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Running Head: OPEN ACCESS AND RETENTION

Addressing the Tension Between Open Access Admission and Improving Retention Rates at
Crowder College

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Educational Practice

August 2016

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Abstract

Most community colleges embrace an open-access admission policy. At the same time, community colleges are pressured to improve retention rates. This project sought to address the tension between open-access and improved retention rates by determining which markers of academic preparedness predicted fall-to-fall retention in past admission cohorts of a community college. Data for three incoming classes of new students were analyzed using two separate logistical regressions, one on Pre-Admission/Enrollment variables and one on Post-Matriculation variables. The analysis of Pre-Admission/Enrollment variables, suggested that students who were male, 23 years or older and who had a low ACT Math Sub Score, and/or a low COMPASS Math were less likely to return. The analysis of the Post-Matriculation variables suggested that students with a low Term 1-GPA, a low Term 2-GPA, and other than 15 credits attempted were less likely to return. These results suggest that interventions targeted at incoming students with this profile could improve fall-to-fall retention. Also, interventions with students with a first term GPA below 2.80 could improve fall-to-fall retention.

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Earl R. Macam
Brittany L. Neunuebel
August 1, 2016

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Chapter 1

Introduction

The open-access admission policy has been the mantra for public community colleges for decades. Since the goal of community colleges is to serve students in the community, open-access admission allows students, regardless of academic readiness, to enroll in higher education and potentially earn a degree. Furthermore, an open-access policy grants students the opportunity to take classes for occupational enrichment purposes, and not necessarily seek a degree. At the same time, community colleges (as well as four-year institutions) have come under fire from funding sources, the community, and policy makers to track and improve retention rates. This places community colleges in the position of trying to serve two masters with competing goals. Considering that there seems to be a link between an open-access admission policy and low student retention rates, predictions can be made that:

- An open-access policy allows underprepared students to be admitted.
- Underprepared students struggle to be successful in for-credit courses.
- Underprepared students are often placed in multiple non-credit courses.
- Underprepared students earn few credits that apply to a degree.
- Underprepared students tend to quickly exhaust financial aid.
- Underprepared students are more likely than others to drop out.

The result is low retention rates at community colleges with open-access. If retention of students to program completion, is a goal of community colleges administrators, they should be concerned with the impact of open-access on student retention.

The administration of Crowder College, a small, public community college in southwest Missouri, desires to improve its retention rate. Crowder, compared to other institutions in Missouri, and even in the country, has an average retention rate of 51.1% fall-to-fall (See Table 4.3). Yet, Crowder perceives its retention rate to be a problem and aims for a much higher percentage of students retained. A low retention rate creates multiple problems. For the institution, it means an environment of uncertainty that can impact price, financial aid allocated to the institution, and the monies spent on student recruitment. For the student, it means the goal of entering a stable and lucrative career is dashed. Hence, open-access community colleges are challenged to retain students who are unlikely to be admitted to four-year colleges or universities.

This study is part of a larger client-based problem of practice undertaken by the Higher Education Student Services Learning Community in the Doctoral of Education program at the University of Missouri - St. Louis. The learning community invited institutions to propose a problem that could be studied as a dissertation in practice. The problem Crowder College presented dealt with retention concerns on their campus and was selected as the proposal of choice by the larger learning community. This dissertation is one of four approaches to examining fall-to-fall retention at Crowder College.

The purpose of this project was to analyze the impact of Crowder's open-access admission policy by studying whether (and how) preparedness predicted fall-to-fall retention at the institution. Further, this analysis identified underprepared students most at-risk of leaving Crowder College during, or after, the first year.

While this project examines retention issues at Crowder College, the tension between open-access for underprepared students and maintaining high retention rates

prevails. This tension exists on many community college campuses across the country. Such tensions seems to be brought on by funding pressures that are similar at four-year institutions. Identifying which students are at the highest risk of dropping out is important for all institutions, since corresponding interventions potentially improve retention rates.

To establish a context for this chapter, the authors examine the mission and student population of American community colleges. Then, open-access admission policies are discussed followed by the significance of addressing the tensions between open-access and higher retention rates. Lastly, specific terms used in this dissertation are defined.

The Many Missions of American Community Colleges

Vaughn (2006) states that a community college exists with the expectation to allow adult individuals access to education in its region. Jacobs-Biden (2007) describes how the community college mission has evolved. She writes about the socio-economic needs community colleges met following World War II and in the early 1950s. The community college was a place where equal opportunity was possible. She goes on to state that community colleges help not just those who wish to transfer to four-year programs, but also, students in career, vocational, technical, contact education, and community services (2007).

With varying mission statements, it may seem like no community college is the same; however, there are similarities. According to Vaughan (2006), most community colleges seem to embrace these commitments:

- Serving all segments of society through an open-access admissions policy that offers equal and fair treatment to all students.

- Providing a comprehensive educational program.
- Serving the community as a community-based institution of higher education.
- Teaching and learning.
- Fostering lifelong learning (p. 3).

Exploring these various missions may be best viewed through the lens of three categories developed by Bailey and Morest (2004): core, vertical, and horizontal. The core category refers to the traditional view of college as an institution that provides degree programs and many curricula that are easily transferable to a four-year college. The vertical category includes agreements between the community college and local high schools or universities. The horizontal category fulfills the need for non-credit courses, such as continuing education, professional career enrichment programming, and community activities. The American Association of Community Colleges ([AACC], 1998) stated:

The network of community, technical, and junior colleges in America is unique and extraordinarily successful. It is, perhaps, the only sector of higher education that truly can be called a 'movement,' one in which the members are bound together and inspired by common goals. From the very first, these institutions, often called 'the people's colleges,' have stirred an egalitarian zeal among their members. This success has branded the community college as a value, tradition, and a place of honor in many cities. (p. 5)

The mission of community colleges, then, is typically all-encompassing and comprehensive.

Student Populations in Community Colleges

A diverse student population is a critical component for many community colleges. Students attend for various reasons. Some attend to prepare for a four-year degree program, while others attend to change careers and take courses to train or prepare for that transition. Many only take a single class to further their current career and meet their goals. Diverse options for attending are characteristic of the community college.

While the traditional student, a high school graduate, occupies most of the seats in a community college classroom, many other seats are filled by middle-aged men and women who find themselves re-educating for the purpose of changing or improving an occupation. Many are first-generation (to attend college) students who are depending on services at the college to provide direction. Jacobs-Biden (2007) states this best, "The community college classroom is unlike any other classroom in America. Diversity, rather than homogeneity, is the norm" (p. 2). Jacobs-Biden (2007) further describes this classroom; it is filled with about 20 students, majority female, a quarter middle-aged, with many taking remedial courses, and around 67% of the students receiving financial aid. With such a diverse student population with different motives and intentions, it makes sense for a community college to have multiple goals under one mission.

Open-access, and a commitment to accessibility, leads to a diverse student body of individuals with various goals. Open-access provides most students the ability to pursue their dream of a college education (Jacobs-Biden, 2007). For many students who need and want to enrich themselves, the open-access model also provides training and a comprehensive form of higher education beyond high school. Furthermore, institutions with this philosophy are considered, by some, to help students reach their academic

potential and, in the process, increase their capacity to earn a higher wage (Jacobs-Biden, 2007). Students who earn a degree may see an increase in lifetime earnings compared to those who do not achieve a post secondary degree (Oreopoulos and Petronijevic, 2013). Under this philosophy, students meeting basic requirements of entrance are welcome and have a place at community colleges.

Open-Access

Even though institutions have varying and distinct compositions – that may not compute with other campuses, open-access is the main feature of the current community college model. Researchers agree that open-access policies are common to community colleges. Shannon and Smith (2006) comment that the traditional open door program, which ensures the benefit of education to all, is a foundational tenet that all community colleges embrace. Vaughan (2004) goes on to say, “Nothing is dearer to community colleges than the belief that they can, and should, serve all eligible people who seek admittance” (p. 52).

Bailey and Morest’s (2004) horizontal category includes the non-credit courses and community activities a community college provides. Horizontal activities have recently expanded. Bailey (2002) believes most community colleges expanded their missions to include non-degree and continuing education courses. This expansion of non-credit and community activities naturally flows from open-access policies.

Each institution might define *traditional college student* in its own way. Yet, Choy (2002) believes that most students at community colleges would not be categorized as traditional. The students at community colleges are usually part-time students, considerably older than most traditional college freshmen at four-year institutions, need

financial support from parents or from work income, and may have had a weak high school preparation for college (Choy, 2002). These students may eventually transfer to more than one institution before earning a degree, and the student body may include those who are taking courses to learn a new skillset for employment (Spellings, 2006; Gabriel et. al., 2001).

In summary, the various missions of community colleges influences its student population. However, the value of open-access and the capacity for the college to educate all students is critical. Thus, community colleges will certainly continuing enrolling non-traditional students.

Open-Access at Crowder College

At Crowder College, most policies can be found in the institution's catalog. The catalog is updated yearly. The 2015-2016 polices that generally relate to open-access admission regulations are described below.

The general admission requirements listed below are for all programs except Nursing, Veterinary Technology, and Occupational Therapist Assistant, which have specific requirements for entrance at Crowder. For admission to Crowder College, individuals must submit the following documents:

- Application for admission with the required \$25 application fee.
- All high school and college transcripts.
- Certificate of home school completion or certificate of high school equivalency (Crowder Catalog, 2015/2016, p. 7).

