and tools. First-generation students' experiences in higher education often involved cultural and societal exposure during their academic journey (London, 1989; Weis, 1985, 1992). London (1989) stated that first-generation students struggle with periods of confusion and seclusion. This study focused on improving retention rates by identifying at risk students and implementing support during the students' first year of a health science program. Retention has been the focal point throughout higher education, consequently efforts targeting retention have increased. These efforts have helped in the availability of tools

and resources for students, such as study skills workshops or in some cases childcare information.

Student retention should not just focus on the students that excel but also the students that need help to persist throughout a program. Retention is not a cookie-cutter system that has a one size fits all, in fact a more personalized approach is required. Braxton and Mundy (2002) stated that student retention requires solutions resulting from several theoretical approaches. The theoretical approaches in identifying at-risk students have been viewed through a focal lens in an institutional domain that includes student affairs, academic affairs, higher administration, and institutional research. Early identification of at-risk students can help provide students access to appropriate tools and resources that will help motivate and increase academic success (Cariaga-Lo et al., 1997; Huff & Fang, 1999; Penick & Morning 1983). With mounting efforts by institutions to retain students in an academic setting, emphasis on health science professions students has also increased (Johnson, Johnson, McKee, & Kim, 2009b). Retention of health science students has always been at the epicenter for faculty, deans, and higher administration in health science institutions. Health science students not only need knowledge of the concepts but will also be expected to apply that knowledge into the clinic or hospital setting. The aging nursing workforce has been the contributing factor to the nursing shortage (Wells, 2007). Wells (2003) stated that challenges in student retention significantly impacted the ability to replace aging nurses. The retention of health science students is of importance because health science professionals are a vital contributor to the workforce to all hospitals and clinics.

Attrition rates vary at distinct types of higher education institutions as illustrated

by the data of the Committee on Allied Health Education and Accreditation in the 1989-1990 academic year (cited in Gupta, 1991), range from above 7% (health science centers and medical schools) to around 24% (workforce programs and technical schools).

Student dropout as is retention are at the epicenter of all educational institutions.

According to the ACT organization, student attrition and retention practices have been monitored using national surveys (ACT, 2012). ACT conducted a fourth national survey to compile data that yielded responses from 305 community colleges; the data revealed that first year to second-year retention rate mean and median was 56%. Completion rates of community college students were even lower with a mean of 27% and a median of 23%. Community college's median degree completion goal was 32% of students finishing and graduating from college (Habley, Valiga, McClanahan, & Burkum, 2010).

Eighty-three community colleges with $\geq 20\%$ of black students enrolled responded to the survey. In the study, 64 colleges out of the 83 responded with their colleges' current first to second-year retention rate. The first- and second-year retention mean was 56%, and the median was 53%. Seventy-seven community colleges out of the 83 responded to the degree completion rates questions in the survey, generating a mean degree completion rate of 32% and a median rate of 25% (Habley, Valiga, McClanahan, & Burkum, 2010).

Thirty-seven community colleges with Hispanic enrollments $\geq 20\%$ responded out of a total of 1,104. First and second-year retention rates reported 56%, and the median was 59%. Median degree completion rates out of the 37 community colleges with $\geq 20\%$ Hispanic students were 34% and a mean degree completion rate of 41% (Habley, Valiga, McClanahan, & Burkum, 2010).

Student retention is a significant problem faced by a large, diverse, urban community health science college in Texas. This large, diverse, urban community college in Texas had a degree completion rate of 23% in 2014. The completion rate in 2015, 2016, and 2017 was 20%, 18%, and 19% respectively (HCC, 2018). According to Wells (2003), students are challenged to complete school while at the same time managing many issues, including family responsibilities. Early identification of students can address such cognitive and non-cognitive risk factors (Johnson et al., 2009).

The Personal Background Preparation Survey (PBPS) is utilized to identify students at-risk early and to assist in improving retention. The PBPS, first developed by Johnson and Johnson (2009), can “identify and quantify a student’s cognitive and non-cognitive academic performance risks” that can impede the student’s academic performance (Johnson, Johnson, McKee, & Kim, 2009b, p. 739). The PBPS can diagnostically and prescriptively “facilitate proactive targeting of corrective interventions aimed at reducing Adverse Academic Status Events (AASE) and attrition among health science education students at-risk for academic difficulties” (Johnson, Johnson, McKee, & Kim, 2009b, p. 739-740).

In a study aimed at identifying the effectiveness in teaching and learning in an academic setting (Olmesdahl, 1999), content overload and learning difficulties described cognitive factors as critical concerns. Jeffreys (1998) stated that other cognitive risks include “a student’s involvement with the academic process at the college, such as academic support services, study skills, and study hours” (p. 42). Additionally, Jeffreys mentioned non-cognitive factors such as “finances, hours of employment, outside encouragement, and families responsibilities” (Jefferys, 1998, p. 42). Non-cognitive

characteristics that could deter students from being successful include perceived control, academic self-concept, time management, and learning styles (DeAngelis, 2003; Garton, Dyer, & King, 2000; Stupnisky et al., 2007).

Statement of the Problem

Net loss to the economy has had a significant impact on retention and completion of degree rates among two-year colleges and four-year universities (Schneider & Yin, 2011). Schneider and Yin (2011), stated that for Fall 2002 full-time students that were unable to complete a bachelor's degree within six years resulted in monumental loss for the federal government. Those losses represented a net loss of nearly \$4 billion in lost income and above \$550 million in lost federal income taxes (Schneider & Yin, 2011). The report above specifies that the high costs incurred by the students, their families, and the taxpayers are the results of low graduation rates (Schneider & Yin, 2011).

The decision to enter a health professional program entails a significant investment of time on the part of the student and their immediate family (O'Neill, Wallstedt, Eika, & Hartvigsen, 2011). Health Science programs are structured differently than academic programs; health science programs are designed to teach the students the content in class and subsequently have the students translate that knowledge into the hospital workforce. Rigors in medical science programs have increased standards, while courses are becoming more relevant and compelling (Dienstag, 2008). The author stated that more advanced premedical science preparation needs to fulfill expectations fostering analytic thinking and analysis of complex systems to provide rigor for premedical students. This type of pedagogical approach could be challenging to students and can have potentially adverse effects on the students and influence them into leaving the

programs. Therefore, identifying at-risk students in their first semester of studies to improve retention is imperative to ensure program completion at a large, diverse urban community college in Texas. If the identification of at-risk students remains unaddressed, students may have difficulties completing the semester or the program. Accumulating evidence of health science programs suggested that early identification of students is imperative for promoting student success. Student persistence can be affected by identifying potential risk factors that predict student success and promote interventions that support students early in the first semester (Hopkins, 2008). Participants in higher education need to understand these emergent cognitive and non-cognitive factors that hinder student retention in health science programs. This research addressed a gap in understanding the implications of early identification of at-risk students and supporting them in a health science program in an effort to increase retention rates.

Student-success Adaptation of the Clinical Medical Model

Dr. Ronald Johnson and Dr. Craig Johnson in 2018 developed the Student-success Adaptation of the Clinical Medical Model to target student success. The purpose of this model is to “reduce student attrition and increase student persistence, success, and graduation” (Johnson, Johnson, Vijayan, Tata, & Villegas, Jr., 2018, p.2). This model consists of identification at-risk students, intervention and evaluation process aimed to improve retention rates. Cognitive and non-cognitive factors are the foundation of what will guide health science professionals in becoming successful.

Tinto (1987) suggested that colleges need to be committed to students in order for there to be effective retention. With states’ legislatures altering their funding model to

reward student completion instead of student enrollment, colleges and universities have to evolve and align their missions to incorporate student retention. Tinto's (2006) model of Student Retention suggested that colleges have the responsibility to retain students. The foundation of Tinto's model is that social and academic interactions are essential to student retention (Rendón, Jalomo, & Nora, 2000). Effective retention strategies consist of a multifaceted approach that involves the student, Academic Affairs, and Student Affairs, who are all focused on student success.

The Student-success adaptation of the clinical medical model, (presented in Figure 1), provides the process institutions could follow to identify at-risk student's early (Johnson et al., 2018).

