Predictors of Success for Students Who Test Into Developmental-Level Courses at a Community College

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Abstract

Community colleges continuously look for methods to increase the possibilities of student success and retention. This study examined the success of students in developmental courses and college-level courses while they were taking both levels of courses concurrently. The researcher defined success as students completing both the developmental coursework and general education courses with a 2.0 grade point average or greater on a 4.0 grading scale. Using the same definition of success, the researcher also examined the relationship ethnicity and students' successful completion of developmental courses as well as the relationship between age and student success in developmental courses. The study included an analysis of data from one community college over a three-year span to determine relationships of success in developmental reading, writing, and math courses and success in general education courses taken concurrently. The results of the study suggested that in 16 of the 24 developmental and general education courses, when students were successful in the developmental courses, they were successful in their general education courses. There was a relationship found between ethnicity and one developmental course, and a relationship between age and one developmental course.

Dedication

This study is dedicated to my husband, Ron, who encouraged me to persist to finish this endeavor. Even though he doubted my sanity when I began this process, he consistently supported my decision. I know that there were many times that I was frustrated and tired, yet he always knew when to give me space or a needed hug.

This study is also dedicated to my parents, Calvin and Juanita McKee who instilled in me the importance of never giving up.

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Finally, I would like to thank my former classmate, Mrs. Julie Bliese, for the time and effort she spent helping me in this journey. We spent countless hours together working, crying, laughing, and consoling one another, and I will be eternally grateful for her help and friendship.

Table of Contents

List of Tables

List of Figures

Chapter One

Introduction

Labor experts believe that by the year 2025, there will be 23 million less people with college degrees than the total number needed in our country's workforce (Merisotis, 2012a). The community college plays a significant role in providing education to postsecondary students for our country's employers. More than 45% of all undergraduates in the United States are enrolled in community colleges (Provasnik & Planty, 2008). Unfortunately, while enrollment in community colleges has increased in the past decade, overall success rates remain very low, and more than one half of all community college students place into at least one developmental education course during their first year in college (Baily, Jeong, & Cho, 2008). Developmental education programs are expensive for both students and institutions. While students are enrolled in developmental education, they accrue debt, deplete time and money, and diminish their eligibility for financial aid. A survey of students in developmental classes found that most of them believed they were prepared for college when they enrolled (Strong American Schools, 2008). When students believe they are prepared for college but find they have to return to the basics of high school, they often become frustrated and leave college. Even though the costs of remediation are high, the cost of losing this large population is a major concern of community colleges. Retention of students is important to maintain financial stability and to continue offering academic programs.

For the purpose of this study, retention is defined as completion of the first year of college, followed by enrollment in the subsequent academic year (ACT, Inc., 2011). Alexander Astin and Vincent Tinto have unduplicated research in first-year college

retention, but other researchers have continued Astin's (1993) study on retention and the environment and Tinto's (1987) retention theory. The first-to-second year persistence rate is crucial because more students leave during that first year than any other year (Astin, 1993; Strayhorn, 2012; Tinto, 1987). Colleges and universities experienced increased enrollments during the 1970s and 1980s, and there was little concern about retention of students. Today's higher education market competes with online as well as brick-and-mortar institutions, and there are fewer traditional aged students. Higher learning institutions must attract new students, as well as retain the current students to remain competitive (Baum, Little, & Payea, 2011).

Understanding why students leave is essential if colleges want to increase retention rates. Baum, Little, and Payea (2011) wrote: "there are formidable challenges at every level of the system that confront students who aspire to enroll and succeed in college" (p. 4). In addition to the issues within the system, community college students are more likely to have child care responsibilities, financial issues, insufficient high school academic preparation, and lack of knowledge on how to navigate college (Bailey, 2011, p. 1). With an average attrition rate of more than 41% from the first to second year, community colleges must try to determine the cause of that attrition to meet external expectations (ACT Inc., 2007). Community colleges in Kansas are being pressured to retain students from several external sources such as the Kansas Board of Regents, the Higher Learning Commission, and the U. S. Department of Education. The Higher Education Act uses graduation rates as a measure of institutional effectiveness (U.S. Department of Education, 2008). In addition, the Kansas Board of Regents uses

rubrics to address accountability based on the number of students graduating or transferring to a four-year college or university (2011).

The United States once led internationally in college completion rates; however, Americans are now ranked 12th with regard to the number of students completing a college education (Achieving the Dream, 2011). President Obama addressed the nation in a special report on the economy and stated

> now is the time to build a firmer, stronger foundation for growth that will not only withstand future economic storms, but one that helps us thrive and compete in a global economy. It's time to reform our community colleges so that they provide Americans of all ages a chance to learn the skills and knowledge necessary to compete for the jobs of the future" (American Association of Community Colleges, 2011).

President Obama challenged community colleges to graduate an additional five million Americans by 2020 (Baime, 2012). To successfully achieve President Obama's challenge, community colleges must retain students, thereby increasing their graduation rates. A study on retention predictors showed "the strongest predictor for retention is passing a developmental reading course" (Fike & Fike, 2009). Retention, especially of students in remedial courses, is a concern for many community colleges (Tinto, 1994; Fike & Fike, 2009). Students who need remedial courses drop out at higher rates than students who do not need remedial work, and "the more remedial classes they need to take, the less likely they are to stay in school" (Esch, 2009, p. 39). Students who tested into the lowest level of developmental courses had less than a 20% chance of completing

the pre-requisites for the needed math course to graduate, according to authors of a study of the Virginia community college system (Roksa & Jenkins, 2009, p. 2).

First-year student retention has been a topic of concern for many years (Giaquinto, 2010; Hickman & Crossland, 2004; Jaeger & Eagen, 2011). Jaeger and Eagen (2011) found having part-time instructors teach a first-level college course, or gatekeeper course, had a negative impact on retention of students, while upper level courses taught by part-time instructors had little or no effect on retention (p. 2). Giaquinto's study (2010) reinforced the Jaeger and Eagen's study that supported the idea that the type of instruction students receive in their first-semester classes influenced their retention rates. Hickman and Crossland's research (2004) explored the need to have instructors who were adept at interactive teaching, especially with students in developmental education. The more developmental courses students need, the less likely they are to persist in school. Only 19% of students needing three or four remedial courses when they begin college earn a degree (Strong American Schools, 2008).

While the need for community colleges to offer remedial classes is great, the fact remains that remediation is expensive. In 2006, Ohio spent more than $100 million on university-level developmental education (Kirshstein, 2011). If colleges need to spend resources on remediation for students, administrators need to understand what techniques may or may not influence retention. Techniques to increase retention "should be tailored to each institution and then evaluated to make sure they are meeting the unique needs of the institution and its students" (Fike & Fike, 2009, p.68).

Background

Johnson County Community College first offered classes in the fall of 1969 with an enrollment of 1,389 students in northern Johnson County. As both the county and the college population grew, the college moved to a more southern location in the fall of 1972 (Bishop, 2002, p. 39). JCCC has increased the number of students every year since 1972, resulting in an enrollment of 20,869 students in the fall of 2010 (JCCC, Institutional Research, 2011a,). Student population increased 9.2% from fall 2007 to fall 2010 as indicated below:

Table 1

Johnson County Community College Enrollment Data 2007-2010

Year	Fall	Spring	Summer
2007	18,913	17,312	8,535
2008	19,062	17,760	9,141
2009	20,401	18,086	9,836
2010	20.869	19,223	10,029

Note: Adapted from Institutional Research Enrollment Summary 2007-2010 (Johnson County Community College, Institutional Research, 2011b).

Degree-seeking students need test scores on either the American College Testing (ACT) exam or Scholastic Aptitude Test (SAT) to place them in college-level courses. If students have not completed the ACT or SAT tests, they are asked to take placement tests for math, reading, and writing at JCCC. Students are placed in developmental or college-level courses based on evaluations of scores on the Computer-Adapted Placement

Assessment and Support System (COMPASS) tests, developed by ACT (JCCC, Enrollment, 2012). According to the ACT website, COMPASS evaluates students' level of skills in reading, writing, and math (ACT, Inc., 2011). The COMPASS math test evaluates students' skills in pre-algebra and algebra. The writing test assesses students' essays on content, organization, style of writing and the grammar and punctuation. A multiple-choice test evaluates the reading and vocabulary comprehension (ACT, Inc., 2011). Placement exams, like the COMPASS test, are used in most of the two-year institutions, and do a better job at placing students in math than in English or reading (Adams, 2012; Parsad, Lewis, & Greene, 2003).

Each semester approximately 2,000 students must take the JCCC COMPASS placement test because they do not have an ACT or SAT score, and only 8% of those students do not need to take at least one developmental course (JCCC, Institutional Research, 2010). Also, the data have shown that more than 92% of students testing into one or more below college-level courses do not finish the sequence of developmental classes (JCCC, Institutional Research, 2011b), which affects JCCC external reports of retention. According to the National Community College Benchmark Project (2009), JCCC is below the national average of 50% for fall to fall persistence rates. JCCC administration is concerned about students who do not successfully finish the developmental sequences of classes.

JCCC increased institutional resources for students who are considered at risk of dropping out after one semester. Juneau, Montana State Superintendent of the Office of Public Instruction, believes an at-risk student is one "who is affected by environmental conditions that negatively impact the student's educational performance or threatens a

student's likelihood of promotion or graduation" (2010). Some students are more at risk than others. Studies in the 1990s have supported the theory that African-American and Hispanic students experience high levels of discrimination and harassment and do not persist from one year of college to the next (Malaney & Shively, 1995; Nora & Cabrera, 1996; Strayhorn, 2012; Terenzini, 1992). Malaney and Shively examined the social and academic experiences of minority students during their first year at a public university, while Nora and Cabrera (1996) researched the role of prejudice on students' academic success. Strayhorn's study (2012) found a link between social integration and satisfaction in college for African American males. Terenzini's study (1992) included four- and two-year college students, and discovered that minority students have more self-doubt and feelings of isolation. The U. S. Census Bureau reported that community colleges enroll 52% of all undergraduate Hispanics, 40% of African-Americans, and 38% of the Caucasian students (National Center of Educational Statistics, 2009). *A Study of White, Black, and Hispanic students' Transition to a Community College* (1998), reported that the African-American and Hispanic students have a more difficult time transitioning to college (Bulakowski, Jumisko & Weissman, 1998, p. 2; Graves, 2008).

In fall 2007, 84.6% students at JCCC reported they were Caucasian, 15.4% reported non Caucasian. In fall 2010, 81.5% of students were Caucasian, with 18.5% reporting other ethnic status. JCCC has witnessed a 4.7% increase in minority students in four years (JCCC, Institutional Research, 2011c). Figures 1 demonstrates that JCCC have a slowly growing population of minority students, and there is a need to address ethnic differences in academic success.

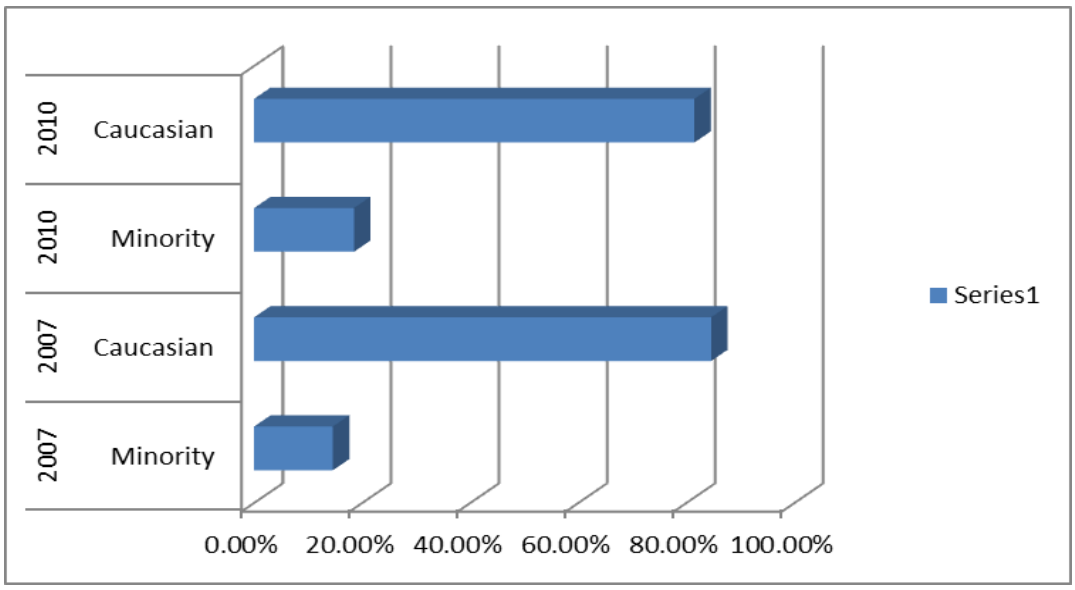

Figure 1. Johnson County Community College Minority Enrollment Fall 2007 and Fall 2010.

Note: Adapted from Institutional Research Enrollment Summary report for JCCC from 2007 and 2010 (Johnson County Community College, Institutional Research, 2011b).

While the ethnic rate grew at a slow and steady rate, the age groups at JCCC changed more rapidly. In 2007, JCCC's enrollment of students included 41.9% in the 18-23 year-old age bracket. In 2010, the 18-23 year olds constituted 46% of the population. Figure 2 illustrates all the age groups in the fall of 2007 and the fall of 2010.

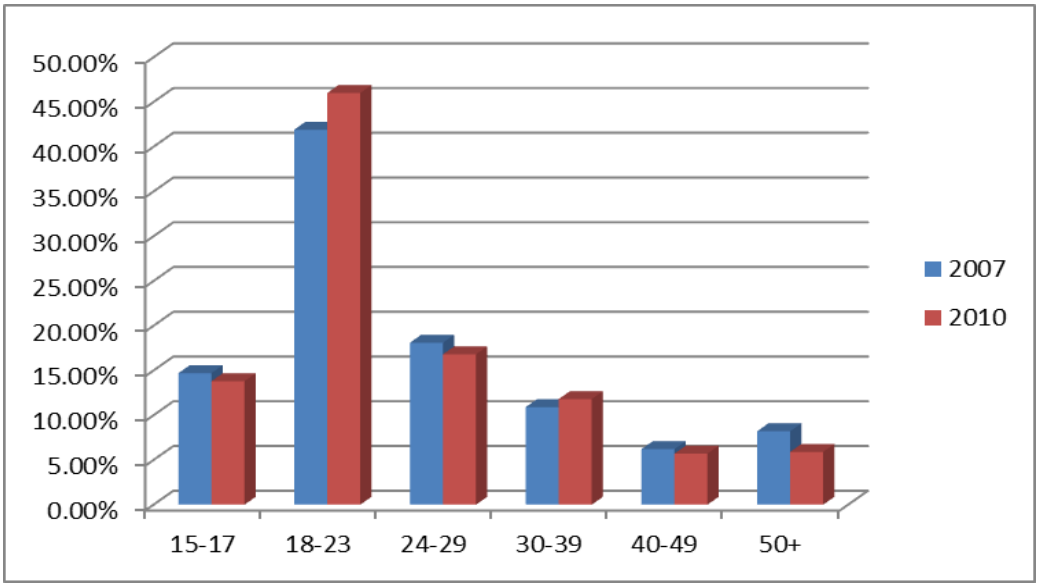

Figure 2. Johnson County Community College Age Breakdown for Fall 2007 and 2010. *Note*: Adapted from Institutional Research Enrollment Summary report for JCCC from 2007 and 2010 (Johnson County Community College, Institutional Research, 2011b).

