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Instructional Technology and Self-Directed Learning For Students' Academic Success

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INSTRUCTIONAL TECHNOLOGY AND SELF-DIRECTED LEARNING FOR STUDENTS' ACADEMIC SUCCESS

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Abstract

Student achievement in the public education system of the United States is ranked substantially lower compared to other countries. One of the initiated goals proposed by the United States government is to increase the number of college graduates by partnering with community colleges (Office of the Press Secretary, 2015). Community colleges are open enrollment institutions, which often assist students described as at-risk. To serve the community college population of students, special curricular strategies have been implemented.

One tool identified for meeting the goal of increasing college graduation for the population of students at-risk is utilization of instructional technology. Instructional technology, assists students, at-risk, by providing them with tutorials for basic skills and critical thinking. However, a significant achievement gap still exists between performing and underperforming students in community colleges. If the achievement gap is ignored, there is a possibility that the gap will continue to exist and possibly increase.

The purpose of this study was to further understand the use of instructional technology in education to achieve students' academic success, specifically focusing on students in pre-credit community college courses. In addition to the focus on instructional technology, this study concerned itself with students' level of self-directed learning to achieve academic success. This study was conducted in the Summer 2014 and Fall 2014 semester at an urban community college. The study used Murphy's Computer Self-Efficacy (CSE) scale to measure students comfort level in using technology, Guglielmino's Self-Directed Learning Readiness (SDLR) scale to measure students' level of learning style, students' final course grade to assess the traditional metrics for students' academic success, and O'Brien's Career Aspiration Scale (CAS) as an alternate scale to assess students' academic success.

This study did not find significant correlation between self-directed learning, instructional technology, and students' final course grade. However, this study did find significant correlation between self-directed learning, instructional technology, and students' career aspiration. Further research is needed to better understand how to use instructional technology and self-directed learning to assist community college students who are at risk to achieve academic success.

Key Words: Academic Success, At-risk Students, College and Career Aspiration, Community College, Instructional Technology, Self-Directed Learning, Standardized Tests, Students of Color, Underperforming Students

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Dedication

I dedicate this achievement to my family. Thank you Herbert Henderson, my lifelong partner who continues to support me and provide a strong foundation in making dreams come true. Thank you Cynthia Crowe, my sister who has been my support system since I was a little boy and challenged me to not limit the possibilities of what I can achieve. In memory of AnCynthia Wiggins, my mother who supports me from heaven and who taught me the importance of education. In memory of George Wiggins, Jr. and Cornel Wiggins, Sr., my father and brother who taught me the courage in taking on the challenges in life. Finally, I dedicate this achievement to my family members and best friends that have always been there when I needed them and a special thank you to those who took every step with me - Veronica Smith, Cassandra Stephens, and Dianne White.

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Chapter One

Introduction

The United States needs to be globally competitive. This means there is a need for a highly trained workforce skilled to fill the void in science, technology, engineering, and mathematic (STEM) career positions. Currently on a global level, the educational system of the United States is under-performing, as compared to other countries. The 2012 and 2014 education ranking reports the main findings of internationally comparable data from The Learning Curve Data Bank concludes that the United States continues to rank below the top ten education systems (Learning Curve, Pearson, 2014; OECD, 2014). One of the goals believed to allow for the United States to remain competitive on a global scale is to improve the graduation rate, including students in community colleges.

Historical Background of the Research Issue

Community colleges have a renewed interest in supporting students' academic success. Historically, community colleges have existed to serve students as an alternate way to access higher education. This access included serving students who did not have other opportunities to attend higher education institutions. President Obama's administration renewed the commitment to the education of underserved populations of students with the announcement of the American Graduation Initiative (Office of the Press Secretary, 2009). The goal of the American Graduation Initiative is for the United States to have the highest proportion of college graduates in the world by 2020 (Office of the Press Secretary, 2009). In 2015, President Obama's administration continue to support the American Graduation Initiative by offering two years of community college free for responsible students (Office of the Press Secretary, 2015). Responsible students are defined as those individual who receive a 3.0 GPA in high school, maintain a 2.5 GPA while

in enrolled in a community college, and make steady progress toward completing their program (Office of the Press Secretary, 2015). This initiative is directed toward producing a literate work force capable of competing globally.

The Obama administration believes that the goal of increasing college graduates could best be accomplished by building on the strengths of the community colleges and through new science and technology innovations for the 21st century (Office of the Press Secretary, 2009). The American Graduation Initiative is similar to the goal of educational leaders that have implemented innovative plans to increase students' academic success to graduate (Baldwin, Bensimon, Dowd, & Kleiman, 2011; Bragg, Kim, & Barnett, 2006; Adams, 2012; Dassance, 2011). For example, Illinois Lt. Governor Sheila Simon announced that her goal will increase the number of individuals with college degrees to 60 % by the year 2025 (Simon, 2014). In Illinois Lt. Governor Sheila Simon's 2014 Survey Evaluation Committee Annual Report, she identifies the need to increase technology capacity and support as part of Illinois State Board of Education improvement plan (Simon, 2014). One of the main methods supported by the US Department of Education and community colleges' educational leaders to improve students' academic success is to increase the use of instructional technology in community colleges (Anglin, 2011; Dassance, 2011; Levinson, 2005; Office of the Press Secretary, 2009; Office of the Press Secretary, 2015).

Statement of the Problem

Instructional technology historically has been used in education to assist in achieving students' academic success. Studies support the various use of instructional technology in learning especially when approaching technology in education by intentionally considering the need of the student, content of the material, and the teacher's use of technology (Collins &

Halverson, 2009; Damarin, 1998; McKeachie & Svinicki, 2014). When specifically considering how instructional technology relates to the students, the major focus has been the students' learning style, technology skill level, and access to technology (McKeachie & Svinicki, 2014). In an effort to support these focus areas, the use of technology in education has been used in two major directions. The first direction was using technology for students as a powerful tool for investigation, problem solving, and creative expression (Damarin, 1998). The second direction was using technology that provided individualized instruction toward pre-specified, fragmented knowledge and skills (Damarin, 1998). Both of these directions have been successful in achieving students' academic success. However, there have been concerns with the use of instructional technology assisting all students including at-risk students who are often identified as students of color. One of the possible approaches to assist at-risks students in their academic success is to better understand their learning style and the students' level of self-directed learning.

Self-directed learning is a learning style that is individualized by intentionally creating a partnership between students and teachers to accomplish student's academic success. Self-directed learning provides the opportunity for students to achieve significant academic success based on the students' specific need for support (Grow, 1991; Guglielmino, 1978; Hyland & Kranzow, 2011; Knowles, 1975).

There has been a significant amount of research that has focused on community colleges that focus on the use of technology for students' academic success. Also, there has been a significant amount of research supporting the success use of self-directed learning for students' success. However, there is limited research for at-risk students on the community college level

utilizing instructional technology as well as the students' learning styles to achieve academic success.

Purpose of the Research

The purpose of this study was to further understand the use of instructional technology in education to achieve students' academic success, specifically focusing on students in pre-credit community college courses. In addition to the focus on instructional technology, the study concerned itself with students' level of self-directed learning to achieve academic success. Finally, this study explored how students' academic success is currently defined and brings forth the discussion of utilizing an alternate assessment such as students' career aspiration to determine students' potential for academic success.

Research Questions

The following research questions guided this study.

1. What relationship exists between instructional technology, self-directed learning, and academic success?
2. Which variable is more likely to predict student's academic success: instructional technology or self-directed learning?

Definitions of Terms

Instructional technology is limited to the use of supplemental educational software that the instructor provides to the student to support the student's academic success in the academic learning community. The instructional technology is web-based software that supports the content of the course assigned textbook. The learning community includes face-to-face classrooms that use instructional technology as a tool in the learning environment. The academic

software can be used inside or outside of the traditional classroom time (Mouza, 2003; Staples, Pugach, & Himes, 2005; Prain & Hand, 2003).

Diverse students are individuals in higher education seeking a certification or college degree that are referred to as Native American, Asian, Pacific, Black, African, African American, Hispanic, and other races that are considered a minority in the United States. The term diverse students does include students that experience similar issues related to exclusion because of sexuality, gender, religion, class, and other forms of identity; but is not the major focus of this study.

Academic success metrics are grades achieved in community college courses that are indicated as A, B, C, D or F (4.0, 3.0, 2.0, 1.0, or 0). The academic successes metrics also include the letters that are represented when student either voluntarily withdraw from a course or the student receives an administrative withdraw from a course due to inactive participation in a course. Another aspect of academic success is the inclusion of student's career aspiration.

Career aspiration is the student's motivation to set and achieve objectives to meet their career goals (Cobb & Quaglia, 1996). The additional metric for student's success could provide better insight to a student's motivation to succeed that might not be detected when referring to academic grades. Quaglia and Cobb (1996) Career Aspiration Scale (CAS) provides a reliable likert type scale for students' to self-access their level of achieving career goals. CAS consists of 10 items that is based on a higher score identifying students with stronger achievement orientation and a lower score identifying students with less motivation toward achievement. This information related to career and achievement motivation is especially useful for diverse communities as identified in research studies (Duffy & Klingaman, 2009; Tovar-Murray, Jenifer, Andrusyk, Angelo, & King, 2012)

Chapter one provides an introduction and brief history for this research study. This chapter identified the key concern in improving the United States' education system specifically focusing on community colleges. Within the community college, the chapter provided information about several variables that impact the academic success of at-risk students. Chapter one included the research questions that guided this research by specifically looking at instructional technology as a tool for learning and gaining a better understanding of a student's learning style defined by self-directed learning.

Chapter Two

Literature Review

The purpose of this literature review is to examine the already existing discussion in scholarship that relates to this research study. The literature review summarizes information related to community colleges, academic success, instructional technology, and self-directed learning.

In an effort to improve the graduation rate in the United States, President Obama's administration and community college leaders believe that instructional technology has the potential to help community college students to succeed in their academic career (Office of the Press Secretary, 2009; Office of the Press Secretary, 2015). President Obama's administration and community college leaders' belief is based on the possibility that students using technology will learn more in less time than they would in traditional classrooms without technology (Anglin, 2011; Levinson, 2005; Office of the Press Secretary, 2009; Office of the Press Secretary, 2015). Instructional technology is often used to improve student's academic performance (Chen, 2007; Chisholm & Wetzel, 2001; Collins & Halverson, 2009; Dresel & Haugwitz, 2008; Gonzalez, Pomares, Damas, Garcia-Sanchez, Rodriguez-Alvarez, & Palomares, 2013; Hyland & Kranzow, 2011; Jong, Lai, Hsai, Lin, & Lu, 2013; Orrill & Recesso, 2008). Some studies show that instructional technology does increase students' performance (Bajt, 2011; Gonzalez, Pomares, Damas, Garcia-Sanchez, Rodriguez-Alvarez, & Palomares, 2013; Jong, Lai, Hsai, Lin, & Lu, 2013; Kennedy, Judd, Churchward, & Gray, 2008). However, studies have not proven that instructional technology significantly increases students' academic success when they are from diverse backgrounds. (Chen, 2007; Chisholm & Wetzel, 2001; Collins & Halverson, 2009; Hyland & Kranzow, 2011; Jong, Lai, Hsai, Lin, & Lu, 2013; Orrill & Recesso, 2008). Community colleges' demographic is a diverse background. Based on

previous study that support the use of instructional technology, further understanding is needed to identify if instructional technology will provide the benefits that are supported by President Obama's administration and community college leaders for diverse students including at-risk students who are often identified as students of color.

Based on the increased use of instructional technology in community colleges, this literature review discusses factors that might contribute to closing the achievement gap in an effort to increase community college students' academic success. This literature review will focus on two components: community college students' academic success using instructional technology and the effectiveness of assessing students' level of self-directed learning for academic success. The literature review will initially focus on community colleges and academic success, followed by the use of instructional technology in education and then the use of self-directed learning for students' academic success. Lastly, the literature review will discuss the possibility to consider instructional technology and self-directed learning to achieve students' academic success.

Community College

To understand the role of community colleges in the United States educational system, this section includes the following subsections. Subsection one provides a brief history of community colleges. Subsection two discusses the current state of community college. Subsection three focuses on the diversity in community colleges. Subsection four provides an overview of students' academic success defined by standardized tests. Subsection five provides an alternative assessment of students' academic success using students' college and career aspirations.