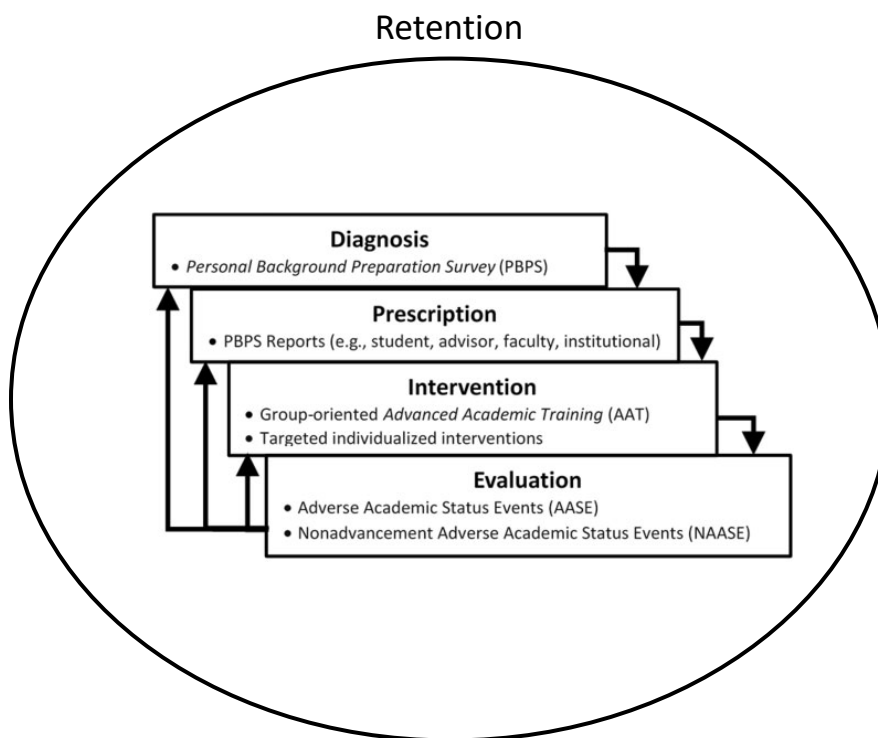


Figure 1: Student-success adaptation of the clinical medical model. “Diagnosis, prescription, intervention, evaluation, advanced academic training, and college student success.” by Johnson, R., Johnson, C. W., Vijayan, S., Tata, D., & Villegas Jr., R. (2018), Journal of College Student Retention, 0(0), 1-22. Retrieved from <https://doi.org/10.1177/1521025118779803>

- Note:
 - Boxes indicate the stage in the process
 - Arrows indicate the next step in the process

Finding when is the right time for the intervention on students has been debated for decades. There is little research about when a college or university should seek out at-risk students and inform them of available support and resources. Most higher education institutions participate in orientation and workshops that will enhance student engagement before the beginning of the semester, usually at a student orientation event. During mandatory orientation, faculty and staff have an opportunity to provide insight

into some of the issues associated with retention, such as providing information on financial assistance. Once the students start the semester, if any student needs remediation, faculty and staff should engage with the student and have a remediation plan. The remediation plan could involve workshops and tutors for the students.

Although the orientation event occurs at most higher education institutions it is by no means targeted for the at-risk students, it is presented to a general audience.

Identification of potential external risks that students might face need to be identified by the Student Affairs department before the implementation of an intervention. Some of these external risks could be working full-time, caring for children or an elderly person, and/or financial instability. These external risks will need to be investigated to determine if the risk is interfering with academic performance. The college or university seeks to have the full attention of the student during classes and tackle any distraction that might prevent the student from advancing.

Purpose of the Study

The purpose of the study was to measure the effectiveness of a self-report survey to identify at-risk students and provide cognitive and non-cognitive resources during their first semester at a community college. The study measured the at-risk codes generated by the self-reported survey with the outcome codes assigned by the advisors at the end of the first semester of the students' first year. The data used in this study pertains to health science cohort classes starting in Fall 2010 to Spring 2015.

Research Question

The Student-success Adaptation of the Clinical Medical Model has built the research question investigated. The following research question is intended to provide

answers to the dilemma posed in the statement of the problem. The following research question seeks to understand the role of retention and early interventions targeting student success:

What is the relationship of scores on the Personal Background Preparation Survey and first-semester educational outcomes for students at a health science community college?

Context for the Study

The study was implemented in a large, diverse, urban community college located in southeast Texas. The large, diverse, urban community college in Texas offers degrees and certificates ranging from Dental Assisting to Medical Assisting and from Respiratory Therapy to Diagnostic Medical Sonography.

Significance of the Problem

The significance of the problem was that research in health science education has shown that early identification of a student's cognitive and non-cognitive risk factors is essential in preventing failure (Winston, van der Vleuten, & Scherpbier, 2010a). The key to success is the length of a supportive intervention, as short-term remedial approaches have produced short-term results (Cleland et al., 2013). Continuous remediation through a student's academic career is connected to a higher likelihood of program completion and successful graduation (Seidman, 1996; Winston, van der Vleuten, & Scherpbier, 2010b; Winston et al., 2014). The importance of early identification and support of at-risk students needs emphasis; otherwise, healthcare students could perform poorly on clinical or academic examinations (Cleland et al., 2013). The study is significant because it introduces a framework for improving retention by supporting students in their pursuit

of academic success and passing licensure boards following graduation.

Educational Value of the Study

In order to study this phenomenon, the research must determine if the relationship between an early identification survey of at-risk students and student retention in a health science program can be significant in achieving support towards student success. Early identification has been studied in other programs within the health profession but has yet to determine an effective way of identifying at-risk students in the health science institutions.

Definitions

For this study, the following terms are operationally defined to provide clarity:

Adverse Academic Status Events (AASE): are “measures of student educational outcomes that, if not addressed, could lead to non-advancement or attrition, according to Johnson et al.” (2009a, 2009b). AASE is coded at the end of the semester and year by the following: (GS) Good Standing, (NE) Not Enrolled, (SG) Student Graduated. Program completion is a student’s progress through their program becoming successful and graduate” (Johnson, Johnson, McKee, & Kim, 2009b).

Attrition: refers to a student who does not matriculate at an institution of higher education in successive terms (Berger et al., 2012).

Cognitive factors: These are analytical skills such as reading, writing, and mathematics (Sternberg, 2008).

Dismissal: refers to a student not allowed to re-enroll by the institution of higher education (Berger et al., 2012).

Engagement: is the action of engaging or being engaged.

Health Science: Health professionals of allied health and nursing.

Non-advancement Adverse Academic Status Events (NAASE): are “coded by the following at the end of the semester and year: (DN) dismissal due to academic record, (SP) suspended from the program, (WP) withdrew from the program. (Johnson, Johnson, McKee, & Kim, 2009b).

Non-cognitive factors: These non-cognitive factors are a set of skills that integrate analytical, practical, and creative ways of thinking (Sternberg, 2008).

Persistence: refers to a student’s longing to stay within the program within the institution of higher education and finish their degree (Berger et al., 2012).

Personal Background Preparation Survey (PBPS): was “the first reliable diagnostic and prescriptive instrument to establish documented predictive validity for student Adverse Academic Status Events (AASE) among health science professional students” (Johnson, Johnson, McKee, & Kim, 2009b, p.744).

Resources: is a source of information that will help improve student success in the class/program.

Retention: refers to the ability of the institution of higher education to retain a student from the start of the program through graduation (Berger et al., 2012).

Student Outcome: a result; a consequence.

Tools: is something that a student could use to assist them within the classroom or outside of the classroom.

Withdrawal: refers to the student’s departure from the institution of higher education (Berger et al., 2012).

Voluntary withdrawal: refers to when a student decides not to enroll again in the next

semester.

Involuntary withdrawal: refers to when the institution of higher education does not authorize the student to enroll again in the next semester.

Institutional departure: defines the process of leaving the institution of higher education.

System departure: refers to the student's departure from the entire higher education system.

Limitations of the Study

Due to the intricacy of the topic, this institution has not assessed if the PBPS survey is reliable for retention purposes. In this study, archival data was used and had a total enrollment of approximately 2000 students limited to this institution. Other institutions are necessary for the study to be generalized.

Each advisor assigned to the health science program monitors students throughout the academic year and guides them to interventions pertaining to their individual needs. Advisors will then allocate the student's AASE code or outcome at the end of the semester and year-end. Having one individual advisor assigning the AASE code restricts the process to only that individual and is only reliable as the individual assigning the code. The limitations in conducting this study using this model include the following. The self-report survey required particular protocol and procedures, but due to personnel and time constraints, one advisor had to assign the AASE code without validation. There is difficulty in relying on one person interpreting the assigned AASE code. Finally, the research must examine what other institutions use to early identify students and consider if more than one advisor should be able to interpret the AASE outcome codes.

Summary

This chapter discussed factors related to retention, a multifaceted, complex issue that must be addressed in order to ensure student success in higher education. The study presented a model for understanding the essential parts of the process. Higher education retention strategies are an evolving entity, and colleges must adapt to these student success progressions coherently by involving all departments in pursuit of success. Retention strategies will ensure a comprehensive approach to improving retention rates and will also aid in the completion of programs.

Chapter II

Literature Review

In academia we don't know ourselves very well. We're not reflective. We don't ask, 'What's our work all about; what are we really trying to do?' And I think if we are able to create better opportunities for faculty and staff to talk openly and honestly about such matters, a lot of things would start to get better.

Alexander Astin

The following literature review includes the readiness of a high school student, how important it is for higher education institutions to early identify at-risk students, the PBPS survey, engagement with students throughout the student's higher education career, and how imperative retention should be to higher education. The literature review used the following databases and sources: the Cumulative Index for Nursing and Allied Health Literature (CINAHL), the Educational Resources Information Center (ERIC), PubMed, the National Center for Education Statistics (NCES), and ProQuest.

