

INVESTIGATING THE PREDICTIVE RELATIONSHIP BETWEEN ADULT READING
ABILITY AND AGE, ETHNICITY, RACE, AND EDUCATIONAL ATTAINMENT

by

Angela Leigh Castleman

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Liberty University

2017

INVESTIGATING THE PREDICTIVE RELATIONSHIP BETWEEN ADULT READING
ABILITY AND AGE, ETHNICITY, RACE AND EDUCATIONAL ATTAINMENT

by

Angela Leigh Castleman

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Liberty University, Lynchburg, VA

2017

APPROVED BY:

Gary Kuhne, Ed.D, Committee Chair

Jessica Talada, Ed.D, Committee Member

Dave Arnold, Ed.D, Committee Member

Scott Watson, Ph.D, Associate Dean, Advanced Programs

ABSTRACT

The demand for literacy skills in today's everchanging workforce is an issue that plagues our nation. With millions of Americans reading below basic levels of proficiency, adults are not equipped to meet the demands, and colleges and universities must identify ways to address the problem. The purpose of this correlational study was to determine if any predictive relationship exists between the predictor variables age, ethnicity, race and educational attainment and the criterion variable, adult literacy, as measured by the Pearson MyReadingLab Pre-Assessment. The participants used in this study were non-traditional students enrolled in the Associate of Science Business program (ASB) at a Midwestern private Christian university. A simultaneous multiple linear regression analysis of the criterion and predictor variables was conducted to determine correlation.

Keywords: andragogy, adult Literacy, nontraditional students, developmental education, college readiness

Dedication

To my fiercely loyal husband, Carson, and our amazing children, Claire and Carter. Your unconditional love and support made this achievement possible. I love you all to the moon and back...and back again!

Acknowledgements

First and foremost, I acknowledge Jesus Christ as my Lord and Savior and the anchor of my life, without whom I would never have accomplished this goal.

With deepest appreciation, I acknowledge my Chair, Dr. Gary Kuhne. I will be forever grateful for your willingness to work with me when I was without a Chair but eager to begin again. I also acknowledge my committee members, Dr. David Arnold, a dear friend, colleague, and advisor who has graciously supported the Castleman Family for many years, and Dr. Jessica Talada whose encouragement and feedback have been invaluable.

I am beyond blessed and grateful for my family who have never given up on me and supported my every endeavor. Thank you to my husband, Dr. Carson Castleman, who has been my biggest cheerleader and sounding board, my daughter Claire whose humor provided many bright spots along the way, and my son Carter who was just a baby when I began my journey but has most recently provided plenty of hugs and encouraging words.

Thank you to my parents, Mike and Sherry Williams, who not only gave me my start in the world but have given selflessly of their time and resources to care for me and my children while I worked and whose love and belief in me has constantly compelled me forward.

Thank you to my closest and dearest friend in all the world, my twin sister and confident, Amy Miller, who makes me a better woman and has loved and supported me my whole life.

Thank you Dr. Jodi Mills, a stats rock star who guided me so patiently along the way of Chapter 4 and to Jule Kind, whose masterful editing is sincerely appreciated.

Thank you to all my friends and colleagues from Stephens Elementary School, Randall K. Cooper High School, and Indiana Wesleyan University who have walked the long journey of completing this project with me, cheering and encouraging with every step.

Table of Contents

ABSTRACT	3
Dedication	4
Acknowledgements	5
Table of Contents	6
List of Tables	8
List of Figures	9
List of Abbreviations	10
CHAPTER ONE: INTRODUCTION	11
Background	11
Problem Statement	15
Purpose Statement	17
Significance of the Study	18
Research Question	19
Null Hypothesis	19
Definitions	19
CHAPTER TWO: LITERATURE REVIEW	20
Theoretical Framework	23
Related Literature	26
Summary	47
CHAPTER THREE: METHODS	51
Design	51
Research Question	51
Null Hypothesis	52
Participants and Setting	52
Instrumentation	54
Procedures	56
Data Analysis	58
CHAPTER FOUR: FINDINGS	60
Overview	60
Research Question	60
Null Hypothesis	60
Descriptive Statistics	60
Results	68

Hypothesis	69
Assumption Tests.....	69
Summary of Findings.....	73
CHAPTER FIVE: CONCLUSIONS	75
Overview	75
Discussion	75
Implications	79
Limitations	80
Recommendations for Future Research	81
References	83
Appendix A.....	98
Appendix B	99