Crowder College embraces the open-access principle to include students in the community, no matter their educational background. Once a student pays the application

fee, and proves the equivalent of high school completion, a student can be admitted to Crowder. Griffith and Connor (1994) state the need for a multiple purpose campus to ensure a place for all types of students, especially when open-access policies allow the majority of students to attend community colleges:

...We argue so strongly for the comprehensive mission of the community college, the multiple purpose campus. But across the country, pressures are growing for change. With public four-year institutions eliminating classes, raising tuitions, and setting earlier application deadlines, the overflow comes to the community college. And as community colleges suffer budget cuts, as more four-year students crowd into community colleges, more of the students who are less academically prepared, or do not yet know what they hope to accomplish, are being squeezed out. (p. 119)

It seems that Crowder is striving to fulfill its mission to be a comprehensive community college. It had a conditional admission policy, in the 2015-2016 catalog, that is compatible with Griffith and Connor's (1994) statement. The conditional policy states:

Applicants who would otherwise be denied admission (or readmission) to Crowder College may be granted conditional admission after review from the Admissions Committee. The Committee will stipulate the terms of admission as deemed appropriate based on the information provided by the applicant at the time of admission and additional information the applicant provides. (Crowder Catalog, 2015/2016, p. 8)

Crowder has in place this policy to the advantage of the applying student. Certain circumstances could arise (i.e. dual enrollment students) to offset the actual admission

requirements; and therefore, it is important to note that a committee at Crowder has the final decision in admission.

When entering Crowder, placement testing can determine a student's preparedness and deficiency in corresponding areas that might need assistance. It is important to note the placement test policy when assessing the impact of open-access:

To facilitate student success at Crowder College, the following guidelines have been established for enrollment in Crowder courses. Crowder College will accept the ACT scores for college-level placement if a student has an English score of at least 18, a math score of at least 23 and a reading score of at least 18. If a student's ACT scores are below the levels listed above, s/he must take the COMPASS test for placement purposes. (Crowder Catalog, 2015/2016, p. 10)

It seems Crowder College has reasonable assessments and benchmarks in place to determine the academic needs of entering students. Griffith and Connor (1994) discuss how important it is to all students of various educational abilities to have a place where they can acquire or enhance job skills. They use an example of an assembly line worker who wants to become a machinist, or a student who wants to learn to read better. Accurate placement testing directs students to developmental courses in which they can excel is a perfect combination for students to achieve their goals. Some students might feel discouraged by having to complete multiple non-credit developmental courses before they can begin degree credit courses. This balance between credit courses and developmental courses is a fine line that many community college students face.

Community colleges are supposed to be the type of institution where students have a place to achieve a dream and see the world through a different lens.

Pressures on community colleges to straighten or shorten the paths of their millions of students, pressures to limit their comprehensive offerings and close their open doors, jeopardize the work of these colleges. This threatens many of their students with what may be the most dangerous social and personal phenomenon: an absence of hope. (Griffith & Connor, 1994, p. 131)

The notion of hope is the goal of the community college, and that is why open-access is a part of the community college mission. Hope should be provided for all students; but, open-access might reduce completion rates because underprepared students do not persist at high rates. Now, community colleges are being held accountable for low completion rates and this, in turn, can impact funding. Crowder College can benefit from examining how its open-access policy positions students to persist from year-to-year and ultimately, complete a program.

Significance of the Project

To determine what markers of preparedness were associated with Crowder's fall-to-fall retention rate from 2011 to 2013, the researchers used existing institutional data. Patterns of underpreparedness associated with the likelihood of dropping out can be identified; therefore, Crowder College can design interventions to support students with these profiles. Also, Crowder might find ways to work with its feeder school districts to supplement instruction so that students are better prepared for college-level work.

The tensions among open-access admission policies, underprepared students, and improving retention rates are common for community colleges today. The interventions identified in this study might help other community colleges address similar tensions.

The results might be a higher retention rate for Crowder College, but also, a larger number of students who complete a program, or achieve their career goals.

Definition of Terms

For the purpose of this project, terms related to the study are defined as follows:

Community College – according to the *Study in the States*, produced by the U.S. Department of Homeland Security (2012), community college is defined as a two-year post-secondary institution. Most of these institutions award technical degrees, associate degrees, and have adult education courses. Sometimes, the institutions are named junior or technical colleges. They are typically supported by local government funds and follow the same laws that any four-year institution would follow.

Open Access – Boggs (2011) defines open-access as an open-door institution that provides access to all - even those not intending to complete a degree. The open-door institution is for any individual who may have chosen to not attend a four-year institution due to many reasons, including academic preparation or financial ability.

Retention Rate – Tinto (2006-2007) defines retention rate as the persistence of students to graduation. Moreover, Burrell (2015) states retention is the rate at which a student population starts a degree program and returns to enroll in a designated, following semester, for example fall-to-spring or fall-to-fall. Low retention rates, when many students leave without completing the program, can hurt an institution's funding and recruiting.

Conclusion

Open-access admission policies drive the purpose and mission of community colleges. As a result, this policy positions community colleges to enroll students who

may be underprepared and not equipped for the rigors of higher education. Students who do not possess the capacity to persist will eventually withdraw, thus affecting the colleges' retention rate. The researchers will contemplate and investigate the tensions among open-access, underprepared students, and retention rates at a community college.

Chapter 2

Review of Relevant Literature

Many community colleges employ admission practices and policies appropriate for the populations they serve. Some admission policies are selective: students must meet certain criteria to be admitted. Other policies are in the spirit of open-access education for all. These admission policies have an impact on institutional retention rates generally. Selective admission is associated with higher retention rates whereas open admission is commonly associated with lower retention rates. This chapter reviews literature pertaining to the history of the community college, definitions of open access, sustainability of open-access, the impact of open-access, the current state of open-access in higher education, and future considerations.

History of the Community College

William Rainey Harper, the then new president of the University of Chicago in 1892, spoke to his faculty about a change in thought concerning the University. He proposed that the handpicked University of Chicago faculty should no longer focus on general education material, but instead, could focus on their research. J. Stanley Brown, the superintendent of a public high school, applied Harper's ideas to create a place where students could gain the knowledge of the first two years of undergraduate study (i.e. general education) before entering a university typically staffed by research faculty (Jacobs-Biden, 2007). It was named Joliet Junior College (Vaughan, 2006). Brown's creation was the birth of the community college and open-access as we know it today (Phillippe & Patton, 2000). A high school graduate could complete his or her high school

degree and stay in the same building for college courses. Community colleges soon increased in number and spread across the country.

Throughout history, community colleges evolved to meet the ever-changing needs of society and the economy. For example, when the market crashed in 1929, graduation numbers decreased. However, three years later, numbers increased indicating students expected the community college degree to help them find a job (Jacobs-Biden, 2007). Currently, many students, and their parents, view a college degree as the gateway for obtaining a good-paying job (Phillippe & Patton, 2000). Previously, people were able to obtain positions without a college degree; but, over time, the need for higher education increasingly became a priority.

At first, the community college was strictly for those who had a high school diploma. This transitioned into accommodating soldiers returning from World War II without a formal secondary education who needed a degree (or formal training) to find gainful employment (Vaughn, 2006). In the 1960s, baby boomers were ready for college, and open enrollment became the norm for community colleges (Scherer & Anson, 2014). From the mid-sixties to the early nineties, the community college accommodated legislation such as Title IX and the Americans with Disabilities Act, transforming higher education into an opportunity where nearly everyone could reach for the *American Dream* (Scherer & Anson, 2014).

From the early 1990s to the present time, the focus of a post-secondary education has changed from access to completion (Jacobs-Biden, 2007). Many employ the use of a college education, but proportionally, fewer people are completing degrees. Institutions are now using initiatives to help produce quality degreed students. As a reaction to social

and economic mores of the new millennial generation, community colleges' missions have adapted to fit the needs, desires, and goals of today's student (Jacobs-Biden, 2007).

Definitions of Open-Access

Open-access should not be considered a new invention. Palinchak (1973) states, "In their own manner, elementary and secondary education have had open, and even mandatory admissions" (p. 148). Although open-access seems like a wonderful idea on paper the lived reality creates a tremendous tension. This tension manifests itself in the form of attrition, as under prepared students have difficulty achieve success. Open-access in blatant terms means, "a policy that would permit anyone to pursue education beyond the secondary level" (Palinchak, 1973, p. 148). Understanding that there are different components and limitations to an open-access policy, and that they differentially impact retention at community colleges, it is important to review these characteristics before further investigating the policy of open-access.

Everett (2015) realized the importance of community colleges and their ability to retain and/or transfer students to other institutions. Everett (2015) deduced that institutions are not successful if students do not either retain or transfer. Federal policies for funding (and opportunity for colleges) seem to follow this same thought pattern, even though students may come back years after dropping out. Community colleges are important to the success of students, and while they are a good fit for most students, open-access needs to be defined to fully understand the impact it has on students and retention.

Everett defines access as conditions that hinder or promote stop or boost students from attending college (2015). Heller (2011) puts access in five different categories:

- Financial
- Geographic
- Programmatic
- Academic
- Cultural/Social/Physical

Heller's use of these categories can be broken down even further to understand where students might encounter some issues, or successes, with access. These are explained in more depth below.

Financial Accessibility

Financial accessibility is described as the financial resources available to students to attend a higher education institution (Heller, 2001). Community colleges are usually a low-cost choice for students to pursue during their first two years of an undergraduate education, or when expanding a knowledge base for a career. Usually, students who are categorized at a lower-socioeconomic level find available monies and financial help at local community colleges. Statistics of the American Association of Community Colleges [AACC] (2014) show that, "58% of students attending community colleges received aid, with 38% receiving federal grants, 19% receiving federal loans, 12% receiving state aid, and 13% receiving institutional aid." As the AACC (2015) states over half of the students at community colleges need financial assistance, and the community college is generally able to provide an affordable and funded education. The real irony, as McPherson and Schapiro (2006) state, is that institutions "that are making the most visible efforts, and getting the most public attention for expanding their low-income student populations

educate many fewer low-income students than do a great many other colleges and universities that don't get a lot of credit for their efforts" (p. 8).

Geographic Accessibility

Geographic accessibility, as Heller (2011) referred to it, is the distance students travel to attend college. Cohen, Brawer, and Kisker (2014) and Horn, Nevill, and Griffith (2006) concluded that at least 96% of community college students only travel around ten miles to attend college and are mostly in-state residents. With students mainly being admitted close to their homes, the population attending a community college can easily be determined. Community colleges have the advantage of knowing that the majority of students will attend from local areas. As a result, a benefit is gained by coordinating with local high schools and businesses in an effort to improve student outcomes.