Cognitive Factors

Criteria used to select applicants in health science community college admissions often include evaluation of applicants' pre-requisite grade point average, the use of placement testing, an interview, and for some programs, a written essay. Before applicants can complete the application phase, they must first take a placement entrance exam into the college. The placement exam consists of taking the Computer Placement Assessment and Support System (COMPASS) or the Texas Assessment of Academic Skills (TAAS), which places students in the appropriate Math, Reading, and English course. Undergraduate university students could also take an admission test called the Scholastic Assessment Test (SAT) or the American College Testing (ACT) exam. Burlison, Murphy, and Dwyer (2009) illustrated that the SAT and ACT entrance

examinations are valid measures of academic preparedness taken during college placement. Cognitive placement tests focus on basic skills like math, reading, and writing and provide a combined score (Mathews, 2010). Boylan (2009) stated that this combined score might be efficient but is not an effective tool for delivering target interventions. Boylan also found that most colleges are using SAT and ACT scores to measure basic cognitive skills in the assessment of students' academic preparedness. In some health science programs like nursing, dental hygiene, and radiography the Elsevier's HESI Admission Assessment (A²) is administered and is used to measure college readiness.

Open enrollment colleges have often accepted students that are underprepared and circumvent this unpreparedness by placing them in remedial courses. These colleges test all students entering the institution, and the results of the placement test helped colleges place students in Math, English, and Reading (Roa, 2004). A study of underprepared high school seniors that entered higher education, (Griffin, 2008) found that 50% of the students improved their academics and adapted to the rigors of higher education. In addition to cognitive factors, non-cognitive factors can also impact at-risk students.

Non-cognitive Factors

While cognitive factors play a vital role in defining economic success, non-cognitive factors such as persistence, self-assurance, and motivation are equally significant in determining economic success (Heckman, 2008). Boylan (2009), also in agreement, described that non-cognitive factors such as academic preparedness are equally crucial to postsecondary students' as cognitive skills. SAT used alone, research indicates, is a poor predictor of college students' academic preparedness (Deil-Amen &

Tevis, 2010).

Borghans, Meijers, and Weel (2008) studies revealed that non-cognitive factors (behaviors in this case) such as the lack of self-discipline and drive, affect cognitive test scores such as IQ scores indicating that non-cognitive factors can influence academic performance. Additionally, an individual's grit (i.e., determination) was also linked to successful retention (Duckworth, Peterson, Matthews, & Kelly, 2007).

Griffin (2008) study focused on additional non-cognitive factors such as a unstable housing, no job, or parents with limited education and identified them as risk factors that contributed to students withdrawing from school. The Annie E. Casey Foundation research found that many personal factors can contribute to academic under-preparedness including (a) a missing parent, (b) transportation issues, (c) parental unemployment, (d) inadequate access of health insurance, (e) and illiterate parents (Griffin, 2008). These factors are only relevant if we can also measure the effectiveness of self-report surveys.

Measuring the Effectiveness of a Self-Report Survey

For data collecting, a self-report survey has been carried out using web-based services instead of a traditional paper-and-pencil method (Weigold, Weigold, & Russell, 2013). The findings show the traditional method for administering self-report surveys is comparable quantitatively and qualitatively with web administered self-report surveys (Weigold, Weigold, & Russell, 2013). Additionally, another study reported that there was higher response rates for surveys delivered electronically (95%) versus surveys sent in the mail (79%) (Kiernan, Kiernan, Oyler, & Giles, 2005).

Self-report methods are essential for measuring non-cognitive and cognitive

engagement (Fredricks & McColskey, 2012). In another study, Appleton, Christenson, Kim, and Reschly (2006) stated that self-report methods are vital in evaluating non-cognitive and cognitive engagement. Overall, self-reporting methods are used by postsecondary institutions because it is practical easy to administer in classroom settings (Fredricks & McColskey, 2012). The self-report could be given to a large sample of students, making it easier to retrieve data and link results across health science programs. The data collected from self-reporting methods provide us with a glimpse of the student readiness as they are entering postsecondary education.

Student Readiness

High school students' level of preparation for college could hinder their ability to transition into college during their first year as they are facing cultural, social, and academic transitions and, as a consequence, impact student success. (London, 1989; Weis, 1985, 1992). It is imperative for colleges to focus on improving college readiness for all students. Transitioning into college has proven challenging to some students and is manifested by multiple factors ranging from student's emotions, societal issues, and academic adaptation (Chickering, 1969). Some students can adjust to the rigors of higher education, whereas other students are powerless to meet the demands of college. In a national study of community college education (McCabe, 2000), found that around 40% of entering community college students and nearly 30% of all entering college students were underprepared in one of the skills relating to math, writing, and reading. Roderick, Nagaoka, and Coca (2009) stated that although there has been an increase of high school students entering higher education over the past several decades, substantial differences remain in how students are prepared to enter postsecondary education. Roderick et al.

(2009) stated, “that the three most commonly recognized indicators used by colleges [for college readiness are] coursework required for college admission, achievement test scores, and grade point averages” (p. 185). These three indicators in student performance of college readiness have revealed significant racial and ethnic disparities (Roderick et al., 2009). A final report of the Commission on the Future of Higher Education (U.S. Department of Education, 2006) stated that improving high school students’ academics are crucial in improving the success of students in college.

Nontraditional or high-risk students are having trouble entering college, even though receiving a college education remains paramount to achieve financial stability (Day & McCabe, 1997; Lavin, 2000; Ntiri, 2001). Situations like these are due to the potential risk associated with the student's personal, financial, and academic issues (Hoyt, 1999; Valadez, 1993). Higher education institutions have the responsibility of forecasting the preparedness of students entering higher education (Byrd & MacDonald, 2005). One measure of preparedness could be placement testing. The transition from high school to college is an experience that can be difficult and that some students will struggle with (Conley, 2007).

Postsecondary education is not the same as high school in many ways, as almost all the instructions that students have learned over the previous 13 years of school are either removed or changed drastically (Conley, 2007). College instructors often require students to read around eight books throughout the semester compared to a high school class that requires, on average, no more than two (Standards for Success, 2003). Students are also required to write multiple papers in a semester. The papers students submit for a grade in a class must be a well-written paper according to trustworthy sources (National

Survey of Student Engagement, 2003, 2004, 2006).

Health science programs can be even more challenging to transition into than four-year universities because students are expected to directly apply knowledge in a clinical setting, as evidenced by the externship practicum requirement. Classes not only have a lecture portion, but they also have a lab skill component in which students are using theory and applying it directly. Additionally, students face rigors in health science programs, which require higher levels of learning.

Bloom, in collaboration with Tyler, is recognized for Bloom's Taxonomy (Bloom et al., 1956). Bloom realized the importance of education was not to compare students but to support students in achieving academic success. The multi-tiered model of Bloom's Taxonomy categorizes cognitive thinking into six levels of knowledge, comprehension, application, analysis, synthesis, and evaluation. Bloom shaped this taxonomy and classifying learning that generally occurs in education (Bloom et al., 1956). Bloom's taxonomy levels can be used to assess students at different levels.

By implementing the levels of learning starting from the bottom of the model (Bloom's taxonomy) faculty can build upon the basic levels of learning ultimately reaching the highest level, which students might not have been exposed to in high school. The use of Bloom's Taxonomy will assist today's teachers to precisely align their educational objectives in the classroom (Forehand, 2008). In health science programs, professors are expecting students to be able to reach higher levels of cognition, such as being able to evaluate a situation and create a solution on the spot. Health science program institutions can provide resources and tools that can help underprepared students reach those levels of learning.

Early Identification of At-Risk Students in Health Science Programs

Early identification models have been developed to support students as they enter health science programs. Anecdotal data suggests that at-risk students tend to be from middle to low socioeconomic status, non-traditional students, married or have children, take care of a senior, or work more than 20 hours a week while attending college full-time. Some students have problems at all stages of their educational career; other students have difficulties sporadically. A proportion of students fail to graduate at all. In another study as many as 10-15% of students were annually affected by problems to some degree, either voluntarily leaving or failing a course (Yates, 2011). There are often multiple reasons for a students' struggle in higher education, including issues adjusting to the academic workload and personal issues (Yates, 2011). Hopkins (2008) noted that "higher education has continued to face concerns about lower academic achievement and higher attrition rates among associate degree nursing (ADN) students" (p.254). Hopkins (2008) suggested that "identifying factors that predict student success and applying student support interventions early in the first semester can affect student persistence" (p. 254). By identifying students early in their programs, colleges can equip at-risk students with tools and resources so that they can persist through courses and completion. Promoting engagement and guidance may contribute to student retention (Gerdes & Mallinckrodt, 1994). Early identification of at-risk students is part of a larger area of research on student retention across higher education in health science programs (Gupta, 1991; Tinto, 1975; Wells, 2003; Winston et al., 2010b). Due to the fact that student engagement efforts are critical factors of postsecondary education, institutions of higher education should focus on student's success to inspire student engagement (Pascarella &

Terenzini, 2005).

Seidman (1996, 2012) developed a retention model that focused on the early identification of at-risk students through intensive and continuous interventions. The model tested the aim that early identification of an at-risk student, along with timely engagement of the respective faculty, and the support of the institution of higher education, will increase retention. Early identification of at-risk students involves gathering vital information about a student's readiness to handle the rigors of college classes. Collecting data about at-risk students should happen before the student's start of the semester. Identifying potential risks early and engaging them in the process, is crucial and will assist students with tools and resources. Once a student has potential risks identified, continuous monitoring throughout the student's educational career needs to occur until the student is successful. One way higher education institutions can identify at-risk students early is the implementation of the Personal Background Preparation Survey.