List of Tables

Table 1 Associated Quantitative Measure of Text Complexity (Pimentel, 2013).....	35
Table 2 Lexile Reader Measures by Grade Level.....	55
Table 3 Minimums and Maximums for Lexile and Age.....	61
Table 4 Descriptive Statistics for Lexile and Age.....	61
Table 5 Descriptive Statistics of Lexile by Age Range.....	62-64
Table 6 Frequency – Race.....	64
Table 7 Descriptive Statistics of Lexile for Race.....	65
Table 8 Frequency – Ethnicity.....	65
Table 9 Descriptive Statistics of Lexile for Ethnicity.....	66
Table 10 Frequency – Educational Attainment.....	67
Table 11 Descriptive Statistics of Lexile for Educational Attainment.....	68
Table 12 Pearson Correlation Coefficients for Lexile and Age.....	72
Table 13 Pearson Correlation Coefficients for Lexile and Educational Attainment.....	72
Table 14 Eta Correlations for Race, Ethnicity, and Educational Attainment.....	73

List of Figures

Figure 1 Linearity Between Lexile and Age.....	70
Figure 2 Scatterplot for Lexile.....	71

List of Abbreviations

Adult Basic Education (ABE)

Adult Education (AE)

Associate of Science in Business (ASB)

Common Core State Standards (CCSS)

English as a Second Language (ESL)

General Education Development (GED)

Learning Disability (LD)

National Assessment of Adult Literacy (NAAL)

National Adult Literacy Survey (NALS)

National Center for Educational Statistics (NCES)

Secondary Education (SE)

CHAPTER ONE: INTRODUCTION

Background

It is estimated some 30 million adults (about 14% of the adult population) in the United States are reading below basic levels of proficiency (National Assessment of Adult Literacy [NAAL], 2006; Sabatini, Shore, Holtzman, & Scarborough, 2011). According to data from a recent international survey conducted by the Organization for Economic Cooperation and Development (OECD), only “12% of U.S. adults” performed at the highest level of proficiency in literacy skills while the majority of adults scored below average for literacy skills (“Adults Falling Behind,” 2013, p. 6). These basic skills are needed to search, comprehend and use continuous texts (NAAL, 2006). Literacy skills are essential for personal and professional success, serving to provide individuals an opportunity to thrive individually, socially, and economically (Hauser, Edley, Koenig, & Elliott, 2005). The impact of literacy is significant beyond an individual level; literacy as a collective construct has implications including a nation’s economic status, the capacity of its workforce, and its competition in a global society (Hauser et. al, 2005). “Deficiencies in literacy skills and mismatches between the skills of citizens and the needs of an economy can have serious repercussions” (Hauser et. al, 2005, p. 24). With such serious implications, literacy has historically been examined from various perspectives including K-12 and post-secondary settings alike.

Despite the nation’s shared belief in the value of literacy, determining a clear definition of these skills and the manner in which they should be measured, has not been without discussion. Varying opinions exist regarding the necessary skills for individual success in society and the manner in which they should be assessed (National Center for Education Statistics [NCES], 1993). The 1993 National Adult Literacy Survey (NALS) originated as a

means to address these very issues and provide information on the status of English literacy skills of adults in the United States (Kirsch, Jungeblut, Jenkins & Kolstad, 1993).

Through the Adult Education Amendments of 1988 (amendments to the Adult Education Act of 1966), Congress required the Department of Education to report on the status of literacy of adults in the U.S. and provide a definition of literacy (Hauser et. al, 2005). From this legislation, the Department's National Center for Education Statistics (NCES) collaborated with the Division of Adult Education and Literacy to plan a national household survey of adult literacy (NCES, 1993). The NCES awarded a contract to the Educational Testing Service (ETS) to develop and administer the survey as well as analyze and report the results (NCES, 1993). Various stakeholders were also involved in the creation and completion of the NALS survey including experts from business, industry, labor, government, research and adult education (NCES, 1993). This collaboration resulted in the third and largest study of adult literacy funded by the federal government and conducted by ETS (NCES, 1993). The two previous studies included a 1985 household survey of literacy skills of 21 to 25-year olds funded by the U.S. Department of Education and a 1989–90 survey of literacy proficiencies of job seekers, funded by the U.S. Department of Labor (Kirsh & Jungeblut, 1986; Kirsch, Jungeblut, Jenkins, & Kolstad, 1993). This work evolved into the creation of a definition of literacy that served to guide the NALS survey. "Literacy is the ability to use printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential" (Kirsch et al., 2001, p. 70).