The criteria for admission to take credit classes at JCCC include being a graduate of "an accredited high school or a recipient of a general educational development (GED) diploma, or be 18 years of age or older and having been determined by JCCC to be able to benefit from the courses in which [students] wish to enroll" (JCCC, Admissions, 2011d). After admission, if students need financial aid, they must complete the COMPASS exam or have appropriate scores on incoming SAT or ACT tests to place them in college-level courses. If students place into developmental reading, they must enroll in the appropriate reading course, and they are required to see an academic counselor. Students who place into a developmental writing course may choose any additional course that does not have a pre-requisite of writing. If students place into a developmental math course, they may also enroll in any additional class that does not have a math pre-requisite (JCCC, Testing, 2011).

Often decisions to select certain college-level courses are based on what the course title may be, what the perceived workload may be, or what a student's friend is selecting. Student selection of courses, according to Wilhelm and Conegys (2004), involves "high involvement, high risk decision-making situations because the cumulative effect of the series of choices students make each semester/quarter" that may impact their entire future (Wilhelm & Conegys, 2004). JCCC administrators would like to help students make better choices of general education courses as they continue their remedial courses. Johnson County Community College staff are determined to understand the reasons that more than 80% of the students who placed into developmental courses did not enter their second year of college (JCCC, Institutional Research, 2010); therefore, college administrators want to know the college-level courses that students can successfully complete while completing their developmental courses.

Statement of the Problem

Each year thousands of young adults graduate from high school and enroll in colleges and universities; many of these students are not prepared for the academic rigor of college-level courses. Higbee, Arendale, and Lundell (2005) found that "Ninety percent of high-school seniors expect to attend college while only 47% of high school graduates have completed college preparatory curricula" (p. 2). Students who have not completed college preparatory curricula in high school test into developmental courses, rather than college-level courses, decreasing the possibility of retention. Students who are not prepared for college are often labeled at-risk students (Laskey & Hetzel, 2011, p. 31).

Added to the issue of academically underprepared students, community colleges enroll other at-risk students, such as first-generation college students and minority students who do not persist (Bailey, 2011). According to the College Board and National Conference of State Legislatures policy guide, in Kansas, Caucasians have a 44.1% rate of graduating in three years with an associate's degree, compared to African Americans at 28.7% and Hispanics at 14.3% (2011). First-generation students also have lower retention and success rates (Thayer, 2000; National Center of Education Statistics, 2011).

Strategies to improve the success rate for at-risk students need the work of faculty and staff of the entire institution. "No single strategy in isolation will increase student success rates on a substantial scale; rather strategies must work together in concert across the college" (Bailey, 2011, p. 3). Bailey also contended that most community colleges offer many courses and programs, but they fail to "map out their offerings in a way that makes [choosing appropriate courses] apparent to students" (2011, p. 3). College administrators should re-examine policies and practices to give students a pathway to the appropriate courses or programs, helping them have a higher opportunity for academic success. JCCC plans to provide a roadmap for students who test into developmental courses and need to select their college-level general education classes. JCCC plans to study student success in both developmental courses and college-level general education courses to better guide students in their selection of all courses.

Purpose Statement

The purpose of this study was to determine which college-level courses students succeed in while successfully completing developmental courses with 2.0 grade point or higher on a 4.0 grading scale. The second purpose was to determine if there was a

relationship between ethnicity or age and students receiving a 2.0 grade point in developmental courses.

Significance of the Study

Developmental education has existed in community colleges since the 1960s, as long as community colleges have existed. Developmental education has come at a high cost to colleges, and there is little evidence between college developmental education and successful student outcomes (Calcagno & Long, 2008). This researcher helped identify student success in college-level general education courses and remedial courses. The research also contributed to the body of knowledge regarding student retention and success of students at community colleges. JCCC administration would like to be able to recommend general education courses when students place into developmental education to help ensure success and retention of students.

Delimitations

Frank Pajares (2011) defined delimitations in an article "The Elements of a Proposal," detailing how researchers narrow the scope of the study. This study was delimited to Johnson County Community College, a large suburban commuter community college in the Kansas City area. The JCCC population chosen by this researcher was limited to students who took the ACT COMPASS entrance exam and did not have an ACT or SAT score to place them in a college-level course. All students in this study tested into one or more developmental courses. The study included student data from fall 2007 to fall 2011. The study was also limited to first-time, full-time college students, and the data did not include students who used "other" to report ethnicity or those who did not report ethnicity.

Assumptions

Paul and Elder (2012) from the Critical Thinking organization defines an assumption as **"**something we take for granted or presuppose. Usually it is something we previously learned and do not question" (p. 143). Assumptions are "factors potentially influential to your study for which you have no hard data, might never know, and can't or don't intend to control" (Pepperdine University, 2011). One assumption was that students honestly reported ethnicity. A second assumption was that the data collected from our Office of Institutional Research was accurate. It was also assumed that all data entered by the researcher into Excel and the SPSS Statistics Student Version 16.0 for Windows was accurate.

Research Questions

Lunenburg and Irby (2008) stated that research questions are "critical components" of dissertations (p. 126). The following questions guided this study:

1. To what extent is there a relationship between the success of students in developmental math and success of students in general education courses?
2. To what extent is there a relationship between the success of students in developmental reading and writing and the success of student in general education courses?
3. To what extent is there a relationship between ethnicity and student success in developmental courses?
4. To what extent is there a relationship between ethnicity and student success in developmental courses?

Definitions of Terms

Achieving the Dream Program. Part of the Community Colleges Count, a national nonprofit organization, began in 2004 with funding provided by Lumina Foundation for Education. From that initiative, Achieving the Dream was built on the belief that broad institutional change, informed by student achievement data, is critical to significantly improving student success rates (Achieving the Dream, 2011).

At-risk students. For this study, students who enroll at Johnson County Community College and test into remedial writing, reading, and/or math were considered at-risk students. Bulger and Watson (2006) stated that the definition of at-risk students should include "background characteristics (including technology proficiency), internal characteristics, and environmental factors into a set of variables which may be used in quantitative and qualitative research" (p. 24).

Fall-to-fall persistence. Students who enroll in both the fall and spring semesters of one academic year and enroll in the fall semester of the next academic year were labeled persistent for this study.

First-time student. For this study, first-time students are those students who have no previous record of attending college.

Full-time student. According to JCCC policy 311.04, "Enrollment in 12 or more credit hours is considered full-time status" (JCCC, 2011e, Board Policies).

Gatekeeper Courses. In the Achieving the Dream dataset, the first college-level courses are referred to as gatekeeper courses (2011).

JCCC Success. JCCC and others define success as helping students learn and helping them reach their academic goals (JCCC, Student Success and Engagement, 2011f).

Non-traditional students. The National Center of Educational Statistics states that non-traditional students over the age of 24 "has been the defining characteristic for this population" (2011, pp. 14). Therefore, this study will use non-traditional as students 25 or older.

Persistence. Persistence is described ''maintenance of continued enrollment for two or more semesters, specifically from Fall term to Spring term and/or completion of a degree or certificate or transfer to a four-year college'' (Crawford, 1999, p. 13).

Retention. For this study, retention refers to the institution's statistical data of student completion of the first year of college, followed by enrollment in the subsequent academic year (ACT, Inc., 2011).

Student Success. For this study the term is associated with students who complete their coursework with a cumulative 2.0 grade point average or higher.

Traditional students. Based on the definition of non-traditional students, for this study, traditional students are students aged 18-23 enrolling in college for the first-time.

Overview of Methodology

Student data were collected from Johnson County Community College. The sample comprised three years of data, fall 2007 through fall 2010, for students who took the ACT COMPASS entrance exam and placed into developmental reading, writing, and/or math courses. This quantitative study explored predictors of success for students who placed into one or more developmental courses. A chi square test of independence

was conducted to analyze the relationship between success in developmental courses and success in 20 general education courses. Chi squares tests were also used to analyze the relationship between success in developmental courses and the demographic variables, ethnicity and age. For the purpose of this study, the ethnic groups identified as minority included African-American, Hispanic, Asian, and American Indian. Non-minority was identified as Caucasian.

Summary & Organization of the Study

This research study is presented in five chapters. Chapter one includes the purpose of the study, research questions, and definitions of terms used throughout the study. Chapter two examines a review of literature related to factors that contribute to student success during their first year of college, the history of the university and community college, and the difference of missions between the two. Chapter three presents the research design for this study, data collection procedures, and statistical analysis. Chapter four is an analysis of the data and findings of the research. Chapter five presents additional literature findings, conclusions about the study, and recommendations for future studies.

Chapter Two

Review of Literature

To understand the role community colleges have in the education of adults, it is necessary to know the history of a junior or community college. The first public junior college was established in Illinois by the president of the University of Chicago and the principal of Joliet High School in 1901 (Beach, 2011). These educators believed that the junior college would provide students two additional years of secondary school, and classes were held in the high school. In the 1960s the junior college expanded into community and technical colleges and, with that, the purpose became two-fold: to prepare students to transfer to universities and to prepare students to enter the workforce as skilled laborers (Beach, 2011).

This chapter presents literature regarding developmental courses and the retention of students through the sequence of those developmental courses. First, information on the history of higher education is investigated. Second, a comparison of four-year and two-year college missions is presented. Third, information concerning the need for developmental education courses in a community college is presented. Fourth, age and ethnicity in developmental education are explored. Finally, the success of community colleges using various methods to retain students through the developmental course sequences is included.

Even though study results vary, the one overall factor remains the same; "community colleges enroll about half of all first-time college students in the United States" (Beach, 2011 p. xix), and most of those students will never earn an associate's degree.

History of Higher Education

Three historical events have influenced higher education in the United States. The first was the origins of the land-grant university in the 1860s that combined theoretical and more practical education. The second event was the legislation of the G.I. Bill in the 1940s that helped finance education for students, and the third event was the formation of the contemporary community colleges (Parnell, 1985, p. 83).

Many have written books about the history of higher education, including Frederick Rudolph who wrote *The American College and University* in 1962. In 1965, Laurence Veysey published *The Emergence of the American University* that focused on the shift that occurred in the late nineteenth century concerning the American university. Scholars continue to use the Rudolph and Veysey books as references, but critics claim that both books are elitist. Others claim that the books exclude important historical events (Lucas, 1994).

Christopher Lucas wrote *American Higher Education: A History* in 1994, and his focus was understanding the past to better assess the issues and concerns in education today. Rather than looking at Harvard University as the founding institution, Lucas begins his book with the schooling in Mesopotamia, several centuries before the founding of Harvard in 1636 (Lucas, 1994, p. 26).

Over the past 150 years, a publicly funded, hierarchical system for educating American's children has evolved through the development of common schools, high schools, colleges and universities, and community colleges. In the early years of higher education, admission was often linked to financial or social status. According to *A History of Higher Education* by John Thelin (2004), during the colonial period, Latin

mottos relayed the "high-minded purpose" of a university (p. 41). Latin mottos ranged from Harvard's motto of light and truth, to South Carolina College's, "Learning humanizes character and does not permit it to be cruel" (p. 41). Even though the mottos were lofty, college proponents did not believe that everyone should have a formal education.

Even though the Declaration of Independence declared that "all men are created equal," Thomas Jefferson never intended for it to apply to women and minorities (Stubblefield & Keane, 1994, p. 52). In 1779, Thomas Jefferson's "Bill for the More General Diffusion of Knowledge" proposed education for everyone, even though it sought to "produce a white male intellectual elite to serve the nation's civic and political needs" (Stubblefield & Keane, 1994, p. 53).

Gender, race, social class, and religion influenced participation in a college education. There is no record of a woman of the colonial period earning a degree The Puritans believed that women should be literate, but they were not concerned about the intellectual betterment, and yet they wanted women to be able to read the Bible. Benjamin Franklin, who espoused self-improvement, believed that female education should focus on marriage and motherhood (Stubblefield & Keane, 1994). In 1787, Abigail Adams traveled to London with her husband who was serving as an ambassador. Abigail attended a series of science lectures in London, learning about electricity, magnetism, hydrostatics, optics, and pneumatics (Stubblefield & Keane, 1994, p. 108). Her experience was unusual because in the United States, most of the American college courses for women centered on organizing a household.

The earliest women's colleges opened in the mid 1800's. The Midwest had the majority of the women's colleges in the country (Thelin, 2004, p. 55). Preparation of women to become school teachers came after 1830 (Stubblefield, 1994, p. 110). Hiring women teachers for lower pay than men was common (p. 110). The highest-achieving women born between 1790 and 1830 taught school, as well as over half the African-American women listed in *Notable American Women* by B. M. Solomon (Stubblefield & Keane, 1994, p. 111).

Adult education developed in the 1830s, and institutions developed intellectual communities with talented volunteers who lectured on a variety of topics. The era of growing literacy and improved communications flourished, and the public developed a thirst for self improvement (Stubblefield & Keane, 1994, p. 91).

Federal grants after the Morrill Act of 1862, helped establish many of the state colleges. The Hatch Act of 1887 gave states additional federal grant funds to establish agricultural interests. Federal interest in agriculture, military training, and engineering prompted state university growth in the Midwest and West (Thelin, 2004, p. 135). Most state universities were located in the rural communities, rather than the larger cities. Thelin claimed that since most Catholic immigrant groups settled in urban areas, the majority of the rural areas had Protestant families, and states wanted to keep immigrants out of the state universities (p. 141-142).

After the Civil War, science became a focus, rather than religion in universities. This led to a more specific curriculum, which led to the creation of departments within the university (Kerr, 1991, Prologue). In turn, this led to the graduate study for the Doctor of Philosophy (Ph.D.) degree and the rise in power of faculty governance. By the

year 1910, there were 350,000 students in higher education (Kerr, 1991, p. xii). This was also the period in which the research university came into being.

In the 1920s, the Carnegie Corporation initiated a campaign on behalf of adult education, establishing the American Association for Adult Education (AAAE) (Stubblefield & Keane, 1994, p. 191). The AAAE organization provided a platform for experts in various fields to inform policy, with a goal of helping the general public be able to make more informed decisions. The Carnegie Corporation's President, Frederick Keppel, edited a collection of essays titled *The Way Out* in 1926, which called for an experiment in liberal education. The publication focused on offering advanced study for the working class, hoping to provide for social stability. The AAAE members and Keppel initiated "research, experimental projects, demonstrations, and institutional and special-population studies" on adult education or a study for the working class (Stubblefield & Keane, 1994, p. 193).

The 1930s Depression prompted universities to expand their curriculum to include community development. The University of Minnesota received a Carnegie Corporation grant to study the abilities of community individuals, hoping to strengthen the extension of community development within the structure of the university (p. 200). Universities also started evening colleges, which provided educational opportunities for community adults. Evening colleges offered short courses on parenting, but they also offered courses in art, literature, music, and health (p. 201).

World War II put demands on American industries for more workers trained in science and engineering. A special wartime college experience for civilians was offered in 250 colleges through the Engineering, Science and Management War Training

Program, sponsored by the Department of Education (Stubblefield & Keane, 1994, p. 240). Like the universities, there was discrimination against women and African-Americans in the defense training programs. Even though there was an extreme shortage of white males in the workforce, women and African-Americans did not become a part of this training until after 1942 when Congress prohibited discrimination on the grounds of gender or race (p. 241).