Introduction to community colleges. There is a significant amount of existing research concerning the exclusion and marginalization at the K - 12 public education level compared to the community college level. The research focused on K-12 public education could impact community college students because the majority of students enrolled in community colleges are students from public high schools (American Association of Community Colleges, 2015). Another contributing factor is that initially community colleges were part of the K-12 state public education system (Levinson, 2005). The public education system has made several attempts for diverse learners to accomplish successful academic learning outcomes (Levinson, 2005). Diverse students are referred to as Native American, Asian and Pacific Islander, Black, African, African American, Hispanic, and other races that are considered a minority in the United States. However, as the terms referring to diversity change based on social and political movements, other historical and current terms referring to this group are included (Banks & Banks, 2007; Sleeter & Grant, 2007). Public education aims to create an inclusive learning community by providing an opportunity for all students (This includes and is not limited to immigrants, ex-slave children, children on Indian Reservations, and students that experience exclusion due to sexuality, gender, religion, class, and other forms of identity.). However, review of recent literature shows that the aim for an inclusive learning community has not been achieved. Instead, the exclusion and marginalization of certain groups continues to exist in education (Dassance, 2011; Friedl, Pittenger, & Sherman, 2012; Krebs, Katsinas, & Johnson, 1999; Pickett, 1998; Sleeter & Grant, 1991). This literature applies to K-12 as well as to community college system, which originated as part of the K-12 public education system (Levinson, 2005). Historically, community colleges have served students who are unable to attend traditional 4-year colleges and universities.

The history of community colleges. The community college system has existed for over 100 years in the United States (Illinois Community College Board, 2006; Levinson, 2005). The first community college in the United States was Joliet Junior College established in 1901 in Illinois (Illinois Community College Board, 2006; American Association of Community Colleges, 2015; Levinson, 2005). Illinois adopted the first junior college legislation in 1931, which allowed the Board of Education of Chicago to establish, manage, and provide maintenance of one junior college offering two years of college work beyond high school as part of the then K-12 public education system. Later the United States legislation in 1937 and 1942 allowed for additional referendums and provisions, and these additional referendums and provisions which led to standards and procedures that established junior colleges throughout the United States in 1951. These referendums and provisions also created several new public junior colleges in Illinois that were provided state funding in 1955. Furthermore, these provisions caused the creation of the Junior College Act of 1965 to oversee the Junior Colleges in the United States. The establishment of the new community colleges further increased the access to higher education for diverse students.

As a result of the increase in the number of community colleges, the Illinois Community College Board (ICCB) was created to administer the Public Community College Act to maximize the ability of the community college to serve their communities, promote collaboration within the system, and accommodate state initiatives that are appropriate for community colleges. The Public Community College Act made a strong commitment to achieve a system that would be accountable to develop individuals to be informed, responsible, and contributing citizens through community colleges (Illinois Community College Board, 2006; Levinson,

2005). Throughout the history of community colleges there has been an ongoing challenge to uphold these commitments made by the Illinois Community College Board (2006).

The challenges to implement the Illinois Community College Board's (ICCB) obligations to an inclusive learning environment for a diverse community are a result of the ongoing struggles on how the obligations are interpreted and enforced (Krebs, Katsinas, & Johnson, 1999; Pickett, 1998). One of the historical challenges for community colleges to provide an inclusive learning environment is the community college's administration's unwillingness to change the physical location of community colleges. The lack of community colleges in specific areas prevented access to community colleges for underperforming students. For example, junior colleges in the late 1950's, were a shared physical space with high schools, but it was decided through significant resistance from high school administration to establish a separate location for junior colleges. This resistance in changing to a new structure was mainly received from many influential members that had their professional employment connected with the community college program and personal status at stake in the high school communities they served (Krebs, Katsinas, & Johnson, 1999). This incident is a possible conflict of ICCB (2006) commitment to creating an inclusive learning environment for diverse students. ICCB (2006) states no individual is inherently more important than another. Although it does not directly affect the students' experience in the classroom, it could have an indirect impact on the students and community's learning experience by limiting the availability of educational resources. Eventually, the change to separate the location of community colleges from high school was successfully passed and eventually provided learning opportunities for a more diverse group of students. The community college's resistance to change to meet the ICCB (2006) commitment

of supporting a diverse learning environment not only occurred outside the classroom at the institutional level, but also within the classroom.

Successful learning communities are classrooms that practice inclusive pedagogy to provide an opportunity for academic success for all students with different learning styles and cultural differences. One of the challenges in providing diverse students' academic success in education is to be inclusive of all students. Banks and Banks (2007) caution that narrow, inflexible teaching practices are not sensitive to all students' need; including students of color. The insensitive teaching practices assume all students learn best in the same process as well as environments that exclude consideration of learning style, background, and level of experiences. Sleeter and Grant (2007) further support the approach for inclusive education by identifying that an inclusive education provides a learning environment that focuses on the individual goals and abilities of each student. Community colleges are open enrollment institutions that allow all students to have an opportunity to continue their education after K-12 public education. Pickett (1998) provides an example of teachers taking action to address the inequality in the classroom as a result of not having the appropriate educational resources for diverse students.

Picket (1998) partnered with another faculty member to create a book that was more inclusive and suited the needs of the students at the junior college. Although the publishers saw the book as a necessity that was aimed at the two-year college diverse student market, the publishers did not want to include the women's full name or list the junior college that would identify the teachers were from a rural, southern state. However, the faculty members were resistant to the changes suggested by the publishers. The book was eventually published in 1993 with the faculty's full names and affiliated college followed by eight editions of the book, "Technical English: Writing, Reading and Speaking." This action provides an example of the

community college faculty commitment to an inclusive learning environment by not tolerating prejudice and denigration of character in the community college system (ICCB, 2006). Although confronted with possible prejudice, the literature shows community college is an effective and necessary resource for diverse students (Krebs, Katsinas, & Johnson, 1999; Picket, 1998).

There has been significant progress in community colleges creating an inclusive environment for all students, demonstrated by administrators seeking out physical locations for open community colleges for needed communities and faculty taking the initiative to provide resources to diverse students in the community college classroom. Community colleges continue to be a primary resource for student's pursuing higher education including a large population that identify as students of color. In the fall semester of 2013, the majority of undergraduate students in the United States who identified as students of color attended community colleges: 61% Native American, 57% Hispanic, 52% Black (American Association of Community Colleges, 2015). However, community colleges continue to face the challenge to close the achievement gap to allow for diverse student's academic success (Krebs, Katsinas, & Johnson, 1999). The recent focus by the current government has made the academic achievement and success of community college students from diverse backgrounds a primary goal that was historically implemented on a smaller scale.

The current state of community colleges. Community colleges remain an important part of the United States education system. This importance was particularly apparent with the American Graduation Initiative that provided direct financial assistance to community colleges to better serve the country in offering easily accessible, high quality education and training programs (Office of the Press Secretary, 2015). This initiative was supported by educators that

believe these institutions have the potential to reach a diverse group of students and support their academic success (American Association of Community Colleges, 2011; Simon, 2012).

The initiative to assist students' academic success is a concern for students from K-12 public education entering community college. Students entering college who are not prepared impose a challenge for the community college commitment for students to receive a degree and possibly matriculate from two-year to four-year institutions (Baldwin, Bensimon, Dowd, & Kleiman, 2011; Dassance, 2011; Friedl, Pittenger, & Sherman, 2012). Literature has identified a gap in the perception of students' readiness to successfully reach the next level of education; such as, secondary education to community college and community college to four-year institutions (Baldwin, Bensimon, Dowd, & Kleiman, 2011; Dassance, 2011; Friedl, Pittenger, & Sherman, 2012). Community college administrators and faculty continue to work toward solutions on increasing retention and providing support for students' academic success.

Diversity in community colleges. All community colleges have similarities, yet it is imperative that each local institution must know the students it serves and then develop plans that complement the diverse campus culture (Baldwin, Bensimon, Dawd, & Kleiman, 2011). Based on the national data collected in fall 2013, 46% of all students in higher education in the United States were enrolled in community colleges (American Association of Community Colleges, 2015). Not only were there a significant number of students in higher education enrolled in community colleges, but community colleges also provided a learning opportunity to a significant number of diverse and nontraditional college students. Based on the 2013 American Association of Community Colleges' data, community colleges students who were taking credit courses consisted of 57% women, with a mean age of twenty-eight years old, and a median age of twenty-four years old. Community college diversity percentages from the 2013

data showed the following national percentages of students enrolled in community college: 5% Asian or Pacific Island; .5% Native American; 16% African American; 20% Latino; 54% White (Illinois Community College Board, 2014).

The index of student diversity continues to increase in community colleges as shown in the community college demographic data for Illinois from 2006, 2011, and 2013 (see table 1). Students who identify as students of color continue to increase in enrollment at community colleges as the number of students who identify as white continue to decrease.

Table 1

Community College Demographics from 2006, 2011, and 2013

Demographics	2006 Percentage	2011 Percentage	2013 Percentage
African American	15 %	17 %	16 %
Asian or Pacific Island	4 %	4 %	5 %
Latino	17 %	17 %	20 %
Native American	.3 %	.4 %	.5 %
White	61 %	56 %	54 %

Note. Adapted from "Illinois Community College Board", 2014.

When reviewing the students demographics in the 2006 data, community college consisted of 4% Asian or Pacific Island; .3% Native American; 15% African American; 17% Latino; 61% White (Illinois Community College Board, 2006). The 2011 data showed a consistent level of diversity in students' demographic data. Community college diversity percentages from the 2011 data showed the following percentages of students: 4% Asian or Pacific Island; .4% Native American; 17% African American; 17% Latino; 56% White (Illinois Community College Board, 2011). This consistency in the 2006, 2011, and 2013 data demonstrates that community colleges continue to serve students from a diverse population. In addition, the changes within the last few years continue to show the increase in the move toward a more diverse student population in community colleges between 2011 and 2013. Although the number of students who identify as

students of color continue to increase in community colleges, the number of students who enroll in credit courses are lower for students who identify as students of color compared to students who identify as white: 50% White, 21% Hispanic, 14% Black, 6% Asian/American, 1% Native American, and 2% who have two or more races. The achievement gap between community college students of color and white students continue to increase with students of color not achieving academic success compared to their white classmates. The measurement for a student's academic success is measured by the students' performance on standardized tests.

Academic Success

Standardized tests. The lack of academic success is noted by the ongoing significant achievement gap between underperforming and performing students (Chen, 2007; Chisholm & Wetzel, 2001; Collins & Halverson, 2009; Dresel & Haugwitz, 2008; Hyland & Kranzow, 2011, Irwin-Golowich, 2013). This achievement gap begins in the K-12 schooling years and continues in higher education institutions such as community colleges.

The achievement gap historically remains constant between White students and students of color, especially Black and Hispanic students (Department of Education, 2011, Paige and Witty, 2010). One of the concerns for the achievement gap is the potential bias in standardized tests. Research continues to focus on the bias in standardized tests. Two of the major biases discussed in standardized tests are offensiveness and under penalization (Popham, 2006). A test item that contains elements that insult any specific group based on their personal characteristic is considered offensive. A test item that unfairly penalizes test-takers is one that places an inequitable disadvantage on any group, because of the question's personal characteristics. A Common view in research on standardized tests is that there is a difference in the test scores of students of color and whites students (Popham, 2006). A second common view is the concern

that test scores alone do not accurately assess the student's academic level (Popham, 2006). Students who do not receive a determined score on standardized tests due to biases or other factors are a major concern in the public education system.

Students in the K-12 public education system who do not meet state targets on standardized test requirements are defined as at-risk students (Department of Education, 2011). At-risk students are defined as students who are underperforming at the expected education of level and are at risk of not successfully completing their academic career such as high school graduation (Illinois State Board of Education, 2014). When reviewing standardized test scores, the students who under-perform in the K-12 experience often result in the students' lack of preparation for college, which tends to lead to these students' academic failure when they enroll in college (Baldwin, Bensimon, Dowd, & Kleiman, 2011; Brag, Kim, & Barnett, 2006; Adams, 2012; Dassance, 2011). As a result of low standardized test scores, the options for at-risk students to attend four-year institutions are limited. The limitation for students to attend four-year institutions is partly due to many four-year institutions' minimum entrance requirements that include standardized test scores. Thus, the majority of these students at-risk choose to enroll in community colleges, if they desire to continue their education after completing high school (Baldwin, Bensimon, Dowd, & Kleiman, 2011; Brag, Kim, & Barnett, 2006; Adams, 2012; Dassance, 2011). Community colleges are open enrollment institutions that allow students who score below standardized tests minimum requirements to enroll in higher education institutions. Standardized tests are one measurement used to determine a student's potential for academic success; however, there are other assessments that should be considered. When attempting to determine students' potential to complete their academic career, another assessment to understand students' potential for academic success is students' college and career aspiration.