Programmatic Accessibility

Community colleges have a mission to help the local area meet the demand of stimulating the job market. This is met by offering accessible degree and certificate programs that meet the needs of the students (Heller, 2011). Boggs (2011) construed that community colleges were ideal for diverse groups of students, specifically first-generation college attendees because institutional and local business leaders worked together to develop courses, certificates, and degrees that would meet the needs of local industries. The community college is a place for anyone to gain education in a particular field. Kuh, Kinzie, Buckley, Bridges, and Hayek (2006) reported that students attend community college with a variety of objectives in mind: 57% reported pursuit of an associate's degree, 48% were planning on transferring to a 4-year institution, 41% reported attending due to an interest in improving job-related skills, 30% to change

careers, and 29% to complete a certificate program. Additionally, 40% of students attend for the purposes of self-improvement and personal enjoyment. These numbers indicate the majority of students are attending a community college to pursue the completion of a particular program, or a skill set to bring to a job. In order to remain a valuable and essential institution, community colleges need to ensure they have programs that will help students achieve the goals, or students may leave their institution.

Academic Accessibility

Students from all backgrounds attend community colleges, and most with varying degrees of academic preparedness. Heller (2011) summarizes academic accessibility as the academic preparation of a student. Academic preparation is more than what one has already learned. It also includes study skills and time management, for example.

McPherson and Schapiro (2006) asked for K-12 education and post-secondary education to communicate regularly on bridging the gap of what was being taught in the classrooms. Fisher (2007) quoted Drummond in an interview stating, "...as many as 90 percent of incoming students test below college level in mathematics, and over 70 percent test below college level in reading and/or writing" (p. 3). McPherson and Shapiro (2006) state that at least half of the students entering college are not academically prepared. A discussion between K-12 education and post-secondary levels is needed. While some discussion has been undertaken, more is required to help the students on both sides so students are better prepared academically.

Taking into consideration that at least half of the community college population is often comprised of non-traditional students years removed from high school, data concerning academic preparedness seems relevant. Even if high schools are preparing

students properly, they are not able to impact the non-traditional students who may enroll at a college. McPherson and Schapiro (2006) discuss *cool-out* students who attend community college and expect their education to be an easily accessible achievement, only to lose the ability to continue at a higher level after their community college coursework. They go on to cite the *2000 - 2001 Baccalaureate and Beyond Survey* compiled by the National Center for Education Statistics (2014). The findings reported that 19.5% of students who received a Bachelor of Arts were students who began at a community college and that, “among Latinos, that figure was nearly one in four” (2006). These are very promising results for community colleges and might indicate the *cool-out* phenomenon is declining. Students may be taking education more seriously, even if they attend an open admission community college.

Cultural/Social/Physical Accessibility

Heller (2011) concluded that cultural, social, and physical accessibility involves support and encouragement from family, friends, or others. Heller (2011) goes on to state that institutions should make sure that there are no other barriers to attendance, such as discrimination or physical issues, on the campus for students. According to the literature, the most common reasons for withdrawing from college are (a) feeling underprepared academically and emotionally, (b) family issues, and (c) financial hardships (Gabriel, et. al, 2001; Scoggin & Styron, 2006; Resch & Hall, 2002). Faculty expectations, and students’ lack of knowledge of these expectations, can also cause some students to withdraw from the institution (Karp & Bork, 2012). Rarely do students enter a college course fully understanding the complexity of the structure of the course requirements.

Sustainability of the Open-Access Model

Shannon and Smith (2006) commented that among the many threats to the open-access mission of community colleges, fiscal sustainability is the biggest. Community colleges all possess the mission of providing a solid and suitable education at a low cost. Although these costs have seen an increase, Shannon and Smith (2006) go on to state “the average price of attending a community college is lower than that of a four-year college, and has not increased at the same rate as tuition and fees at four-year institutions” (p. 16). Based off cost of college education trends, statistics show a vast difference in the funding needed to attend a community college as compared to a four-year institution, this difference is close to \$9,000 in 2013-2014 (U.S. Department of Education, National Center for Education Statistics, 2016). Concerns over the open-access model, as we know it, have increased. Vaughan (2004) maintained that it would be financially unhealthy for community colleges to enroll students without appropriate state funding for them. Instead, Vaughan (2004) encouraged community colleges to provide a service to society by promoting the programs that currently have selective admissions based on high demand in a field. Nursing is an example. Vaughn (2004) goes on to state:

...as practiced in the past, open-access is a failure. Community colleges cannot serve all students who want to attend or continue to enroll a large number of students for whom they receive no state financing, a practice that ultimately leads to fiscal irresponsibility (p. 53).

This can be a very discouraging position that colleges will not want to face. Therefore, Vaughn (2004) proposed that open-access can be saved if community colleges stay true

to their missions by serving *all* parts of society – with a focus on program completion, not education for the sake of *fun*.

Scherer and Anson (2014) expressed concerns that the traditional community college model is unsustainable. They traced the concerns to the swift growth of community colleges that occurred in the mid-twentieth century. They explained that over 500 community colleges were opened in the 1960s. This growth provided affordable and accessible options for many students that universities would not have considered for admission (Scherer and Anson, 2014). Criticism of the open-access community college model began roughly a decade later because underprepared students were entering community colleges. Many students would enroll lacking the requisite academic skills to succeed and persist in college. Essentially, students were not ready to enter post-secondary education.

To tackle the deficiency of college readiness, many community colleges began incorporating placement exams during the 1980s and 1990s (Scherer & Anson, 2014). With lower admission standards, researchers promoted that institutions could still maintain a respectable retention rate with student assessment and provision of constructive support programs (Lotkowski, Robbins, & Noeth, 2004; Tinto, 2002). In order to identify students who are the most at-risk, and in need of support, institutions can look at ACT scores and high school GPA, and possibly psychosocial factors (Radunzel & Nobel, 2012). “Moreover, using multiple measures, including augmenting pre-enrollment measures with information collected early in college (such as mid-term grades during a student’s first term) to predict later college success enables colleges to identify and intervene with high risk students in appropriate ways” (Radunzel & Nobel, 2012, p. 47).

As above, Vaughn (2004) and Scherer and Anson (2014) suggested that ensuring access to all may encourage a lethargy in student engagement and preparation, thus making it harder for higher standards to be reached and sustained in community colleges.

Impact of Open-Access

Community colleges are providing career training through certificates in vocational areas by making education available to those students who have previously been underrepresented in higher education. The term *underrepresented* is generally attributed to non-traditional students, low-income students, and minorities.

Underrepresented students might be encouraged by career preparation courses and degrees to transition into jobs after completion.

This type of career training previously was offered mainly by proprietary schools and vocational institutions, but community colleges now have similar programs to better serve the needs of local businesses and communities. This service has increased the importance of community colleges, especially in rural areas where career training is difficult to obtain. (Kasper, 2003, p. 14)

The creation of such certificate programs encourages an increase in potential jobs opportunities for these students, in their local community.

Shannon and Smith (2006) state that open-access at community colleges provides an opportunity to attend college that may not exist for many students. Community colleges enroll:

- 47% of Black undergraduate students.
- 56% of Hispanic undergraduates.
- 48% of Asian/Pacific Islanders, and;

- 58% of Native American students (American Association of Community Colleges, 2006).

Further, Shannon and Smith (2006) argue that “because so many of these students come from low-income or educationally disadvantaged backgrounds, one can infer that without the open door, few would be able to attend an institution of higher education” (p. 16).

Concurrently, Vaughn (2004) agrees, “about 60% of public community college students today are first generation” (p. 52-53). The literature points to community colleges increasingly recruiting and admitting students who have traditionally been shut out of universities.

Open-access policies are a benefit to all students who need the flexibility, the low cost, and the geographic accessibility that community colleges offer (Shannon & Smith, 2006). Spellings (2006) concurs by pointing out that over 40% of undergraduates attend community colleges, and that around 30% of these students are over the age of 24.

The Reverse Effect of Open-Access

The open-access admission policy can have negative effects on student motivation in high school, especially when admission to local community college is guaranteed (as long as one is a high school graduate or has completed the GED). This laissez-faire attitude about academic achievement is rooted in a students’ psyche, and at times, makes it hard to successfully break into a higher education environment. High school seniors tend to checkout if they do not need to extend themselves for anything more than a community college. Students approach their last year of high school disengaged in the classroom and are unmotivated to enroll in more challenging courses (Scherer & Anson, 2014). Knowing the next step of post-secondary education is practically assured, students

know they need not stretch to meet academic standards for admission (Scherer & Anson, 2014). Thus, many students with this mentality may miss out on important secondary courses that are essential to college success, i.e. English, math, and science. Scherer and Anson (2014) feel community colleges are sending the wrong message that a student's senior year in high school is an opportunity for the lowest academic aspirations.

Kevin Skelly, the superintendent of Palo Alto Unified School District, and Scott Laurence, the superintendent of San Mateo Union High School District, state that:

Community colleges' open enrollment policies have a negative effect on student motivation during high school particularly during the senior year. Seniors going to JC's (junior college) know their admission is guaranteed, so they often slack off and avoid challenging course work, particularly during their senior year. The bad habits formed in high school are not easily shaken. (2011)

When a grade point average of 2.00 is the requirement for admission to a postsecondary institution, students can be unconcerned with expanding their knowledge base, increasing their abilities, or enhancing their own intellectual skills. Open-access admission standards tend to undermine the motivation for scholastic achievement in America.

Open Access vs. Open Curricula

Although open-access admission policies permit most students to enter community college with a high school diploma or equivalent credential, this policy is not synonymous with open curricula. Open-access means all students are welcome with minimum requirements upon entrance. Open curricula places restrictions on credit coursework for students who many need some additional readiness and preparedness skills to achieve success in college-level course work. Students who do not meet the basic

entrance requirements of the college are placed into remedial courses or developmental programs, so that their basic academic skills can be enhanced before they are granted degree-seeking status (Jacobs-Biden, 2007).