Knowing that there would be an influx of new American workers after the War, President Roosevelt signed into law the Servicemen's Readjustment Act in 1944. Popularly known as the G.I. Bill, it was designed to support adult literacy classes, high school completion, college, and professional schools (Stubblefield & Keane, 1994, p. 245). Educational leaders recognized the importance of the World War II programs in training and education and made plans for the programs in peacetime. The American Council on Education, with funding from the Carnegie Corporation and the General Education Board, sponsored a two-year study that produced nine monographs on different aspects of military educational programs (p. 246).

Adult education continued after World War II, making postsecondary education the norm of adult life. Universities continued to increase in student numbers with nontraditionally-aged students and part-time students. Universities encountered another growing student body, the ten million adults who enrolled annually for noncredit programs (Sparks, 1985). The extension centers of universities for continuing education courses became popular in the 1950s, stimulated by grants from the Kellogg Foundation (Rohfeld, 1990). Great emphasis was placed on open access in universities, and therefore

there was need to prepare students in these continuing education courses to transfer to a senior college or university (Baker, 1994, p. xiii).

The public two-year colleges provided continuing education for community members, job skills for students who wanted a different career, and remedial education for students out of high school not academically prepared for the rigors of a four-year college or university (Thelin, 2004, p. 332). Having multiple missions led some researchers to believe that the community college could not define itself and was unable to adequately prepare all groups. Astin's study (1993), *What Matters in College*, excluded community college students on his survey to look at the impact of the college experience. In fact, Astin stated that community colleges were not real colleges (1993, Foreword). Astin's statement could have arisen from the fact that two-year institutions had emerged from other educational institutions. Junior colleges were lower divisions of senior institutions, units of K-12 schools, or specialized, such as technical or women's colleges (Baker, 1994).

Other authors have found that community colleges are just different than four-year institutions in their "student population, curriculum structures, and faculty composition" (Levin & Montero-Hernandez, 2009, p. 13). Levin and Montero-Hernandez (2009) found that community colleges had personnel who really cared about students, and they responded to "student characteristics, diversity, and needs" (p. 185). Their conclusion was that community colleges learn to adapt to their environment (p. 194).

The economic downturn in 2008 had an unexpected impact on community colleges' enrollment. While the numbers of students increased, federal and state funds

decreased (American Association of Community Colleges, 2009). In an attempt to help unemployed Americans, President Obama pledged to regain the lead in the number of Americans having a college degree by the year 2020 with the American Recovery and Reinvestment Act that "includes over $30 billion to address college affordability and improve access to higher education" (American Association of Community Colleges, 2011).

The Pew Research Center surveyed more than 1,000 college presidents about the quality of higher education, and 1 in 3 presidents felt that the "industry that they lead is heading in the wrong direction" (Fischer, 2011, p. 38). Presidents are concerned about the lack of preparation they see in students as compared to a decade ago. College presidents also claimed that college students today study less than they used to study. In addition, they did not believe that Obama's goal to have more college degrees or certificates than any other industrialized country by 2020 was possible.

The more optimistic responses of administrators came from the presidents of highly selective colleges. However, the presidents of less-selective four-year colleges, two-year colleges, and for-profit colleges who were less optimistic, face waning state support, while private colleges are having difficulty with students not being able to pay the higher tuition. The federal government and the U. S. Department of Education began scrutinizing proprietary colleges, resulting in increased and closer monitoring (Fischer, 2011).

The American public is also concerned about the rising costs of a college education. The estimate for the least expensive bachelor's degree is over $22,000, and the most expensive being double that amount (Johnson, 2009). The Pew Research Center

surveyed 2,142 Americans, aged 18 and older and found that 75 percent of those polled said college was "economically out of reach for most people" (Fischer, 2011, p. 50). The belief that a college education is too expensive for most is shared across class and race lines, but that view is not shared by college presidents. "Forty-two percent of university leaders, in fact, say most Americans are able to pay for a college degree" (Fischer, 2011, p. 51).

Education in the United States attempts to offer equal opportunities for a diverse population. "A pluralistic society generated differentiated systems of education and information diffusion" (Stubblefield, 1994, p. 312). Even though America is considered the land of opportunity, some citizens are still denied adequate preparation to postsecondary or adult education.

Missions of Four-Year and Two-Year Colleges

The American Association of Junior Colleges reported in 1922 that the mission of a junior college was to provide instruction of a "collegiate grade" (Thornton, 1972, p. 26). Junior colleges were established to relieve the pressure on universities that were growing rapidly, offering courses for the freshman and sophomore years of university study (Baker, 1994). The junior college mission was in its infancy when it was expanded to include terminal education, or occupational education as we know it today (Baker, 1994).

Much has been written on the mission of the community college. Gleazer (1980) wrote that community colleges facilitate lifelong learning (p. 14). In 1988, a report by the American Association of Community and Junior Colleges (AACJC) 19-member

Commission on the Future of Community Colleges noted that building communities is an important mission of a community college.

Others believe that the mission of the community college should be focused on helping students succeed. "The only new dimension is the intricate web of support that helps students succeed" (Shaw & Jacobs, 2003, p. 83). Another aspect of student development is that of helping a diverse body of students succeed. The Commission on the Future of Community Colleges in their report, *Building Communities: A Vision for a New Century,* stressed the importance of student diversity, recommending equality of opportunity, developing outreach programs for disadvantaged students, and greater attention to student retention (1988).

Whatever mission community colleges and universities have, they must be ready to educate our citizens. The Georgetown University Center on Education predicts that by 2018, more than 60% of American jobs will require some form of postsecondary education (Merisotis, 2012b). The Lumina Foundation states that 60% of Americans will need a high-quality postsecondary degree or credential by 2025 for the United States to stay globally competitive. In the State of the Union speech on January 24, 2012, President Obama talked about the cost of higher education and tried to assure Americans that they would have access to educational opportunities (Merisotis, 2012a).

President Obama expressed the great need to educate more Americans, but this was not a new idea. President Truman's Commission on Higher Education of 1947 recommended that the college student population in the United States should double by 1960 (Gilbert & Heller, 2010, p. 1). However, college education was expensive and most average-income Americans could not afford the cost. One of the controversial

recommendations made by the Commission was that the federal government should provide financial assistance to students who had served in the armed forces (Gilbert & Heller, 2010, p. 2). The Commission members stated that the purpose of the report was to assure "the expansion of adult education programs and the distribution of Federal aid to education in such a manner that the poorer States can bring their educational systems closer to the quality of the wealthier States" (Hutcheson, 2007, p. 109).

Following the Truman Commission's report, the G.I. Bill was passed. Even though the G.I. Bill was a major federal initiative to provide financial aid to students, it did not provide the sweeping open access to higher education. In an article in *The Journal of Economic History*, Turner and Bound (2003) claimed that the G.I. Bill did not even help all the veterans of World War II, because the colleges in the south were still closed to African Americans (pp. 145-177).

In 1977, Margaret Spellings, Secretary of Education led a commission that resulted in a report *A Test of Leadership: Charting the Future of U.S. Higher Education.* The report stated that there was a need for higher education to perform differently and better than in the past. The Spellings report identified a concern that the action following the Truman Commission had not generated access as intended (Hutcheson, 2007, p. 112).

In the late 1980's, community colleges were places for less academically inclined students to gain the credentials they needed to get a job and for workers who had been driven out of manufacturing positions to receive retraining (Carey, 2007, p. 24). Community colleges' missions included academic transfer, workforce education, and adult basic education In 1991, community colleges were merged with vocational or technical schools, and the technical colleges began offering the non-transfer associate

degree programs (Clayton & Weiss, 2011, p. 8). Community colleges or comprehensive colleges often reference workforce preparation in their missions, but more often the missions include broader goals, such as lifelong learning and global awareness (p. 9).

It is evident that during the 1990s, policy makers and scholars had the perception that community colleges were not major players in higher education (Levin & Montero-Hernandez, 2009). Authors pointed out that community college students were demographically different than four-year college or university students. Today, we know that community college students are older than the typical four-year college or university student, and because of the age difference, there are socioeconomic differences. Community colleges also have a larger minority population and part-time faculty members are the majority of the teachers. Community colleges are judged by politicians and scholars as "underperforming because of the low graduation rates" (Levin & Montero-Hernandez, 2009, p. 2).

Community college students are also unique from university students in that their goal may not be to graduate when they begin their studies. Students might attend a community college for self-enrichment or self-improvement. Students might be interested in developing a skill for the workplace, or just taking some general education courses before transferring to a university (Beach, 2011).

There are many reasons for the low rate of graduates from community colleges, but it is important to ensure that students are gaining the necessary skills and knowledge for the future. The Commission on Access, Admissions and Success in Higher Education met in 2008 and discussed college and high school completion rates. Data indicated that the proportion of adults with postsecondary credentials was not keeping pace with other

industrialized nations. Data also indicated there were disparities between low-income and minority students and middle class students. The Commission established a goal that 55 percent of the nation's young adults would attain an associate degree or higher (Lee, Edward, Menson, & Rawls, 2012). The Commission on Access, Admission and Success in Higher Education established recommendations that included:

1. Provide a program for preschool education, targeting low-income families.
2. Improve middle and high school counseling.
3. Implement research-based dropout prevention programs.
4. Align K-12 education system with college admission expectations.
5. Improve teaching quality, focusing on recruitment and retention.
6. Clarify and simplify admission process.
7. Provide more need-based grant aid, making the financial aid system more transparent.
8. Keep college affordable.
9. Increase college completion rates.
10. Provide postsecondary opportunities for adult education programs. (p. 2)

Despite these recommendations, only 60.8% of states have a formal alignment between high- school standards and college and workplace expectations. Kansas is not one of those states. In addition, Kansas does not have a college-ready assessment system, but they have adopted the Common Core Standards (Lee, Edward, Menson, & Rawls, 2012).

President Bill Clinton's Middle Class Bill of Rights in 1995 was called the G.I. Bill for America's Workers (Moore, 2009, p. 57). The G.I. Bill called for one-stop career

centers to offer Americans easy access to reliable, up-to-date information on where the jobs were, what skills were in demand, and the performance records of training institutions. This resulted in the inflation of adult training programs in community colleges (p. 58).

As for the G.I. Bill, it did not help many African-Americans after World War II, but the benefits continue today to help soldiers returning from Iraq and Afghanistan. Federal benefits for veterans include educational and vocational counseling, and reimbursement for the full cost of an undergraduate program at a college or university. Unlike Truman's G.I. Bill, Clinton's Middle Class Bill of Rights provided upfront tuition payment to the school, a monthly living allowance and a book stipend (U. S. Department of Veterans Affairs, 2012).

In large part because of the new-found recognition of the role community colleges play, today, over 11 million students are enrolled in a community college (Pew Research, 2009). Two organizations advocate and represent community colleges on a national level: American Association of Community Colleges, which involves college presidents, and the Association of Community College Trustees, which represents governing college boards (American Association of Community Colleges, 2011). Community college students and institutions receive financial support through grants, local property taxes, and state aid (2011).

The missions of four- and two-year institutions have not changed drastically over the years, but the missions are very different. Community colleges have learned to maximize their resources to offer an open access system with a comprehensive curriculum, including developmental education and services for disadvantaged students.

Community colleges receive less in state funds than universities. In California where 20 percent of all community college students in the nation attend, public universities are state-funded at almost twice as much as community colleges, and the University of California is funded over three times as much as any community college (Levin & Montero-Hernandez, 2009, p. 195).

The four-year institutions strive to offer high quality liberal arts and science programs, reflecting strong academic cultures and traditions. In *The Community's College: A History of Johnson County Community College, 1969-1999,* a retired professor wrote that in the first years after establishing the college, the JCCC motto was "Yes, we have no traditions" (Bishop, 2002, p. 15). The college motto was used in professional journals and newsletters when the college recruited faculty and staff members. The recruitment ads also stated that the college had no "Ivied philosophies or hidebound procedures" hoping to distinguish itself from nearby universities (p. 15).

Developmental Education and Community Colleges

As the number of community colleges and student enrollment in them increased, the number of underprepared students also grew. The United States Department of Education report, cited by McIntosh and Rouse (2009) stated that 75.6% of public four-year institutions and 99.6% of public two-year colleges were offering developmental courses. A survey conducted in 1982 and 1983 at the Pennsylvania State University involving 18,000 incoming college freshmen showed that 98 percent expected to earn a B average or better in college (Parnell, 1985, p. 109). At the same time, 61 percent estimated they would study less than 20 hours a week.

Some students have viewed the open-door community college policy as an invitation to expend a minimum amount of work in high school. Students say that they can always get into a community college, however, few seem to know what it takes to complete a community college program. High school students, parents, and counselors need to know the rigors of completing any community college program (Parnell, 1985, p. 110). Unfortunately, students begin their community college experience expecting that they will have to exert little effort to succeed.

The need for developmental education in community colleges is clear. "Three out of every five community college students need at least one remedial course, and fewer than 25 percent of those students successfully earn a degree" (McClenney, 2010, p. 8). Student readiness for college varies from state to state, but only 14% of students in college developmental courses said that their high schools prepared them well for college. Almost 40% said their schools did a poor or fair job in helping them understand what courses they should take to prepare them for college (Strong American School's Project, 2008). Parnell wrote in *The Neglected Majority* that the "academic and vocational desert of American education is the high-school general education program" (p. 37). Parnell felt that both the high school academic and vocational tracks lack focus, and that more than 40% of the academic track centers on other activities (p. 38). High school curriculum needs to include methods to teach students to analyze, write well, and think critically. Most tests in American schools are used for accountability and are multiple choice exams that do not require deep thinking (Wagner, 2008).

When students begin college and find they must retake course material they covered in high school, they become discouraged. In the Strong American Schools

survey, 64% of students enrolled in remedial education had to take more than one development course (2008, p. 12). The National Center for Education Statistics (2004) reported that students who enroll in remedial education are most likely to drop out. Of students from the 1992 high school class who enrolled in college and took no remedial classes, 57% earned a bachelor's degree within eight years. However, of students who enrolled in one or two remedial courses, only 29% graduated with a bachelor's degree.

In most colleges, students enroll after taking a placement test, and students with greater math, English and/or reading deficiency skills may need to take a sequence of remedial courses. For example, if students test into the lowest level of math at JCCC, they must take Fundamentals of Math, Elementary Algebra, and Intermediate Algebra before enrolling in the first college-level math course, College Algebra. This could mean that some students must complete 7-8 developmental education courses if they test into more than one area of sequential developmental courses.

Developmental programs are expensive for institutions. The estimated cost of remediation is more than $1 billion a year at community colleges and another $500 million at four-year colleges (Bailey, Jeong & Cho, 2008). An *Inside Higher Ed* report claims that the nation loses more than $3.7 billion a year because students are not learning the skills needed to succeed in college or work while they are in high school (Potluri, 2006). Estimates show that our economy has lost $2.3 billion because remedial students are more likely to leave college without a degree, thus reducing their earning power (Potluri, 2006). If students did not require remediation in college, it is estimated that Kansas could save $15,470,969 a year, and students would earn an additional income

of $27,063,035. The net benefit to the state economy would be $53,078,545 (Potluri, 2006).

Some colleges, such as the Chicago City College system are considering reductions of remedial education because of budget cuts. The National Center for Education Statistics estimates that student tuition for remedial courses only covers one-fifth of the cost of education (2004). However, Kay McClenney, Director of Community College Survey of Student Engagement (CCSSE), noted that other colleges are finding ways to increase their developmental education program offerings (2010).

The Bill and Melinda Gates Foundation has funded Valencia College in Florida and Zane State College in Ohio to improve their remedial education programs. Several nonprofits and commissions are pushing for broader policies to better prepare students for college before they leave high school. The Common Core State Standards Initiative was designed to address the mismatch between the skills that high schools require for graduation and what colleges expect students to know (McClenney, 2010).