College and career aspiration. College and Career aspiration focuses on the students' self-assessment of their motivation to set and achieve objectives to meet their college and career goals (Alexander & Cook, 1979; Jencks, Cobb & Quaglia, 1996; Crouse, Jencks, & Mueser, 1983; Plucker, 1998, Witmer, 2014). Studies show the idea that students who believed they were prepared for school had a higher level of college aspiration and academic success (Chenoweth & Theokas, 2011; DuFour & Marzano, 2011; Maness, 2013; Pitre, 2006).

College and career aspiration focus on the importance of support and modeling to achieve success in accomplishing goals by understanding the consequences of positive and negative behaviors. The majority of college and career aspirations assessment is based on the theoretical framework of social cognitive theory advanced by Albert Bandura (1986). Albert Bandura's perspective on social cognitive theory takes into consideration how personal agency is created by the interaction of behavior, personal factors, and the environment (Bandura, 1986). Bandura's perspective accounts for the need to consider individual differences that might influence aspirations and outcome expectations that differ even though individuals might be exposed to similar environments (Zimmerman, Bandura, & Martinez-Pons, 1992). Researchers interested in studying individual differences in career aspirations and outcomes sought a survey instrument for this purpose. One of the survey instruments used to measure career aspiration is O'Obrien's Career Aspiration Scale. O'Brien built on the work of Fassinger (1985, 1990) to create the Career Aspiration Scale (CAS). The career aspiration scale is a self-assessed metric that provides an insight to a student's motivation to succeed.

The career aspiration scale provides insight for a student's motivation to succeed that is not necessarily detected when referring to academic grades that include outside assessments that could be bias such as the classroom environment and instructional strategies. Including the

student's perspective could enhance the understanding of a student's attitude and disposition to succeed in their academic career compared to their level of motivation to succeed. Thus, the career aspiration scale could support the diverse student body in community college by providing another measure for judging the probability of graduation.

With the diverse student population in community college, varied classroom strategies continue to be important to provide an inclusive learning environment such as the guidelines established by the Public Community College Act. Not only is it important to understand diversity in the classroom; but, also in the use of technology as the government and educational leaders continue to support the use of instructional technology for all students' academic success, especially when seeking solutions to increase student's academic success that could influence closing the ongoing achievement gap.

Technology

To further understand the use of instructional technology in the United States educational system, the technology section covers the following subsections. Subsection one provides a brief history of culture in technology. Subsection two focuses on the diversity in instructional technology. Subsection three provides an overview of the use of instructional technology in practice.

History of culture in technology. Historically, there was the concern that technology is not culture-free (Chisholm, 1995). Research indicated that women, members of the working class, and people of color would design and apply advanced technologies differently were they given the opportunity (Chen, 2007; Chisholm, 1995). Computer software continues to be a human creation, and as such, reflects the culture of the individuals who create them. Computer software is biased, incorporating cultural preferences for such things as analytic and linear

thinking; the way information is organized, and culture-specific logic and rules (Chisholm, 1995). The existing research has established that this can be a disadvantage for underperforming students (Bollash, 2013; Chen, 2007).

It is important for educational institutions to identify culture in learning and support the inclusion of culture when teaching (Bollash, 2013; Bush, 1983; Zuboff, 1988; Brunner, 1992; Morgall, 1993; Dery, 1994; Cohn, 1996). The history of culture in technology has shown challenges similar to those found in education. Technology has not always been inclusive for diverse developers or users. Historically, the development of technology was dominated by white men and was not inclusive to diversity (Chen, 2007; Chisholm, 1995; Damarin, 1998).

The concern of culture in technology has been an on-going issue and continues as an influence on the effective use of technology for instruction. There are encoded dominant culture aspects in the classroom technologies in today's society that have certain features (some identified and some not yet uncovered) that perpetuate Eurocentric, masculine ideas and ideals (Damarin, 1998). When considering various aspects of technology, one must always include the idea that technology is a social construction and thus it is inherently situated within a culture and its values (Lee, 2011).

Diversity in instructional technology. Educators are impacted by the advancement of technology in the world, as it has become integrated in daily use. The use of technology is integrated in our daily life and impacts our perspective in completing tasks that we must accomplish (Anglin, 2011; Collins & Halverson, 2009). Technology continues to be a vital part of daily events as more applications and needs are identified and developed. The ongoing development of technology has strongly impacted the education community.

As early as the 1960's, educational computing was developed to assist students' academic success (Anglin, 2011; Damarin, 1998). Educational computing took two divergent visions and directions. In one vision, students use the computer as a powerful tool for investigation, problem solving, and creative expression (Damarin, 1998). In the second vision or direction, the power of the computer is used for individualizing instruction toward pre-specified, fragmented knowledge and skills (Damarin, 1998). Most often schools that have a history of low student achievement frequently adopt integrated learning environments (ILEs) (Damarin, 1998). The use of technology does have a positive impact in students' academic success (Bajt, 2011; Gonzalez, Pomares, Damas, Garcia-Sanchez, Rodriguez-Alvarez, & Palomares, 2013; Jong, Lai, Hsai, Lin, & Lu, 2013; Kennedy, Judd, Churchward, & Gray, 2008), but technology has not been verified to decrease the significant achievement gap (Bajt, 2011; Chisholm, 1995; Chen, 2007; Collins & Halverson, 2009; Damarin, 1998).

The traditional learning environment is slowly changing by converting the physical space of traditional classrooms into technology-enhanced classrooms. The traditional learning environment is drastically changing in higher education. Collins and Halverson (2009) provide two arguments that support and explain why technology will revolutionize schooling. The first argument is a reaction to a changing world and the second argument is the ability to meet the needs of the student. Focusing on the second argument, learning technologies provide direction on how to improve student motivation to engage in their learning by producing a generation of people who seek out learning by giving them more control over their own learning (Collins & Haverson, 2009). For example, the use of the Internet, toddler computers, computer games, and online tutoring provide an environment for learners to seek out information on each person's individual pace. This approach considers the use of technology as a tool by digital natives and

digital immigrants (Kennedy, Judd, Churchward, & Gray, 2008). This approach also allows us to create schools that embrace the spectrum of capabilities and comfort in using technology to reshape education (Collins & Halverson, 2009).

Several researchers suggest how to use instructional technology to contribute to a positive learning outcome for various groups. Lowell and Phillips (2010) completed a research study analyzing software programs approved for reading and writing classes. The research study, "Commercial Software Programs Approved for Teaching Reading and Writing in the Primary Grades: Another Sobering Reality" evaluated thirteen commercially available software programs for reading and writing courses. The research study used a software evaluation that consisted of the following:

- Overall design of the software program, including whether the programs' visual and auditory media are aesthetically pleasing to young children.
- Content criteria and indicators examine what is actually taught or addressed by the program.
- Instructional design criteria and indicators examine the educational soundness of software programs

(Lowell and Phillips, 2010)

Lowell and Phillips (2010) research confirmed that the majority of the software programs evaluated did not adapt to student needs, thereby limiting their usefulness as educational tools. As a result of their research findings, Lowell and Phillips (2010) concluded that additional research is needed on how technology can best be used in pedagogically sound ways to support programs of study. Lowell and Phillips (2010) identified the school level challenge in the use of the instructional software.

Another research study had similar finding on a broader level. Marri (2007) identified an issue by looking at how research is examining the issue of "who is and who is not" represented in instructional technology. Marri (2007) study, "Working with blinders: A critical race theory

content analysis of research on technology and social studies education," involved the interaction between technology and race/ethnicity by looking at two journals - Theory and Research in Social Education (TRSE) and Contemporary Issues in Technology and Teacher Education (CITE). Using the Critical Race Theory Framework, Marri (2007) reviewed two major journals to answer the following research questions:

- How many of the articles in TRSE and CITE directly focused on the incorporation of technology?
- How many of these technology-focused articles incorporated issues of race/ethnicity in their examination of technology?
- How are issues of race/ethnicity such as racism addressed in articles that focused on technology and race/ethnicity?

(Marri, 2007)

Marri's (2007) findings were dismal by confirming, "who is not" represented in the research study about the interaction of technology and race/ethnicity. Of the forty-five technology related articles in the two journals, fifteen articles mentioned race/ethnicity. Although the numbers indicated representation of the topic in the journals, it is misleading in that the articles did not critically include racial/ethnic demographics; but only mentioned the various groups. As a result of the research study, Marri (2007) states that scholars must go beyond the blinders to address the critical intersection between technology and race/ethnicity. This approach will hopefully allow for all students to be included in the learning environment to achieve academic success.

With the increase in diversity and intent on providing students' positive learning outcomes, it is imperative that solutions are implemented for underperforming students. The inclusion of technology in our daily lives is more prevalent than ever before, which impacts the use of technology in education. From a diversity approach, the literature identifies that different cultural communities may expect children to engage in activities at vastly different times in childhood (Rogoff, 2003). By taking this type of approach, education would understand that

each student does not enter the classroom at the same level of engagement and the difference must be considered when providing a successful learning environment for the student. Not only is it important to acknowledge the difference, but to ensure that the assessment tools include the understanding that there are timetables of development in other communities that differ from the classroom expectation for the level of engagement for the student (Rogoff, 2003).

Use of instructional technology in practice. Various educational approaches have led to the use of technology in the classroom to contribute to students' success in K-12 public education and higher education. Using instructional technology in education provides the opportunity for students to develop and use their individual learning styles to connect to the learning experience (Ferdig, Coutts, DiPietro & Lok, 2007; Kennedy, Judd, Churchward, Gray, & Krause, 2008). Instructional technology and intercultural educators employ web-learning technologies in similar ways to position critical intercultural education (ICE) strategies into learning for the purpose of creating an inclusive and culturally relevant pedagogy to support the use of technology in the academic success for K-12 and higher education students of color (Ferdig, Coutts, DiPietro, & Lok,2007). By implementing these approaches, it appears that the students to make a direct connection to the topic without a conflict in their cultural identity.

When referencing direct connection in a classroom, one of the possible perspectives is creating an inclusive learning environment. An identified concern for students, who are not achieving academic success, is a lack of knowledge about the use of computers and Internet resources for academic success. There are some students who are uncomfortable with the resources available on the computer and Internet. The students are often referenced as digital natives. There is a concern of the perception of digital natives being comfortable with technology. Digital native refers to students who have been exposed to technology from early

childhood, but there are some other aspects that must considered when considering a student's comfort level in using technology (Kennedy, Judd, Churchward, & Gray, 2008). One of the barriers that schools face in using technology effectively in the classroom is cultural lag (Chen, 2007). Cultural lag is slowness in the rate of change of one part of a culture in relation to another part. The difference in change results in maladjustment within society, as from the failure of understanding the use of technology to effectively assist students of color and their academic success. Cultural lag is a concern as computer usage within classrooms are increasing at a significant rate.

Recent literature continues to identify a concern about the inclusion of culture within technology (Chen, 2007; Chisholm & Wetzel, 2001; Damarin, 1998). There is a challenge in isolating the success and failure in utilizing instructional technology as an effector on student achievement (Neill & Mathews, 2009). Neill and Mathew (2009) identify a 22% increase in students standardized test scores when effectively using instructional technology to assist 7th and 8th graders in mathematics and English courses. However, Neill and Mathew (2009) did not focus on the learning outcomes to specific demographics including students who are generally identified as at-risk students. Roberson (2011) views this approach as limiting the understanding of the school culture. As a result of the limitations in the research, Neill and Mathew (2009) identify the need for future research to specifically focus on gender, socio-economic status, and ethnicity. Similar to students in K-12 public education, community colleges have had success in using instructional technology. However, the challenge also exists at the community college level to effectively use instructional technology for underperforming students.

Currently, there is a movement for community colleges to assist in increasing the academic success of students. This movement requires community colleges to look at the falling

completion rate in higher education and address the issues to improve students' academic success. The main indicators for student's academic success that are aligned with the community colleges' philosophy are preparedness, participation, and affordability (Dassance, 2011). Community colleges are challenged with at least two explicit expectations for student learning to meet these indicators. First, provide Twenty-first Century learning that includes the mastery of skill and knowledge and problem solving that requires communication using a variety of technologies (Lundberg, 2012). Second, approach learning and teaching that includes learning communities, service learning, and internships (Lundberg, 2012). Community colleges are attempting to meet these explicit expectations by using tools such as instructional technology.

Community colleges have embraced the use of instructional technology to assist in student's academic success. One approach is the use of web 2.0 technologies. This approach is founded on the belief that the use of technology used by children in their formative years may very well assist in the students learning to achieve academic success (Bajt, 2011). The uses of web 2.0 technologies are online software applications that allow users to create and modify content (Bajt, 2011). Educators taking this approach allow their students to support their own learning (Bajt, 2011). In addition, there are studies that require the instructor (or college) to determine what student learning styles are best served by web 2.0 technologies (Bajt, 2011; Gonzalez, Pomares, Damas, Garcia-Sanchez, Rodriguez-Alvarez, & Palomares, 2013; Jong, Lai, Hsai, Lin, & Lu, 2013). Besides using technology to individualize instruction, one approach that requires and defines the teacher and student partnership in learning is self-directed learning.