College entrance exams (i.e. ACT and SAT), along with achievement (i.e. COMPASS) and placement tests, help community college academic officials determine a student's readiness for college-level work. Community colleges are challenged to help underprepared students remediate their skills so they can be successful in the classroom. Although students entering a community college may assume they can dive into college-level courses, academic personnel might have to help these students adapt to the extra step of remedial courses. Once students have completed the requirements to enter college-level, credit courses, they can begin pursuing their chosen degree program. Academic success for these students can mean persistence, and eventually, degree completion at that institution.

Access, Student Success, Retention, and Faculty Engagement Interaction

Student success, retention, and faculty engagement should all be considered when institutions battle a decrease in enrollment and low retention rates. College administrators often have to be prepared to address concerns about low enrollment, attrition, and completion rates. As Wild and Ebbers (2002) state, these factors remain critical and require colleges and universities to identify an institution's goals regarding retention.

Services that community colleges have been able to provide to their students range from displaced workers and Veterans Affairs offices, remedial courses, faculty interaction, and one-stop shop centers. Lewin (2010) discusses how community colleges are widely seen as the solution to many problems and how displaced workers are

registering in courses to prepare themselves for a new career. Researchers Cho and Karp (2013) analyzed the need for First Year Experience (FYE) courses at community colleges after finding that students enrolled in a community college usually have low levels of academic preparation, need at least one developmental course, and can take longer to get through a series of courses. Wilt (2006), Dean of Instruction at Eastern Shore Community College, found a direct correlation between offering counseling and academic services in a one-stop shop environment and improvement of persistence in college for low-income students. Creating this environment gave students access to academic support in a centralized area with a private setting. These centers have the ability to help students with everything from academic coursework questions to financial concerns. With the focus on the success of the student, and the services that a college can provide, light is shed on the current demands faced by institutions as a result of open-access policies.

Student Engagement and Preparedness

Gullat and Jan (2003) summarized national studies, which have deduced that improvements at institutions are best realized by having strong administrative leadership with a commitment to results-oriented communication. Through collaboration, academic and student affairs best encourage growth in future development of programs for students. (Gullat and Jan, 2003) With proper research, assessment use, and implementation of best practices, colleges can formulate new policies that address retention and persistence. Commitment to engagement opportunities with the community can also provide support for students on campus. For example, partnerships with community members, alumni, and businesses could establish opportunities that would create networking, thus boosting college access.

Proper and early testing to successfully place students is also important. Fisher (2007) quotes Drummond from her interview by stating, "...as many as 90 percent of incoming students test below college level in mathematics, and over 70 percent test below college level in reading and/or writing (p. 3)." Taking into consideration that at least half of the community college populations are non-traditional students who are years removed from high school, these numbers seem accurate. Even if high schools are preparing students properly, they do not reach the non-traditional students who may enroll in college.

In addition to the basic academic preparation needed to persist in college, Karp and Bork (2012) discuss how students face many hurdles that must be navigated. Students who lack college readiness skills, such as study habits, time management, and professional relationship skills with faculty and staff may not be successful in college, even if their academic skills are sharp (Karp & Bork, 2012). Attrition occurs when students who lack academic readiness enroll in courses, and then struggle to succeed in credit obtainment.

Current State of Access to Higher Education

Higher education institutions have worked on issues involving college access for many years. Affordability has been considered an eminent obstacle for students to attend college; however, Gullat and Jan (2003) state that an obstacle that is equal, especially for minority groups, is academic readiness. Institutions must meet the demand in preparing today's students for college.

Students are generally encouraged to graduate from high school and then attend college. Institutions have strategic plans among their offices to address needs of students

who might need remedial courses to assist in navigating the college environment. Once students complete the first year, a vital checkpoint has been reached. The National Center for Higher Education Management Systems (2014) relays that 46.4% of first-year students who entered four-year institutions dropped out, or did not complete their second year. Choy (2002) states that the students who withdrew did possess certain behaviors that distinctly separated them from those who continued into the next semester. One positive effect of drop-out rates for community colleges is witnessed when weaker students, not able to continue, leave the institution opening seats for stronger students. Stronger students have the ability to persist, thus helping retention numbers. Students who are retained after the first year hold a better chance of degree completion if the correct interventions and support services are provided (Castleman & Long, 2013).

Federal and State Policies on Access

One of the strongest motives shaping an institution's attitude regarding college access, student success, and retention are the federal, state, and institutional policies that govern higher education. One of the first rulings to affect higher education was Section 504 of the Rehabilitation Act of 1973 (U.S. Department of Labor, 2015). This national law prohibits organizations and employers who receive federal funding from refusing individuals with disabilities the equal ability to receive benefits and related programs. Establishments typically involved are: hospitals, mental health centers, human services programs, and most importantly, education (U.S. Department of Labor, 2015). This law, ultimately pushed higher education institutions to begin admitting a broader array of students. In addition, the ruling drove colleges and universities to provide students in

need of assistance the necessary accommodation and support services, in an effort to ensure student success (U.S. Department of Health and Human Services, 2006).

Recent federal and state policies, along with the U.S. Department of Labor Section 504 of the Rehabilitation Act of 1973, have effected higher education. The American Association of State Colleges and Universities [ASCU] (January, 2013) stated that the United States is currently in the lengthiest post-recession recovery since the Great Depression, which is an outcome of the 2007 economic decline. With state legislatures concentrating on programs and policies intended to stimulate economic development and job creation, Congress has mandated that states begin creating and implementing higher education backing that is based on state performance. According to the 2013 ASCU report, 33 states articulated interest in, or were currently applying some form of performance-based funding. The latest attention given to state allocations being related to performance and accountability has caused an emphasis on enhancing key outcomes, such as completing degrees and increased retention. This funding structure has had a direct influence on institutional policies concerning early alert systems, tutoring programs, and faculty/staff engagement (ASCU January 2013).

Future Consideration

With budget cuts and obligations affecting degree attainment for student populations, community college campuses have found themselves with less state funding. In turn, this is causing issues when addressing the open-access admission and retention changes that are needed across the country. Issues may be created for students who need more academic or financial support to enroll at a community college. Carter (2006) described college campuses developing different ways to help these students financially

by creating programs (such as grants, loans, and work study) that would encourage a degree to be completed.

Bueschel (2009) encouraged the open-access mission of community colleges, but understood the need to admit better academically prepared students due to these budget issues. Examples of at-risk students may be first-generation or adult learners who may need additional support due to their being underprepared (Gabriel, et. al., 2001; Karp & Bork, 2012; Simmons, 2013). Interventions designed to provide an educational service to this community should have positive effects on open-access admission, and the same effect on persistence and retention.

Some community colleges are experiencing declining enrollment and dwindling degree completion rates, so a plan must be executed to counter these trends. Other times, researchers have provided common best practices designed to help colleges achieve higher retention rates. One such group is Hanover Research (2011), which provides six recommendations to raise retention and persistence for college students:

- Address academic and non-academic issues (examples are happiness and success).
- Embrace successful first-year retention efforts (examples are learning communities and summer reading programs).
- Promote academic and social development (examples would be introducing resources to students and providing deeper learning conversations on campus around a topic).
- Mandate a required first-year experience course or seminar with the focus being on academic readiness.

- Issue each student a mentor on campus (examples could be an advisor or a tutor).
- Create summer bridge programs for conditionally admitted students the summer before beginning coursework; this will help these students become academically prepared and familiar with the campus.

These should be considered by all college campuses in an effort to encourage students to succeed.

Summary of Literature

Community colleges do exist for specific reasons, mainly for helping assist the public in achieving education beyond high school. Community college is an alternative education to four-year universities for students who are not academically, financially, or socially positioned to enter four-year universities, as well as for those students who are searching for their educational path. The literature notes the unique role and services these institutions provide the local community. Along with knowing the role of community colleges, it is important to recognize the categories, i.e. financial, programmatic, etc., that these institutions encounter while providing a service. Also, admission of certain populations of students can result in a cultural change on a community college campus, i.e., reverse transfer students. Finally, to sustain existence, community colleges may have to modify academic programs or services so classrooms can be filled. Understanding the data presented by a particular community college, and how the policies might affect the retention rate, would help institutions improve the persistence of their students to completion of a degree.

The literature points to a quandary faced by most community colleges today. While committed to open-access policies, community colleges are under pressure and often measured in performance-based metrics, among them persistence to completion. To serve both masters, it is important for community colleges to identify at-risk students as early as possible and to design interventions that can help underprepared students close the gap with their classmates as quickly and cheaply as possible.

Chapter 3

Methods

The purpose of this project was to determine what markers of preparedness predict fall-to-fall retention at Crowder College in three recent classes. The range of preparedness is wide due to the open-access admission policy. This analysis identifies the underprepared students most at-risk of leaving Crowder College during, or after, their first year. The researchers used institutional data provided by Crowder College to examine the student body entering the college from 2011 to 2013. The dataset analyzed consisted of students who matriculated at Crowder College and indicated they were degree seeking.

Crowder College

Crowder College serves 5,845 students from an area comprised of nine counties reaching as far as 150 miles from campus. Students are recruited and enrolled from the surrounding Missouri areas, Kansas City and Columbia, as well as the neighboring states of Arkansas and Oklahoma. Crowder College has multiple campuses throughout southwest Missouri that service this region. Every year, approximately one thousand new students drop out between the fall and spring semesters. Forty-five percent of students are full-time. This leaves 55% of the student population as part-time students, and possibly individuals that do not have plans to be on a continuous path to degree completion. Minority enrollment is approximately 10% of the student body. Crowder College is the only community college within Newton County, Missouri. The retention rate is 51.1% fall-to-fall (See Table 4.3). In comparison, The National Center for Higher Education

Management Systems (2010) cites the national average for a two-year public institution to be 53.6% in 2014.