Community colleges must find creative ways to provide students the needed remedial education while providing them incentive to continue their education through the necessary developmental courses. Acceleration is becoming a popular strategy for improving outcomes of students who need developmental education. Advocates of acceleration argue that a greater portion of students would complete remediation and succeed in college-level courses if colleges would help them complete requirements more quickly or enroll them in college-level courses while providing effective academic support (Edgecombe, 2011).

Many community colleges have implemented innovative programs to provide an alternative to the traditional delivery of developmental education. Developmental Summer Bridge Programs (DSBP) have become a popular intervention to orient students to college. These summer bridge programs are designed to assist underprepared first-year students.

A study conducted in 2011 looked at the effectiveness of the DSBP at eight institutions in Texas. The participants were recruited from area high schools based on their placement test scores. The overall sample included more women than men, 84.3% Latino, and primarily traditional college-aged students (Wathington, Pretlow, & Mitchell, 2011, p. 2). Students attended the DSBP for 3-6 hours a day, 4-5 days a week for 4-6 weeks. Students received accelerated learning in either math, writing, or reading. The hope was that at the bridge program's conclusion, the students would be able to enter college-level courses when the subsequent fall semester began. The study discovered, however, that recruitment was difficult. The study's findings also suggested that it was challenging for students with different levels of developmental needs to be in one classroom, but that tutors and mentors improved the student success. Data collected indicated that DSBP students subsequently attempted a greater number of college-level courses than students not in the program, suggesting that the program students had a reduced need for remediation (p. 5).

Summer bridge programs have been successful in many institutions, but they are only one method to increase student retention and learning. The 2006 Spellings Commission Report prompted institutions to re-examine the effectiveness of programs designed to improve retention. The report focused on higher education's need to increase

the access and retention for minorities and first-generation college students (McCurrie, 2012). Since the report was published, organizations such as Achieving the Dream and American Diploma Project (ADP) have expanded their memberships (p. 30). Policy makers, higher education leaders, and businesses work together to affect postsecondary preparation by aligning high school standards, graduation requirements, and assessment with college-level expectations. The Common Core Standards for P-20 education is being modeled after the ADP requirements (p. 30).

The Achieving the Dream initiative, founded by the Lumina Foundation for Education is also striving to expand community college student success, focusing on economically disadvantaged students and students of color. A primary goal is to assist colleges and state agencies to build a "culture of evidence" to gather, analyze and make better use of data (Bailey, Jeong, & Cho, 2008, p. 5). The Lumina Foundation has undertaken this funding effort after finding that African Americans' and Latinos' enrollment in colleges and universities has increased since 1994, but both groups have remained underrepresented in higher education.

The Lumina Foundation is not alone in expressing a need for better data to determine why students are not succeeding in college. The study by Bailey, Jeong, and Cho (2008) found that only 3-4 out of 10 students who need developmental courses actually complete the sequence of needed classes. Almost half fail to complete the first course of the sequence, and most students drop out in the beginning of their studies (p. 31). An analysis of these results suggests that colleges lose their developmental students early in the sequences, and that there may be a need to offer student success courses or learning communities for first-year students.

There are two common hypotheses regarding students who take college remediation courses. The first hypothesis is that remedial courses may provide students with the skills they need to be successful academically, helping them persist through to graduation. In contrast, the second hypothesis suggests that remediation slows student progress, and may lower self-esteem, and increase the potential of dropping out (Bettinger & Long, 2007; Jacob & Lefgren, 2004). Some studies question the necessity for remedial courses, and question if the skills learned in remedial courses could be taught in college-level courses to avoid extra years for remedial education (Armstrong, 1999; Jenkins, Jaggars, & Roksa, 2009).

Developmental courses do differ in their impact by the level of student preparation. The largest negative effects were found for students on the cusp of remedial course placement (Boatman & Long, 2010). A study in community colleges in Tennessee has suggested that students who placed on the margin between remedial and a college-level mathematics course took nearly 6.5 fewer college-level credits by the end of their third year than students not needing remedial courses (Boatman & Long, 2012), Similarly, the study concluded that these students who tested just below the college-level course requirement in reading, took an average of 7.0 fewer college-credits by the end of their third year. However, it appears that students on the margin between a remedial and college-level writing course were enrolled in nearly the same number of credits at the end of their third year. The study concluded that colleges must customize to accommodate different levels of remediation, emphasizing that a single policy approach is not recommended (Boatman & Long, 2012).

Some students may view the sequence of developmental courses as too long and overwhelming to attempt. Accelerated learning allows students to complete multiple sequential courses in a regular semester. Currently, Johnson County Community College offers a two-week accelerated developmental math course to let students complete two or three levels of remedial math in one semester. The first-level remedial math course, Fundamentals of Math, is taught with Elementary Algebra, and students earn three credits for each of the courses. Two actual courses taught in the same classroom are also termed paired or linked courses. While some paired or linked courses could be in the same discipline, community colleges are also integrating remedial courses with college-level courses. Students taking a developmental writing course would also enroll in a college-level literature course is one example. Linked courses allow students to accrue college credit earlier and makes basic skills instruction more relevant for them (Edgecombe, 2011). Edgecombe believes that such linked or paired courses work because "students benefit psychologically from tackling harder coursework" (Edgecombe, p. 8).

As Chaffey College in Rancho Cucamonga, California, noticed the rising remediation needs of incoming students, the college administrators recognized that more students were underprepared than ready for college-level courses. As a result, they changed their entire approach to remediation. First, they threw out the word "remediation," and opted for "foundational skills." Next, they approached the issue as college wide, something that moved away from a particular subset of classes (Esch, 2009). Chaffey College opened several centers that offered students supplementary lessons and learning activities that were tied to the students' class work. The idea was to give students an additional experience outside their actual classrooms (Esch, 2009).

With the completion of a study at Baltimore County Community colleges, students who tested into the highest level of developmental English courses were placed into a college-level English course. The students concurrently enrolled in the developmental course and the college-level course, and the same instructor taught the two courses back-to-back. Approximately 60% of these students enrolled in the two courses passed the college-level English course, as compared to 25% of students who took the two courses sequentially (Jenkins, Speroni, Belfield, Jaggars, & Edgecombe, 2010).

Virtually every successful developmental program includes comprehensive support services such as assessment and placement systems, tutoring, intrusive advising and counseling, and supportive faculty and staff. Supplemental instruction and student success courses have also proven to be effective. Increasing completion rates for developmental students is challenging, but retention of students in developmental education is demanded if we want to improve America's declining position in the global economy (Ozz, 2012).

Ethnicity and Age Differences of Community College Students

Community colleges and universities have commonalities, such as offering curriculum and promoting student achievement. At the same time, the goals of students in community colleges and universities are often quite different. While the goal of most university students is to obtain a degree, community college students could take courses for a myriad of reasons. Students might want an associate's degree, a one-year certificate, a series of classes needed for job retraining, or one course for personal enrichment. "Students in a community college also may be testing postsecondary education in a convenient, inexpensive environment" (Wild & Ebbers, 2002). Whatever

reasons students have when they begin at a college or university, that transition from school or work to college is challenging. Many first-time freshmen are confused over the enrollment process and the plethora of classes available to them.

Bulakowski, Jumisko, and Weissman (1998) conducted a study of Caucasian, Hispanic, and African-American students' transition to college from work or high school. In three separate focus groups, students were asked questions about their shift to the community college. All groups saw a connection between postsecondary education and getting a job. African-Americans and Hispanic students more frequently said they wanted to set an example for others and to be the first in their families to go to college. African Americans also felt a need to dispel the negative racial stereotypes, and they felt going to college would accomplish that.

The educational goals of the students varied by ethnicity. The most common goal among the Caucasian students was to complete an associate's degree and then transfer to a university. Many of the Caucasian students mentioned that they planned to earn a BA, MA, or a Ph.D. The goal of the majority of Hispanic students was to receive an associate's degree. African-American students varied from wanting to complete one or a few courses to earning a certificate or associate's degree (Bulakowski, Jumisko, & Weissman, 1998).

Finances were an obstacle mentioned by all three groups. They stated that work and family responsibilities inhibited them from reaching their goals. Caucasian and Hispanic students said they had difficulty selecting and scheduling their courses. The African-American students felt the biggest obstacle for reaching their goals was their lack of preparation for the academic rigor of college.

California has the largest state system of colleges with 110 colleges and three million students, including 120,000 first-time freshmen in 2008 (Gandara, Alvarado, Driscoll & Orfield, 2012). In a study of the system to determine transfer outcomes in community colleges, state educators found that 17% of the cohort had transferred in five years. Even within this small percentage, African-American and Latino students comprised a disproportionately lower percentage of the transfers. After seven years, 30% of the white students, and 41% of the Asian students had transferred, but only 17% of Latinos and 19% of African-American students had enrolled in a university (Gandara, Alvarado, Driscoll & Orfield, 2012). To attract students of all ethnic backgrounds, four-year institutions should ensure easy transition and credit transfer from the community college to the university.

A study at a comprehensive community college in Chicago found that academically, African-American and Hispanic students "quickly fall behind" Caucasian students in college, even when they have similar scores on standardized tests (Bulakowski, Jumisko, and Weissman, 1998). A slow and steady rise in Scholastic Assessment Test (SAT) scores among African-Americans and other minority students has been evident. Some have theorized that African-American and other minority students receive different treatment from instructors, with expectations for minorities being lower than for their Caucasian counterparts. The study supports that the lower expectations influence the performance gap (Taylor, 1996).

No Child Left Behind was an attempt to lessen the achievement gap for minority and disadvantaged students in the K-12 arena. There is evidence that the achievement gaps widen as students mature (Schneider, Martinez & Owens, 2006; Kao & Thompson, 2003). At the university level, a study of four postsecondary institutions in Texas by

Fletcher and Tienda (2008) found "substantial racial and ethnic differences in grade point average, academic probation, and college persistence" (p. 2).

In K-20, Hispanics represent about 16 percent of the population, and 21 percent of students in school. Hispanic students are the fastest growing minority and account for half of our nation's growth since 2000 (The CollegeBoard Advocacy & Policy Center, 2011). Hispanic students are more likely to be placed into lower academic tracks throughout their high school years. In 2007-08, 45 percent of Hispanic students in community colleges had taken at least one remedial course.

Many Hispanic students start their college education at a community college. In 2008, 49 percent of Hispanic college students were enrolled in community colleges and 31 percent were enrolled at public colleges and universities (The CollegeBoard Advocacy & Policy Center, 2011). However, the transfer rate is low for Hispanic students, with less than 20 percent transferring from two- to four-year institutions. The educational attainment for Latino adults is very low. In 2009, 39 percent of Latinos ages 25 and older had not obtained a high school diploma. The college attainment rate is much lower with only 19 percent of Latino adults having earned an associate degree or higher (The CollegeBoard Advocacy & Policy Center, 2011). Some educators feel that Latino parents value character and moral development more than academic achievement. Latino parents consider ethics and morality a foundation for success, and they often have conflicts with school policies and the use of punishment (Brown, A., 2008, p. 3).

Counselors, educators, and other personnel need to change their techniques when working with Latino students and their parents, since parents may find it difficult to let their children leave the home to pursue their education. Other Latino parents may need their children to help generate income for the family (CollegeBoard Advocacy & Policy Center,

2011). Colleges that have been successful in serving Latino students have involved the parents in their children's education by understanding sociocultural variables that affect parental involvement and by "promoting more democratic education that recognizes the intimate relationship among schooling, social issues and macro-level policies" (Brown, A. 2008, p. 6).

Colleges that have been successful in having high transfer rates for Latino students have strong college-going cultures, commitment to students, and effective student support services. Researchers also found that having a strong high school and four-year college relationships were important components of student transfer success. Many colleges use student ambassadors to promote the colleges in the high schools and host a parents' night to introduce the college to the high school community (Gandara, Alvarado, Driscoll, & Orfield, 2012).

Almost all of the Latino and African-American students who graduate from low performing high schools and go to community colleges, need remediation or developmental education. The students' needs are extensive, with reading skills at the 3rd and 4th grade levels. Often students need math remediation as well. If students attend part-time, it could take years to move through the developmental sequence. Bailey points out that "The more levels of developmental courses a student must take, the less likely that student is to ever complete college English or math" (2011, p. 8).

The Building Pathways to Transfer report (2012) concluded with recommendations to increase funding for outreach initiatives in the area high schools, evaluation of special programs targeted at African-American and Latino students who want to transfer, different delivery models of developmental education that focus on reducing the time to take college credit courses, increased research of institutions that do

an effective job of transferring students of color from low performing high schools, and additional research on the poor transfer rates of African-American students (Gandara, Alvarado, Driscoll, & Orfield, p. 110).

When examining gaps in the rates of success for non-traditional and traditional aged students needing to take developmental courses, a study by Bailey, Calcagno, Crosta, and Jenkins (2007) concluded that there is a negative impact on degree attainment for traditional aged students. The study also found that developmental courses in reading and writing had the same impact on both the older and younger students, and the key barrier to success for older students was mathematics. Lastly, the study found that passing a college-level composition course doubled the chances that students would graduate.

The College Board published a report in 2010 with a warning that nearly two-thirds of black male college students fail to graduate (Young, 2012). The Community College of Philadelphia offers a federally funded program for African-American male students. The students are assigned support coaches and tutors. The college also provides life skills workshops, cultural enrichment activities, and financial assistance. In the first year, of the 144 students in the program, 90 percent were still attending classes in the next academic year, more than twice as many as before the program was initiated (Young, 2012).

Summary of Literature Review

The typical image of a college freshman is an 18 year-old, attending college full-time, beginning with the fall semester after high school graduation. The community college student profile is quite different. They are often older and many attend part-time,

beginning in the spring, summer, or fall semesters. The need for a caring environment is needed in all educational institutions, but community colleges work hard to maintain a caring environment. Community colleges are constantly seeking ways to engage, retain, and care for their student populations. Emphasis is placed on student success, and focus is placed on both the well prepared students and the underprepared students. "Community colleges do not pride themselves on how many students fail, but rather they rejoice at how many succeed" (Parnell, 1985, p. 93).

Community colleges need to recognize the need for creative programming to better serve the increasingly large number of underprepared students. Community colleges must learn from the past and work together with their K-12 partners as well as their university partners to increase retention and help students succeed. When underprepared students select the college-level courses, along with their developmental courses, Johnson County Community College would like to predict success by helping students make good choices. Using demographic data, in addition to limiting certain college-level courses for students in developmental education courses will hopefully lead to greater student retention and success. In chapter three, the methodology of the study to determine if there are predictors of success for students who successfully complete both developmental education and college-level courses is presented.

Chapter Three

Methods

The purpose of this study was to determine if students are successful in both remedial courses and general education courses. The second purpose was to determine if age or ethnicity influenced the success of students in their developmental course studies. This study was conducted at a selected comprehensive two-year public institution, in northeast Kansas. The study was focused on full-time, first-time students who tested into remedial education but enrolled in both remedial and college-level courses. This chapter describes the methodology used in conducting this research study. Included in this chapter are the research design, population used, and a sample of the students used in this study. Detailed information related to the sampling process, data collection, data analysis, hypothesis testing, and the limitations of the study are provided.