Self-Directed Learning

To further understand how self-directed learning contributes to student academic success, the Self-Directed Learning section covers the following subsections. Subsection one provides a

brief history of self-directed learning. Subsection two provides an overview of the use of self-directed learning in practice.

History of self-directed learning. Self-directed learning is an intentional partnership between students and teachers to accomplish individual student's academic success. Self-directed learning places the accountability for a student's academic success on both the student and the teacher. The self-directed learning approach enables students to achieve significant academic success in various learning environments (Grow, 1991; Guglielmino, 1978; Hyland & Kranzow, 2011; Knowles, 1975).

Self-directed learning has been identified as a model for developing and implementing successful learning resources systems as early as the 1970's. Self-directed learning calls for individuals to engage in a series of learning projects that involve the following elements: development of the skills of self-directed inquiry, diagnosis of learning needs, teachers support for successful student learning outcomes, and individuals have unlimited possibilities for growth (Knowles, 1975). Self-directed learning is a process used by students to self-monitor and to self-adjust as needed, allowing them to proactively consider what is working, what isn't, and what might be done better as they learn (Wiggins & McTighe, 2005). Self-directed individuals are therefore more successful in their lives. (Grow, 1991; Guglielmino, 1978; Marriam, Caffarella, & Baumgartner, 2007)

Self-directed learning is an ongoing reliable approach to use for student's academic success. Researchers (Grow, 1991; Guglielmino, 1978; Merriam, Caffarella, & Baumgartner, 2007; Wiggins & McTighe, 2005) continue to support the self-directed learning method as appropriate for traditional and non-traditional learners who have not fully developed an understanding of self-assessment in learning. The reference for self-directed learning continues

in textbooks and research such as the *Understanding by Design* by Grant Wiggins and Jay McTighe (2005). The use of self-directed learning encourages an honest self-assessment based on the students' understanding of what they know and need to know to reach their goals.

A more definitive approach to student's academic success using self-directed learning is Grow's model. Grow's Staged Self-Directed Learning (SSDL) model outlines how teachers can help students become more self-directed in their learning (Grow, 1991). Grow identifies four stages of the self-directed learner to assist facilitators in successfully working with learners to become self-directed learners:

> Stage 1: Dependent learner: Learners of low self-direction who need an authority figure (a teacher) to tell them what to do.
> Stage 2: Interested learner: Learners of moderate self-direction who are motivated and confident but largely ignorant of the subject matter to be learned. The teacher motivates and guides the learner.
> Stage 3: Involved learner: Learners of intermediate self-direction who have both the skill and the basic knowledge and who view themselves as being both ready and able to explore a specific area with a good guide. The teacher facilitates as an equal in the learning environment.
> Stage 4: Self-directed learner: Learners of high self-direction who are both willing and able to plan, execute, and evaluate their own learning with or without the help of an expert. The teacher cultivates the student's ability to learn.
> (Grow, 1991)

Grow's model is not limited to increasing the understanding of students to better understand how they can take more ownership in the learning environment, but it also identifies the roles for teachers to assist students in becoming self-directed learners. Grow (1991) states that effective teachers individualize their teaching strategies to match the learners' stage of self-direction and allow the students to become more self-directed in their learning.

Self-directed learning in practice. One of the greatest aspects of self-directed learning is that it can be applied in several areas of educational topics and assist in diverse learners' academic success (Gibbons, 2002). Self-directed learning has been applied in various

learning environments ranging from home schooling teenagers to developmental courses to graduate-level web application design (Van Berkel, 2006; Danforth & Goron, 2006). In home schooling teenagers, self-directed learning was helpful in addressing parents with limited formal education on the importance of role models and self-motivation in education. (Danforth & Goron, 2006). This concern is important when working with learners in understanding technology that continues to change and relies on the learner to take the initiative to seek out additional information and resources to understand new features applied in technology.

Another positive aspect of self-directed learning methodology is that it can be taught and modeled for the learner. The influence of tutoring competencies on problems, group functioning, and student achievement in problem-based learning relates to a strong connection of modeling with the self-directed learning theory (Van Berkel, 2006). A tutor's task is to stimulate active, self-directed, contextual and collaborative learning and to display interpersonal behavior that is conducive to students' successful learning (Van Berkel, 2006).

Recent research continues to support the use of self-directed learning as a model for implementing successful learning. Recently, Gureckis & Markant, 2012 pointed to two components of self-directed learning: cognitive and computational. This idea creates additional dimensions for considering self-directed learning. From a cognitive perspective, self-directed learning allows learners to focus their effort on information they do not yet possess by seeking out the information to increase their understanding on a specific topic (Gureckis & Markant, 2012). From a computational perspective, self-directed learning allows learners to be “active learners” that select their own learning pace and material that emerges from information from using instructional technology (Gureckis & Markant, 2012). Thus, research on self-directed learning not only supports the importance of self-directed learning for the student, but also

supports the importance of teachers understanding how to utilize self-directed learning in environments that use instructional technology to assist in learning (Hyland & Kranzow, 2011). Hyland and Kranzow (2011) identifies the increase in the use of instructional technology and how there is a lack of research in how instructional technology is impacting education and the importance of self-directed learning. Research has identified the need to consider four components when considering technology in education: student, teacher, content, and technology (McKeachie and Svinicki, 2014). Self-directed learning with the use of instructional technology can allow for the student and teacher to partner in achieving academic success for all students in a diverse community such as community colleges.

Instructional Technology and Self-Directed Learning

To make technology integration successful, McKeachie and Svinicki (2014) emphasized a student's learning style, technology skill level, and access to technology should be considered. Self-directed learning is one of the best learning style option for topics and subjects that continue to develop at a rapid pace and continue to change; such as instructional technology. Self-directed learning theory is an effective approach for providing learners success in academics (Grows, 1991; Guglielmino, 1978; Gureckis & Markant, 2012; Hyland & Kranzow, 2011; Knowles, 1975). Some of the key components in self-directed learning are the ability to self-assess; independently seek out resources; self-motivation to achieve academic success; and possessing the determination to overcome obstacles in learning (Grow, 1991; Knowles, 1975). These components are critical for learners to succeed in education, especially when considering the historical cultural obstacles that have existed in education and technology.

Summary

Community colleges serve non-traditional students who are often perceived to be at risk due to the failures of the K-12 system to meet the needs of urban students. The achievement gap for students in the public education system has existed for over fifty years. The PSAE consistently demonstrates that the percentage of White students passing the standardized test is significantly higher than the percentage of students of color passing the PSAE; especially Black and Hispanic students (Illinois State Board of Education, 2012). As a result of not achieving the minimum required standardized test scores, underperforming students are often limited to enrolling in community colleges to seek higher education.

The Community College Act of 1965 and the recent American Graduation Initiative identifies the long-term commitment of community colleges to provide academic success for diverse students. The government and community college leaders believe it must provide the underperforming students the appropriate tools to achieve their academic goals (Office of the Press Secretary, 2009; Office of Press Secretary, 2014; Simon, 2012). Research, government leaders, and college administrators support that fact that one of the tools most often used to assist in student's academic success is technology.

One of the successful methods of instruction for students in community college, particularly those who must take bridge or remedial courses is the use of instructional technology. Instructional technology in education has been utilized for over fifty years as a tool for students' academic success. There is a direct connection, which shows that instructional technology improves students' academic success when properly implemented (Bajt, 2011;

Gonzalez, Pomares, Damas, Garcia-Sanchez, Rodriguez-Alvarez, & Palomares, 2013; Jong, Lai, Hsai, Lin, & Lu, 2013; Kennedy, Judd, Churchward, & Gray, 2008).

Although academic success is documented for students' academic success based on standardized tests, the research on the bias of standardized tests exists; but it is not part of this literature review based on scope of the research. Instead, this literature review confirms that culture bias does exist in education and instructional technology. The existence of cultural bias in education was demonstrated in this literature review in community colleges. This bias could potentially limit students' academic success inside and outside the classroom by the presence of political obstacles that determine the location of community colleges and limitation of academic tools to provide an inclusive learning environment for diverse students (Krebs, Katsinas, & Johnson, 1999; Pickett, 1998). Similar to the cultural bias in education, the literature identifies that there is a cultural bias in instructional technology (Bajt, 2011; Chisholm, 1995; Chen, 2007; Collins & Halverson, 2009; Damarin, 1998). The literature identifies the need to further research the success of using instructional technology for the academic success for diverse students. (Bajt, 2011; Barron, Kemker, Harmes, & Kalayddjian, 2003; Ferdig, Coutts, DiPietro, &Lok, 2007; Prain & Hand, 2003; Roberson, 2011).

There are two major concerns identified on cultural bias from the perspective of instructional technology: user and developer. From the user perspective, there exists cultural lag as the slowness in the rate of change of one part of a culture in relation to another part, resulting in maladjustment within society, as from the failure of understanding the use of technology to effectively assist students of color and their academic success (Chen, 2007). From the developer perspective, the development of technology was dominated by white men and was not inclusive to diversity (Chisholm, 1995; Collins & Halverson, 2009; Damarin, 1998). The different

perspectives of instructional technology might limit the understanding of how to efficiently use the technology for academic success based on a student's background that includes digital natives and digital immigrants' perspectives and misconceptions. One of the challenges in a diverse learning environment is to provide the appropriate tools to the appropriate student that allows the student to self-monitor and self-adjust as needed to accomplish their individual academic success.

Self-directed learning has demonstrated success in various learning environments for diverse learners (Grow, 1991; Guglielmino, 1978; Hyland & Kranzow, 2011; Knowles, 1975). Grow's (1991) model creates an inclusive learning environment that enable teachers to individualize their teaching strategies to match the learners' stage of self-direction and allow the students to become more self-directed in their learning. However, Hyland and Kranzow (2011) identifies that there is a lack of research in how instructional technology is impacting education and the importance of self-directed learning.

Inclusive practices could consist of an intentional learning environment that allows the teachers to partner with students on individual levels of learning that embrace the students' view of learning. This practice of teaching has been successfully adopted by integrated learning environments (Damarin, 1998). These practices could be accomplished by instructors being prepared to facilitate an inclusive learning environment using instructional technology for every individual student, no matter how culturally similar or different. The above practices align with the findings from Prensky's (2011) interview that focuses on students' perspective of what they want from their schools and classrooms. Students do not want be lectured, but want to make decisions and share control to be creative by using tools of their time to get an education that is not just relevant, but real (Prensky, 2010).

Based on historical trends, technology continues to be implemented as a feasible solution for underperforming students' success in their academic career. Technology utilizes a self-directed learning environment that is inclusive to a diverse student-learning environment (Collins & Halverson, 2009; Hyland & Kranzow, 2011; Orrill & Recesso, 2008; Roberson, 2011). In addition, underperforming students continue to have a higher level of enrollment in community colleges compared to enrollment in other higher education institutions. As education continues to become diverse and community colleges seek to increase the academic success of students, additional research is needed on using instructional technology and assessing the degree of self-directedness. The participants and study method is described in the next section.

Chapter Three

Methodology

Chapter 3 provides the approach to the research and the methods completed to obtain the data for the study. This chapter includes the participants' information, details of the instruments, design of the study, procedure for collecting the data, and data analysis method.

Participants

Demographic information on the students who participated in the research study provided useful information that was similar to the national average for students who are at risk. There were a total of 64.5% (n = 80) female students and 35.5% (n = 44) male students. The participants in the research identified their ethnicity as 0.6% (1) Native American, 4% (5) as Asian American, 33.9% (42) as Black or African American, 50.8% (63) as Latino, 6.8% (11) as White/Caucasian, and 5.6% (7) as Multiple ethnicity/other. The ages of the students range were 71.0% (88) between the ages of 18 years old and 20 years old, 20.2% (25) between the ages of the 21 years old and 25 years old, and 8.8% (11) between the ages of 26 years old and older. The students previous educational experience of the participants showed that they were significantly from public education settings: 74.4% (93) received a public high school education, 6.4% (8) received a private high school education, 13% (15) GED, and 5.6% indicated other form of K-12 education. The employment status of the participants were 44.8% (56) unemployed, 28.8% (36) part-time working 20 hours or less, 12.8% (16) full-time employed, 11.2% (14) work-study student, and .8% (1) self-employed.