The Dataset

The dataset for this project included data for students admitted to Crowder College from 2011 to 2013, who were degree seeking. Self-identified non-degree seeking students were not included in the three-year dataset. Within the dataset, there were a total of 3,351 cases; 976 cases in entrance year 2011, 1,089 cases in entrance year 2012, and 1,286 cases in entrance year 2013. Crowder College made available forty-five different variables including demographic variables, ACT Composite scores, ACT Math Sub Scores, ACT English Sub Scores, high school Grade Point Average (GPA), high school rank, COMPASS scores, college term Grade Point Average (GPA) for both first and second terms, grades earned in many introductory courses, and return enrollment. Identifying markers were removed by Crowder College before the dataset was sent to the investigators.

Procedures

Prior to data analysis, the investigators examined the dataset to eliminate outlying cases likely to be data entry errors that would cause incongruent results. Outliers were reviewed, and a decision was made in each case about whether the value was an extreme or likely to be an error, in which case the value was removed from the dataset.

Variables

The investigators established a list of predictive variables for use in this study. These selected variables were obtained in the College's application process and were

used in the logistical regression analysis to determine if they predicted return enrollment (See Table 3.1).

For this project, the investigators excluded data on college classes taken, and grades received in those courses. First and second term college GPA were instead included to reflect performance in the first year.

Data Analysis

The investigators calculated means and standard deviations of the demographic data to describe the students included in the dataset. All variables were correlated to determine which were related to one another. Then, the investigators performed one simple logistical regression to determine what student characteristics of academic preparedness predicted a single independent variable, which was Cohort Return Enrollment. The expectation was to identify those independent variables that predict return enrollment by using a logistic regression equation. The regression was performed using SPSS software, which provided a visual graph, as well as the numerical distribution of the numbers to show predictive analysis. For this project, students' benchmark indicators at admission, for example, ACT Scores and COMPASS scores, as well as college term GPAs, were used to predict return enrollment.

Table 3.1*Variables Used in Predicting Cohort Return Enrollment*

ACT Composite Score	COMPASS Math	Entrance Age	Term 1-GPA
ACT English Sub Score	COMPASS Reading	Ethnic Heritage	Term 2-GPA
ACT Math Sub Score	COMPASS Writing	Term1 Hours Attempted	Career-GPA
ACT Reading Sub Score		Ever Received Pell	
ACT Science Sub Score			

Investigation

After outlier values were eliminated from the dataset, the investigators ran descriptive statistics and a simple regression for the single independent variable, which was cohort return enrollment.

Once patterns of persistence and retention were discovered within the benchmark variables, the authors made inferences, which produced concrete recommendations to Crowder College for possible interventions. For example, if a student was not likely to be retained, based on variable analysis and predictive modeling, Crowder might design interventions targeted at students with this pattern.

Limitations of the Study

Limitations were found within the dataset by the researchers, and it was determined that certain analyses could not be made. One limitation was the inconsistency of the high school GPAs reported. There are various grading scales employed in calculating high school GPA, and many schools throughout America grant weight or extra points for classes taken at an advanced level. According to the *2011 State of College Admission* report, produced by the National Association for College Admission Counseling (NACAC), “Sixty nine percent of respondents to NACAC’s 2010 Counseling Trends Survey reported that they weight students’ high school GPA’s to account for course difficulty” (p. 26). The dataset did not possess precise grading scale information for the high school attended by the student to allow accurate comparisons. For example, it was difficult to conclude that a 3.98 GPA was calculated from a 4.00 scale versus a 5.00 scale.

Furthermore, a limitation was that the dataset presented was historical. The researchers were provided data from 2011 to 2013, while the current academic year is 2015-16. There is no way to know whether the results of the analysis would be the same results obtained for the 2014-15 academic year.

Yet another limitation observed was the descriptive statistic for age of student (See Table 4.2). The minimum age listed was 16, leaving the researchers to assume that these young students were enrolled in dual-credit high school courses. The maximum age indicated was 112, and there was no way to determine if this was an accurate age.

Conclusion

The focus of analysis for this dissertation was to determine how underpreparedness, as allowed by the open-access admission policy of Crowder, related to retention. Indicators of preparedness were placed in a simple logistical regression to determine which predicted Cohort Return Enrollment. The goal was to suggest either a change in admission policy and/or a change in policy regarding the academic/emotional support services given to students who enter Crowder underprepared.

Chapter 4

Results

The results of the statistical analysis of the Crowder College dataset are reviewed in this chapter. Again, the purpose of this project was to analyze the impact of the open-access admission policy by studying whether and how preparedness predicts fall-to-fall retention at Crowder College. The dataset was presented by Crowder College in Microsoft Excel format with each case given a unique numerical identifier in place of any identifying information. Each case represented an enrolled student at Crowder College. Prior to transferring the dataset for analysis to the SPSS statistical software, the researchers reviewed the data for errors and irregularities. It was to be expected that some data from such a large dataset could be erroneous. Entries that fell outside the allowable range for a variable were deleted from the dataset and that entry considered missing data. Some missing data was recovered during this reconciliation process. For example, ACT Composite scores were recalculated for those cases that had obviously incorrect or missing scores. Based on the researchers knowledge of ACT Composite score calculations, if scores entered appeared out of range or obscure, a recalculation was done by simply averaging the sub scores for each subject area. The average of the four subject sub scores (English, Mathematics, Reading Comprehension, and Science Reasoning) is calculated to be the ACT Composite. This is a standard ACT Composite calculation and is widely known amongst educators. Additionally, descriptive statistics were computed to determine minimum and maximum values for the numerical variables and mean values and standard deviations for each variable were calculated.

In this dataset, 1,933 cases represented female students, which was 57.7% of the

entire dataset. Conversely, 1,388 cases were male students, which was 41.4%. The descriptive statistics revealed the average age of the students was 21.79 years old.

In this analysis, the variable of Cohort Return Enrollment was selected as the dependent variable. Furthermore, only certain variables were used in this statistical analysis to correlate with the dependent variable. The independent variables that were selected and examined against the dependent variable were: Entrance Age, Term 1-GPA, Term 2-GPA, Career GPA, Ever Received Pell Grant, Gender, Attribute (i.e. First Generation, Single Parent Home, etc.), Ethnicity, ACT Composite, ACT English, ACT Math, ACT Reading, ACT Science, COMPASS Math, COMPASS Reading, and COMPASS Writing.

Correlations between the dependent variable and some independent variables (i.e. ACT Composite, ACT English, ACT Math, ACT Reading, ACT Science, COMPASS Math, COMPASS Reading, and COMPASS Writing) were computed. Finally, logistical regression analysis was performed with the independent variables and the dependent variable of Cohort Return Enrollment.

Descriptive Statistics

The means and standard deviations of the independent variables are reported in Tables 4.1 and 4.2. ACT Composite and Sub Scores (N = 1,872) and, COMPASS Sub Scores (N = 2,678) appear in Table 4.1. Age (N = 3,322), credit hours attempted (N = 3,351), Term 1-GPA, Term 2-GPA, and Career-GPA appear in Table 4.2. Not all students were required to take the COMPASS exam - only those students who did not present a required ACT score at the time of admission took the COMPASS exam.

Table 4.1

Descriptive Statistics for ACT Composite, ACT Sub Scores, and COMPASS scores

	<i>N</i>	Min	Max	<i>M (SD)</i>
ACT Composite	1871	4	34	19.56 (3.76)
ACT Math Sub Score	1871	0	34	18.88 (3.82)
ACT English Sub Score	1871	6	35	19.05 (4.84)
ACT Reading Sub Score	1871	0	36	20.26 (5.05)
ACT Science Sub Score	1871	0	34	20.22 (3.88)
COMPASS Math	2678	0	366	91.09 (59.82)
COMPASS Reading	2678	0	199	134.95 (78.00)
COMPASS Writing	2678	0	413	127.98 (69.78)

National Average for ACT Composite = 21 (2015)

Table 4.2

Descriptive Statistics for Age of Student, Credit Hours Attempted In Term, Term 1-GPA, Second Term 2-GPA, Overall-GPA

<i>Characteristic</i>	<i>N</i>	Min	Max	<i>M (SD)</i>
Age of Student	3322	16	112	21.79 (8.30)
Credit Hours Attempted In	3351	0	30	12.08 (3.49)
Term 1-GPA	3351	.00	4.00	2.39 (1.37)
Term 2-GPA	2508	.00	4.00	2.34 (1.32)
Career-GPA	3351	.00	4.00	2.31 (1.21)

Table 4.3

*Descriptive Statistics of “Did Student Return to Crowder College”
Fall-to-Fall Enrollment based on Gender and Age*

<i>Characteristics</i>	Did Return to Crowder	Did Not Return to Crowder
Female	1073	860
Age 16-22	856	648
Age 23 and older	217	212
Male	626	762
Age 16-22	520	585
Age 23 and older	106	177
Gender Unknown	12	18

Summary of Descriptive Statistics

Only 1,872 or 55.9% of the Crowder College cases analyzed had an ACT Composite score recorded (see Table 4.1). As can be seen in Table 4.1, there is a very large range for ACT Composite Score and subject Sub Scores. The mean ACT Composite score was 19.56 points with the highest possible score being 36 points. Historically, according to *The Condition of College & Career Readiness Report (2015)*, produced by ACT, Inc., the national average for ACT Composite is 21.0.

There were 3,322 cases that reported an entrance age, and the average age for those cases was 21.79 years with a standard deviation over 9 years. The variable of credit hours attempted indicates the number of class credits hours enrolled in each term by each case. The mean of 12.08 credits is equivalent to approximately four classes.

With regard to gender, there were a known 1933 female students, 1388 male

students, and 30 students did not indicate gender. Female students did not return to Crowder fall-to-fall at a rate of 44.5% ($n = 860$). Male students did not return to Crowder fall-to-fall at a rate of 54.9% ($n = 762$).