The Personal Background Preparation Survey

Seidman (1996, 2005) formularized the role of early identification in his model for student retention: $RET = EARLY_{IDENTIFICATION} + (EARLY + INTENSIVE + CONTINUOUS)_{INTERVENTION}$, or, $RET = E_{ID} + (E + IN + C)_{IV}$. The formula states that retention equals early identification, plus early intensive continuous intervention will equal student success. The PBPS is "the first diagnostic and prescriptive instrument that can enable proactive interventions aimed at reducing Adverse Advance Status Events (AASE) and attrition among health science professions students" (Johnson, Johnson, McKee, & Kim, 2009b, p. 744) that analyzed at-risk students for academic difficulties.

Each standard deviation increased in PBPS total risks, the odds of AASE in first-year or second-year increased from “135% to 143% ($p < .05$)” (Johnson, Johnson, McKee, & Kim, 2009b, p. 749), controlling for underrepresented minority student (URMS) status and the affiliation of the school. The PBPS represented an increase in retention between the first and second years.

With mounting efforts on retention, the emphasis on the progression of students in health science professions has been put at the forefront, especially the underrepresented minority student population (Johnson, Johnson, McKee, & Kim, 2009b). Evidence presented by Vijayan (2012) demonstrated that interventions using PBPS resulted in a one-third decrease in the odds of Non-advancement Adverse Academic Status Events (NAASE). These results indicated that interventions introduced using the PBPS might have the potential to reduce AASE or attrition URMS and non-URMS of students attending health science community colleges, positively impacting costs and shortages of health science professionals (Vijayan, 2012).

The PBPS was administered to students before the matriculation of the student into their courses (Johnson, Johnson, McKee, & Kim, 2009b). Once a student completes the semester, the advisor records the outcome of AASE. The AASE, made of 12 AASE codes related to types of student attrition, including two additional AASE codes related to types of retention (Johnson, Johnson, McKee, & Kim, 2009b). The AASE codes were assigned by the advisor to every student at the end of the academic semester (16 weeks).

The PBPS is used to facilitate the identification of at-risk students early and target corrective interventions to reduce AASE. By identifying students' cognitive and non-cognitive risks, the PBPS and AASE represents an essential first step in early

identification of at-risk students. By administering the PBPS, student engagement for students has begun and as research shows student engagement contributes to student success.

Student Engagement

Kuh (2009) noted that the history of American higher education had been founded through the rise “of student engagement as an organizing construct for institutional assessment, accountability, and improvement efforts” (p. 5). Kuh (2009) stated, “the engagement premise is straightforward and easily understood: the more students study a subject, the more they know about it, and the more students practice and get feedback from faculty and staff members” (p. 5). Engagement helps develop the student’s mind and heart which expands their capacity for success (Kuh, 2003).

In 1970, C. Robert Pace developed the College Student Experiences Questionnaire (CSEQ), which he termed “quality of effort” (p. 65-149). Pace stated that students increased their learning from studying when the student invested more time and energy in tasks (Pace, 1990). Alexander Astin (1984) developed his “theory of student involvement” (p. 518), contributing to student development. The *Involvement in Learning* report (National Institute of Education, 1984) of which Astin was a contributor, emphasized the importance of engagement in student academic success. Since then, scholars have conducted research studies addressing various dimensions of student involvement, time on task and the connection to various positive outcomes in higher education (Pascarella & Terenzini, 2005; Pike, 2006; Tinto, 1987, 1993).

Engagement today has represented the quality of effort and participation in learning activities (Kuh, 2009). Kuh (2003) stated that the introduction and prevalent use

of the National Survey of Student Engagement (NSSE) and its community college counterpart, the Community College Survey of Student Engagement (CCSSE), has helped strengthen student engagement in higher education by assessing student's evaluations at the end of each semester and improving engagement between the student and teacher. The teacher-student relationship that develops during the time a student is in class is an essential influence in a student's learning experience for academic success (Hauer et al., 2012). Student learning, engagement, and motivation all lead to the student experience, which is a factor that influences student retention (Tinto, 1993).

Student Retention

Student retention is recognized as one of the most widely studied areas in higher education. Tinto (2006) suggested that as higher education evolves “from one of plenty to one of diminishing resources, there has also been a heightened focus on the part of institutions on increasing the rate at which students persist and graduate from both two- and four-year colleges and universities” (p. 2), contributing to student retention. Retention of current students increases cost-effectiveness rather than acquiring new incoming students (Davis, 2009). Hence one of the reasons why higher education institutions have vested interests in increasing retention rates. Tinto (2006) stated that student's “individual attributes, skills, and motivations” (p. 2), were perceived as student deficiencies, and institutions would blame students for failing. Now higher education institutions have a better understanding of the factors that contribute to low retention rates.

Ideas about retention and its causes began as part of a broader change in the 1970s in how we understood the role of the environment and, in particular, the role of the

institution in student decisions that may lead to dropping out (Tinto, 2006). Until this time institutions were not doing enough to retain students. Tinto (2006) stated that researchers learned that “involvement matters and that it matters most during the critical first year of college” (p. 3). Bahrassa, Syed, Sue, and Lee (2011) stated “ethnic differences in college performance suggests that the transition from high school to college may be a particularly challenging time,” for minorities (p. 415). The transition from high school to college was one way why institutions focused on retention in the first year of postsecondary education students, notably the transition from high school to college, and the nature of student engagement with faculty. Services ranging from enriching the freshman year experience through extending new student orientation, freshman seminars, and a variety of extracurricular activities created a more involved student (Upcraft, Gardner, and Associates, 1989). In early efforts, the strategies implemented to target retention lacked sophistication and did not include students in two- and four-year universities, and students of a different race, ethnicity, gender, socioeconomic status, and orientation. The faculty was mostly absent, and retaining students fell to the student affairs professionals.

Research on student retention has been progressive. The first efforts focused on the understanding of students’ different ethnic backgrounds (Tinto, 2006, p.3). Tinto additionally suggested that scholars learned the understanding of “how the process of student retention” (p. 4) is different between “institutional settings, residential and non-residential, two- and four-year” (p. 4), which contributed to inconsistent nature of higher education. Finally, researchers learned more about how dynamic student retention is and have appreciated the boundaries of their early retention models. Scholars dedicate and

compare their studies in explaining why students leave college (Tinto, 2006).

Vincent Tinto & Alexander Astin: Theorists of Retention

Tinto (1975) used and enhanced Spady's (1970) adaptation of Durkheim's theory to guide his development of his interactionalist theoretical model of student departure (Bean & Eaton, 2001). The model implies that the characteristics of student's entry, coupled with the student's commitment to the institution and determination to graduate, influence decisions of student departure. Tinto (1975) suggested that "the notion that the relationship between academic and social integration and dropout, and in turn, between the goal and institutional commitment and dropout is asymmetrical in nature" (p. 110), that impacts student retention. Tinto argues that "it is the individual's integration into the academic and social systems of the college that most directly relates to his continuance in that college" (Tinto, 1975, p. 96). The "cornerstone of the research on retention" involves Tinto's theory of academic and social integration (Morrison & Silverman, 2012, p. 77). The ability of a student to integrate well academically may compensate for a lack of social integration is suggested by Tinto's explanatory model (Pascarella & Terenzini, 1983). The influence of social class, and level of family and student income mitigated high academic performance. Low socioeconomic students, who earn high grades, are more likely to advance in a college program than students with high socioeconomic backgrounds when studied from a social class, level of income perspective (Paulsen & St. John, 2002). Tinto's (2007) theory also advocates that college has a responsibility in student retention, including roles for faculty, and commitment concerning socioeconomic, racial, and ethnic diversity. Tinto suggests that faculty should be involved in orientation programs and have early contact with students. Faculty should

share among themselves, problems encountered by students, and plan ways of dealing with such problems in order to retain students (Braxton, Brier, & Steele, 2007).

In the late 1960s, Alexander Astin studied retention along with his colleagues at UCLA using national databases that contained data from hundreds of colleges (Berger, Ramirez, & Lyons, 2012). From analyzing these data, Astin stated that involvement was the key to retention. Student involvement theory focuses on the motivation and behavior of students rather than the subject matter. As students were engaged in their academic endeavor and college life, the higher the likelihood the students were retained. Astin (1977, 1985) suggested that departure decisions influenced the quantity of physical and psychological energy that students devoted to their college experience (both social and academic). Astin's model became the foundation for many student retention interventions in colleges throughout the country. Astin's (1999) student involvement theory compliments Tinto's theory and focuses on student involvement leading to social integration. Astin (1999) implied that student involvement is defined as the effort the student exerts socially and academically in the student's college experience.

American higher education has withstood over 300 years of changes in mission, curriculum, students, and financing while continuing "to be among the most well-respected postsecondary institutions in the world" (Berger, Ramirez, & Lyons, 2012, p. 13). These "changes have affected the nature of retention in terms of patterns of retention, institutional concern about retention, the ways in which retention has been conceptualized and studied, and the range and types of strategies that have been used to try to improve retention" (Berger et al., 2012, p. 8).