Research Design

This quantitative, descriptive design was conducted to examine the success of students in both developmental and general education courses. According to Johnson and Christiansen (2008), "quantitative research relies primarily on the collection of numeric data" (p. 33). In this quantitative study, student academic scores in remedial and general education college-level courses were compared. This researcher analyzed students' remedial course scores in reading, writing, and math and the students' course grades in 20 general education courses. This researcher selected the 20 general education courses based on transferability of courses and the ones most often selected by students enrolled in developmental series of classes.

The research study included the dependent variable of student success, which was determined by the students' attainment of an A, B, C, or P in both the student's remedial and college-level courses. Unsuccessful completion equaled a D, F or W. The study included two additional independent variables of ethnicity and age. Ethnicity and age data were extracted from student applications as they were self-reported to the college.

Population

The subjects for the study were students (N = 822) enrolled at JCCC who were first-time, full-time students who tested into one or more remedial courses fall 2007 through fall 2010. The college director of Institutional Research granted authorization to access and use data for the sole purpose of this study (Appendix A).

Sampling

This researcher used purposive sampling to identify participants. Purposive sampling is described by Lunenburg and Irby (2008) as a "sample based on the researcher's experience or knowledge of the group to be sampled" (p. 175). Test scores of first-time, full-time students testing into remedial reading, writing, and/or math were used as the first criterion in this study. The second criterion was the students enrolled in remedial education courses and concurrently enrolled in the selected 20 college-level courses. The third criterion was age and ethnicity to determine if either had an influence on the success of the students in remedial math, reading or writing.

Instrumentation

Based on the study's research questions and hypotheses, the variables were the successful completion of a developmental course and successful completion of a general

education course. The research also looked at the relationship between age and ethnicity and success in remedial courses.

JCCC uses the COMPASS scoring system to place students in developmental or college-level courses. The following Table 2 shows the scores required on the COMPASS placement test for students to enroll in the college-level English course, Composition I, and the developmental English courses, Writing Strategies and Introduction to Writing.

Table 2

JCCC COMPASS Placement Scores for English

Course number	Course title	Score needed
ENGL 102	Writing Strategies	1-21
ENGL 106	Introduction to Writing	22-74
ENGL 121	Composition I	$\geq$75

Note: Adapted from Johnson County Community College Testing, 2011

The COMPASS scoring system to place students in developmental reading, Fundamentals of Reading or Reading Skills Improvement are illustrated in Table 3.

Table 3

JCCC COMPASS Placement Scores for Reading

Course number	Course title	Score needed
RDG 125	Fundamentals of Reading	0-55
RDG 126	Reading Skills Improvement	56-79

Note: Adapted from Johnson County Community College Testing, 2011

Table 4 illustrates needed COMPASS scores to enroll in the developmental math courses, Fundamentals of Math and Elementary Algebra, and the college-level math courses, Intermediate Algebra and College Algebra.

Table 4

JCCC COMPASS Placement Scores for Math

Course number	Course title	Pre-algebra score	Algebra Score
MATH 111	Fundamentals of Math	23-50	
MATH 115	Elementary Algebra	≥51	0-45
MATH 116	Intermediate Algebra	No pre-algebra test	≥46-65
MATH 171	College Algebra	No pre-algebra test	≥66

Note: COMPASS is an adaptive test, taking students from pre-algebra to algebra and beyond. (Johnson County Community College *Testing*, 2011).

Students who wish to earn an associate of arts degree and transfer to a four-year university or college must take general education courses. "General education at Johnson County Community College combines essential thinking skills with knowledge from areas such as the arts, communication, humanities, language, mathematics, natural sciences, and social sciences" (JCCC, 2011d). The college offers more than 1,100 courses but over 50% are career and technical courses. Another 20 – 30% of the courses require a pre-requisite course, such as foreign languages and science courses. General education courses at JCCC fall into four categories: social sciences, humanities, communications, and science and math. JCCC's Office of Institutional Research identified 20 general education courses that were most frequently selected classes by students who tested into developmental education. The selected classes included: Accounting I, Drawing I, Principles of Biology, Principles of Biology Lab, Human

Anatomy and Physiology, Introduction to Business, Introduction to Computer Concepts and Applications, PC Applications: MS Office, Desktop Photo Manipulation I, Composition I, U. S. History Since 1877, Introduction to Humanities, Business Math, Introduction to Philosophy, Introduction to Psychology, Introduction to Sociology, Interpersonal Communication, Public Speaking, Personal Communication, and Introduction to Theatre (see appendix C for descriptions of the classes).

Validity

Lunenburg and Irby describe validity as the "degree to which an instrument measures what it purports to measure" (p.181). Lunenburg and Irby further define reliability as the "degree to which an instrument consistently measures whatever it is measuring" (p. 182). JCCC measures success of students by looking at fall-to-fall retention and completion of courses with a C or better. Pascarella, Smart, and Ethington (1986) contend that retention "may be a significant indicator of institutional quality and impact" (p. 100). Others suggest that retention has become a gauge of institutional effectiveness and a measure of the institution's commitment to students (Massy, 2012).

Data Collection

This study was approved by the Internal Review Board at Baker University on July 6, 2012, (see Appendix B). The researcher was also granted permission to use the JCCC Office of Institutional Research data collection (see Appendix A). All data collected were extracted from the Banner database at Johnson County Community College by the Office of Institutional Research. These data were originally maintained in Johnson County Community College's database, supported by Banner software. To secure anonymity of the subjects and any other information about the subjects that may

be considered personal and confidential, each student included as a subject of the study was assigned an identification number.

Data Coding

A data analyst from JCCC's Institutional Research department organized the data into three Excel workbooks related to students enrolled in 2007-2008 academic year, 2008-2009 academic year, and 2009-2010 academic year. The archival student data were also combined by the researcher into one Excel workbook. The researcher recoded data using grades of A, B, C and/or P equaling "successful." Grades of D, F, and/or W were identified as "unsuccessful."

Data Analysis and Hypothesis Testing

The researcher imported data from the Excel workbook into IBM SPSS Statistics 18.0 Faculty Pack for Windows, and conducted hypothesis tests to address each of the research questions. A Chi Square Test of Independence was conducted on each cross tabulation table with Fundamentals of Math, MATH 111; Elementary Algebra, MATH 115; Writing Strategies, ENGL 102; Introduction to Writing, ENGL 106; Fundamentals of Reading, RDG 125; or Reading Skills Improvement, RDG 126, as the row variable, and one of the 20 general education courses as listed in Appendix C as the column variable. The two developmental math courses were combined because of sample size. The reading and writing developmental courses were also combined because of sample size. The results of each test helped determine if students are successful in general education courses during the same semester as they are successful in a developmental course.

Research question 1. To what extent is there a statistically significant relationship between the success of students in developmental math and student success in general education courses?

Research hypothesis 1. There is a statistically significant relationship between the success of students in developmental math course and student success in general education courses A chi-square test of independence was used to determine if there was a significant relationship between the success in developmental math and the success in the general education courses.

Research question 2. To what extent is there a relationship between the success of students in developmental reading and writing and the success of students in general education courses?

Research hypothesis 2. There is a statistically significant relationship between the success of students in developmental reading and writing student success in general education courses. A chi-square test of independence was used to determine if there was a statistically significant relationship between the student success in developmental reading and writing and student success in general education courses.

Research question 3. To what extent is there a relationship between ethnicity and success of students in the developmental courses? For the purpose of this study, the researcher used two groups: students reporting they were Caucasian and students reporting all other ethnicities.

Research hypothesis 3. There is a statistically significant relationship between ethnicity and the success of students in developmental courses. A chi-square test of

independence was used to determine if there is a relationship between ethnicity and the success of students in developmental courses.

Research question 4. To what extent is there a relationship between age and success of students in the developmental courses? For purposes of this study, the researcher grouped students 18-24 as traditional students, and students 25 or older as non-traditional students.

Research hypothesis 4. There is a statistically significant relationship between age and the success of students in developmental courses. A chi square of independence was used to determine if there is a relationship between age and the success of students in developmental courses.

Limitations

The limitations of a study are those "characteristics of design or methodology that set parameters on the application or interpretation of the results of the study" (Kline, 2011). The number of students enrolled in selected general education courses was limited in some instances. Students self-reported their ethnicity, and the Office of Institutional Research analyst transferred data from one software to another. In addition, the grades assigned by various instructors, especially in writing-based courses, are also factors that are not under the control of the researcher and may have limited this particular study.

Summary

This chapter described the research design, population and sample, hypotheses, data collection, and analysis used in this study. Statistical analyses using chi-square tests of independence were used to determine if there were significant statistical relationships

between the success for students in remedial courses and student success in college-level courses. Chi-square tests of independence were also used to determine if there were significant statistical relationships between ethnicity or age and student success in developmental courses. The results of this study are presented in Chapter four.

Chapter Four

Results

Grades in developmental reading, writing, and math courses and grades in general education courses were analyzed for this study. The researcher examined the relationship between student success in developmental courses and student success in general education classes, as determined by a 2.0 or better grade point average in both courses, based on a 4.0 grading scale. The researcher also examined if there was a relationship between age or ethnicity and student success in developmental courses. In this chapter, the researcher describes data related to the study. Each hypothesis was tested using a chi square test of independence.

Descriptive Statistics

The study's sample consisted of 822 students who were first-time, full-time students from fall 2007 through fall 2010. The sample included 452 Caucasian students, 267 non-Caucasian students, and 103 who had unreported ethnicity. There were 720 traditional-aged students aged 18-24, and 102 nontraditional students aged $\geq$25 included in the study. If students completed the developmental and general education courses and earned an A, B, or C, they were considered successful. If students enrolled in both a developmental and general education course, but earned a D, F, or W, they were considered not successful. Hypothesis testing included four research questions, using 52 hypotheses to test the four questions.

Hypothesis Testing

The researcher chose 20 general education courses (see Appendix C) that were most frequently selected by the 2007-2010 first-time, full-time students who tested into one or more developmental courses at Johnson County Community College.

Research question 1. To what extent is there a relationship between the success of students in developmental math and student success in general education courses?

Chi-square tests of independence using the twelve general education courses and the developmental math courses were used to determine if there was a significant relationship between student success in the two developmental math courses and student success in each general education course. Eight of the 20 general education courses selected for this study did not have sufficient enrollment to conduct an analysis of a relationship. The eight courses listed in Appendix C that were not analyzed include: Drawing I, Principles of Biology Lab, Human Anatomy and Physiology, Desktop Photo Manipulation I, PC Applications: MS Office, Introduction to Philosophy, Business Math, and Personal Communication. Observed and expected frequencies are presented in Tables 5-16, using the developmental math courses for the row data and the 12 general education courses for the column data. The 12 tables support the hypothesis tests that were conducted to address research question one.

***Research hypothesis 1*.** There is a statically significant relationship between the success of students in developmental math and student success in the general education course, Accounting I. The observed and expected frequencies presented in Table 5 are evidence of the significant relationship between success for students in developmental math courses and student success in in the general education course, Accounting I (X^2 =

9.28, *df* = 1, *p* = .002). More students were successful (*n* = 11) in developmental math and Accounting I than expected by chance (*n* = 7.3). More students were unsuccessful (*n* = 9) in both courses than expected by chance (*n* = 5.3).

Table 5

Crosstab for Developmental Math and Accounting I

Developmental Math			Accounting I		Total
			Successful	Not Successful	
	Successful	*O*	11	7	18
		E	7.3	10.7	
	Not Successful	*O*	0	9	9
		E	3.7	5.3	
	Total		11	16	27

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 2. There is a statistically significant relationship between the success of student in developmental math and student success in the general education course, Drawing I. The enrollment in developmental math and Drawing I was not sufficiently large enough to conduct an analysis of the relationship between the success in developmental math and success in the general education course, Drawing I.

Research hypothesis 3. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Introduction to Business. The observed and expected frequencies presented in Table 6 are evidence of a significant relationship between success for students in developmental math courses and success in the general education course,

Introduction to Business (X^2 = 6.11, *df* = 1, *p*. = .013). More students were successful (*n* = 11) in developmental math and Introduction to Business than expected by chance (*n* = 8.8). More students were unsuccessful in developmental math and Introduction to Business (*n* = 4) than expected by chance (*n* = 1.8).

Table 6

Crosstab for Developmental Math and Introduction to Business

Developmental Math			Introduction to Business		Total
			Successful	Not Successful	
	Successful	*O*	11	0	11
		E	8.8	2.2	
	Not Successful	*O*	5	4	9
		E	7.2	1.8	
	Total		16	4	20

Note: *O* = Observed Count, *E* = Expected Count.

***Research hypothesis 4*.** There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Introduction to Computer Concepts and Applications. The observed and expected frequencies presented in Table 7 are evidence of a significant relationship between success for students in developmental math courses and success in the general education course, Introduction to Computer Concepts and Applications (X^2 = 6.94, *df* = 1, *p*. = .008). More students (*n* = 16) were successful in developmental math and Introduction to Computer Concepts and Applications than expected by chance (*n* = 7.3).

More students were unsuccessful in developmental math and in Introduction to Computer Concepts and Applications (n = 13) than expected by chance (n = 8.8).

Table 7

Crosstab for Developmental Math and Introduction to Computer Concepts/Applications

Developmental Math			Introduction to Computer Concepts & Applications: Successful	Introduction to Computer Concepts & Applications: Not Successful	Total
	Successful	*O*	16	6	22
		E	11.8	10.2	
	Not Successful	*O*	6	13	19
		E	10.2	8.8	
	Total		22	19	41

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 5. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, U.S. History Since 1877. The observed and expected frequencies presented in Table 8 are evidence of the statistically significant relationship between success in developmental math courses and success in the general education course, U. S. History Since 1877 (X^2 = 4.87, df = 1, p. = .027). More students were successful (n = 11) than expected by chance (n = 7.7) in both the developmental math and U.S. History Since 1877. More students were unsuccessful (n = 14) in developmental math and History Since 1877 than expected by chance (n = 10.7).

Table 8

Crosstab for Developmental Math and History Since 1877

Developmental Math			History Since 1877		Total
			Successful	Not Successful	
	Successful	*O*	11	3	14
		E	7.7	6.3	
	Not Successful	*O*	10	14	24
		E	13.3	10.7	
	Total		21	17	38

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 6. There is a significant relationship between Student success in developmental math and student success in the general education course, Introduction to Theatre. The researcher concluded that the relationship was not statistically significant (X^2 = .353, *df* = 1, *p.* = .552).

Table 9

Crosstab for Developmental Math and Introduction to Theatre

Developmental Math			Introduction to Theatre		Total
			Successful	Not Successful	
	Successful	*O*	7	4	11
		E	6.4	4.6	
	Not Successful	*O*	4	4	8
		E	4.6	3.4	
	Total		11	8	19

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 7. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Introduction to Humanities. The observed and expected frequencies presented in Table 10 are evidence of a significant relationship between success for students in developmental math courses and success in the general education course, Introduction to Humanities ($X^2 = 7.80$, $df = 1$, $p. = .005$). More students were successful ($n = 9$) than expected by chance ($n = 5$). More students were unsuccessful ($n = 20$) in developmental math and Introduction to Humanities than expected by chance ($n = 16$).

Table 10

Crosstab for Developmental Math and Introduction to Humanities

Developmental Math			Introduction to Humanities		Total
			Successful	Not Successful	
	Successful	*O*	9	6	15
		E	5.0	10.0	
	Not Successful	*O*	4	20	24
		E	8.0	16.0	
	Total		13	26	39

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 8. There is a statistically significant relationship between the success of students in developmental math courses and student success in the general education course, Introduction to Sociology. The observed and expected frequencies presented in Table 11 are evidence of a significant relationship of success for students in developmental math and student success in the general education course, Introduction to Sociology ($X^2 = 12.40$, $df = 1$, $p. = .000$). More students ($n = 43$) were successful in both classes than expected by chance ($n = 34$). More students ($n = 30$) were unsuccessful in a developmental math and Introduction to Sociology than expected by chance ($n = 21$).