It is important to note the significance of this definition in comparison to those of the past. Traditional definitions of literacy focus on decoding and comprehension while this one incorporates a "broad range of skills that adults use in accomplishing the many different types of

literacy tasks associated with work, home, and community contexts” (NCES, 1993, p. 3). In 1992, the NALS was administered and was then revised and repeated in 2003 under a new name, the National Assessment of Adult Literacy (NAAL). This definition of literacy was used in both surveys. The NALS and NAAL are regarded as measures of functional literacy in English, because they focus on how adults use printed and written information (Hauser et. al, 2005).

The surveys measured four levels of literacy on a scale from 0 to 500; *Below Basic* indicates no more than the most simple and concrete literacy skills; *Basic* indicates skills necessary to perform simple and everyday literacy activities; *Intermediate* indicates skills necessary to perform moderately challenging literacy activities; *Proficient* indicates skills necessary to perform more complex and challenging literacy activities (NAAL, 2006). These levels were applied to three types of literacy tasks: prose, document, and quantitative. Prose literacy examples include news stories, brochures, and instructional materials; document literacy examples include job applications, maps, and food and drug labels; quantitative literacy examples include identifying and performing computations using numbers found in printed material such as checkbooks, order forms, or loan applications (Kutner, Greenberg, Jin, Boyle, Hsu, Dunleavy, 2007). More than 19,000 adults (age 16 and older) completed the 2003 assessment (NAAL, 2006).

This assessment differed from indirect measures of literacy, which rely on self-reports and other subjective evaluations, rather, it measured literacy directly through tasks completed by adults (Kutner et al., 2007). Some 30 million American adults had *Below Basic* prose literacy, 27 million had *Below Basic* document literacy, and 46 million had *Below Basic* quantitative literacy (Kutner et al., 2007). Furthermore, these deficiencies have been studied specifically in low-literate adults revealing challenges with word recognition, decoding, and spelling (Sabatini,

2002). In light of these results, adults returning to college or seeking a college education are often unprepared and lack the skills to navigate basic college reading tasks. “Adult learners attempting to change their lives through the promise of formal education...are an increasingly important segment for all of higher education” (Guidos & Dooris, 2008, p. 45).

The reality of skill deficits that exist in the nation’s adult population has brought attention to the needs of adult learners. The National Center of Education Statistics (2009) reported that 38% of the eighteen million college students enrolled in 2007 were twenty five years of age or older. According to Zafft (2008), that percentage has grown to over 70%. Enrollment of adult students in higher education was projected to grow by almost 2 million students between 2000 and 2014 (U.S. Department of Education, 2005). This group is comprised of older students, parents (especially single parents) with full-time jobs (Zafft, 2008). Kenner & Weinerman (2011) classify adults as entry level learners between the ages of 25-50 who have a high school diploma or a GED, are financially independent, and have one semester or less of college coursework. These students need to obtain a college education in order to develop their careers and acquire new skills and knowledge to compete in a global society (Wlodkowski, 2003). The needs of these non-traditional students demand a format that differs from those of their traditional counterparts. “Adult learners have historically tended to garner more attention at community colleges than from other types of higher education institutions” (Guidos & Dooris, 2008, p. 45). Institutions of higher learning have created accelerated program formats in the past twenty years to attract adult students (Wlodkowski, 2003). NCES projects higher education enrollment of students over twenty-five between 2007 and 2018 will at the very least remain stable or potentially increase in this current decade (Hussar & Bailey, 2009).

Adult learning theory originated from the organizational development (OD) field because pedagogical models in traditional higher education did not correlate with the workplace training environment (Kenner & Weinerman, 2011). Malcolm Knowles coined the phrase “andragogy” which recognizes the needs of this population and distinguishes adult learning theory from traditional pedagogy (Knowles, 1984). Adult learners seek a balance between the roles of student, employee, and family member (Gooden, Matus-Grossman, Wavelet, Diaz, & Seupersad, 2002). These “adults are more rooted in their community and, therefore, need a clear picture of how their educational and career goals connect with local employment markets (Zafft, 2008, p. 8). According to Knowles (1984), adult learners are typically more task and goal oriented and seek a context for learning that connects their studies with their academic pursuits. Research on adult students has frequently demonstrated they are more anxious about their academic abilities than their younger counterparts (Cleary, 2008).