There were 2609 students of traditional age, 16 – 22 years old, and 712 non-traditional students, 23 years old and older. Traditional age students did not return to Crowder at a rate of 47.3% ($n = 1233$) and non-traditional age students did not return to Crowder at a rate of 54.6% ($n = 389$).

Finally, Crowder Grade Point Average (GPA) for the entire dataset appears in Table 4.2. This table shows the Term 1-GPA ($M = 2.39$), Term 2-GPA ($M = 2.34$), and Career-GPA's ($M = 2.31$) were similar. The number of students with a Term 2-GPAs dropped to 2,508 cases or 74.8% of the Term 1-GPA cases, which indicates attrition between the first and second semester.

Summary of Frequency Statistics

Frequency statistics were computed to determine certain patterns and characteristics of the dataset. Frequency data was used to establish groupings of variables and to decide on which variables to calculate regression statistics. For example, in reference to ethnic origin, due to the frequency of certain populations, the researchers decided to separate those cases identified as White, Hispanic, African-American, and Multi-Racial into individual codes. All other ethnic groups were combined into one code. It is striking to observe that 46% of students were first generation attending college. Finally, 72.9% of the cases were between the ages of 18-21 years of age. The age range of students at Crowder College is younger than the traditional four-year institution (Choy, 2002). This runs counter to the national research that indicates an older population largely

comprise the community college population. "The average age of a community college student is 29, and two thirds of community college students attend part-time" (American Association of Community Colleges, 2016)

These statistics indicated that 34.2% of cases entered with an ACT Composite score of 19 or higher, and half of the students achieved an overall career grade point average of 2.58 or higher. According to the frequency counts, approximately half of all cases achieved a GPA of 2.79 or higher after their first term at Crowder College. In contrast, approximately half of all cases had recorded a second term GPA at 2.66 or higher. It is noticeable to the researchers that the Crowder grade point average decreased from Term 1 to Term 2.

Although 12.08 credit hours are the mean credit hours taken, most students (90.6%) were enrolled in 15 credit hours of coursework during their enrollment at Crowder. This is equivalent to 5 classes per term, assuming 3-credit hour courses. Exactly 51.1% of those students enrolled in 15 credits did return to Crowder College in their second term, while 48.9% did not return (see Table 4.4). Sixty two percent (N=2076) of students received a federal Pell grant to assist in funding their Crowder College education (see Table 4.4). Considering the impact of financial aid, a conclusion can be made that almost two-thirds of the Crowder College population has need for federal financial aid dollars.

Table 4.4

*Descriptive Statistics of “Did Student Return to Crowder College”
Fall-to-Fall Enrollment and “Did Student Receive Federal Pell Grant”*

<i>Characteristics</i>	<i>N</i>	<i>%</i>
Did Return to Crowder	1711	51.1
Did Not Return to Crowder	1640	48.9
Did Receive Pell Grant	2076	62.0
Did Not Receive Pell Grant	1275	38.0

Results of the Correlation Calculations

Correlations between the ACT Composite and Sub Scores, and among the COMPASS Sub Scores, were calculated. Table 4.5 contains the correlation among ACT scores. ACT sub-scores were correlated with each other, as well as correlated to the composite score. All four Sub scores (Math, English, Reading, and Science) were moderately correlated (.252-.261) to the Composite. ACT Science Sub Score was strongly correlated to the Math Sub Score, $r = .685$, whereas Reading Sub Score had a weaker correlation to the Math Sub Score, $r = .542$. There was further evidence that the ACT Reading Sub Score and ACT English Sub Score had very strong correlation to each other, $r = .722, p < .01$. Additionally, as seen in Table 4.6, there were strong correlations between COMPASS Reading and Writing scores, $r = .620$. Conversely, COMPASS Math Sub Scores are only mildly and negatively related to Reading and Writing sub scores, $r = -.188$ and $r = -.120$, respectively.

Additionally, in Table 4.7, Independent Variables were correlated to the Dependent Variable of *Did Student Return to Crowder College*. The strongest correlations to the Dependent Variable were found for Term 1-GPA ($r = .502$), Term 2-

GPA ($r = .517$), and Career-GPA ($r = .493$), $p < .01$.

Table 4.5

Correlations of ACT Scores

		ACT Composite	ACT Math Sub Score	ACT English Sub Score	ACT Reading Sub Score	ACT Science Sub Score
ACT Composite	Pearson Correlation Sig. (2-tailed)	1	.793**	.879**	.854**	.837**
ACT Math Sub Score	Pearson Correlation Sig. (2-tailed)		1	.628**	.542**	.685**
ACT English Sub Score	Pearson Correlation Sig. (2-tailed)			1	.722**	.639**
ACT Reading Sub Score	Pearson Correlation Sig. (2-tailed)				1	.666**
ACT Science Sub Score	Pearson Correlation Sig. (2-tailed)					1

**Correlation is significant at the 0.01 level (2-tailed).

Table 4.6

Correlations of COMPASS Scores

		COMPASS Math Sub	COMPASS Reading Sub	COMPASS Writing SUB
COMPASS Math	Pearson Correlation	1	-.188**	-.120**
	Sig. (2-tailed)		.000	.000
COMPASS Reading	Pearson Correlation		1	.620**
	Sig. (2-tailed)			.000
COMPASS Writing	Pearson Correlation			1
	Sig. (2-tailed)			

**Correlation is significant at the 0.01 level (2-tailed).

Table 4.7

Correlations of Fall-to-Fall Cohort Return Enrollment to Independent Variables

<i>Characteristics</i>	<i>N</i>		<i>Did Student Return to Crowder College</i>
ACT Composite	1872	Pearson Correlation	.146**
		Sig. (2-tailed)	.000
ACT Math Sub Score	1871	Pearson Correlation	.155**
		Sig. (2-tailed)	.000
ACT English Sub Score	1871	Pearson Correlation	.133**
		Sig. (2-tailed)	.000
ACT Reading Sub Score	1871	Pearson Correlation	.114**
		Sig. (2-tailed)	.000
ACT Science Sub Score	1871	Pearson Correlation	.130**
		Sig. (2-tailed)	.000
COMPASS Math	2678	Pearson Correlation	.174**

		Sig. (2-tailed)	.000
COMPASS Reading	2678	Pearson Correlation	-.127**
		Sig. (2-tailed)	.000
COMPASS Writing	2677	Pearson Correlation	-.065**
		Sig. (2-tailed)	.001
Term 1-GPA	3351	Pearson Correlation	.502**
		Sig. (2-tailed)	.000
Term 2-GPA	2508	Pearson Correlation	.517**
		Sig. (2-tailed)	.000
Career-GPA	3351	Pearson Correlation	.493**
		Sig. (2-tailed)	.000
Did Student Received Federal Pell Grant	3351	Pearson Correlation	.065**
		Sig. (2-tailed)	.000
Did Student Return to Crowder College	3351	Pearson Correlation	1
		Sig. (2-tailed)	
Age of Student	3322	Pearson Correlation	-.095**
		Sig. (2-tailed)	.000
Credit Hours Attempted In Term	3351	Pearson Correlation	.236**
		Sig. (2-tailed)	.000
Gender	3321	Pearson Correlation	-.103**
		Sig. (2-tailed)	.000

**Correlation is significant at the 0.01 level (2-tailed).

Contingency

Contingency Table for Hosmer and Lemeshow Test informed the researchers that the model of predictability was good. The Hosmer and Lemeshow test indicates a X^2 -Test = 28.14, as well, p -value < .001. Based on these calculations, the researchers conclude that the logistical regression model was a good fit.

Regression

Logistical regression was calculated for the dependent variable, Cohort Return Enrollment, and all independent variables identified above. Prior to computing the logistical regression, the researchers identified two profile groups of variables. The groups were characterized as Pre-Admission/Enrollment variables, and Post-Matriculation variables.

Pre-Admission/Enrollment variables are those statistics that are collected during the admission process, i.e. ACT Composite, Compass Math, Entrance Age, (see Table 4.8). Post-Matriculation variables are those statistics that are determined after a student's enrollment at Crowder College, i.e. Term 1-Hours Attempted, Term 1-GPA, Career-GPA (see Table 4.9). All independent variables were placed in either of two independent logistical regressions and significance values (Sig.) were obtained using these models. Based on the significant level of $p \leq .05$, it can be determined which independent variables predict Cohort Return Enrollment. As indicated in Table 4.8, it appears that five Pre-Admission/Enrollment variables can be seen as significant predictive indicators of retention: ACT Math Sub Score, Compass Math, Entrance Age, Attribute –Citizen Legal Resident (2), and Gender, $p < .05$. Post-Matriculation variables that predict retention are best seen in Table 4.9. These variables, Term 1-Hours Attempted, Term 1-GPA, Term 2-

GPA, and Career-GPA, are determined by the researchers to be significant predictors, $p < .05$.

By using the logistic regression equation, the researchers were able to predict the likelihood of students returning to enroll at Crowder College based on the Term 1-GPA, Term 2-GPA, and ACT Math score. Using the logistic regression equation: $\text{Exp}(B) \times (\text{difference in unit}) / 1 + \text{Exp}(B) \times (\text{difference in unit}) = \text{probability of return enrollment}$, researchers were able to predict the probability of retention.

Considering Term 1-GPA and Term 2-GPA, the researchers found that by using the logistic regression equation, and using the $\text{Exp}(B)$ unit given in Table 4.9, that the probability of students returning for the next semester at Crowder is 58%, as long as their GPA was 2.8 or higher the first or second term. The chance of students returning is above 50% when they perform moderately well in their first or second semester. This percentage shows the researchers that students who are already enrolled at Crowder, but have a GPA lower than 2.8, could be considered at-risk students for leaving, creating an opportunity for Crowder to provide certain services to these students to retain them into the next year.