Organizations of higher education holistically have added retention practices

targeting student success in preeminent colleges or universities. These techniques provide a vehicle for understanding student readiness, early identification of at-risk students, Personal Background Preparation Survey, student engagement, and retention for purposes of degree attainment.

Health Science Self-Report Survey

Research about health science programs' self-reports is scarce, and often only examines one program and does not provide a holistic view of an entire health science community college. Research in the health science field, for the most part, only concentrates on nursing programs.

A self-report study of 97 nursing students found significant moderate correlations between academic variables and academic achievement. The researcher suggested that incoming students in the study did not have correct perceptions of the required skills needed in academics in the nursing field (Jeffreys, 1998). Jeffreys (1998) stated other cognitive risks include "a student's involvement with the academic process at the college, such as academic support services, study skills, and study hours" (p. 42). Additionally, Jeffreys mentioned non-cognitive factors such as "finances, hours of employment, outside encouragement, and families responsibilities" (Jefferys, 1998, p. 42).

Walker et al. (2011) studied nine nursing programs that consisted of 4-year regional schools and community colleges in East Texas to identify and intervene in the nursing program attrition rates. The administered survey revealed that of the 898 students, 77% were considered on track for graduation, 17% were off track, and the remaining 6% were no longer in the nursing program (Walker et al., 2011). The study discovered that the rate of falsely identifying a student as at-risk was extremely high

(Walker et al., 2011).

Summary

This chapter examined the literature on student readiness, early identification of at-risk students, the Personal Background Preparation Survey, student engagement, and how retention affects the student's ability to succeed in higher education. An institution of higher education's ability to retain students could translate into an institution that truly understands the complexity of challenges that students face as they enter college. The framework presented the evolving theories of at-risk students through decades of research in the area of retention. This research provided a review of how early identification of at-risk students will assist those students and help them succeed. Chapter 2 also discussed research that focused on a greater understanding of cognitive and non-cognitive factors that have impacted students in higher education. Finally, the study reviewed the process of how student engagement assists higher education's goals of student retention. The next chapter will focus on the methodology for this study.

Chapter III

Methodology

The purpose of this study was to measure the predictive validity of a self-report survey to identify at-risk students to provide cognitive and non-cognitive resources during their first semester at a community college. The data used in this study was from students entering a large, diverse urban southwestern health science community college in five semester-cohorts starting with a fall 2010 baseline semester and including fall 2013 to spring 2015. This chapter evaluated the degree to which PBPS scores predicted Adverse Academic Status Event (AASE) and Non-advancement Adverse Academic Status Event (NAASE) measures of students' end-of-semester outcomes. Chapter 3 includes the research question, a description of the variables, conceptual/operational definitions, and measures along with the research design and summary.

Research Question

What is the relationship of scores on the Personal Background Preparation Survey and first-semester educational outcomes for students at a health science community college?

Variables. The independent variable was the student's total risk level of educational risk, as measured by the PBPS score. The dependent variable was a student's end-of-semester outcomes as measured by Adverse Academic Status Events (AASE) and Non-advancement Adverse Academic Status Events (NASE). The variables for this study are outlined in Table 1.

Table 1

Variables

Research Question	Variables
What is the effectiveness of a self-report survey to identify at-risk students to provide cognitive and non-cognitive resources during their first semester at a community college?	<ul style="list-style-type: none"> • Advance Academic Status Event (AASE) Educational Outcomes by semester-cohort • PBPS Risk Factors • <i>Race</i> • <i>Gender</i>

The risk scores assigned by the advisor are categorized by ten PBPS risk categories found in Table 2.

Table 2

PBPS Risk Categories and Sample Item Stems

PBPS Risk Category	Sample Item Stems
Personal	Did you have to overcome a difficult personal or family situation?
Familial	In your household, how many children are under your responsibility while you attend school?
Academics	How long did it take you to complete your preprofessional education program and/or undergraduate degree?
Self-concept	I get easily discourage when I try to do something and it doesn't work.
Support	If I run into problems concerning school, I have someone who will listen and help me.
Financial	I have financial concerns that will affect my educational program.
Leadership	I am sometimes looked up to as a leader by others.
Discrimination	I expect I will encounter discrimination in school.
Community service	There is no use in doing things for people; you only find that you get no gratitude – only trouble in the long run.
Long range goals	Once I start something, I am determined to finish it.

Note. Reprinted with permission from "Personal background preparation survey for early identification of nursing students at risk for attrition," by C. Johnson, R. Johnson, M. Kim, and J. McKee, 2009a, *The Journal of Nursing Education*, 48 (11), 609. Retrieved from <https://doi.org/10.3928/01484834-20090716-06>

UT Health AAT Research Office analyzed and determined the PBPS total risk scores and defined the AASE codes assigned to each student at the end of the semester in the health science program. There are 19 AASE codes, including positive and negative codes, with each related to an outcome category found in Table 3.

Table 3

Adverse Academic Status Codes, Events, Outcomes, and Sample Criteria

Code	Event	Sample Criteria
Positive Outcome		
GS	Good Standing	No academic issues
LP	Leave of absence-positive	Leaves school voluntarily
NP	Not enrolled – positive	Leaves school for other reasons before the semester starts. The student decides not to enroll in the program
SG	Student graduated	Student graduated from the program
WP	Withdrew from a course – positive	Student withdrew from a course in good standings
Neither Non-advancement nor Attrition Outcome		
AP	Alternate pathway	The student selects an alternate career pathway
EA	Early Alert	Poor academic performance within the semester
PT	Part-time	Decides to enroll in part-time instead of a full-time load
RA	Remedial assistance	Student requires assistance for tutorial, counseling, or mentoring
W	Warning	The student is informed of poor performance with the possible failure of class or program
Non-advancement or Borderline Non-advancement Outcome		
FC	Failed course(s)	Student failed a course or courses
IC	Incomplete course(s)	The student did not complete assignments within the semester
IG	Inadequate grade	Student average is not high enough to complete course
LN	Leave of absence – negative	The student decides to leave the course due to poor academic performance
MP	Marginal performance	The student is allowed to repeat a failed course based upon the potential to complete program
P	Probation	The student is allowed to remain in the program subject to improved grades in class
RC	Repeat course(s)	The student did not pass a class and will have to repeat the course
WN	Withdrew from a course – negative	Student withdrew from a course with poor academic performance
Attrition Outcome		
D	Dismissed	The student fails to meet the required criteria to progress in the program
NN	Not enrolled – negative	The student is performing poorly and decides to leave the program
RY	Repeat year	The student is required to repeat a year to remain in the program
SP	Suspended from program	The student is suspended due to personal/behavior or academic performance
WA	Withdrew for academic reasons	The student is failing and withdraws from course
WO	Withdrew for other reasons	The student has issues that will prevent he/she from re-taking classes or registering

Note. Adapted from "Using the personal background preparation survey to identify health science professions students at risk for adverse academic events," by C. Johnson, R. Johnson, J. McKee, and M. Kim, 2009b, *Advances in Health Sciences Education*, 14 (5), 745. Retrieved from <https://doi.org/10.1007/s10459-009-9156-4>

Measures. Personal Background Preparation Survey (PBPS). The PBPS measures and delivers “a total score for student academic persistence risk indicators across 10 cognitive and noncognitive categories (personal, familial, academics, self-concept, support, financial, leadership, discrimination, community service, long-range goals) (Johnson, Johnson, Vijayan, & Villegas Jr., 2018, p. 8). All students answered a questionnaire survey administered before entering their health science program. The PBPS includes items that assess students’ potential risks and questions about student perceptions of the subject matter before starting the program. Johnson et al. (2018, p. 8) “consistently established the PBPS predictive validity and reliability (Cronbach’s $\alpha = .77$, $.75$, and $.80$) of students total PBPS risk scores for first- and second-year AASEs across multiple diverse populations and disciplines within health science professions schools at multiple levels”.

Academic Status Event Outcomes. UT Health AAT Research Office analyzed and determined the PBPS total risk scores and defined the AASE codes assigned to each student at the end of the semester in the health science program. There are 24 AASE codes, including positive and negative codes, with each related to an outcome category. At the end of each 2013 – 2015 semester, AASE evaluators were trained (college Student Advisors and assigned staff members) to review first semester students’ academic outcomes.

Nonadvancement Academic Status Events. UT Health computer-recoded AASE codes to binary non-advancement academic status events (BNASEs; non-advancement = 1, good standing = 0).

Research Design

The study used a correlational design to analyze correlation between the predictor PBPS total risk scores and of multiple semester-cohorts (baseline-fall-2010, fall-2013, spring-2014, fall-2014, spring-2015), among newly enrolled students' initial risk levels as assessed by the PBPS, their educational outcomes, and the presence versus absence of interventions. This research design will answer the research question to see if the self-report is an effective tool to identify at-risk students. The research design will also see if a student's success rate increases when at-risk students are engaged and advisors intervene.