Table 11

Crosstab for Developmental Math and Introduction to Sociology

Developmental Math			Introduction to Sociology		Total
			Successful	Not Successful	
	Successful	*O*	43	22	65
		E	34.0	31.0	
	Not Successful	*O*	14	30	44
		E	23.0	21.0	
	Total		57	52	109

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 9. There is a statistically significant relationship between the success in developmental math courses and student success in the general education course, Composition I. The observed and expected frequencies presented in Table 12 are evidence of a significant relationship between success for students in developmental math and student success in Composition I ($X^2 = 52.33$, $df = 1$, $p. = .000$). More students in developmental math and Composition I were successful ($n = 94$) than was expected by chance ($n = 66.4$). More students ($n = 79$) were unsuccessful in developmental math and Composition I than expected by chance ($n = 51.4$). .

Table 12

Crosstab for Developmental Math and Composition I

Developmental Math			Composition I		Total
			Successful	Not Successful	
	Successful	*O*	94	27	121
		E	66.4	54.6	
	Not Successful	*O*	35	79	114
		E	62.6	51.4	
	Total		129	106	235

Note: *O* = Observed Count, *E* = Expected Count.

***Research hypothesis 10*.** There is a statically significant relationship between the success of students in developmental math courses and student success in the general education course, Principles of Biology. The observed and expected frequencies presented in Table 13 are evidence of a significant relationship between the success of students in developmental math and student success in Principles of Biology ($X^2 = 11.09$, $df = 1$, $p. = .001$). More students were successful in developmental math and Principles of Biology ($n = 12$) than expected by chance ($n = 6.5$). More students ($n = 30$) were unsuccessful in developmental math and Principles of Biology than expected by chance ($n = 24.5$).

Table 13

Crosstab for Developmental Math and Principles of Biology

Developmental Math			Principles of Biology		Total
			Successful	Not Successful	
	Successful	*O*	12	11	23
		E	6.5	16.5	
	Not Successful	*O*	4	30	34
		E	9.5	24.5	
	Total		16	41	57

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 11. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Principles of Biology Lab. The enrollment in developmental math and Principles of Biology Lab was not sufficiently large enough to conduct an analysis of the relationship between the success in developmental math and success in the general education course.

Research hypothesis 12. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Human Anatomy and Physiology. The enrollment in developmental math and Human Anatomy and Physiology was not sufficiently large enough to conduct an analysis of the relationship between the success in developmental math and success in the general education course.

Research hypothesis 13. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Introduction to Psychology. The observed and expected frequencies presented in Table 14 are evidence of a significant relationship of student success in developmental math and student success in the general education course, Introduction to Psychology ($X^2 = 54.63$, $df = 1$, $p. = .000$). More students were successful in developmental math and Introduction to Psychology ($n = 78$) than expected by chance (n = 49.8). More students were unsuccessful ($n = 98$) in developmental math and Introduction to Psychology than expected by chance ($n = 69.8$).

Table 14

Crosstab for Developmental Math and Introduction to Psychology

Developmental Math			Introduction to Psychology		Total
			Successful	Not Successful	
	Successful	*O*	78	37	115
		E	49.8	65.2	
	Not Successful	*O*	25	98	123
		E	53.2	69.8	
	Total		103	135	238

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 14. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Desktop Photo Manipulation I. The enrollment in developmental math and Desktop Photo Manipulation I was not sufficiently large enough to conduct an

analysis of the relationship between the success in developmental math and success in the general education course.

Research hypothesis 15. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, PC Applications: MS Office. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success in developmental math and success in PC Applications; MS Office.

Research hypothesis 16. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Introduction to Philosophy. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success in developmental math and success in Introduction to Philosophy.

Research hypothesis 17. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Interpersonal Communication. The observed and expected frequencies presented in Table 15 are evidence of a significant relationship of success for students in developmental math and student success in the general education course, Interpersonal Communication ($X^2 = 7.56$, $df = 1$, $p = .006$). More students were successful ($n = 28$) in developmental math and Interpersonal Communication than expected by chance ($n = 23.4$). More students were unsuccessful in developmental math and Interpersonal Communication ($n = 12$) than expected by chance ($n = 7.4$).

Table 15

Crosstab for Developmental Math and Interpersonal Communication

Developmental Math			Interpersonal Communication		Total
			Successful	Not Successful	
	Successful	*O*	28	3	31
		E	23.4	7.6	
	Not Successful	*O*	18	12	30
		E	22.6	7.4	
	Total		46	15	61

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 18. There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Business Math. There was not a sufficiently large enough enrollment to conduct an analysis of the relationship between success in developmental math and success in Business Math.

***Research hypothesis 19*.** There is a statistically significant relationship between the success of students in developmental math and student success in the general education course, Public Speaking. The observed and expected frequencies presented in Table 16 are evidence of a significant relationship of success for students in developmental math and student success in the general education course, Public Speaking (X^2 = 18.77, *df* = 1, *p*. = .000). More students were successful in developmental math and Public Speaking *(n* = 49) than expected by chance (*n* = 39.8). More students were

unsuccessful in developmental math and Public Speaking (n = 20) than expected by chance (n = 14.2).

Table 16

Crosstab for Developmental Math and Public Speaking

Developmental Math			Public Speaking		Total
			Successful	Not Successful	
	Successful	*O*	49	5	54
		E	39.8	14.2	
	Not Successful	*O*	21	20	41
		E	30.2	10.8	
	Total		70	25	95

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 20. There is a significant relationship between student success in developmental math and success of students in the general education course, Personal Communication. Enrollment was not sufficiently large enough to conduct an analysis of relationship between student success in developmental math and student success in Personal Communication.

Research question 2. To what extent is there a relationship between the success of students in developmental reading and writing and general education courses?

Two developmental reading courses, Fundamentals of Reading and Reading Skills Improvement, and two developmental writing courses, Writing Strategies and Introduction to Writing, were examined for success, along with the 20 general education courses. Eight of the twenty general education courses selected for this study did not

have sufficient enrollment to conduct an analysis of the relationship. The eight courses not included in tables include: Drawing I, Principles of Biology Lab, Human Anatomy and Physiology, Desktop Photo Manipulation I, PC Applications: MS Office, Introduction to Philosophy, Business Math, and Personal Communication.

Chi-square tests of independence using the twelve general education courses and the developmental reading and writing courses were used to determine if there was a significant relationship between the student success in the developmental reading and writing courses and student success in each general education course. Observed and expected frequencies are presented in Tables 17 - 28, using the developmental math courses for the row data and the 12 general education courses for the column data. These tables support the hypothesis tests that were conducted to address research question two.

Research hypothesis 21. There is a statistically significant relationship between student success in developmental reading and writing and success of students in the general education course, Accounting I. Using chi square test of independence the researcher found that there was a marginally significant relationship between student success in developmental math and student success in Accounting I as seen in Table 17. Students tended to be successful in both the developmental reading and writing courses and successful in the general education course, Accounting I ($X^2 = 3.20$, $df = 1$, $p. = .07$).

Table 17

Crosstab for Developmental Reading/Writing and Accounting I

Developmental Reading & Writing			Accounting I		Total
			Successful	Not Successful	
	Successful	*O*	1	3	4
		E	.3	3.8	
	Not Successful	*O*	0	12	12
		E	.8	11.3	
	Total		1	15	16

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 22. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Drawing I. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success in developmental reading and writing and success in Drawing I.

Research hypothesis 23. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Introduction to Business. The observed and expected frequencies presented in Table 18 are evidence of a significant relationship between student success in developmental reading and writing and student success in Introduction to Business ($X^2 = 8.93$, $df = 1$, $p. = .003$). More students were successful ($n = 9$) than expected ($n = 5.8$) by chance. More students were unsuccessful ($n = 7$) in developmental reading and writing and Introduction to Business than expected by chance ($n = 3.8$).

Table 18

Crosstab for Developmental Reading/Writing and Introduction to Business

Developmental Reading & Writing			Introduction to Business: Successful	Introduction to Business: Not Successful	Total
	Successful	*O*	9	1	10
		E	5.8	4.2	
	Not Successful	*O*	2	7	9
		E	5.2	3.8	
	Total		11	8	19

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 24. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Introduction to Computer Concepts and Applications. A chi-square test of independence was used to determine if there was a significant relationship between the student success in developmental reading and writing and student success in Introduction to Computer Concepts and Applications ($X^2 = 2.38$, $df = 1$, $p. = .123$). The relationship for success was marginally significant. There were more students successful ($n = 16$) in the developmental writing and reading courses and Introduction to Computer Concepts and Applications than expected by chance ($n = 11.8$). In addition, there were more students who were unsuccessful ($n = 10$) in a developmental reading and writing course and the general education course, Introduction to Computer Concepts and Applications than expected by chance ($n = 7.6$).

Table 19

Crosstab for Developmental Reading/Writing and Introduction to Computer Concepts & Applications

Developmental Reading & Writing			Introduction to Computer Concepts & Applications: Successful	Introduction to Computer Concepts & Applications: Not Successful	Total
	Successful	*O*	19	17	36
		E	16.6	19.4	
	Not Successful	*O*	4	10	14
		E	6.4	7.6	
	Total		23	27	50

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 25. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, U.S. History Since 1877. The observed and expected frequencies presented in Table 20 are evidence for the significant relationship of success for students in developmental reading and writing and student success in U.S. History Since 1877 ($X^2 = 5.95$, $df = 1$, $p. = .015$). More students were successful ($n = 7$) in developmental reading and writing courses and U. S. History Since 1877 than expected by chance ($n = 3.6$). More students were unsuccessful ($n = 7$) in developmental reading or writing courses and U. S. History Since 1877 than expected by chance ($n = 4.4$).

Table 20

Crosstab for Developmental Reading/Writing and History Since 1877

Developmental Reading & Writing			History Since 1877		Total
			Successful	Not Successful	
	Successful	*O*	7	1	8
		E	4.4	3.6	
	Not Successful	*O*	3	7	10
		E	5.6	4.4	
	Total		10	8	18

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 26. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Introduction to Theatre. The observed and expected frequencies presented in Table 21 are evidence that there was not a significant relationship between student success in developmental reading and writing and student success in Introduction to Theatre ($X^2 = 1.04$, $df = 1$, $p. = .308$).

Table 21

Crosstab for Developmental Reading/Writing and Introduction to Theatre

Developmental Reading & Writing			Introduction to Theatre		Total
			Successful	Not Successful	
	Successful	*O*	6	7	13
		E	5.1	7.9	
	Not Successful	*O*	1	4	5
		E	1.9	3.1	
	Total		7	11	18

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 27. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Introduction to Humanities. The observed and expected frequencies presented in Table 22 are evidence there was not a significant relationship between student success in developmental reading and writing and student success and success in Introduction to Humanities (X^2 = .00, *df* = 1, *p*. = .70).

Table 22

Crosstab for Developmental Reading/Writing and Introduction to Humanities

Developmental Reading & Writing			Introduction to Humanities		Total
			Successful	Not Successful	
	Successful	*O*	2	10	12
		E	2.0	10.0	
	Not Successful	*O*	2	10	12
		E	2.0	10.0	
	Total		4	20	24

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 28. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Introduction to Sociology. The observed and expected frequencies presented in Table 23 are evidence of a significant relationship between success in developmental reading and writing and success in Introduction to Sociology (X^2 = 19.61, *df* = 1, *p*. = .00). More students were successful (*n* = 25) in developmental reading and writing courses and Introduction to Sociology than expected by chance (*n* = 15.5). More students were unsuccessful (*n* = 34) in a developmental reading and writing and Introduction to Sociology than expected by chance (*n* = 24.5).

Table 23

Crosstab for Developmental Reading/Writing and Introduction to Sociology

Developmental Reading & Writing			Introduction to Sociology		Total
			Successful	Not Successful	
	Successful	*O*	25	21	46
		E	15.5	30.5	
	Not Successful	*O*	3	34	37
		E	12.5	24.5	
	Total		28	55	83

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 29. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Composition I. The observed and expected frequencies presented in Table 24 are evidence of a significant relationship between success in developmental reading and success in Composition I ($X^2 = 10.65$, $df = 1$, $p. = .001$). More students were successful ($n = 17$) in Composition I, and in developmental reading than expected by chance ($n = 11.5$). More students were unsuccessful ($n = 17$) in developmental reading and Composition I than expect by chance ($n = 11.5$).

Table 24

Crosstab for Developmental Reading and Composition I

Developmental Reading			Composition I		Total
			Successful	Not Successful	
	Successful	*O*	17	7	24
		E	11.5	12.5	
	Not Successful	*O*	5	17	22
		E	10.5	11.5	
	Total		22	24	46

Note: *O* = Observed Count, *E* = Expected Count.

***Research hypothesis 30*.** There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Principles of Biology. The observed and expected frequencies presented in Table 25 are evidence of a significant relationship between success in developmental reading and writing and success in Principles of Biology ($X^2 = 9.85$, $df = 1$, $p. = .002$). More students were successful ($n = 10$) in a developmental reading or writing course and Principles of Biology than expected by chance ($n = 5.8$). More students were unsuccessful in both ($n = 17$) than expected by chance ($n = 12.8$).

Table 25

Crosstab for Developmental Reading/Writing and Principles of Biology

Developmental Reading & Writing			Principles of Biology		Total
			Successful	Not Successful	
	Successful	*O*	10	13	23
		E	5.8	17..3	
	Not Successful	*O*	0	17	17
		E	4.3	12.8	
	Total		10	30	40

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 31. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Principles of Biology Lab. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success in developmental reading and writing and success in Principles of Biology Lab.

Research hypothesis 32. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Human Anatomy and Physiology. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success in developmental reading and writing and success in Human Anatomy and Physiology.

Research hypothesis 33. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Introduction to Psychology. The observed and expected

frequencies presented in Table 26 are evidence of a significant relationship between success of students in developmental reading and writing and student success in the general education course, Introduction to Psychology (X^2 = 56.28, *df* = 1, *p*. = .000). More students were successful in developmental reading and writing and Introduction to Psychology (*n* = 79) than expected by chance (*n* = 51.1). More students were unsuccessful in both (*n* = 92) than expected by chance (*n* = 64.1).

Table 26

Crosstab for Developmental Reading/Writing and Introduction to Psychology

Developmental Reading & Writing			Introduction to Psychology		Total
			Successful	Not Successful	
	Successful	*O*	79	52	131
		E	51.1	79.9	
	Not Successful	*O*	13	92	105
		E	40.9	64.1	
	Total		92	144	236

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 34. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Desktop Photo Manipulation I. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success in developmental reading and writing and success in Desktop Photo Manipulation I

Research hypothesis 35. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the

general education course, PC Applications: MS Office. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success developmental reading and writing and success in PC Applications: MS Office.

Research hypothesis 36. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Introduction to Philosophy. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success in developmental reading and writing and success in Desktop Photo Manipulation I.

Research hypothesis 37. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Interpersonal Communication. The observed and expected frequencies presented in Table 27 are evidence of a significant relationship between success for students in developmental reading and writing and student success in Interpersonal Communication ($X^2 = 21.11$, $df = 1$, $p = .000$). More students were successful ($n = 30$) in developmental reading and writing and Interpersonal Communication than expected by chance ($n = 20.6$). More students were unsuccessful ($n = 23$) in developmental reading and writing and Interpersonal Communication than expected by chance ($n = 13.6$).