Regarding the ACT Composite scores, and using the logistic regression equation, and using the $\text{Exp}(B)$ unit given in Table 4.8, the probability of students returning for the next semester at Crowder is 65%, as long as their composite score was 16 or higher. The mean score for ACT Composite, currently at Crowder, is 19.56 (See Table 4.1). This predictability model informs the researchers view on how Crowder College could provide early support for at-risk students being admitted to their institution.

Table 4.8

Logistical Regression of Pre-Admission/Enrollment Variables for Cohort Return Enrollment

		<i>B</i>	<i>S.E.</i>	<i>Wald</i>	<i>df</i>	<i>Sig.</i>	<i>Exp(B)</i>	<i>95% C.I. for EXP(B)</i>	
								<i>Lower</i>	<i>Upper</i>
Step 1 ^a	ACT Composite Score	-.069	.076	.836	1	.361	.933	.804	1.083
	ACT Math Score	.083	.032	6.94	1	.008	1.09	1.02	1.156
	ACT English Score	.025	.029	.694	1	.405	1.03	.967	1.086
	ACT Reading Score	.015	.025	.350	1	.554	1.02	.967	1.066
	ACT Science Score	.039	.029	1.87	1	.171	1.04	.983	1.101
	Compass Math	.004	.001	11.80	1	.001	1.00	1.00	1.006
	Compass Reading Score	-.001	.001	.584	1	.445	.999	.998	1.001
	Compass Writing Score	.002	.001	2.78	1	.096	1.00	1.00	1.003
	Entrance Age	.036	.017	4.53	1	.033	1.04	1.00	1.071
	Attributes-First Generation			8.35	4	.080			
	Attributes-Single Parent (1)	-1.05	1.43	.533	1	.465	.35	.021	5.82
	Attributes-Citizen Legal Resident (2)	-.298	.122	5.91	1	.015	.74	.584	.944
	Attributes-Displaced Homemaker (3)	-.740	.421	3.09	1	.079	.48	.209	1.09
	Attributes-Migrant (4)	-.234	.226	1.07	1	.301	.79	.509	1.23
	Gender			16.23	2	.000			
Gender (1)	21.83	40194.38	.000	1	1.000	3022254799.87	.000	.	
Gender (2)	21.34	40194.38	.000	1	1.000	1854760172.20	.000	.	

Ever Received Pell	.11	.122	.860	1	.354	1.12	.881	1.42
Constant	-	23.86	40194.38	.000	1	1.000	.000	

a. Variable(s) entered on step 1: ACT Composite Score, ACT Math Score, ACT English Score, ACT Reading Score, ACT Science Score, Compass Math, Compass Reading Score, Compass Writing Score, Entrance Age, Attributes, Gender, Ever Received Pell.

Table 4.9

Logistical Regression of Post –Matriculation Variables for Cohort Return Enrollment

		<i>B</i>	<i>S.E.</i>	<i>Wald</i>	<i>df</i>	<i>Sig.</i>	<i>Exp(B)</i>	<i>95% C.I. for EXP(B)</i>	
								<i>Lower</i>	<i>Upper</i>
Step 1 ^a	Term 1- Hours Attempted	.11	.018	33.81	1	.000	1.11	1.07	1.15
	Term 1-GPA	.43	.071	36.94	1	.000	1.54	1.34	1.77
	Term 2-GPA	.88	.054	266.44	1	.000	2.42	2.17	2.69
	Career-GPA	-.19	.102	3.39	1	.066	.83	.68	1.01
	Constant	-3.26	.297	120.53	1	.000	.04		

a. Variable(s) entered on step 1: Term1HoursAttempted, Term1GPA, Term2GPA, Career-GPA.

Summary

Calculating descriptive statistical analysis proved important in establishing the mean values in certain independent variables. Correlation statistics indicate moderate to strong correlations within ACT Sub Scores, especially between Science and Math sections, and English and Reading sections. In addition, very strong correlation between the COMPASS Reading and Writing sub scores. As well, the contingency tables do show an effective model. Most importantly the findings within the logistical regression calculations indicate that a total of eight variables can be strong predictors of Cohort

Return Enrollment: ACT Math Sub Score, COMPASS Math, Entrance Age, Attribute - Citizen Legal Resident (2), Gender, Term 1-Hours Attempted, Term 1-GPA, and Term 2-GPA.

ACT Math Sub Score, with $p = .008$, shows as a predictor of fall-to-fall return enrollment. Descriptive statistics shows the mean ACT Math Sub Score = 18.88.

Conclusion could be made that those students who have an ACT Math Sub Scores lower than 18 are likely to leave. As well, COMPASS Math Sub Score showed significance in predicting Cohort Return Enrolment, with $p = .001$. The mean COMPASS Math Sub Score = 91.09. Again, students who score below 91 on COMPASS Math are more likely to dropout.

Furthermore, regression analyses determined that citizenship was a significant predictor of Cohort Return Enrollment. Yet, a majority of students in our dataset were citizens, so the practical significance of citizenship in attempting to raise the retention rate might be negligible.

Age and gender also proved to have significance in predicting Cohort Return Enrollment. Researchers inferred, based on Table 4.3, men are more likely to not return to Crowder College fall-to-fall, as compared to women, since 54.9% of the men did not return. Also, non-traditional aged student, those 23 years of age and older, tend to leave Crowder College at a higher rate, 54.6% of non-traditional age students versus 47.3% of traditional age students. When reviewing these two variables, researchers can conclude that non-traditional male students show a greater risk of not returning to Crowder.

Finally, the Post-Matriculation variables that deemed significant were Term 1-Hours Attempted, Term 1-GPA, and Term 2-GPA. Although the mean value of Term 1-

Hours Attempted = 12.08, a vast majority of students take 15 credits hours. Since this variable is significant to Cohort Return Enrollment, and almost half of the students taking 15 credits hours do not return, researchers suggest that enrolling in more than 15 credits hours has a negative affect on a student's likelihood to return to Crowder fall-to-fall. Also, the results suggested that GPAs lower than 2.80 are associated with a greater likelihood that students dropout and have negative affects on Crowder's retention rate.

In the end, these significant Pre-Admission/Enrollment variables and Post-Matriculation variables identified by the two regression analyses suggested a profile group of students most at risk of not returning for the sophomore year: men, 23 years of age or older, with low mathematics proficiency, and who struggle to earn successful grades.

Chapter 5

Recommendations and Implications

In response to an invitation for proposals, Crowder College administrators asked the Higher Education Learning Community of the Doctor of Education program at the University of Missouri – St. Louis College of Education to help identify ways to improve Crowder’s retention rate. While the Crowder College retention rate compares favorably to other community colleges, the administrators were concerned about the large number of students not returning to complete a program. As one of four related projects to address this retention issue, the authors of this specific project conducted two separate regression analyses on data provided by Crowder College to identify specific variables that predict return enrollment. The results identified characteristics of students most at-risk for leaving Crowder College by the sophomore year. Being an open-access admission institution, Crowder College has liberal admission standards. If the students admitted to Crowder who are at-risk of not completing a program can be identified, specific interventions could be implemented to both increase student access and improve the Crowder College retention rate.

Data from students admitted from 2011 to 2013 were submitted to the researchers by Crowder College. After cleaning the dataset, the researchers used SPSS software to run descriptive statistics, correlations, and logistical regressions. The independent variables were run against the same dependent variable, Cohort Return Enrollment. This was chosen as the dependent variable because it is seen as an important metric to judge successful persistence and eventual completion of a degree program. It is much less likely that students will finish in a reasonable time frame if they do not return for their second

semester or sophomore year. Seven significant independent variables predicted return enrollment. These independent variables were put into two specific profile groups. The first profile group, Pre-Admission/Enrollment Variables, was made up of Citizen/Legal Resident, ACT Math Sub Score, COMPASS Math, Age, and Gender. The second profile group, Post-Matriculation, consisted of Term 1-GPA, Term 2-GPA, and Term 1-Hours Attempted.

Pre-Admission/Enrollment Profile Group

The first variable to make up the Pre-Admission/Enrollment Profile Group was Citizen/Legal Resident. However, because the majority of students at Crowder have legal status this finding might be of little practical significance in identifying an at-risk group of incoming students.

The variable ACT Math Sub Scores was a predictor of Cohort Return Enrollment. The analysis showed that the lower the ACT Math sub score the more likely students did not return and descriptive statistics suggested students with a sub score under 20 should be considered at-risk. The COMPASS Math Placement score was also a predictor. It is assumed that students with a low ACT Math score took the COMPASS Math placement and most scored poorly on this test. Radunzel and Nobel (2012) held that at-risk students, regardless of institution type, could in fact be identified through ACT scores.

Regression results also indicated that age (i.e. 23 years old and older) and gender (i.e. male) predicted Cohort Return Enrollment. This adds non-traditional aged students and males to the at-risk group. Thus, the researchers suggest that these variables in the Pre-Admission/Enrollment category provides the profile of a group very much at-risk of not being retained: non-traditionally aged men with low mathematics proficiency.

Admission counselors and academic advisors could have an impact on increasing the Crowder college retention rate by intentionally engaging students in this profile group. Intentional programming for this group of students could improve student performance in the first term, hence enhancing persistence to program completion.

High-Level Solution

This profile group should be easily identifiable before matriculation. Crowder faculty and staff could improve the retention of students in this profile group by implementing a number of different interventions. First it is clear that low mathematics proficiency, as indicated here by low test scores, is a disadvantage. Crowder could partner with feeder high schools to boost mathematics instruction and identify the mathematics skills and concepts needed both for scoring well on tests such as ACT and COMPASS and for succeeding in college credit mathematics courses.

Second, admission counselors and academic advisors should carefully monitor students who are admitted with a low ACT Math sub score. These students need to be placed into courses conservatively, even if students are anxious to earn credit toward a degree. The table showcasing how counselors and advisors could easily identify these low sub scores was discussed in chapter 4 (see Table 4.1). Providing these students with a Summer Bridge option could potentially help low-scoring COMPASS Math placement students better prepare for success in developmental math coursework. Another option would be for Crowder to include new initiatives to their developmental math courses. For example, Cullinane and Treisman (2010) describes the Staeway Initiative that is providing new ways to assist students who score low on math assessments.