Table 2

Frequencies and Percentage for Participant Variables

Participants Variable	Category	Frequency	Percentage
Computer Usage	Monthly	4	3.2
	Weekly	25	20.2
	Daily	84	67.7
	More than 10 hours a day	11	8.9
	Total	124	
Gender	Female	80	64.5
	Male	44	35.5
	Total	124	
Age	18 - 20	88	71
	21 - 25	25	20.2
	26 - older	11	8.8
	Total	124	
Ethnicity	Latino	63	50.8
	Black/African American	42	33.9
	White/Caucasian	7	5.6
	Asian American	5	4
	Other	7	5.6
	Total	125	
Education	Public High School	93	74.4
	Private High School	8	6.4
	GED	15	13
	Other	6	4.8
	Total	122	
Family Status	Single	70	56
	Married/Domestic Partnership	28	22.4
	Widowed	3	2.4
	Divorced	11	8.8
	Separated	9	7.2
	Total	121	
Employment Status	Unemployed	56	44.8
	Part-time (20 hours or less)	36	28.8
	Full-time	16	12.8
	Work-study Student	14	11.2
	Self-Employed	1	0.8
	Total	123	

Instrumentation

Final course grade. The final course grade is the score the students received at the end of the semester. The final course grade was based on the students' grade that was received in the pre-credit English course. The final course grade is based on the students' score on the standardized test given to the student at the end of the semester. The standardized test score is based on a scale of 1 to 4 with 4 being the highest score the students can achieve. In order to pass the pre-credit English course, the students must score at least a 3 on a scale of 1 to 4 with 4 being the highest score.

Career Aspiration Scale (CAS). The Career Aspiration Scale is a self-assessed metric that provides an insight to a student's motivation to succeed. The scale consists of 10 questions that allow the participants to use a Likert type scale to self-evaluate their level of truth to the statements. CAS uses a scale that ranges from 0 to 4 (0 = Not at all true of me, 1 = Slightly true of me, 2 = Moderately true of me, 3 = Quite a bit true of me, and 4 = Very true of me). CAS questions 3, 4, 7, and 10 are reversed scored. The higher the average the higher the level of the students' career aspiration. CAS has been used in several research studies and proved to be reliable (Cox 2002, Diaz 1988, & Harriman 1990).

O'Brien developed the "Career Aspiration Scale (CAS)" as part of her doctoral research in 1996. The Career Aspiration Scale has an internal consistency reliability estimate of .85 (Gray & O'Brien, 2007). A second research study demonstrated an internal consistency reliability estimate of .75 for the Career Aspiration Scale (Gray & O'Brien, 2007). The Career Aspiration Scale has been adapted into other scales created by O'Brien and partnering researchers. The other scales also focus on providing support by assessing individual's cultural

and racial socialization, self-efficacy, and multiracial challenges and resilience (O'Brien, Heppner, Flores, & Bikos, 1997; Berbery & O'Brien, 2011; Salahuddin & O'Brien, 2011).

Computer Self-Efficacy Scale (CSE). The Computer Self-Efficacy scale (CSE) is a self-assessed metric that provides an insight to a student's knowledge of computers (Coover, Murphy, & Owen, 1989). The scale consists of 35 questions that allow the participants to use a Likert type scale to self-evaluate their level of truth to the statements. CSE uses a scale that ranges from 1 to 5 (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree or Disagree, 4 = Agree, and 5 = Strongly Agree). The higher the CSE average score the higher level of the students' confident and knowledge in using technology. The scale has been used in several research studies to identify individuals' knowledge and confidence level with using technology (Brown, 2008; Pierce, 2002; Simsek, 2011; Specht, 2008).

Murphy developed the "Computer Self-Efficacy Scale (CSE)" as part of her doctoral research in 1989. The principal factor analysis of Computer Self Efficacy Scale produced a 3-factor solution which explained 92% of the systematic covariance among the 32 Computer Self-Efficacy questions (Coover, Murphy, & Owen, 1988). The Computer Self-Efficacy Scale had three factors that had alpha reliabilities of .97, .96, and .92 (Coover, Murphy, & Owen, 1988). The Computer Self-Efficacy Scale has been adapted into other similar studies to assess individual's knowledge and confident in using technology (Brown, 2008; Pierce, 2002; Simsek, 2011; Specht, 2008).

Self-Directed Learning Readiness scale (SDLR). The self-directed learning survey is a measurement of a student's level of self-directed learning based on Guglielmino's (1978) Self-Directed Learning Readiness scale. The scale consists of fifty-eight questions that allow the participants to use a Likert type scale to self-evaluate their level of truth to the statements. The

SDLR scale ranged from 1 to 5 (1 = Almost never true of me: I hardly ever feel this way. 2 = Not often true of me: I feel this way less than half the time. 3 = Sometimes true of me: I feel this way about half the time. 4 = Usually true of me: I feel this way more than half the time. 5 = Almost always true of me: There are very few times when I don't feel this way.). The scale has been used in several research studies and proved to be reliable (Cox 2002, Diaz 1988, & Harriman 1990).

Guglielmino developed the "Self-Directed Learning Readiness Scale (SLDRS) as part of her doctoral research in 1977. Guglielmino (1978) SLDRS was created using a three-round Delphi survey completed by 14 experts in the field of self-directed learning; including Knowles and Tough. Pearson product moment correlation on Self-Directed Learning using a Spearman-Brown correction produced a reliability coefficient of .94 (Guglielmino & Guglielmino, 1991).

The version of the Self-Directed Learning Readiness Scale used for this study is for the general adult population. The survey is known as the Self-Directed Learning Readiness Scale – Adult/Learning Preferences Assessments (SDLRA-A/LPA) (Appendix A). SDLRA-A/LPA consist of fifty-eight questions that uses a Likert scale. The measurement for the SDLRA-A/LPA uses above average (227 – 290), average (202 – 226), and below average (58 – 201) (www.lpasdlrs.com). The average score for SDLRS-A/LPA is 214 and the standard deviation is 25.59.

The terms used for the readiness of self-directed learning defines above average SDLRS-A/LPA score as individuals who usually prefer to determine their learning needs and plan their own learning, average SDLRS-A/LPA score are individuals more likely to be successful in more independent situations, and below average SDLRS-A/LPA score are individuals who usually prefer very structured learning such as lecture and traditional classroom settings. The SLDRS has

been modified over time, but it continues to be a major quantitative tool used to measure individual's self-report on self-directed learning.

Demographic questionnaire. The demographic survey contains questions to obtain information to provide a description of students' self-identity, that is, students were asked to supply the information about their self-identity. This demographic data was chosen based on reviewing several other related research studies so that the results can be used comparatively with previous studies. Some of the key information that was collected in the questionnaire includes ethnicity, age, gender, type of secondary degree achieved (high school or GED), type of high school attended (public, private, GED, or other), and current employment status (Cox 2002, Diaz 1988, Guglielmino & Guglielmino, 2003; Harriman, 1991).

Computer-usage questionnaire. The computer-usage survey is a measurement of student's comfort in using technology. The computer usage measurement for this research was adapted from the questionnaire developed by Kennedy, Judd, Churchward, Gray, and Krause (2008), Kuniavsky (2003), and United States Census (File, 2013). The questionnaires measures key components in using technology: students' level of access to hardware and the Internet, student's level of usage of computer based technologies, students' level of usage of mobile phone based technologies, and student's level of using technology based tools to assist with studies. The adapted version for this research is more focused toward first year students that are using technology for learning purposes in an academic environment (see appendix B).

Procedures

The design of this study was to increase the understanding of the linear relationship between academic success, self-directed learning, and instructional technology in a sample of community college students by using Guglielmino's quantitative survey – Self-Directed

Learning Readiness Scale/Learning Preferences Assessment. The research involved the community college administration to insure the proper process was used for the involvement of students participating in the research.

The students selected for the research were participants approved by the administration including the Dean of Instruction, Director of Institutional Research, Vice President of Academic Affairs, and other leadership required by the community college. The sample of students selected for the research was based on their enrollment in pre-credit college courses that utilize instructional technology in the course, specifically online web tutorial software that is part of the pre-credit course curriculum. The course includes hands-on experience that requires the use of web-based instructional technology.

The population for this study was a sample of first-year community college students enrolled in pre-credit college English courses in either the summer or fall of 2015. The participants for the research were selected based on their status as pre-credit college students at an urban community college. In the summer 2014 semester, there were 12 pre-credit English classes offered that included a total of 163 students. However, only 2 classes were offered in computer classrooms that included a total of 12 students. In addition to the traditional pre-credit English course offered during the summer, the community college offered a mini-course for pre-credit English that required the students to use laptops. There were 2 mini-classes that included 22 students. Based on the research requirement for using computers, 34 students were eligible for the research study. In the fall 2014 semester, there were 54 pre-credit English classes offered that included a total 1,132 students. However, only 7 classes were offered in computer classrooms that included a total of 160 students. There were a total of 194 students recruited for this research study. The community college students recruited were currently enrolled in the pre-

credit college English courses that required the use of supplementary web-based instructional technology and offered the use of technology in the classroom.

Data collection. The data for this research was collected during the beginning of the traditional higher education academic course summer 2014 and fall 2014 term. The researcher provided a survey that was distributed to the students during the orientation and with an introductory letter based on the guidelines of DePaul's University IRB process and City Colleges of Chicago IRB process. The research followed with the faculty on having the potential participants complete the survey to get the appropriate sample required for this study.

The students identified to participate in the research were provided anonymous numbers to complete research survey. The students received an orientation on the research. The orientation occurred at the beginning of the semester based on the instructors' schedule to allow the orientation. The orientation consisted of instructions on how to complete the Self-Directed Learning Readiness Scale – Adult/Learning Preferences Assessments (SDLRS-A/LPA) information. In addition, the researcher stressed that participating in the survey is voluntary and did not impact the students' grades if they decided not to participate. As part of the orientation, the students were provided a permission form to release their academic records for the researcher to access their final grade in the course identified as part of the research study. The instructions informed the students that the questionnaire was to assist in better serving the students and not clearly stated that it is a self-report on student's level of self-directed learning. This approach was Guglielmino's advice to prevent bias in completing the survey. This approach to introducing the survey has also been the practice of several other studies that have used Gugleilmino's SLDRS (Cox 2002, Diaz 1988).

Kennedy, Judd, Churchward, Gray, and Krause's (2008); Guglielmino and Guglielmino (2003); and the United States Census Bureau's Computer and Internet Use in the United States (File, 2013) survey were models for this portion of the study that focused on the students' use of instructional technology. The research and survey utilized a quantitative approach to measure an individual's level of comfort in using technology. The specific computer survey for this research was the Computer Self-Efficacy Scale. The research data included additional student specific information to gain a better understanding of the different aspects of the student's demographic identity. The demographic identity provided student's self-identity of ethnicity, age and gender.

The SDLRS-A/LPS was collected from Guglielmino's SDLRS-A/LPS secured database. The computer self-efficacy, career aspiration, and demographic was collected using a different data survey tool to allow for more data collection that was not available in Guglielmino's SDLRS-A/LPS tool. The data from the database included paper surveys that were entered into the same online database. This process allowed the inclusion of student's data of those students there not comfortable completing the online survey. The students were surveyed using approved and established survey tools and metrics. The students were asked to complete Guglielmino's (1978) Self-Directed Learning survey, Murphy's Computer Self-Efficacy Scale Survey, and O'Brien Career Aspiration Scale Survey. In addition, the students completed demographic information to provide additional insight to the participants in the research. Finally the students provided permission for the researchers to receive their final grade in the course that was part of the research study.

Protection of human participants. In order to insure the safety of the participants, DePaul University's Institutional Review Board and the Community College Institutional

Review Board approved this study. The researcher for this study worked with a subject-matter expert and the community college administration to recruit participants for this study.

Data Analysis

This quantitative study utilized a descriptive data analysis on the variables selected for the study. The independent variables selected for the study included gender, age, ethnicity, years of college experience, education, computer usage, Career Aspiration Scale, Computer Self-Efficacy Scale, and Self-Directed Learning Readiness Scale.

The data analysis included information from Guglielmino's secured database that compiled the information of the students' surveys. The analysis provided from the SLDRS-A survey included student's survey ID, SDLRS score, sample mean, standard deviation, variance, range, standard error, kurtosis, minimum and maximum score, skewness, and number of valid observations, and missing observations. The data was analyzed by using hierarchical regression to determine the significant findings for the research hypothesis.

The hierarchical regression analysis allowed for the study to compute the degree to which the variables were related to each other. The data between a student's level of self-directed learning and use of instructional technology was used to determine a hierarchical regression line. In addition, the data of the students' demographic information was used to determine a hierarchical regression line for the same sample of students. The goal for the level of statistical significance for the research study was $p = .05$. The statistical significance was decided based on other similar research studies that used the same level of statistical significance.