Table 27

Crosstab for Developmental Reading/Writing and Interpersonal Communication

Developmental Reading & Writing			Interpersonal Communication: Successful	Interpersonal Communication: Not Successful	Total
	Successful	*O*	30	6	36
		E	20.6	15.4	
	Not Successful	*O*	9	23	32
		E	18.4	13.6	
	Total		39	29	68

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 38. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Business Math. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success in a developmental reading and writing course and success in Business Math.

Research hypothesis 39. There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Public Speaking. The observed and expected frequencies presented in Table 28 are evidence of a significant relationship of success for students in developmental reading and writing and student success in Public Speaking (X^2= 18.94, *df* = 1, *p* = .000). More students were successful in both developmental reading and writing and Public Speaking (*n* = 27) than expected by chance (*n* = 19.2). More students were unsuccessful (*n* = 17) than expected by chance (*n* = 9.2)

Table 28

Crosstab for Developmental Reading/Writing and Public Speaking

Developmental Reading & Writing			Public Speaking: Successful	Public Speaking: Not Successful	Total
	Successful	*O*	27	6	33
		E	19.2	13.8	
	Not Successful	*O*	5	17	22
		E	12.8	9.2	
	Total		32	23	55

Note: *O* = Observed Count, *E* = Expected Count.

***Research hypothesis 40*.** There is a statistically significant relationship between the success of students in developmental reading and writing and student success in the general education course, Personal Communication. Enrollment was not sufficiently large enough to conduct an analysis of the relationship between success in developmental reading and writing and success in Personal Communication.

Research question 3. Is there a relationship between ethnicity and the success of students in developmental courses?

For the purpose of this study, the researcher used two groups: a sample of students self-reporting they were Caucasian and students self-reporting all other ethnicities. The number of students reporting Caucasian as their ethnicity equaled 452. There were 267 students reporting they were non-Caucasian, and 103 students did not report their ethnicity. Observed and expected frequencies are presented in Tables 29 – 34, using ethnicity for the row data and the six developmental education courses for the

column data. These tables support the hypothesis tests that were conducted to address research question three.

Research hypothesis 41. There is a relationship between ethnicity and the success of students in the developmental course, Fundamentals of Math. A chi-square test of independence was used to determine if ethnicity is related to the success of students enrolled in Fundamentals of Math. The contingency table of observed and expected frequencies is illustrated in Table 29, and illustrates the statistically significant relationship of success between ethnicity and Fundamentals of Math (X^2= 3.78, df = 1, p = .03). More Caucasian students were successful (n = 201) than expected by chance (n = 190).

Table 29

Crosstab for Ethnicity and Fundamentals of Math

			Fundamentals of Math		
Ethnicity			Successful	Unsuccessful	Total
	Caucasian	*O*	201	87	288
		E	190.0	97.9	
	Non Caucasian	*O*	168	103	271
		E	178.9	92.1	
	Total		369	190	559

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 42. There is a relationship between ethnicity and the success of students in the developmental course, Elementary Algebra, as illustrated in Table 30. A chi-square test of independence was used to determine if ethnicity is related

to the success of students enrolled in the developmental math course, Elementary Algebra. The relationship between the success of Caucasian students and non-Caucasian students and Elementary Algebra was not significant (X^2= 1.22, *df* = 1, *p* = .16).

Table 30

Crosstab for Ethnicity and Elementary Algebra

			Elementary Algebra		
Ethnicity			Successful	Unsuccessful	Total
	Caucasian	*O*	88	49	137
		E	92.5	44.5	
	Non Caucasian	*O*	120	51	171
		E	115.5	55.5	
	Total		208	100	308

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 43. There is a relationship between ethnicity and the success of students in the developmental course, Writing Strategies. Table 31 illustrates the relationship between ethnicity and success of students in Writing Strategies. The researcher concluded that the relationship was not statistically significant (X^2 = 2.51, *df* = 1, *p*. = .113).

Table 31

Crosstab for Ethnicity and Writing Strategies

Ethnicity			Writing Strategies		Total
			Successful	Unsuccessful	
	Caucasian	*O*	36	37	73
		E	51.1	31.9	
	Non Caucasian	*O*	62	39	101
		E	56.9	44.1	
	Total		98	76	174

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 44. There is a relationship between ethnicity and the success of students in the developmental course, Writing Strategies. Table 32 illustrates the relationship between ethnicity and success of students in in Introduction to Writing. The researcher concluded that the relationship was not statistically significant (X^2 = .437, *df* = 1, *p.* = .509).

Table 32

Crosstab for Ethnicity and Introduction to Writing

Ethnicity			Introduction to Writing		Total
			Successful	Unsuccessful	
	Caucasian	*O*	154	83	237
		E	150.9	86.1	
	Non Caucasian	*O*	95	59	154
		E	98.1	55.9	
	Total		249	142	391

Note: *O* = Observed Count, *E* = Expected Count.

***Research hypothesis 45*.** There is a relationship between ethnicity and the success of students in the developmental course, Fundamentals of Reading. Table 33 illustrates the relationship between ethnicity and success of students in Fundamentals of Reading. The researcher concluded that the relationship was not statistically significant (X^2 = .023, *df* = 1, *p*. = .879).

Table 33

Crosstab for Ethnicity and Fundamentals of Reading

Ethnicity			Fundamentals of Reading		Total
			Successful	Unsuccessful	
	Caucasian	*O*	31	28	59
		E	31.4	27.6	
	Non Caucasian	*O*	27	23	50
		E	26.6	23.4	
	Total		58	51	109

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 46. There is a relationship between ethnicity and the success of students in the developmental course, Reading Skills Improvement. Table 34 illustrates the relationship between ethnicity and success of students in Reading Skills Improvement. The researcher concluded that the relationship was not statistically significant (X^2 = .006, *df* = 1, *p.* = .937).

Table 34

Crosstab for Ethnicity and Reading Skills Improvement

Ethnicity			Reading Skills Improvement		Total
			Successful	Unsuccessful	
	Caucasian	*O*	235	22	257
		E	235.2	21.8	
	Non Caucasian	*O*	165	15	180
		E	164.8	15.2	
	Total		400	37	437

Note: *O* = Observed Count, *E* = Expected Count.

Research question 4. Is there a relationship between age and student success in developmental courses?

For the purpose of this study, the researcher grouped students 18-24 as traditional students, and students 25 or older as non-traditional students. The study sample included 720 students who self-reported they were 18-24 years of age, and 102 self-reported they were 25 years of age or older. Observed and expected frequencies are presented in Tables 35 – 40, using age for the row data and the six developmental education courses for the column data. These tables support the hypothesis tests that were conducted to address research question four.

***Research hypothesis 47*.** There is a relationship between the age of students and the success of students in the developmental course, Fundamentals of Math. The observed and expected frequencies presented in Table 35 are evidence of a significant relationship between student age and Fundamentals of Math (X^2= .5.04, df = 1, p = .01).

More nontraditional-aged students were successful *(n* = 271) than expected by chance (*n* = 262.5). More traditional-aged students were unsuccessful (*n* = 42) than expected by chance (*n* = 33.5).

Table 35

Crosstab for Age and Fundamentals of Math

			Fundamentals of Math		
Age			Successful	Unsuccessful	Total
	Traditional	*O*	280	42	322
		E	288.5	33.5	
	Nontraditional	*O*	271	22	293
		E	262.5	30.5	
	Total		551	64	615

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 48. There is a relationship between age of students and the success of students in the developmental course, Elementary Algebra. The observed and expected frequencies presented in Table 36 are evidence that there was not a significant relationship between student age and Fundamentals of Math (X^2= .20, *df* = 1, *p* = .39).

Table 36

Crosstab for Age and Introduction to Algebra

Age			Introduction to Algebra		Total
			Successful	Unsuccessful	
	Traditional	*O*	135	16	151
		E	133.7	17.3	
	Nontraditional	*O*	166	23	189
		E	167.3	21.7	
	Total		301	39	340

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 49. There is a relationship between age of students and the success of students in Writing Strategies. The researcher concluded that the relationship was not statistically significant (X^2= .260, *df* = 1, *p* = .42).

Table 37

Crosstab for Age and Writing Strategies

Age			Writing Strategies		Total
			Successful	Unsuccessful	
	Traditional	*O*	74	5	79
		E	74.8	4.2	
	Nontraditional	*O*	103	5	108
		E	102.2	5.8	
	Total		177	10	187

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 50. There is a relationship between age of students and the success of students in the developmental course, Introduction to Writing. The researcher concluded that the relationship was not statistically significant (X^2= .007, *df* = 1, *p* = .53).

Table 38

Crosstab for Age and Introduction to Writing

			Introduction to Writing		
Age			Successful	Unsuccessful	Total
	Traditional	*O*	235	22	257
		E	235.2	21.8	
	Nontraditional	*O*	165	15	180
		E	164.8	15.2	
	Total		400	37	437

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 51. There is a relationship between age of students and the success of students in the developmental course, Fundamentals of Reading. The researcher concluded that the relationship was not statistically significant (X^2= 1.29, *df* = 1, *p* = .23).

Table 39

Crosstab for Age and Fundamentals of Reading

Age			Fundamentals of Reading		Total
			Successful	Unsuccessful	
	Traditional	*O*	65	2	67
		E	63.7	3.4	
	Nontraditional	*O*	49	4	53
		E	50.4	2.7	
	Total		114	6	120

Note: *O* = Observed Count, *E* = Expected Count.

Research hypothesis 52. There is a relationship between age of students and the success of students in the developmental course, Reading Skills Improvement. The researcher concluded that the relationship was not statistically significant (X^2= .164, *df* = 1, *p* = .42).

Table 40

Crosstab for Age and Reading Skills Improvement

Age			Reading Skills Improvement		Total
			Successful	Unsuccessful	
	Traditional	*O*	190	16	206
		E	191.0	15.0	
	Nontraditional	*O*	154	11	165
		E	153.0	12.0	
	Total		344	27	371

Note: *O* = Observed Count, *E* = Expected Count.

Summary

Quantitative data analysis of the success of students in developmental courses and general education courses revealed a significant relationship between students who were successful in both developmental and general education courses or unsuccessful in both levels of courses. The observed and expected frequencies for the success in developmental math and success in the general education courses showed evidence that in 11 of the 12 analyzed there was a statistically significant relationship between student success in developmental math and student success in general education courses. The only course analyzed that did not show a significant relationship between the student success in developmental math and student success in the general education course was Introduction to Theatre.

The observed and expected frequencies for the relationship between success in developmental reading and writing and the 12 general education courses analyzed

showed evidence that eight courses had a significant relationship between student success in developmental math and student success in the general education courses. There were statistically significant relationships between the success of students in developmental reading and writing and student success in the following general education courses: Introduction to Business, U.S History Since 1877, Introduction to Sociology, Composition I, Principles of Biology, Introduction to Psychology, Interpersonal Communication, and Public Speaking.

The researcher also examined the relationship between ethnicity and success in developmental math, reading and writing courses. There was one statistically significant relationship found between ethnicity and success in developmental math, Fundamentals of Math. Lastly, the researcher explored if age of students was related to student success in developmental math, reading, and writing. Again, there was one statistically significant relationship found between age and success in a developmental course was for Fundamentals of Math. The next chapter includes a summary of the study, analysis of the results of chapter four, and implications for further research.

Chapter Five

Interpretation and Recommendations

Thousands of incoming students are underprepared for the academic rigors of college-level courses, and students who need to take developmental education courses are less likely to persist (Laskey. & Hetzel, 2011; Strong American School's Project, 2008). This study provided evidence that there is a relationship between success in developmental courses and success in college-level general education courses during the same semester. Chapter one of this study presented the conceptual framework, the purpose, the background and significance of the investigation. A review of related literature regarding community colleges, developmental education, age and ethnicity of community college students was explored in chapter two. Chapter three described the research method and data collection methods. The results of the hypothesis testing were discussed in chapter four. This chapter begins with a summary of the study, an overview of the problem explored, and the methodology used in the study. This chapter also includes a discussion of the finding related to literature, and concludes with implications for implementation and recommendations for further research.

Summary of the Study

Finding ways to help students through developmental education increases their chances for successful completion (Bailey, 2011). For many college students, academic success equals persistence. This study provided evidence that there is a relationship between student success in developmental education courses and student success in general education courses. In 11 of the 12 general education courses analyzed, there was a statistically significant relationship between student success in developmental math and

student success in the general education courses. When students are academically successful, it increases their chances of retention and completion. The study also indicated that students' ethnicity was not related to student success in the developmental math, reading and writing courses. When examining the relationship between the age of students and the success of students in developmental math, reading and writing, the only course that showed evidence of a significant relationship was Fundamentals of Math. The non-traditionally aged students were more successful than expected by chance, and the traditional-aged students were more unsuccessful than expected by chance.

Overview of the problem. Each year, the number of students needing remedial education in higher-learning institutions increases (CollegeBoard, 2011). States and even the nation are not only paying for students to take developmental education, but they are experiencing a financial loss because students who "need remediation are more likely to leave college without a degree, becoming more likely to earn less than if they had gotten a college diploma" (Kraman, D'Amico, & Williams, 2006, p. 15). Faculty and staff at Johnson County Community College have struggled to find methods to increase retention of students who test into developmental education courses.

Purpose statement and research questions. The purpose of the study was to determine if students could be successful in general education courses during the same semester they were taking developmental courses. The second purpose of the study was to determine if there was a relationship between age or ethnicity and success of students in developmental education courses.

Review of the methodology. This quantitative research study involved a sample of full-time, first-time students who tested into one of more remedial courses when taking

entrance placement tests at Johnson County Community College. Developmental courses used in the study included two levels of math, English, and reading. The researcher selected 20 general education courses that have been used regularly by students who test into developmental education. However, eight of the selected courses did not have sufficient enrollment to conduct an analysis of the relationship of success between the developmental courses and the general education courses. Therefore, only 12 of the general education courses were analyzed. The six developmental courses analyzed were Fundamentals of Math, Elementary Math, Writing Strategies, Introduction to Writing, Fundamentals of Reading, and Reading Skills Improvement. Using chi square tests of independence, courses were analyzed for the relationship of success of students in a developmental course and a general education course.

Age and ethnicity of students were each divided into two categories. For this study ethnicity was divided into two categories: Caucasian and non-Caucasian. For age, students 18-24 years of age were labeled traditional, and students 25 years of age or older were labeled nontraditional. Developmental courses included: Fundamentals of Math, Elementary Math, Writing Strategies, Introduction to Writing, Fundamentals of Reading, and Reading Skills Improvement. The researcher used a chi square test of independence to determine if there was a statistically significant relationship between ethnicity or age and student success in the developmental courses.

Major findings. Using chi squares of independence to analyze the success of students in individual general education courses and developmental courses, the evidence showed the likelihood that if students were successful in developmental education courses, they were also successful in their general education courses. The results of the

analysis of quantitative data provided additional information that the age of students in developmental education did not have a significant relationship to success, except in the first level course of developmental math. Additional information was that there was a statistically significant relationship between ethnicity and success in Fundamentals of Math.