More than a decade has passed since the NAAL was conducted. Adult literacy in the context of nontraditional accelerated programs demands more attention and research. The unique characteristics of adult learners necessitate the examination of these attributes in order to determine what literacy deficits exist.

Problem Statement

The problem is more research is needed to determine what characteristics of adult learners seeking a college degree are most likely to predict adult reading ability (Allington, 2009; Hiebert & Martin, 2009; Brenner, Hiebert, & Tompkins, 2009). “Universities expanding efforts to reach adult learners need to better understand the factors that impact upon access, opportunity, and success for these students” (Guidos & Dooris, 2008, p. 45). More research is needed to adequately understand the factors affecting college success, specifically the epidemic of literacy

skill deficits. “The need for effective educational services to boost the reading proficiency of a large and growing population is perceived as a pressing economic and social need (Kirsch, Braun, Yamamoto, & Sum, 2007; Miller, MCardle & Hernandez, 2010; Sabatini et al., 2011). Although additional reports were planned using data from the 2003 NAAL, as of 2007, these reports had not been published. Furthermore, the NCES (2007) recommended an additional report that examined the relationship between basic skills and literacy (Kutner et al., 2007). This report has not been published to date.

Literacy research has shifted in recent years from phonics and fluency to reading comprehension in the K-12 setting (Cassidy & Ortlieb, 2011). This is not to say phonics and fluency are not essential literacy skills, but the focus has certainly shifted in terms of educational accountability. “At this point, it is unclear what this will mean for adult literacy instruction and research” (Jacobson, 2011, p. 132). According to Roller (2001), the National Center for Educational Research, an organization that funds studies for reading comprehension, has not financed any projects addressing adult literacy. These findings are consistent with other studies (Belzer & St. Clair, 2003) noting research regarding adult reading comprehension was minimal. Therefore, the problem is many adults seeking a post-secondary education do not possess the reading ability required by college courses. If institutions of higher learning could predict students’ reading ability based on demographic variables such as age, ethnicity, race and levels of education, they could be more responsive to their students’ needs and devise a plan for addressing their deficiencies.

Purpose Statement

The purpose of this correlational study was to determine if a predictive relationship exists between the predictor variables age, ethnicity, race and educational attainment and the criterion variable, adult literacy as measured by the Pearson MyReadingLab Pre-Assessment. Adult students enrolled in the introductory business course for students in an accelerated program seeking an Associate of Science in Business (ASB) from January 2014 to December 2014 served as the population for this study. These nontraditional students ranged in age from 18 - 65 and minimally completed a GED program or high school equivalent. The racial composition of the group included 63.1% Caucasian, 33.9% African-American, 1.3% Asian, and 1.3% Native American/Alaskan Native while the ethnic composition included 94.5% Non-Hispanic/Latino, 4.5% Hispanic/Latino, and 1% not reported.

In the introductory course of the ASB program, students were given the opportunity to complete a reading ability assessment for extra credit in Pearson's MyReadingLab program. The course was designed for the purpose of acclimating and orientating students to the skills necessary for college success. Students were required to submit the demographic data including age, ethnicity, race and educational attainment as part of the admissions process. Since the assessment was included as part of the course, data was archived as part of the university's private data sets. Archival data from January 2014 through December 2014 was used in this study. This study examined the relationship between the literacy assessment and the demographic data collected in order to determine whether a predictive correlational relationship existed.

Significance of the Study

According to Guidos & Dooris (2008), research conducted on degree-seeking adult learners at four-year colleges and universities is minimal. “Based on studies at several colleges (Wlodkowski, Mauldin, & Gahn, 2001; Wlodkowski & Westover, 1999), the typical adult student in an accelerated program is a thirty-six year old white woman who is married, working full-time outside the home, with more than fifteen years of work experience” (Wlodkowski, 2003, p. 10). These characteristics differ dramatically from adults in basic and secondary education (AE) programs (Mellard & Patterson, 2008). “Adults who participate in (AE) programs resemble the *Below Basic* group from the NAAL sample, and similarly are a more diverse and disadvantaged population in terms of age, race/ethnicity, place of birth, and educational attainment” (Sabatini et al., 2011, p. 118). All states are required by federal funding to provide Adult Basic Education (ABE), Adult Secondary Education (ASE), or General Educational Development (GED) preparation, and English as a Second Language (ESL) programs (Zaft, 2008). States must also provide literacy instruction within these programs (Zaft, 2008).