To test the null hypothesis of the first research question, Pearson r correlation was performed on the question, "What relationship exists between self-directed learning, instructional

technology, and academic success?" The student's final grade in the course and student's career aspiration were the dependent variable that were used to measure academic success. The final grade used was a 0 to 4 scale in a pre-credit English college course. The student career aspiration scale used the Career Aspiration Scale. The independent variables that were the major focus of the research study were self-directed learning and instructional technology. The self-assessment tool used for the independent variable self-directed learning was the Self- Directed Learning Readiness Scale. The self-assessment tool used for the independent variable instructional technology was the Computer Self-Efficacy Scale. In the first analysis of the first research question, the research study used course final grade in pre-credit English course as the measurement for student's academic success as a dependent variable, Self-Directed Learning Readiness scale a measurement for student's level of learning, and Computer Self-Efficacy scale as a measurement of students comfort level in using instructional technology. In the second analysis of the first research question, the research study used the student's career aspiration scale for student's academic success as a dependent variable, Self-Directed Learning Readiness scale a measurement for student's level of learning, and Computer Self-Efficacy scale as a measurement of students comfort level in using instructional technology.

To test the null hypothesis of the second research question, a hierarchical regression analysis was performed on the data to validate the question using two separate measurements:

- Which variable is more likely to predict student's academic success defined by final course grade: self-directed learning or instructional technology?
- Which variable is more likely to predict student's academic success defined by career aspiration: self-directed learning or instructional technology?"

The students' final grade in the pre-credit English course was the dependent variable and the two main predictor variables were self-directed learning and instructional technology. The self-assessment tool used for the independent variable self-directed learning was the Self- Directed Learning Readiness Scale. The self-assessment tool used for the independent variable instructional technology was the Computer Self-Efficacy Scale. In the second analysis of the second research question the student's career aspiration was the dependent variable and the two predictor variables were self-directed learning and instructional technology. The student's career aspiration was measured using the Career Aspiration Scale. The self-assessment tool used for the independent variable self-directed learning was the Self- Directed Learning Readiness Scale. The self-assessment tool used for the independent variable instructional technology was the Computer Self-Efficacy Scale.

Chapter Four

Research Findings

Chapter four examines the basic finding from the study. The first section provides an analysis of the data using standardized test scores as the definition for academic success. The second section provides an analysis of the data using students' career aspiration as an alternate definition for academic success. The final sections provide the findings as it relates to the research study questions that focused on the linear relationship between students' academic success, instructional technology, and self-directed learning.

This research study used descriptive statistics and Pearson r correlations on the variables to analyze the research question, "What relationship exists between self-directed learning, instructional technology, and academic success?" There was no correlation between the dependent variable "student's academic success" and the independent variables "self-directed learning (SDLR)" or "computer self-efficacy (CSE)" when using a students' final grade in a pre-credit English course as a measurement for student's academic success. An overview of the correlation between the variables, mean, and standard deviations is presented in Table 3 (see below).

The demographic variables for the study were gender, age, ethnicity, college experience, K-12 education type, family status, and employment status. The gender was defined as female or male. The age variable was divided into three categories. The ethnicity variable was the student's self-identity as Asian American, Black/African American, Latino, White/Caucasian, or other. The computer usage was based on how often the students used the technology (never, monthly, weekly, daily, or more than 10 hours a day). When considering demographics variables, the data identified one significant correlation between participants' demographics, computer usage, and the students' final grade in the course. The majority of the students

enrolled in the pre-credit English course were female (64.5%). There is a significant correlation between gender and students' final grade in the course ($r = -.339$, $p < .01$) with 64% of males failing the course and 33% of females failing the course by earning a grade of D or lower.

The data identified a significant correlation between the predictor dependent "students' academic success" and the predictor variables "self-directed learning (SDLR)" ($r = .21$, $p < .01$) and "computer self-efficacy (CSE)" ($r = .18$, $p < .05$) when using a students' career aspiration as a measurement for students' academic success. An overview of the correlation between predictor variables and students' academic success as defined by the students' career aspiration scale score is provided in Table 3. When focusing on the students' learning styles, Table 3 indicates a significant correlation between self-directed learning and computer self-efficacy ($r = .24$, $p < .01$). Students who had a higher level of self-directed learning also had a higher level of comfort in using technology and knowledge in using technology ($p < .05$).

The participants' data provided some strong similarities. The majority of the participants in the research study were comfortable using computers with a mean of 3.88 on of 5.0 scale. The majority of the participants in the research study fall within the average range of self-directed learning at 40%, followed by above average self-directed learning at 32%, and then below average self-directed learning at 28%. The self-directed learning average for the participants in this study was 204 compared to the average that has been found in other studies that used Guglielmino's SDLR, which is an average of 214.

There were few significant correlations with the students' demographic variables and final grade in a course. Seventy-four percent of the students who were in the course had a public education background; however, there was not any significant relationship found for public or private K-12 education and the students' final grade in the course ($r = 0.05$, $p > .05$). Seventy-

one percent of the students' were between 18 years old and 20 years old; however, there was not any significant relationship between age and the student's final grade in the course ($r = 0.081$, $p > .05$). Forty-five percent of the students were unemployed; however, there was not any significant relationship between student's employment status and the student's final grade in the course ($r = 0.08$, $p > .05$).

The data was further analyzed to determine the possible significant relationship between the student's demographic information as it relates to the student's career aspiration scale score. The analysis identified there was no significant relationship between students' ethnic identity and students' career aspiration ($r = -.11$, $p > .05$). The analysis identified no significant relationship between gender and students' career aspiration ($r = .068$, $p > .05$). The analysis identified no significant relationship between age and students' career aspiration ($r = .063$, $p > .05$). The analysis identified no significant relationship between employment status and students' career aspiration ($r = -.05$, $p > .05$). The analysis identified no significant relationship between years of college and students' career aspiration ($r = -.04$, $p > .05$).

To understand the use of technology by participants in the research study, the data was analyzed to verify if there was a significant relationship between the students' demographic information, computer usage, and computer self-efficacy score. There was no significant relationship between students' identified demographic information and a students' comfort in using technology. There was no significant relationship between students' demographic and computer usage. There was a significant relationship with students' computer self-efficacy and students' using the home computer for business ($r = .188$ and $p < .05$) and homework ($r = .208$ and $p < .05$).

To understand the student's learning style in the research study, the data was analyzed to verify if there was a significant relationship between a student's demographic and a student's level of self-directedness. There was a significant relationship between a student's age and self-directed learning ($r = .191$ and $p < .05$). The older students had a higher level of self-directed learning. The other demographic information did not show any significant relationship with a student's level of self-directed learning.

Table 3

Means, Standard Deviations, and Pearson-Moment Correlation

	1	2	3	4	5	6	7	8	9	10	11	12
Final Grade	1											
Gender	-0.34**	1										
Age	0.08	0.01	1									
Ethnicity	.28**	-0.14	0.07	1								
College Exp.	-0.14	-0.05	.21*	0.09	1							
K-12 Ed.	0.05	0.6	0.18*	-0.04	0.11	1						
Family Stat.	-0.09	0.104	-0.08	-0.07	0.07	0.02	1					
Emp. Status	0.08	0.16*	0.01	0.03	0.05	.23**	-0.05	1				
Comp. Usage	0.07	-0.11	0.09	0.04	-0.01	0.13	0.06	0.05	1			
CSE	0.01	0.02	-0.11	-0.09	-0.05	0.04	-0.07	-0.05	0.10	1		
SDL	-0.00	-0.16*	.19*	-0.08	0.096	0.04	-0.06	-.17*	0.15*	.24**	1	
CAS	0.002	-0.07	0.06	-0.11	-0.04	-0.04	-0.03	-0.05	0.18*	.18*	0.21*	1
N	116	124	124	124	124	122	121	123	124	124	125	124
Mean	1.9	1.35	1.38	3.75	1.47	1.51	3.74	3.37	2.82	3.88	2.04	2.81
SD	1.308	0.48	0.645	0.852	0.897	1.046	1.676	1.59	0.62	0.81	0.78	1.31

Note: CSE = Computer Self-Efficacy Score; SDL = Self-Directed Learning Score; CAS = Career Aspiration Scale; $p<0.01$; * $p<0.05$

A hierarchical regression analysis was used in four models to analyze the data to test the second research question, “Which variable is more likely to predict student’s final course grade: self-directed learning or instructional technology?” There were two hierarchical regression

analysis completed for analyzing academic success. The first hierarchical regression analysis used the course final grade to define academic success and the second hierarchical regression analysis used the student's career aspiration to define academic success. In analyzing the data, the demographic variables were entered as the first block of variables to complete a hierarchical regression analysis to test the research question. The demographic variables used were ethnicity, gender, age, years of college experience, type of high school attended, and employment status. After analyzing the data with the block of demographic variables, the second model included the student's frequency of using computers. In the third analysis of the data, the students' comfort level in using computers was added to the previous variables in the third model. Finally, the student's level of self-directed learning was included in the hierarchical regression analysis of the data to test the null hypothesis for the research questions.

The data did show predictor variables when using the course final grade as the criterion variable to define student's academic success. In the first model, the block of demographics was analyzed and demographics did account for the variance in course final grade (22%). The demographic variable that did account for the variance was gender (female achieved a higher final course grade). In the second model, the data analysis did not show the use of computers as a predictor when academic success was defined as the course final grade ($p = .172$). In the third model, the data analysis did not show instructional technology (CSE) as a predictor variable when academic success was defined as the course final grade ($p = .284$). In the fourth model, the data analysis did not show self-directed learning scores as a predictor for academic success when academic success was defined as the course final grade ($p = .588$). Table 4 provides the results of the hierarchical regression analysis for student's academic success when the dependent variable is defined as the student's final grade in a course.

Table 4

Hierarchical Regression Analysis for Variables Predicting Final Grade

Model 1

Variables	B	Std. Error	Beta	t	Sig.
(Constant)	1.117	0.914		1.222	0.225
Gender	-0.985	0.247	-0.37	-3.982	0.001
Age	0.134	0.193	0.065	0.693	0.49
Ethnicity	0.514	0.189	0.253	2.716	0.008
College Exp	-0.261	0.148	-0.167	-1.763	0.081
K-12 Ed Type	0.061	0.116	0.051	0.521	0.603
Family Status	-0.003	0.074	-0.004	-0.041	0.968
Emp. Status	0.114	0.079	0.139	1.443	0.152

R = .473[a]	R^2 = 0.223	Adj R^2=0.166	R^2 Ch.=0.223	F Ch.=3.903	df=7	p = .001

Model 2

Variables	B	Std. Error	Beta	t	Sig.
(Constant)	1.353	1.118		1.21	0.229
Gender	-0.998	0.251	-0.375	-3.976	0
Age	0.13	0.194	0.063	0.668	0.506
Ethnicity	0.508	0.191	0.25	2.66	0.009
College Exp	-0.259	0.149	-0.165	-1.735	0.086
K-12 Ed Type	0.065	0.117	0.054	0.553	0.582
Family Status	-0.002	0.074	-0.003	-0.032	0.974
Emp. Status	0.118	0.08	0.144	1.473	0.144
Computer Usage	-0.076	0.206	-0.035	-0.37	0.712

R=.474	R^2=0.224	Adj. R^2=.158	R^2 Ch.=.001	F Ch. = .137	df=1	p =.172

Model 3

Variables	B	Std. Error	Beta	t	Sig.
(Constant)	0.777	1.239		0.627	0.532
Gender	-1.016	0.251	-0.381	-4.04	0
Age	0.144	0.194	0.07	0.742	0.46
Ethnicity	0.528	0.192	0.26	2.753	0.007
College Exp	-0.262	0.149	-0.167	-1.763	0.081
K-12 Ed Type	0.064	0.117	0.053	0.544	0.588
Family Status	0.002	0.074	0.003	0.032	0.975
Emp. Status	0.125	0.081	0.152	1.556	0.123
Computer Usage	-0.119	0.209	-0.054	-0.569	0.571
CSE	0.152	0.141	0.101	1.078	0.284

R=.484	R^2=0.234	Adj. R^2=.16	R^2 Ch.=.01	F Ch. = 1.16	df=1	p =.284

Model 4

Variables	B	Std. Error	Beta	t	Sig.
(Constant)	0.915	1.269		0.721	0.473
Gender	-1.033	0.254	-0.388	-4.061	0
Age	0.167	0.199	0.081	0.836	0.406
Ethnicity	0.516	0.194	0.254	2.663	0.009
College Exp	-0.257	0.15	-0.164	-1.712	0.09
K-12 Ed Type	0.066	0.118	0.055	0.562	0.575
Family Status	0.001	0.075	0.001	0.013	0.99
Emp. Status	0.114	0.083	0.138	1.367	0.175

Computer Usage	-0.104	0.212	-0.047	-0.488	0.626	
CSE	0.176	0.148	0.117	1.188	0.238	
SDL	-0.099	0.183	-0.057	-0.543	0.588	
R=.486	R^2=0.236	Adj. R^2=.16	R^2 Ch.=.002	F Ch. = .295	df=1	p =.588

Note: CSE = Computer Self-Efficacy Score; SDL = Self-Directed Learning Score; CAS = Career Aspiration Scale

The data did show some predictor variables when career aspiration was used as the criterion variable to define student's academic success. In the first model, the demographic variables were entered as the first block of variables to complete a hierarchical regression analysis to test the predictor variables for students' academic success as defined by students' career aspiration. The data analysis, none of the demographic variables accounted for any variance in students' career aspiration (p .556). In the second model, the data analysis did show students' use of computers accounted for 4.2% of students' career aspiration ($p < .05$). In the third model, the data analysis did show instructional technology (CSE) account for 5.1% of students' career aspiration ($p < .05$). The analysis of the data identified students with a higher level of self-directed learning also had a higher level of career aspiration ($p < .05$). Self-directed learning accounted for 5.8% of the variance in a students' career aspiration. The analysis of the data identified students with a higher level of self-directed learning also had a higher level of career aspiration ($p < .05$). Table 5 provides the results of the hierarchical regression analysis for student's academic success when the criterion variable is defined as the student's career aspiration.