The researcher studied the relationship between the success of students in developmental courses and student success in the general education college-level courses. There were statistically significant relationships between the success of students in developmental math and success in college-level courses Accounting I, Introduction to Business, Introduction to Computer Concepts and Applications, U.S. History Since 1877, Introduction to Humanities, Introduction to Sociology, Composition I, Principles of Biology, Introduction to Psychology, Interpersonal Communication, and Public Speaking. There was no statistically significant relationship between success of students in developmental math and the general education course, Introduction to Theatre. However, there was a marginally significant relationship, and more students were successful in Introduction to Theatre and developmental math than expected by chance. The quantitative data suggested that in 11 of the 12 courses analyzed, if students are successful in either the developmental math course, they were successful in the general education course. Additionally, if students were unsuccessful in developmental math, they were unsuccessful in the general education course.

The second finding involved developmental reading and writing courses and the general education courses Accounting I, Introduction to Business, Introduction to Computer Concepts and Applications, U.S. History Since 1877, Introduction to Theatre,

Introduction to Humanities, Introduction to Sociology, Composition I, Principles of Biology, Introduction to Psychology, Interpersonal Communication, and Public Speaking. Statistical analysis revealed there were no significant relationships between the developmental reading and writing courses, and the general education courses tested including Accounting I, Introduction to Computer Concepts and Applications, Introduction to Theatre, and Introduction to Humanities. This researcher concluded that even though there was a significant relationship between student success in developmental reading and writing and student success in eight of the twelve general education courses, the relationship needs further study.

In addition, the researcher's analysis included exploring if there is a relationship between ethnicity or age and the success of students in developmental courses. In analyzing the success of Caucasian and non-Caucasian students, data showed that there was a significant relationship between ethnicity and the success of students in the developmental math course, Fundamentals of Math. The only course that showed that age had a statistically significant relationship in the success of students was Fundamentals of Math. Students 25 or older were significantly more successful than the traditional aged students 18-24 years of age.

Findings Related to the Literature. Studies have shown that nearly 60% of students leaving high schools will need remedial classes before taking college-level courses (Bill & Melinda Gates Foundation, 2012). It is not uncommon for universities to have entrance requirements that prevent the need for offering remedial coursework, but community colleges are open-admission institutions and must provide remedial education to students who need it. Community colleges also have a larger population of first-

generation college students than universities, and typically a more diverse population, and both populations, according to research, have a higher probability of needing remedial education when they begin college (Bulakowski, Jumisko, & Weissman, 1998; Bulger & Watson, 2006).

There is a body of evidence that suggests that students who place into college developmental courses very seldom finish the sequence of remedial courses required to enter college-level courses (Bailey, 2011; Ozz, 2012; Wagner, 2008;). There are two theories that consider the best method to help students succeed through their developmental coursework. Some experts have found that extra support to assist students in their remedial courses is necessary (Esch, 2009; Wathington, Pretlow, & Mitchell, 2011). Others support the idea that students' remedial coursework should be accelerated or blended with college-level courses (Edgecombe, 2011; Jenkins, Speroni, et. al., 2010). This study supports both theories. This researcher found statistically significant relationships between the success of students in developmental math and student success in 11 of the 12 general education courses analyzed. Hypothesis one in this study stated that there was a relationship between student success in developmental math and student success in general education courses. Contingency tables of observed and expected frequencies provided evidence that if students are successful in developmental math, they will be successful in general education courses.

Findings from this study can also support the theory that students need extra support to help them through remedial coursework. The contingency tables of observed and expected frequencies were evidence that there were statistically significant relationships between success of students in developmental reading and writing and

success in a general education course occurred in eight of the twelve general education courses tested. Hypothesis two stated that there was a relationship between the success of students in developmental reading and writing and student success in general education courses. Data supports the theory that colleges need to find ways to help students succeed by providing additional resources.

The literature also supports the fact that more non-Caucasian students place in developmental courses than Caucasians (Bulakowski, Jumisko, & Weissman, 1998; McCurrie, 2012). In this study out of the sample population of 719 students who tested into developmental courses and reported their ethnicity, 267 were non-Caucasian or 37.1%. Given that the general population at JCCC has 26.2% non-Caucasian students, this study supported the theory that more non-Caucasians test into developmental courses than Caucasian students. The literature supported the idea that non-Caucasian students are not as successful in developmental courses as Caucasian students. Hypothesis three of this study stated that there would be a relationship between ethnicity and success in the six developmental courses.

Contingency tables of observed and expected frequencies provided evidence that none of the six developmental courses tested showed a statistically significant relationship between ethnicity and success of students. This researcher found a marginally significant relationship between ethnicity and the success of students in the developmental course, Fundamentals of Math. More Caucasian students were successful in Fundamentals of Math than expected by chance. However, in the other five tables using the developmental math, reading and writing courses, there were no other significant relationships between ethnicity and success in a developmental course.

Literature supported the theory that traditional-aged students did not do as well as non-traditional students in developmental courses (Bailey, Calcagno, Crosta & Jenkins, 2007). Other literature supported the idea that students receiving poor preparation in high school will not persist through the developmental courses (Fletcher & Tienda, 2008; Kraman, D'Amico, & Williams, 2006; Wathington, Pretlow & Mitchell, 2011). Research also revealed that older, returning adults are often in need of review of concepts and can more easily succeed in college-level courses (Karp & Bork, 2012). This study's Hypothesis four stated that there was a relationship between age and the success of students in developmental courses. However, this study's findings did not support the literature that nontraditional students are more successful. The only course tested that showed a statistically significant relationship between age and success in developmental courses was in the first level developmental math course, Fundamentals of Math. Nontraditional students were more successful than traditional-aged students. In all other of the developmental courses, no significant relationships were found between age of students and the success of students.

Recently, remedial education has been the focus of much research, and it has become a political debate because of Obama's goal that colleges graduate five million more students by 2020 (Merisotis, 2012a). Improving developmental education is necessary and is a challenge for community colleges to meet the mandate (Gonzalez, 2012). Remediation is expensive and research does not support one method or program that fits all colleges. Many believe that state policies should allow public institutions the flexibility to approach remediation in whatever method is best for that institution (Fain, 2012).

Conclusions

Implications for action. The results of this study provide implications for further research and action. The study showed a direct correlation between the student success, or nonsuccess, in both college-level courses and developmental courses. A possible action for Johnson County Community College is to limit the college-level courses for students taking developmental education courses to provide structured and intentional support to students to assure their success. The New York City University system opened a unique New Community College that gives students very little choices of classes. The college is using a "resource-intensive approach" to education with mandatory weekly sessions with advisers (Perez-Pena, 2012, pp. 6). JCCC would benefit from looking at successful models of programs to help students in developmental education succeed and graduate.

Recommendations for future research

This researcher examined the relationship between the success of students in developmental courses and college-level courses. Additionally, the researcher examined the influence age or ethnicity had on the success of students in remedial courses. The results of this study show evidence for the need to conduct further research to strengthen the findings that there is a correlation between the success of students in developmental courses and success in general education courses.

Attitudes play an important role for academic success. A researcher could conduct a survey using a Hope Scale survey to determine if attitude contributes to the success or failure of students in remedial and college-level courses. The Hope Scale is a probable predictor of success for students (Snyder, C., 1995). In addition to the Hope

Scale survey further research could include interviews with students to determine their academic goals, demographic backgrounds, and preparation for college studies.

Another factor that needs to be further explored is the validity of placement scores. Two studies from the Community College Research Center at Columbia University found that often there are mistakes involving the community colleges who use COMPASS placement tests. Students do not understand the importance of doing well on the placement tests, and they are often unprepared for the exam, not the coursework (Lewin,, 2012).

Even when students understand the importance of the placement test, the scores vary greatly, with the lower numbers representing a lower grasp of the reading, writing or math. Further research could include a breakdown of the placement scores to determine if the lower levels were the ones who were unsuccessful in the developmental and college-level courses.

Further research might include an analysis of the demographics of the students, including age, ethnicity, and secondary education. The average age of students at JCCC is currently 23. The county has a growing Hispanic population, but currently the United States Census Bureau shows 88.2% of the population is Caucasian. In addition, 51.1% of Johnson County's residents have bachelor's degrees, increasing the difficulty to meet a goal to significantly increase graduation numbers (U. S. Census Bureau, 2012).

Concluding Remarks

In June 2012, the U. S. Chamber of Commerce published a report titled *Leaders and Laggards: A State-by-State Report Card on Public Postsecondary Education* stating that only "One state has a statewide graduation rate greater than 50%. Thirty-three states

have two-year completion rates at or below 25%" (2012, p. 6). The issue of completion is directly related to retention and retention is dependent upon academic success. "Research shows that the leading predictor that a student will drop out of college is the need for remedial education" (Kraman, D'Amico, & Williams, 2006, p. 14). The research from this study strengthens the evidence that students who test into remedial education can be successful in concurrently-enrolled college-level courses. It is imperative to continue the research to determine why students are more successful than expected in developmental courses.

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Appendix A: Permission to Use JCCC Data

JCCC Johnson County Community College
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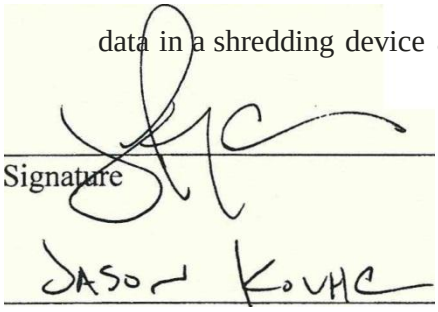
Permission to use the data

Ruth I. Randall, Baker University doctoral student, has my permission to use the following 2006, 2007, 2008, 2009, and 2010 course student data from Johnson County Community College's private database. Age, ethnicity and GPA information will be used, as well as ACT COMPASS information. Ms. Randall's study, Predictors of Success for Remedial Students in College Level Coursework at a Community College, will also have access to students' enrollment during the academic years listed above. The JCCC staff will remove all personally identifiable information and use a numeric value to code the data prior to giving data to Ms. Randall for use in her study. Ruth I. Randall has agreed to destroy the data in a shredding device after three years. There will be no contact with human subjects.



Signature

JASON KOHL

Name

Executive Director, Academic Initiatives
Title

Appendix B: Baker University IRB Permission

BAKER UNIVERSITY
Own Confidence

July 06, 2012

Dear Ms. Randall:

The Baker University IRB has reviewed your research project application (M-0139-0705-0706-G) and approved this project under Exempt Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

The Baker University IRB requires that your consent form must include the date of approval and expiration date (one year from today). Please be aware of the following:

1. At designated intervals (usually annually) until the project is completed, a Project Status Report must be returned to the IRB.
2. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
3. Notify the OIR about any new investigators not named in original application.
4. Any injury to a subject because of the research procedure must be reported to the IRB Chair or representative immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform Office of Institutional Research (OIR) or myself when this project is terminated. As noted above, you must also provide OIR with an annual status report and receive approval for maintaining your status. If your project receives funding which requests an annual update approval, you must request this from the IRB one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Carolyn Doolittle, EdD
Chair, Baker University IRB

Appendix C: General Education Course Descriptions Selected for Study

ACCT 121	Accounting I is an introduction to accounting fundamentals. Upon successful completion of this course, a student should be able to analyze transactions, use various journals and ledgers, prepare financial statements and summarize results at the close of the fiscal period for the sole proprietorship.
ART 130	Drawing I is an introductory course with an emphasis on the development of fundamental drawing skills, increased power of observation and an awareness of the personally expressive and compositional aspects of drawing.
BIOL 121	Principles of Biology is an introduction to selected concepts and principles important to understanding how biological systems operate.
BIOL 122	Principles of Biology Lab examines basic biological concepts by focusing on the structures and functions of plants and animals.
BIOL 144	Human Anatomy & Physiology provides basic knowledge on human structures and their function. Students will study the relationship of structures to function in the organ systems of the human body. Emphasis will be on the identification of the anatomical features and their functions.
BUS 121	Introduction to Business explains the basic principles of the American free enterprise economic system. In addition, the student should be able to explain the fundamentals of starting a business and the interrelationship among the four functional areas: accounting, finance, management and marketing.

CIS 124	Introduction to Computer Concepts and Applications is an introductory, nontechnical computer course, students study computing concepts, terminology, issues and uses. Extensive hands-on experience with the microcomputer is provided using business applications and the operating system to reinforce the concepts.
CPCA 128	PC Applications: MS Office is designed to give the beginning computer user an overview of the personal computer. The student will gain confidence in basic computing skills and concepts through a hands-on approach. Topics include an introduction to computer terminology, hardware, system software, application software, e-mail, and the Internet.
CDTP 135	Desktop Photo Manipulation I: Photoshop teaches students to manipulate digital photographs and images using a variety of basic techniques on either the Macintosh or PC computer platform. Students apply techniques to correct, repair, retouch, create selections, and work with layers on a variety of digital photographs and images, including basic scanning techniques.
ENGL 121	Composition focuses on writing nonfiction prose suitable in its expression and content to both its occasion and its audience. Students will have an opportunity to improve in all phases of the writing process: discovering ideas, gathering information, planning and organizing, drafting, revising and editing.
HIST 121	US History Since 1877 is a survey course that emphasizes development and trends in American society from the 1870s to the late twentieth

century. Topics will include the Reconstruction era, industrialization, immigration, reform movements, World Wars I and II, social and cultural trends, and foreign policy. Emphasis will be on analysis and interpretation of these developments.

HUM 122 Introduction to Humanities is an interdisciplinary study, looking at artistic and technical elements of several art forms, including painting, sculpture, architecture, music, theater, film, dance and literature. Major themes expressed in the works and their reflection of the values of their culture are also examined

MATH 120 Business Math is a course for the student who needs specific skills in mathematics to address business problems and business applications. Students will learn the mathematics involved in payroll, retailing, asset valuation, interest, finance, and the time value of money. Students will use a calculator and computer to solve a variety of applications.

PHIL 124 Introduction to Philosophy introduces students to the basic questions of philosophical inquiry, such as the nature of being, and the ways humans acquire knowledge and moral, social, religious and political values. Emphasis is on the application of the study of traditional problems of philosophy to the study of contemporary society

PSYC 130 Introduction to Psychology is a basic introduction to psychology and includes the study of biological aspects of behavior, the brain, consciousness, sensation and perception, motivation and emotion, stress,

maturation and development, learning and memory, normal and abnormal personality, and social psychology.

SOC 122 Introduction to Sociology introduces students to sociology, the "science of society," and its approach to human social life. The course shows students how sociologists conduct research, and it describes the basic concepts and theories sociologists use to explain the social world.

SPD 120 Interpersonal Communication focuses on the principles of effective speech communication in small group and one-to-one relationships. Theory and practice of interpersonal communication are studied and applied to a variety of life situations. The course focuses on perception, self-concept, listening, conflict, language, nonverbal communication and culture as they relate to interpersonal relationships.

SPD 121 Public Speaking is designed to meet the needs of people who wish to improve their ability to prepare and deliver effective oral presentations before an audience. This fundamental speech course emphasizes creation of ideas, research techniques, outlining, audience analysis, organization and delivery techniques. Students will deliver a variety of speech types including informative and persuasive.

SPD 125 Personal Communication is concerned with the most frequently used human communication skills, interpersonal communication and public speaking. The course demonstrates the natural relationships between communicating one-to-one and in public, showing that skills in one can be employed in the other and giving practice in both. Focus is on

communication theory, listening, concepts of self, language, research techniques, perception and various types of public speaking, such as impromptu, group panel, informative and persuasive.

THEA 120 Introduction to Theatre introduces students to a variety of theatrical experiences, read great plays and see live theater presentations. They also will discuss theater practices, dramatic literature and the history of the theater (Johnson County Community College course descriptions, 2011)