Data Source. The study used archival data collected during 2010 – 2015 under a grant between two southwestern U.S schools. The data source was the student's PBPS score, risk self-assessment, AASE, NAASE, and stored in a secure Microsoft SQL Server database at UT Health. As soon as the researcher received approval from IRB, the researcher sent a data request to UT Health for the de-identified aggregate compiled report.

Student Recommendations. The PBPS produced individualized reports making evidence-based risk-specific recommendations prescribing interventions targeting students' empirically identified risk indicators. Based on Johnson et al. (2012, 2018), the PBPS was used during the 2013 – 2015 semesters to proactively diagnose individualized noncognitive and cognitive academic persistence risk indicators and recommend individualized, targeted interventions for risk amelioration. These risk-ameliorative procedures would be expected to reduce the relationship between students' initial risk levels and student's later adverse academic status events.

Data Collection. Data was compiled every year when students go to the New Student Orientation. The data used in this study was from students entering a large, diverse urban southwestern health science community college in five semester-cohorts starting with a fall 2010 baseline semester and including fall 2013 to spring 2015. In order to analyze the latest data, it was determined to use Fall 2013 to Spring 2015 for purposes of this data. Spring 2015 was the last semester that UT Health AAT Research Office analyzed. The student completed the PBPS survey analyzed by UT Health AAT Research Office. The PBPS also included academic codes that are retention related called Adverse Academic Status Events (AASE). Once students completed the PBPS survey, the responses were accessed using Microsoft Office Access for generating reports by UT Health AAT Research Office. UT Health AAT Research Office analyzed the data and then sent via electronic transmission via a password protected secured server with encryption to the Coordinator in the HCC Coleman Student Services department. The coordinator then saved the data on a password-protected flash drive with encryption and be given to each advisor for their caseload.

Data Analysis Procedures. The study used archival data collected during 2010 – 2015 under a grant between two southwestern U.S schools. A correlational design was used to analyze the predictor PBPS total risk scores that assessed the newly enrolled students' initial risk levels, the presence versus absence of interventions, ethnicity, and gender using correlational design analyses. Correlation statistics using Spearman's Rho were completed to determine if any correlation existed between the student's risk level and their educational outcome. In addition, to further examine the data, chi-square analyses were done for educational outcomes based on the semester. These analyses were done in two ways: all five separate semesters and for the baseline semester compared to the aggregation of the four subsequent semesters.

Summary

This chapter described the purpose of the study, along with the research question associated with the study. This chapter also described the variables associated with the research question and the conceptual/operational definitions. Finally, this chapter described the data source, data collection, and data analysis for this study. The next chapter focused on the results of the methodology used from the investigation of the research question.

Chapter IV

Findings

The purpose of the study was to measure the effectiveness of a self-report survey to identify at-risk students to provide cognitive and non-cognitive resources during their first semester at a community college. Archival data for 1,644 students were analyzed. Table 4 displays the frequency counts for selected variables semesters, gender, race/ethnicity, risk level, and outcome. To answer the research question, Table 5 displays the Spearman correlations for risk level and outcome (semesters and demographics) for the entire sample and for 19 selected subsamples. As additional findings, Table 6 displays the chi-square tests for the outcome variable (success, at-risk, and attrition) based on the semester.

Description of the Sample

Table 4 displays the frequency counts for selected variables. Data were collected for five semesters. The baseline semester (Fall 2010) (24.9%) had an administrative sequence which included no self-report survey, no intervention, and no resource guide for students at-risk. In the following four semesters, a different administrative sequence was used, which included a self-report survey, intervention, and a resource guide that will benefit students who are at-risk. There were more women (78.8%) than men (21.2%) in the sample. The most common racial/ethnic groups were Hispanic (29.2%), Black-African American (21.4%), and Asian (19.1%). The risk level, which are the cognitive and non-cognitive factors associated with each student, ranged from 1-10 (2.9%) on the low end to 41-50 (0.2%) on the high end with a median risk level of $Mdn = 25.50$. Eighty-one percent of the sample had positive educational outcomes, with another 10.7%

being considered at risk, and the final 8.7% of the students had attrition due to their PBPS risk category that attributed to the student's success or failure.

Table 4

Frequency Counts for Selected Variables (N = 1,644)

Variable	Category	<i>n</i>	%
Semester	Baseline Fall 2010	410	24.9
	Fall 2013	429	26.1
	Spring 2014	169	10.3
	Fall 2014	445	27.1
	Spring 2015	191	11.6
Gender	Male	349	21.2
	Female	1,295	78.8
Race/Ethnicity	Caucasian	299	18.2
	Black-African American	352	21.4
	Black-African	152	9.2
	American Indian / Alaska		
	Native	5	0.3
	Hispanic	480	29.2
	Asian	314	19.1
	Pacific Islander	14	0.9
	Middle / Near Eastern	16	1.0
	Other	12	0.7
Risk Level ^a	1-10 (low risk)	47	2.9
	11-20	706	42.9
	21-30	747	45.4
	31-40	141	8.6
	41-50 (high risk)	3	0.2
Outcome	Positive	1,325	80.6
	At-risk	176	10.7
	Attrition	143	8.7

^a Risk Level: *Mdn* = 25.50.

The Fall 2014 semester had the biggest enrollment of students, while Spring 2015 had the lowest. Female students represented a higher percentage of 78.8%, while Hispanics represented a higher percentage of race/ethnicity at a percentage of 29.2%. There were more students at the low to middle tier in terms of risk level, and positive outcome had the highest percentage at 80.6%.

Chi-Square Analyses for Outcome on Risk Score and Racial/Ethnic Group.

Table 5 displays the chi-square tests comparing risk score and racial/ethnic group with educational outcome. Both tests were statistically significant. Specifically, 91.5% of the students in the 1-10 risk score category was successful compared to 67.4% of the students in the 31-50 risk score category, $\chi^2 (9, N = 1,644) = 28.95, p = .001$. Cramer's $V = .09$. For racial/ethnic group, the highest success rates were for Asian students (86.3%) and Caucasian students (82.3%). The lowest success rates were for Other students (72.3%) and Black (African American) students (76.4%). As stated below, the chi-square test was significant, $\chi^2 (15, N = 1,644) = 22.10, p = .02$. Cramer's $V = .08$ (see Table 5).

Table 5

Chi-Square Analyses for Outcome Based on Risk Score and Racial / Ethnic Group

		Educational Outcome					
		Success		At-Risk		Attrition	
Variable	Category	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Risk Score	1-10	43	91.5	3	6.4	1	2.1
	11-20	590	83.6	56	7.9	60	8.5
	21-30	595	79.7	87	11.6	65	8.7
	31-50	97	67.4	30	20.8	17	11.8
Racial / Ethnic Group	Caucasian	246	82.3	32	10.7	21	7.0
	Black (African American)	269	76.4	42	11.9	41	11.6
	Black (African)	118	77.6	18	11.8	16	10.5
	Hispanic	387	80.6	49	10.2	44	9.2
	Asian	271	86.3	24	7.6	19	6.1
	Other	34	72.3	11	23.4	2	4.3

^a Risk Score: $\chi^2 (9, N = 1,644) = 28.95, p = .001$. Cramer's $V = .09$.

^b Racial / Ethnic Group: $\chi^2 (15, N = 1,644) = 22.10, p = .02$. Cramer's $V = .08$.

Note. $N = 1,644$.

The Risk Score between 31-50 ($N=97$) had the largest attrition at 11.8%. The risk score between 11-20 ($N=590$) and 21-30 ($N=595$) had almost the same sample size and percentage in attrition 8.5% to 8.7%. The Asian group ($N=271$) had the highest percentage of success, 86.3%, while the Other racial group ($N=34$) had the lowest percentage 72.3%. Both Black (African American) ($N=269$) and Black (African) ($N=118$) had the highest attrition percentage at over 10% respectively.

Answering the Research Question

Spearman Correlation risk level versus educational outcome. The primary research question for this study was, what is the effectiveness of a self-report survey to identify at-risk students to provide cognitive and non-cognitive resources during their first semester at a community college? To answer this, Table 6 provides the relevant Spearman correlation between the student's risk level and their educational outcome. The correlation was significant ($r_s = .10$) and accounted for 1.0% of the shared variance between the two variables ($r_s^2 = .01$).

Table 6

Spearman Correlations for Risk Level and Outcome for Entire Sample and Selected Subsamples.

Subsamples Sorted by Highest Correlation

Sample/Subsample	<i>n</i>	<i>r_s</i>	<i>r_s</i> ²	
			Percent of Variance	
Total Sample ^a	1,644	.100	****	1.0
Other Subsamples				
Other Racial/Ethnic Groups Only	47	.584	****	34.1
Black-African Only	152	.211	**	4.5
Baseline Semester - Females Only	317	.133	*	1.8
Fall 2014 Only	445	.121	**	1.5
Later Semesters Combined - Males Only	256	.107		1.1
Females Only	1,295	.103	****	1.1
Spring 2015 Only	191	.102		1.0
Baseline Fall 2010 Only	410	.099	*	1.0
Black-African American Only	352	.096		0.9
Males Only	349	.087		0.8
Caucasians Only	299	.067		0.4
Hispanic Only	173	.062		0.4
Later Semesters Combined Only	1,234	.059	*	0.3
Asian Only	314	.054		0.3
Later Semesters Combined - Females Only	978	.046		0.2
Spring 2014 Only	169	.033		0.1
Fall 2013 Only	429	.001		0.0
Baseline Semester - Males Only	93	-.018		0.0

* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.