Third, additional assistance in coursework and tutoring for mathematics is also recommended. Instead of waiting until students begin to struggle in mathematics courses, Crowder staff could provide students in the at-risk profile with assistance before they even start their classes. For example, students could be introduced to a tutor and given the tutor's contact information before classes begin. Admission counselors and academic advisors at Crowder should encourage students in this group to use the Student Support Services Office for the free tutoring in math.

Fourth, requiring all students in the at-risk profile group to take COLL 101 (College Orientation) could be a low cost programming option for Crowder to implement since the course is already offered.

It is possibility that men are at higher risk because they are tempted to work more hours, take a full-time job, or joining the military (Severiens and Ten Dam, 2012). Severiens and Ten Dam also state that men may be able to find a well-paying job without a degree in blue collar work rather than specifically needing a degree right away (2012). Once these men return to school at a non-traditional age, 23 years and older, they may lack the specific skills to succeed in a mathematics course whether developmental or college credit. Along with returning to school, many non-traditional aged students have outside responsibilities (i.e. full-time work or a family) and may not be able to put all of their time and energy into studying and preparing for coursework (Stoessel, Barbarino, Fisseler, & Stürmer, 2015). Men in this group may also lean more toward a degree or career that tends to have more mathematics requirements and proficiency so a lack of proficiency is a significant factor in career choices. With this specific group of students in mind, it would be beneficial for Crowder to assist them once they are on the campus.

To support the men of non-traditional age who have a lower mathematics proficiency Crowder has a few options. Hanover Research (2011) encouraged the use of mentors to improve retention. A mens group, specifically designed to inspire and support the non-traditional male student on campus may, fit this need for the students. This group could be a place where men can discuss responsibilities, the stresses of mathematics courses, and desires for the future. Another way to support the students would be a different layout, or pathway, of mathematics courses. By considering an alternative mathematics direction students may benefit by keeping the skills they are learning fresh in their mind. Advisors could suggest alternative degrees or careers to students if they seem to struggle with that specific degree path due to mathematics courses. By suggesting a different track, but in a similar field, students may succeed at a higher rate.

Business Benefits

By encouraging (or requiring) students to use the free tutoring provided by the Student Support Services Office, a more positive mathematics experience might be promoted, resulting in higher retention rates. If Crowder could form specific groups for men to assist with mathematics study skills or tutoring, the men in the at-risk group could be retained in larger numbers. The researchers understand that this may require Crowder to hire more tutors in the mathematics area, but the benefits should outweigh the cost, as these students could be retained in larger numbers, and bring in more tuition revenue from additional terms of enrollment. Creating a support group for men could promote this tutoring service, too, for a low cost and encourage men to get involved in an organization on campus.

Crowder College should consider a task force to study the effectiveness of their developmental mathematics courses, so adjustments could be made to promote new avenues for students who score low on the ACT Math and Math COMPASS tests. The researchers recommend Crowder consider alternatives to these mathematics courses by providing students with an *off-ramp* course if they need more assistance in their developmental math skills. This course would move more slowly and enhance additional mathematics skills for students to gain more confidence in their learning of mathematics concepts. St. Louis Community College (STLCC) South County Education and University Center has a successful format that Crowder might want to consider, called 7-one-7 (2016). In this program students take two courses for seven weeks, take a week break, and after that take two more courses for seven weeks (STLCC, 2016). This allows students to take a full course load but only take two courses at a time (STLCC, 2016). This format could easily be adapted to developmental mathematics courses at Crowder to extend learning and promote students to continue their education quickly.

After careful monitoring of student progress in initial mathematics courses, students who perform poorly on early graded assessments or mid-term examinations, could be placed in a supplement mathematics course which continues to meet the remainder of the semester. The purpose of this supplement mathematics class would again be, the pace of teaching the mathematics concept. Students who struggle in mathematics courses often complain about how “fast a concept is explained.” If they do not understand basic concepts they fall further behind. The supplemental mathematics course would allow weaker students to build confidence in mathematics concepts, perhaps by more individual teaching methods, so to not fail the course. Alternatively, those who struggle

early in a 7-week course could off-ramp to a mathematics course designed for them and that would meet until the end of the semester without a failing grade in the initial 7-week course.

Further research could consider comparing admitted students on the traditional track to those who take a different route (i.e. Summer Bridge programming, or tutoring services) at the beginning of their academic career. Once these groups are established, researchers could use the current three years of data to determine if the implementation of specific interventions will lead to higher levels of student success in the classroom.

With these recommendations established and implemented early and often by faculty, advisors, and admission counselors, the researchers believe that many of these students that fall into this group that fails to return could be retained. The interventions are meant to provide support and acceptance for all students.

Post-Matriculation Profile Group

Additional logistical regression results determined that Term 1-GPA, Term 2-GPA, and Term 1-Credit Hours Attempted predicted persistence at Crowder. The researchers combined these variables into one category and identified them as the Post-Matriculation profile group. Descriptive statistics suggested that students obtaining less than 2.80 GPA, in either term, were at a higher risk of dropping out. Academic advisors could focus on students with low GPAs in the first term. Academic interventions, or enrichment programs targeted at students who have difficulty passing courses or obtaining high marks, could raise students' GPAs ultimately making it more likely they persist until degree completion.

High-Level Solution

It is important to see the connection between the Pre-Admission/Enrollment and the Post-Matriculation variables identified in this study as significantly predicting Cohort Return Enrollment. Men who enter Crowder and are underprepared in mathematics are at-risk of performing poorly in mathematics courses, either developmental or credit courses, impacting their GPA and the number of courses successfully passed. A low first-term GPA could cascade into a state jeopardizing retention. Financial aid could be at-risk as progress toward the required credits for a degree are accumulated slowly and confidence is undermined to the point the students drop-out.

Solution Details

Hanover Research (2011) suggests mentoring conditionally admitted students and encouraging Summer Bridge program courses. Students identified in the Post-Matriculation profile group could benefit from having a mentor on campus. The researchers believe that requiring a COLL 101 course for all students would be beneficial, but students who have a Term 1-GPA below 2.80 should take a newly designed course, College Orientation 102.

Once students have taken mid-term examinations, and received grades, any low mid-term grades could be flagged, and a required advising session recapping the term should be conducted with these identified students. Additionally, based on the data, students with a 2.80 GPA or lower after the first term could be encouraged to enroll in only 12 credit hours the subsequent semester.

Business Benefits

The researchers understand that it can be extra work to apply for federal funds for summer bridge programming, in addition time consuming to add the mentoring role to advisors or tutors on campus for the students in the Post-Matriculation profile group. However, they believe that if Crowder implements these procedures and programs, students will be retained at a higher rate.

Creating a new course, COLL 102, may take further planning, space, and energy; but, the students who need extra assistance in college readiness skills may find this to be beneficial to their long-term tenure in college.

If not already part of the advising process, academic advisors should be held accountable to assist Crowder students who have low mid-term grades in their first-term cope with any setbacks or challenges. Appointments should be made between advisors and students, and if students do not attend, they should be put on a hold status on course registration until they meet with their advisor and not be able to enroll for the next semester courses. Once the hold status is lifted students can continue with normal registration. This should provide students with the sense that Crowder encourages and invests in resources that promote student success. Flagging students who have a 2.80 GPA or lower after their first term at Crowder, and not allowing them to enroll in more than 12 credit hours should better prepare students for academic success in future semesters. Research shows that reduced course loads for under performing students may increase the likelihood of success.

Recommendations for Future Studies

There are several inquiries Crowder College administrators, staff, and institutional researchers could undertake with the goal of improving retention. The researchers recommend the Crowder College Admission Office create a clearly identifiable method for converting high school GPAs to a single scale. This would make it possible to analyze the impact of high school GPA on retention, something not possible for this study. Additionally, Crowder College should consider preparing data from 2014-2016 to determine if the predictor variables identified here continue to be significant predictors of Cohort Return Enrollment.

The Crowder College registrar could also use the National Student Clearinghouse data to collect information on students who leave Crowder early, to determine if they continue on their education path elsewhere. Students who transfer early should not be considered *dropouts* at Crowder. Instead, Crowder could deem this cohort of students as a positive metric.

Also, Crowder might study the students who did not obtain at least a 2.80 GPA in light of the high school they attended and the high school GPA, and ranking attained. This could help identify students who come from high schools with a weak curriculum, especially in mathematics. This also could signal an opportunity for Crowder to work with feeder schools to develop stronger programs that better prepare students for college success.

An additional recommendation for Crowder would be to pilot a new Conditional Admission Policy. Rather than wait until students fail, students in the at-risk profile

identified here could be placed into a track designed for student success, despite the characteristics that place a student at risk.

Summary and Call for Action

Crowder College is committed to its mission of open access, but the tension between open access and lowering retention rates is likely to continue without specific interventions that target the students most at-risk of leaving before completion. Crowder may wish to consider the new initiatives suggested above. These recommendations are based on an extensive analysis of the data. If Crowder College provides changes to current coursework in COLL 101, and adds an additional course (i.e. COLL 102), students who are being newly admitted, or who had poor performance in their first term, could see a higher retention rate.

Since research showed lower performance rates for male students in mathematics courses, Crowder should institute study groups or enrichment sessions to assist male students in building confidence in their mathematics skills and help them avoid failure. This allows them to attain a higher GPA and accumulate more credits toward degree requirements faster. This in turn would have a positive impact on retention rates.

Furthermore, providing information to advisors and enrollment counselors on how to identify at-risk students in these two profile groups is critical. Monitoring these students during their first semester at Crowder should provide an environment of support, with the hopes of increasing return enrollment. The researchers also see potential inquiries Crowder administrators could conduct to provide more information about at-risk groups and the success of any interventions implemented.

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