Table 5

Hierarchical Regression Analysis for Variables Predicting Career Aspiration

Model 1

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	3.636	0.433		8.407	0
Gender	-0.093	0.123	-0.075	-0.76	0.449
Age	0.031	0.096	0.032	0.316	0.752
Ethnicity	-0.156	0.088	-0.175	-1.781	0.078
College Exp.	-0.083	0.075	-0.111	-1.11	0.269
K-12 Ed Type	-0.03	0.057	-0.053	-0.522	0.603
Family Status	-0.014	0.036	-0.039	-0.389	0.698
Employment Status	0.007	0.039	0.018	0.18	0.858

R=.232	R^2.054	Adj. R^2=.01	R^2 Ch=.054	F Ch.=.841	df	p =.556

Model 2

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	2.985	0.52		5.746	0
Gender	-0.059	0.122	-0.048	-0.489	0.626
Age	0.037	0.095	0.039	0.395	0.694
Ethnicity	-0.139	0.087	-0.155	-1.602	0.112
College Exp	-0.092	0.073	-0.123	-1.248	0.215
K-12 Ed Type	-0.042	0.056	-0.075	-0.747	0.457
Family Status	-0.019	0.035	-0.053	-0.54	0.59
Employment Status	-0.004	0.038	-0.01	-0.101	0.919
Computer Usage	0.218	0.1	0.211	2.176	0.032

R=.310	R^2=.096	Adj. R^2=.025	R^2 Ch=.042	F Ch=4.74	df=1	p =.032

Model 3

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	2.332	0.572		4.076	0
Gender	-0.071	0.119	-0.057	-0.596	0.552
Age	0.051	0.093	0.053	0.553	0.582
Ethnicity	-0.12	0.085	-0.134	-1.419	0.159
College Exp	-0.097	0.072	-0.13	-1.354	0.179
K-12 Ed Type	-0.046	0.055	-0.081	-0.831	0.408
Family Status	-0.011	0.035	-0.03	-0.308	0.759
Employment Status	0.006	0.038	0.015	0.155	0.877
Computer Usage	0.175	0.099	0.17	1.762	0.081
CSE	0.165	0.067	0.233	2.464	0.015

R=.384	R2=.147	Adj. R2=.071	R2 Ch=.051	F Ch=6.07	df=1	p =.015

Model 4

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	1.978	0.571		3.465	0.001
Gender	-0.04	0.116	-0.032	-0.346	0.73
Age	0.002	0.092	0.002	0.026	0.979
Ethnicity	-0.081	0.084	-0.091	-0.971	0.334
College Exp	-0.113	0.07	-0.151	-1.615	0.109
K-12 Ed Type	-0.05	0.053	-0.089	-0.937	0.351
Family Status	-0.005	0.034	-0.014	-0.154	0.878
Employment Status	0.032	0.038	0.083	0.84	0.403
Computer Usage	0.138	0.097	0.134	1.415	0.16
CSE	0.116	0.068	0.164	1.723	0.088

SDL	0.221	0.082	0.276	2.689	0.008	
R=.453	R2=.205	Adj. R2=.125	R2 Ch=.058	F Ch=7.232	df=1	p=.008

Note: CSE = Computer Self-Efficacy Score; SDL = Self-Directed Learning Score; CAS = Career Aspiration Scale

Chapter Five

Discussion and Conclusion

Chapter 5 discusses and conclusion based on the results from this research study. This chapter discusses the linear relationship between instructional technology, self-directed learning, and academic success. Chapter 5 is arranged in the following order: summary of results, conclusion and explanation of the results, implications for community college, implications for academic success, implications for instructional technology, implications for self-directed learning, limitations of the present study, and future research.

Summary of Results

The purpose of this study was to further understand the relationship between instructional technology as measured by the Computer Self Efficacy Scale, self-directed learning as measured by the Self Directed Learning Readiness Scale, and academic success measured by students' final course grade and also separately measured by Career Aspiration Scale. The research study specifically focused on community college students who are at-risk.

This study analyzed the relationship between the predictor variables and two separate measurements for the criterion variable academic success: course final grade and career aspiration. In the first model of the hierarchical regression analysis that focused on the demographics variable, gender was the only variable that emerged as a significant predictor for students' final course grade. Females had a higher success percentage of passing the course. In the second, third and fourth model of the hierarchical regression analysis, the predictor variables computer usage, instructional technology and level of self-directed learning did not account for significant unique variance in students' academic success when defined by students' final course grade.

When defining academic success by students' career aspiration, the demographics variable in the first model did not account for significant unique variance. Students 'computer usage was identified as a predictor variable for students' career aspiration in the second model of the hierarchical regression analysis. The higher the levels of students use of computers the higher the level of the students' career aspiration, especially when the use of computers at home was for homework and business. When analyzing the data in the third and fourth model of the hierarchical regression analysis, instructional technology and level of self-directed learning did account for significant unique variance in students' academic success when defined by students' career aspiration

When looking at the predictor variables for academic success, this study did not find instructional technology or level of self-directed learning as predictors for the students' final course grade. This study did find that instructional technology and level of self-directed learning as predictor variables for the students' career aspiration.

Conclusion and Explanations of the Results

The following conclusion and explanations are based on the findings of this research study. The relationship between the use of instructional technology and self-directed learning readiness for students' academic success has limited research in the focus on underperforming students. This research study sought to further understand the use of instructional technology and self-directed learning readiness to achieve academic success for underperforming students.

The focus on these participants is to further understand how to increase the academic success of students who have been identified as the demographic that requires relevant resources to succeed in their academic career. In addition to seeking out an understanding of a specific at-risk demographic, this research seeks out student's self-perception of their preparedness for

academic success. The participants in this research were specifically students enrolled in community college pre-credit courses that use instructional technology as part of the program design.

In reviewing the participants in this research study, the students' academic success had two different results based on the separate measurements used to define students' potential academic success. When defining academic success by a students' career aspiration, self-directed learning and instructional technology were predictor variables. However, gender was the only significant predictor for students' academic success when defined by the students' final course grade.

Instructional technology, self-directed learning, and final course grade. The first part of this research focused on the students' success as defined by the students' final grade in a pre-credit college English course. Using a hierarchical regression analysis, the research study did not find students' knowledge in using instructional technology (CSE) and level of self-directed learning (SDLR) as predictor variables when compared to student's final course grade.

A possibility for the lack of significant correlation between a student's use of instructional technology (CSE) and the student's final grade is the aspect of cultural presence in instructional technology and learning that might not relate to a diverse community. Research studies continue to confirm various aspects of technology are a social construction and thus are inherently situated within a culture and its values (Chen, 2007; Chisholm & Wetzel, 2001; Damarin, 1998; Lee, 2011; Selwyn, 2013). When working with underperforming students, schools have historically and currently adopted an integrated learning environment (ILE) such as the instructional technology studied in this research study. In ILE, the computers are used for individualizing instruction toward pre-specified, fragmented knowledge, and skills (Damarin,

1998). During the implementation of the research study, the participants and the teachers expressed concern with the instructional technology that was used for individualized instruction to complete course assignments. The students had concerns about the difficulty in using the instructional technology. The faculty also expressed the same concerns when they reviewed the material that the students had to complete using the instructional technology. The difficulty in using instructional technology related to the software instructions provided to complete the activities, use of terms that might not exist in the students' culture, and incorrect answers provided in the instructional technology that confused the students understanding of the material provided in the instructional technology. In addition, a few students expressed concern that a different instructional technology should be selected that was more user friendly in navigating around the different activities in the instructional technology and involved the students' input. The faculty expressed concern that the instructional technology might have biases similar to standardized tests and textbooks. As a result, some of the teachers used other resources to support the students in the course. The bias in textbooks has been a concern of other researchers (Bello, Provenzo, & Shaver, 2011). Similar to the biases in textbook, instructional technology could also have this limitation since the instructional technology information is built from the information in the companion textbook used for the course. The teachers also expressed a concern of whether the instructional technology would lack creativity and student engagement potential that might result in the students' loss of interest in completing the assignments. The concerns of the students and faculty supports the need for further research that specifically focuses on at-risk students' use of instructional technology.

Another possibility for the lack of significant correlation between instructional technology and the student's final grade is the perception of digital natives' capability to use

instructional technology for learning. The research identified the participants who used the technology for homework and business were more successful compared to students who used technology for games and social media. The majority of students in community college are digital natives. Digital native is a term that refers to students who have been exposed to technology from early childhood. There are some aspects that must be considered when understanding a student's comfort level and knowledge in using technology (Kennedy, Judd, Churchward, & Gray, 2008). One of the barriers that schools face in using technology effectively is cultural lag (Burger, 2013; Chen, 2007; O'Reilly, 2011). Cultural lag is a concern as computer usages in education are increasing at a significant rate in our daily lives. The concept of cultural lag can assist in understanding there is a change in society that includes technology in our daily lives and how it is used. Digital natives are often found using technology for social media, but does that equate to effectively using technology for learning to achieve academic success. Faculty expressed concerns with students working independently on instructional technology. The faculty found students spending too much time on social media instead of using the instructional technology for learning the course material. Further research is required to understand how cultural lag might impact the use of instructional technology by underperforming students.

Several studies have shown a significant positive correlation between students' level of self-directed learning and academic success when using course grades. Students with a higher level of self-directed learning achieved a higher course grade or level of success (Canipe, 2001; Cox, 2002; Johnson, 2003; Posner, 1989). This study's SDLR correlation result was not similar to several other study results that found a significant positive correlation between SDLR and course grades (Canipe, 2001; Cox, 2002; Johnson, 2003; Posner, 1989). This study found no

significant correlation between SDLR and course grades. There were a few other studies that included SDLR that did have the same results as this study. The majority of the students in those studies had a sample of demographics similar to this study; mostly individuals that identified as students of color (Duerr, 2014; Rutland, 1987; Ware, 2003). Based on other self-directed learning research studies, there is further research needed to understand why self-directed learning was not a significant correlation for academic success when the demographic was community college students taking pre-credit college courses.

Instructional technology, self-directed learning, and career aspiration. Using a hierarchical regression analysis, the first model did not find the students' demographic variables as predictor variables when compared to student's career aspiration. In the second, third, and fourth model, the first the research study did find students' computer usage, students' knowledge in using technology (CSE,) and level of self-directed learning (SDLR) as predictor variables for students' career aspiration scale (CAS). There are aspects that might contribute to this result based on other research studies. One possibility is the participants who perceived themselves as more self-directed in learning have established long term goals (identified by their CAS) to succeed in their academic career. Research supports the idea that students who believed they were prepared for school had a higher level of college aspiration (Chenoweth & Theokas, 2011; DuFour & Marzano, 2011; Maness, 2013; Pitre, 2006). College and Career aspiration focus on the student's self-perception of their motivation to set and achieve objectives to meet their college and career goals (Alexander & Cook, 1979; Jencks, Cobb & Quaglia, 1996; Crouse, & Mueser, 1983; Plucker, 1998, Witmer, 2014). SDLR takes a similar approach analyzing how a student approaches goals and seeks out information to accomplish success. Research identifies students who are at a higher level of being a self-directed learner have both the learning skills

and the basic knowledge to succeed in achieving educational goals. In addition, these students view themselves as being both ready and able to explore a specific area with a good guide (Grow, 1991).