Note. r_s^2 is the coefficient of determination expressed as a percentage.

^a Spearman correlation used to address Research Question 1.

As an additional set of analyses, Table 6 also displays the Spearman correlations between risk level and educational outcome for 19 separate subsamples of students. This was done to determine the extent that this relationship was similar or different in a variety of demographic subgroups. The resulting 19 Spearman correlations were sorted high to low based on the size of correlation. The correlations were highest for the subsample of “other racial/ethnic groups” ($n = 47$, $r_s = .584$, $p < .001$, $r_s^2 = .341$) and for “Black-African” ($n = 152$, $r_s = .211$, $p < .01$, $r_s^2 = .045$) (see Table 5).

Additional Findings

Chi-Square Analyses for Outcome based on semester. To further examine the data, Table 7 displays the chi-square analyses for educational outcome based on semester. These analyses were done in two ways: all five separate semesters and for the baseline semester compared to the aggregation of the four subsequent semesters. Both tests were significant at the $p < .001$ level. Inspection of the tables found positive student outcomes to be significantly lower during the baseline semester (Fall 2010) (57.1%). In addition, at-risk student outcomes were significantly higher during the baseline semester (Fall 2010) (36.8%) than for any of the other semesters (see Table 7).

Table 7

Chi-Square Analyses for Outcome Based on Semester (N = 1,644)

Variable	Semesters	Educational Outcome					
		Success		At-Risk		Attrition	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Separate Semesters ^a	Baseline Fall 2010	234	57.1	151	36.8	25	6.1
	Fall 2013	387	90.2	9	2.1	33	7.7
	Spring 2014	146	86.4	0	0.0	23	13.6
	Fall 2014	388	87.2	14	3.1	43	9.7
	Spring 2015	170	89.0	2	1.0	19	9.9
Intervention Grouping ^b	Baseline Fall 2010	234	57.1	151	36.8	25	6.1
	Later Semesters						
	Combined	1091	88.4	25	2.0	118	9.6

^a Separate semesters: $\chi^2 (8, N = 1,644) = 396.58, p = .001$. Cramer's V = .35.

^b Intervention grouping: $\chi^2 (2, N = 1,644) = 389.95, p = .001$. Cramer's V = .49.

A chi-square test for association was conducted between cohort-semester and educational outcomes. There was a slightly positive statistically significant association between cohort-semester and the student's educational outcomes: $\chi^2 (2, N = 1,644) = 389.95, p = .001$. Cramer's V = .49.

Summary

In summary, this study used archival data for 1,644 students to measure the effectiveness of a self-report survey to identify at-risk students to provide cognitive and non-cognitive resources during their first semester at a community college. The analysis

of the primary research question (relationship between risk score and educational outcome) found a significant positive correlation ($r_s = .10$) (see Table 6). In the final chapter, these findings will be compared to the literature, conclusions, and implications will be drawn, and a series of recommendations will be suggested.

Chapter V

Discussion

The decision to enter a health professional program entails a significant investment of time on the part of the student and their immediate family (O'Neill, Wallstedt, Eika, & Hartvigsen, 2011). The prevalence of at-risk students in college around the nation has been a hot topic for higher administration. Research in health science education has shown that early identification of a student's cognitive and non-cognitive risk factors is essential in preventing failure (Winston, van der Vleuten, & Scherpbier, 2010a). The key to success is the length of a supportive intervention, as short-term remedial approaches have produced short-term results (Cleland et al., 2013). The purpose of the study was to measure the effectiveness of a self-report survey to identify at-risk students to provide cognitive and non-cognitive resources during their first semester at a community college. The effectiveness measured the at-risk codes generated by the self-reported survey with the outcome codes assigned by the advisors at the end of the first semester of the students' first year.

The following chapter discusses the findings and conclusions for each of the current study's research questions. The various limitations of the study are also explained as well as the implications for practice and future research.

Findings

Table 8

Summary of Research Findings

RQ	Finding	Implication
1A	For the total sample that consisted of cognitive and non-cognitive risk factors that were correlated with educational outcome at $p < .001$ level, risk level had a significant positive correlation with outcome ($r_s = .100$, $r_s^2 = 1.0$).	<p>Practice: Develop and update a counseling system checklist. Complete resource guide. Supportive leadership needs to be established to encourage and empower advisors to maintain a positive environment.</p> <p>Research: Research should focus on why students' specific risks contribute to their outcome. Narrative/qualitative research methodology to better understand at-risk students. Research should focus on solutions to risk factors.</p> <p>Theory: At-risk students' correlation with outcome aligns with Seiman's retention model formula. Seidman Retention model $RET = E_{ID} + (E + IN + C)_{IV}$</p>
	For other racial/ethnic groups only at $p < .001$ level, risk level had a slight positive correlation with outcome ($r_s = .584$, $r_s^2 = 34.1$).	
	For other Black/African only at $p < .01$ level, risk level had a slight positive correlation with outcome ($r_s = .211$, $r_s^2 = 4.5$).	
	For other baseline semester – females only at $p < .05$ level, risk level had a slight positive correlation with outcome ($r_s = .121$, $r_s^2 = 1.5$).	
	For other females only at $p < .001$ level, risk level had a slight positive correlation with outcome ($r_s = .103$, $r_s^2 = 1.1$).	
	For other baseline fall 2010 semester only at $p < .05$ level, risk level had a slight positive correlation with outcome ($r_s = .099$, $r_s^2 = 1.0$).	
	For other later semesters combined only at $p < .05$ level, risk level had a slight positive correlation with outcome ($r_s = .059$, $r_s^2 = 0.3$).	
1B	For the nonintervention baseline, Fall 2010 of 57% success versus intervention Fall 2013 (90.2%), Spring 2014 (86.4%), Fall 2014 (87.2%), and Spring 2015 (89%) increased the rate of success respectively.	<p>Practice: Provide interventions for at-risk students. One on One and classroom</p> <p>Research: Research should focus on why students' specific counseling system checklist that will increase their success.</p>
	For the nonintervention baseline Fall 2010 of 57% success versus intervention later semesters combined (88.4%) increased the rate of success.	<p>Theory: Nonintervention vs. intervention students aligns with Alexander Astin's theory of student involvement and engagement.</p>

Findings Research Question

Spearman Correlation risk level versus educational outcome. For the total sample at $p < .001$ level, the risk level had a slight positive correlation with outcome. Additionally, the percentage of variance accounted for ($r_s = .100$, $r_s^2 = 1.0$), which would mean for every 1% of total sample students, there would be 99% of good or bad factors accounted for. For other racial/ethnic groups only at $p < .001$ level, risk level had a slight positive correlation with outcome. The percentage of variance accounted for ($r_s = .584$, $r_s^2 = 34.1$), which would mean for every 34.1% of racial/ethnic group students, there would be 65.9% of good or bad factors accounted for. For other Black/African only at $p < .01$ level, risk level had a slight positive correlation with outcome. The percentage of variance accounted for ($r_s = .211$, $r_s^2 = 4.5$), which would mean for every 4.5% of Black/African students, there would be 95.5% of good or bad factors accounted for. For other baseline semester – females only at $p < .05$ level, risk level had a significant positive correlation with outcome. The percentage of variance accounted for ($r_s = .121$, $r_s^2 = 1.5$), which would mean for every 1.5% of Fall 2010 female students, there would be 98.5% of good or bad factors accounted for. For other females only at $p < .001$ level, risk level had a slight positive correlation with outcome. The percentage of variance accounted for ($r_s = .103$, $r_s^2 = 1.1$), which would mean for every 1.1% for other female students, there would be 98.9% of good or bad factors accounted for. For baseline fall 2010 semester only at $p < .05$ level, risk level had a significant positive correlation with outcome. The percentage of variance accounted for ($r_s = .099$, $r_s^2 = 1.0$), which would mean for every 1% of fall 2010 semester students, there would be 99% of good or bad factors accounted for. For other later semesters combined only at $p < .05$ level, risk level had a significant

positive correlation with outcome. The percentage of variance accounted for ($r_s=.059$, $r_s^2=.03$), which would mean for every .3% of later semester students, there would be 99.7% of good or bad factors accounted for. Based on Seidman (1996, 2005) the findings align with the formula of the role of early identification in his model for student retention: $RET = EARLY_{IDENTIFICATION} + (EARLY + INTENSIVE + CONTINUOUS)_{INTERVENTION}$, or, $RET = E_{ID} + (E + IN + C)_{IV}$. The formula states that retention equals early identification, plus early intensive continuous intervention will equal student success. The findings also align with the research that indicated each standard deviation increased in PBPS total risks, the odds of the outcome also increase “135% to 143% ($p<.05$)” (Johnson, Johnson, McKee, & Kim, 2009b, p. 749).

Chi-Square Analyses for Outcome based on semester. As far as intervention vs. non-intervention of students, for the nonintervention baseline Fall 2010 of 57% success versus intervention Fall 2013 (90.2%), Spring 2014 (86.4%), Fall 2014 (87.2%), and Spring 2015 (89%) increased the rate of success respectively. For the nonintervention baseline Fall 2010 of 57% success versus intervention later semesters combined (88.4%) increased the rate of success. Kuh (2009) noted that the history of American higher education had been founded through the rise “of student engagement as an organizing construct for institutional assessment, accountability, and improvement efforts” (p. 5). Kuh (2009) stated, “the engagement premise is straightforward and easily understood: the more students study a subject, the more they know about it, and the more students practice and get feedback from faculty and staff members” (p. 5). Engagement helps develop the student’s mind and heart that expand their capacity student success (Kuh, 2003). Alexander Astin (1984) developed his “theory of student involvement” (p.

518), contributing to student development. The Involvement in Learning report (National Institute of Education, 1984) of which Astin was a contributor, emphasized the importance of engagement in student academic success. Since then, scholars have contributed research addressing various dimensions of student involvement and time on task and the student connection to various positive outcomes in higher education (Pascarella & Terenzini, 2005; Pike, 2006; Tinto, 1987, 1993).

Limitations

One of the limitations was that there was no exit interview administered where students could express if the early interventions had an impact on them. Although a post first semester non mandatory self-report survey was sent out to students there was minimal participation. Even with incentives the self-report survey would be uneventful and did not provide accurate information.

Additionally, each advisor would have their own caseload and construe the outcome of their respective caseload. No other person would be able to check or verify the outcome due to limited personnel and time constraints. Therefore, advancing personal biases into the equation of the outcome. The limitation is that one advisor would select an outcome that might not have been selected by a distinct advisor.

Implications

Future research in health science programs should include a qualitative study that would include an interview at the end of the first semester for those students taking the self-study report. Interviewing would allow students the opportunity to share their experiences throughout the semester to determine what was successful and what was not

in their progression or failure at the end of the semester. A qualitative study would allow the researcher to identify the interventions that were successful.

Future research should also explore the ten risk categories that have been identified as having the greatest impact risk factors, which include personal, familial, academics, self-concept, support, financial, leadership, discrimination, community service, long-range goals. These ten risk categories are the categories that students face in their educational journey. Exploring the impact would determine which of the ten risk categories the institution should concentrate more on.

Future research could also study each health science program individually. The study results were limited to students that took the self-report survey. Researching each program would determine if a specific health science program warrants additional intervention. While the results show a large sample size, further research focusing on individual health science programs would be helpful in designing targeted interventions.

In the meantime, college leadership can begin to establish a foundation of what area of retention to concentrate on. College leaders should disseminate the course of action so that staff and faculty could work together to eradicate the attrition rate as much as possible. By working together, this would start a symbiotic relationship between staff and faculty to help the students achieve success. When staff and faculty communicate together it is more likely that the outcome will be positive in the end.

Implications for Practice

The University of Texas at Houston Office of Educational Research and Development (OERD) has developed a new proactive Advanced Academic Training (AAT) Program for entering first-year students. This new AAT Program provides

information to help students understand how to use daily self-testing and become proactive (instead of reactive to course information) before initiating their first-semester course work. A 3-part AAT training video (with three quiz questions per video) is sent online to first-year students before they start classes as part of the pre-admission AAT Program. All first-year students must also complete a 26 question AAT test during their first week before classes are officially initiated. The AAT was designed to use “retrieval” (daily creation of factual and problem- solving questions and answers (Q/As) from lectures, clinics, assignments, mock licensure or board examinations for spaced daily repetitive self-assessment) combined with other learning technologies (QuizletPlus, Anki, Removal, Camouflage, etc.) for long-term retention and problem-solving.

As a full-time staff member of an urban health science community college for 11 years, the information gathered in this study leads to certain areas that higher administration could target. These targets could potentially lead to an increase in retention and student success throughout all the health science programs. The results reveal that the primary focus should be risk levels and ethnicity.

The study shows that any student with an at-risk level of 11 or above should have interventions that could pinpoint what area the student needs for student success. One finding analyzed students with an at-risk level between 11-30 which was comprised of 125 students with an attrition rate of above 8%. These students could be further engaged with an advisor to evaluate and alleviate any distractions (risks) that could impact student success. A prescription could be implemented so that students within this category will have certain treatments to complete before moving forward in the program.

Another finding that came about from this study was that Black (African American), Black (African), and Hispanics all had an attrition rate of above 9%. The sample of these three ethnic groups consisted of 101 students and could be prescribed certain treatments that could help them be more successful. Each student that can reduce the attrition rate is saving the institution funds and can be considered a win.

Overall, as a staff member from a large urban health science institution, the information gathered from this study will be beneficial to researchers as well as other higher education leaders around the nation. This study shows that by deliberate interaction and engagement with students could influence a student's success within the program. Health science institutions could become much more successful in their pursuit to become a leader and provide society with front-line responders that are so desperately needed.

Conclusion

The results of the study suggest that the self-report in this urban community college does identify at-risk students. Total sample, other racial/ethnic groups only, Black-African only, Baseline semester – females only, fall 2014 only, females only, baseline fall 2010 only, and later semesters combined correlational analysis found that student risk level was slightly positive correlated with their educational outcome.

Overall, students at-risk improved when Seidman's formula is implemented. These results support the retention model of Seidman's. Seidman Retention model $RET = E_{ID} + (E + IN + C)_{IV}$.

The study also revealed that there was a slightly positive statistically significant association between cohort-semester and the student's educational outcomes. When at-

risk students are engaged and advisors intervene student's success rate increases. Kuh (2009) found an emerging association "of student engagement as an organizing construct for institutional assessment, accountability, and improvement efforts" (p. 5), but also noted in (2003) that engagement help expand the student's mind to increase their volume of student success. Astin (1984) also emphasized the importance of engagement in student academic success. If it is an academic institution's wish to improve retention rates regarding at-risk students, they should begin with a prescription plan that provides students the tools they need to foster an environment that leads to success.

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Appendix A

IRB Approval Letters



APPROVAL OF SUBMISSION

May 16, 2019
Ramon Villegas

Dear Ramon Villegas:

On May 16, 2019, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	THE EFFECTIVENESS OF A SELF-REPORT SURVEY TO IDENTIFY AT-RISK STUDENTS TO PROVIDE COGNITIVE AND NON-COGNITIVE RESOURCES DURING THEIR FIRST SEMESTER AT A COMMUNITY COLLEGE
Investigator:	Ramon Villegas
IRB ID:	STUDY00001656
Funding/ Proposed Funding:	Name: Unfunded
Award ID:	
Award Title:	
IND, IDE, or HDE:	None
Documents Reviewed:	<ul style="list-style-type: none"> • R. Villegas HCC IRB 2019-322143001-0001, Category: Additional IRB approval letters; • THE EFFECTIVENESS OF A SELF-REPORT SURVEY TO IDENTIFY AT-RISK STUDENTS TO PROVIDE COGNITIVE AND NON-COGNITIVE RESOURCES DURING THEIR FIRST SEMESTER AT A COMMUNITY COLLEGE, Category: IRB Protocol;
Review Category:	Exempt
Committee Name:	Not Applicable
IRB Coordinator:	Sandra Arntz

The IRB approved the study on May 16, 2019 ; recruitment and procedures detailed within the approved protocol may now be initiated.

As this study was approved under an exempt or expedited process, recently revised regulatory requirements do not require the submission of annual continuing review



documentation. However, it is critical that the following submissions are made to the IRB to ensure continued compliance:

- Modifications to the protocol prior to initiating any changes (for example, the addition of study personnel, updated recruitment materials, change in study design, requests for additional subjects)
- Reportable New Information/Unanticipated Problems Involving Risks to Subjects or Others
- Study Closure

Unless a waiver has been granted by the IRB, use the stamped consent form approved by the IRB to document consent. The approved version may be downloaded from the documents tab.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system.

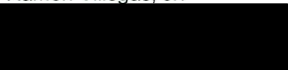
Sincerely,

Research Integrity and Oversight (RIO) Office
University of Houston, Division of Research 713
743 9204
cphs@central.uh.edu
<http://www.uh.edu/research/compliance/irb-cphs/>



Institutional Review Board

Ramon Villegas, Jr.



March 22, 2019

Dear Mr. Villegas:

This is to inform you that your research proposal

"The Effectiveness of a Self-Report Survey to Identify At-Risk Students to Provide Cognitive and Non-Cognitive Resources during Their First Year at a Community College"

has been reviewed and is approved. Because the protocol has been modified to include only data in the exiting UT Health study files, no data will be directly accessed from HCC.

All data collection and analysis are subject to the legal and procedural requirements of Houston Community College and other local, state and federal regulations. Approval by the HCC Institutional Review Board does not mean that HCC implicitly or explicitly endorses research projects.

The effective dates are March 1, 2019 through February 29, 2020. Extensions may be granted, but must be requested in writing.

If you have further questions, please contact me.

Cordially,

Martha Oburn, PhD
Chair, HCC IRB
Houston Community College

cc: Dr. Kurt Ewen, Vice Chancellor of Planning and Institutional Effectiveness
Dr. Philip Nicotera, President Coleman College