Another possibility is the direct correlation between a student's motivation (CAS) and level of self-directed learning. While SDLRS might not be the tool that solely determines a student's academic success, it does provide a sense of the student's ability and learning style to succeed in pursuing a career that requires completing a college degree. The significant correlation with SDLRS and CAS identify students who may be more successful in completing their goals because they perceive themselves as self-directed learners that readily self-assess and seek out needed resources. Students at the highest level of self-direction are both willing and able to plan, execute, and evaluate their own learning with or without the help of an expert (Grow, 1991).

A third possibility is the direct correlation between a student's motivation and ability to learn technology. Career aspiration focuses on the importance of support and modeling to achieve success in accomplishing goals by understanding the consequences of positive and negative behaviors. Career aspiration focuses on the student's self-perception of motivation to set and achieve objectives to meet their college and career goals (Alexander & Cook, 1979; Jencks, Cobb & Quaglia, 1996; Crouse, & Mueser, 1998; Plucker, 1998; Witmer, 2014).

Implications for community colleges

The education system of the United States continues to be challenged as its ranking decreases on a global level for public education. Thus, the perception is that this failure affects the ability of the country to compete in the global economy and to produce a qualified work force. In an effort to increase the United States' public education global ranking, higher

graduation rate in community college has been identified as a goal for a possible solution. Community colleges continue to be a focus for improving education for all students in the United States. Improving education for all students include individuals who cannot afford or are not eligible to go to four-year institutions based on standardized test scores. Community colleges could provide opportunity for students to attend higher education institutions by continuing to effectively use technology to support students' learning. This approach involves understanding the content of the instructional technology material and how it engages the students in learning. Community college should consider implementing standard operation procedures to make instructional technology vendors more accountable in providing the resources to students at an affordable cost and provide metrics of success that demonstrate inclusive learning for diverse students. In addition, community colleges must understand and provide professional development to faculty to continue to learn and improve support for students' academic success by effectively using technology.

Implications for academic success

Graduation is based on the assessment of students' academic success. Traditionally, assessment uses standardized tests to measure students' academic success. This research study further investigated the definition of students' academic success by focusing on students' career aspiration.

Studies have shown standardized tests as being biased, especially for diverse students. Some of the key biases are related to offensiveness and unfair penalization (Popham, 2006). Metrics have been created to determine if tests are biased (Popham, 2006). However, studies continue to address the need for changing the traditional assessment that places high stake standardized tests on students' academic success. One of the options that continues to be

introduced as a solution to support students' academic success is using multiple assessment tools. The use of multiple assessment tools would provide a more in-depth understanding of students' knowledge and skills. One of the possible assessments to include in understanding students' potential for academic success is students' career aspiration. An important factor in understanding students' career aspiration is that it stresses the importance to consider students' individual differences to achieve specific goals. By focusing on the individual differences of students, career and college aspiration could have a positive influence on students' outcome to achieve academic success. This approach would allow for intentional focus on students' individual needs when using instructional technology in learning to achieve academic success. There is a need to better understand an all-inclusive assessment approach to support academic success such as the perspectives that are included in students' career aspiration.

Implication for instructional technology

Current trend identifies instructional technology as a tool supported at the local community and government level that does significantly increase students' performance (Anglin, 2011; Dassance, 2011; Levinson, 2005; Office of the Press Secretary, 2009; Office of the Press Secretary, 2015; Simon, 2014). At the government level, the Obama administration believes the goal to increase college graduates is to include new 21st century innovations (Office of the Press Secretary, 2009). The suggested tools as part of the 21st century innovations include computers, software, and more easily access Internet resources. At the local community level, research continues to demonstrate significant success in using instructional technology (Bajt, 2011; Barron, 2003; Ferdig, Coutts, DiPietro, &Lok, 2007; Prain & Hand, 2003; Roberson, 2011). However, there is a concern that instructional technology has not proven to significantly increase academic success for underperforming students who are of diverse backgrounds that are often

the majority of students who are classified as failing to succeed in academics (Bajt, 2011; Barron, 2003; Ferdig, Coutts, DiPietro, &Lok, 2007; Prain & Hand, 2003; Roberson, 2011). In addition, there is limited quantitative research on the impact of the use of instructional technology in community colleges.

The use of technology is considered as a key means to increase the graduation rate for community college students. Research supports the success of using instructional technology to assist students' achievement in academic success. However, there is a concern that the integration of technology without considering other instructional aspects may not lead to students' academic success. Instructional technology is often implemented without understanding the students who will use the learning tool, cost to students to purchase the software, and ease of access to use instructional technology. There is a need to better understand what type of resources are relevant and how to use the resources in closing the existing achievement gap that has continued to exist in the United States education system for several decades.

Implication for self-directed learning

Studies of self-directed learning show that individuals who use a higher level of self-directed learning strategies are more successful in achieving specific goals compared to individuals who employ fewer strategies of self-directed learning, known as dependent learners (Grow, 1991). Grow (1991) identified four stages of self-directed learning that identify an individual's level to accomplish goals. The goal ranges from students who are closely monitored by teachers to complete learning outcomes (dependent learners), to students that receive minimum support from teachers to accomplish learning outcomes (self-directed learners) (Grow, 1991). Guglielmino (1977) provides a similar quantitative analysis by identifying students as

above average, average, and below average based on her Self-Directed Learning Readiness Scale. Gureckis and Markant (2012) support the range of self-directed learning that allows "active learners" to select their own pace and information in using instructional technology.

Research identifies self-directed learning as a successful approach that provides appropriate resources to support students' academic success. Research supports the self-directed learning method as appropriate for traditional and non-traditional learners to achieve academic success. Self-Directed Learning specifically defines how teachers can help students achieve academic success based on the students' level of learning (Grow, 1991). There is a need to better understand how intentional use of self-directed learning can assist underperforming students to achieve academic success.

Limitations of the Present Study

This research study has several limitations and should be considered when interpreting the results. The first limitation of the study is the selection bias. The majority of the sample consisted of students who identified as students of color. Other community colleges do not always consist of a majority of students who identify as students of color.

The second limitation is that the participants' data was self-reported. This study relies on the students' response to be honest to allow for the accurate interpretation of the research tools. For example, if the students expressed a higher level of confidence in using technology, the participant was not tested to verify their technical skills.

A third limitation is that the survey was not mandatory which resulted in some students not completing the survey. If the students who did not participate in the study had different responses or different grades, it might limit the generalization of the study.

A fourth limitation is that students did not complete the survey or did not answer questions that were optional. If the students who did not participate in the study had different attitudes in responding to the research tools and different final grades, the finding of the study might be limited.

Recommendations for Further Research

There is limited quantitative research on the impact of the use of instructional technology, self-directed learning, and career aspiration to achieve academic success for underperforming community college students. Instructional technology used in learning is an extensive field of interest in research, especially when seeking out solutions to increase students' academic success. The use of instructional technology in education is significantly changing traditional teaching and learning. Professional development is important to enable teachers to successfully implement the use of academic software in the classroom (Mouza, 2003). The whole school approach supports the use of technology inside and outside of the classroom that supports teaching and learning driven by educational goals rather than the capacities of the technologies (Prain & Hand, 2003). There is a need to better understand what type of resources are relevant and how to use the resources in closing the existing achievement gap that has continued to exist in the United States education system for several decades.

There is a concern that technology similar to historical trends in education can fail as a solution if not correctly implemented. The average final course grade for the students in this study was 1.9 on a 4.0 scale based solely on the students exit exam. The current school culture focuses on students' performance on high stakes testing. This focus does not consider the alternate culture that consists of envisioning an education that is connected to the real world. By taking the alternate culture approach, the learning environment can change from the default

culture of a traditional teaching and learning environment to a more student-centered learning environment that allows students to learn at their own pace and style as part of their own identity (Chen, 2007; Chisholm & Wetzel, 2001; Dresel & Haugwitz, 2008; Gano, 2011; Gureckis & Markant, 2012; Lowther, Inan, Strahl, & Ross, 2008; Mouza, 2003; Neill & Mathews, 2009; Prain & Hand, 2003; Staples, Pugach, & Himes, 2005; Roberson, 2011). Further research is required to understand how cultural lag might impact the use of instructional technology by underperforming students.

Supporting resources that contribute to student's academic success occurs inside and outside of the classroom. The informal observation indicates there are outside factors that contribute to the academic success in a course. Students expressed concern with access to technology, work restrictions that were a distraction or forced them to miss class, and students' family role that had a higher priority than attending class or completing assignments.

As the learning environment changes, it could also impact the student indirectly if the teacher is a digital immigrant, uncomfortable using technology (Kennedy, Judd, Churchward, & Gray, 2008). This research study focused on the student and the inclusion of technology, but did not look at the content of the course, content of the instructional technology used for the course, or the professional development support provided to the faculty to use the continuously changing technology to facilitate learning in the classroom toward students' academic success.

Although there has been an increase in the comfort level of teachers using technology, there is a concern for the comfort level of teachers who might be digital immigrants to integrate technology into education or their instructional approach to learning. Some teachers are resistant to the changes technology brings, especially new technology that challenges their perception of their role as teacher (Chen, 2007). Professional development programs designed to help

teachers' result in a teacher's ability to effectively integrate technology into their classrooms (Anglin, 2011; Chen, 2007; Chisholm & Wetzel, 2001; Mouza, 2003).

Teachers who embrace culture in education have also been successful in using technology in education. An example of inclusion of culture is Chisholm and Wetzel (2001) model that consisted of six elements when integrating technology in the classrooms: cultural awareness, cultural relevance, a culturally supportive environment, equitable access, instructional flexibility, and instructional integration. Further research should consider these factors in how it impacts a student's grades and career aspiration to achieve their academic success. The concerns of the students and faculty supports the need for further research that specifically focuses on at-risk students' use of instructional technology.

The proper use of tools, such as instructional technology, creates an inclusive self-directed learning environment that can allow for individual student's academic success. However, caution should be utilized when using instructional technology, recognizing limitations that need to be overcome for a diverse learning community. The electronic classroom poses particular problems and issues for the pursuit of an agenda of equity and fairness to all in a diverse culture (Neill & Mathews, 2009). The technologies themselves and the vision of an electronic community are largely the products and dreams of privileged White men (Damarin, 1998). When considering inclusiveness, the literature identifies the need for students to make a connection to the learning environment (Bajt, 2011; Merriam, Caffrella, & Baumgartner, 2007; Pickett, 1998; Sleeter & Grant, 2007; Wiggins & McTighe, 2005). There is a need to better understand how intentional use of self-directed learning can assist underperforming students to achieve academic success. Based on other self-directed learning research studies, there is further research needed to understand why self-directed learning was not a significant correlation for

academic success when the demographic was community college students taking pre-credit college courses.

Conclusion

The focus of this study was to understand if there is a linear relationship between instructional technology and self-directed learning for academic success. In addition, the research study attempted to understand if instructional technology or self-directed learning was a predictor for students' academic success. Specifically, the study focused on community college students in an urban public education system using instructional technology as part of the course design.

Thus, there is an increasing body of research that indicates technology may facilitate academic success. Major work by Ferdig, Coutts, DiPietro, & Lok, (2007) showed that instructional technology is one of the preferred tools used to assist students in their academic success. Neill and Mathew (2009) research showed a significant increase in 7^{th} and 8^{th} grade students' Mathematic and English standardized test scores when effectively using instructional technology.

Grow (1991), Gibbons (2002), and Knowles (1975) confirm the importance of self-directed learning for academic success. Lucy Guglielmino and Paul Guglielmino's (2003) major quantitative studies reveal that students' academic success has been accomplished by using self-directed learning. Similar to the research supporting self-directed learning as a way to increase students' academic success, research identifies the use of instructional technology as a method to support students' academic success.

However, there is limited quantitative research that focuses on the use of both instructional technology and self-directed learning to assist community college students'

academic success. The research focusing on instructional technology and self-directed learning is especially missing for underperforming students. As a result of the limited research on the topic, the research question that was the focus of this study is specifically directed toward underperforming students.

This research study focused on underperforming community college students enrolled in a pre-credit college course and the use of instructional technology and level of self-directed learning readiness to achieve academic success. This research study did not identify a significant correlation in the use of instructional technology or self-directed learning to achieve students' academic success when defined as the students' final grade in the course. Other similar studies identified in the literature review did find significant correlations when using instructional technology or self-directed learning. However, the other studies that had the significant correlations did not focus on at-risk students.

This research study found a significant correlation in the use of instructional technology and self-directed learning to achieve students' academic success when defined as the students' career aspiration. The difference in defining students' academic success provided findings that require further research to identify what type of assessment is needed to support a student's academic career, especially diverse students that are enrolled in community colleges.

In addition, the study poses the need to further research how to effectively use instructional technology and level of self-directed learning readiness to support underperforming students to achieve academic success. The research would assist in improving community college students' academic success and potentially lead to decreasing the achievement gap.

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