Although the results of the NAAL certainly support the need for these programs, there is a significant percent of the adult population lacking the literacy skills necessary to be successful in post-secondary education, but do not qualify for these government programs. Even research pertaining to the challenges of AE students consist of generally small samples (Zaft, 2008). “Creating a more robust definition of college readiness is important, yet K-12 efforts do not provide the model that supports adults attempting to access and succeed in college, especially first-time college-goers” (Zaft, 2008, p. 6). This study yields important information for post-

secondary institutions of higher learning who are striving to meet the needs of adult learners and cultivate success in order to increase retention.

Research Question

RQ1: How accurately can adult reading ability be predicted from a linear combination of age, ethnicity, race and educational attainment among non-traditional college students?

Null Hypothesis

H₀1: No significant predictive relationship exists between the criterion variable adult reading ability (as measured by Pearson's MyReadingLab Pre-Assessment) and the linear combination of predictor variables (age, ethnicity, race and educational attainment) for non-traditional college students.

Definitions

The terms pertinent to this study include the following:

1. *Literacy*- “Literacy is the ability to use printed and written information to function in society, to achieve one’s goals, and to develop one’s knowledge and potential” (Kirsch et al., 2001, p. 70).
2. *Nontraditional student* – Students 20 years of age or older who have earned a high school diploma or GED, and have one semester or less of college coursework. (Kenner & Weinerman, 2011).
3. *National Assessment of Adult Literacy (NAAL)* – A 2003 survey of the English literacy of adults (16 years and older) in the United States (Kutner, et al., 2007).

CHAPTER TWO: LITERATURE REVIEW

Adult literacy as a construct has garnered a great deal of attention in the context of Adult Basic Education and Adult Secondary Education programs which are categorized under the larger umbrella known as Adult Education (AE) (Kruidenier, 2002; McShane, 2005). AE refers to publically funded programs designed to provide basic skills instruction to adult learners whose skills are below high-school level. These programs also include General Educational Development (GED) preparation, and English as a Second Language (ESL) programs. Although states are required by federal funding to provide these programs, they are not necessarily designed to address the needs of adults seeking a college education (Zaft, 2008).

Approximately 2.4 million adults with low literacy skills are being served by AE programs (US Department of Education, 2010). Despite the numbers of students being served by these federally funded programs, there are still millions of adults who struggle with basic reading tasks, whose needs are not being met. The disparity in skills of adults served by AE programs varies from barely literate to reading well, but there are significant numbers of students in between whose skills are only sufficient for basic reading skills needed in their home or on the job (Mellard, Fall, & Mark, 2009). These students are seeking to further their skills beyond a high school diploma or GED certificate, and yet they lack the literacy skills to achieve higher education and employment goals (Mellard et al., 2009). They may have even attempted college, but did not complete their degree. These adult students, unlike their traditional counterparts, may have been out of school for decades (Hardin, 2008). Adult learners face different challenges and opportunities than full-time 18 to 24-year-old baccalaureate students where research has typically been focused (Guidos & Dooris, 2008). This reality provides justification

for further research on the factors such as literacy skills that impact adult students' success in obtaining a post-secondary degree (Guidos & Dooris, 2008).

In order to address adult literacy as it pertains to individuals seeking college degrees who have earned high school diplomas, a GED certificate, or even some college credits, it is necessary to understand the historical implications of adult higher education, along with the concepts of developmental education and college readiness. In addition, the current status of adult literacy research and the lack thereof within higher education will also be discussed. The lack of research on adult literacy presents many challenges especially considering attrition rates are higher for nontraditional students than traditional college students (Goncalves & Trunk, 2014). According to the U.S. Department of Education (2016), the percentage of nontraditional students who leave school within the first year is more than twice that of traditional students. "Although there are alternative explanations for why many adults do not participate in higher education, Dann-Messier and Kampits (2004) suggested a childlike naïveté about the benefits of educational attainment" (Belzer & Pickard, 2015, p. 256).

Integrating adult students into an academic environment is difficult especially considering the various characteristics and needs they bring to the classroom. It is not unusual for adults to experience problems with academics due to the length of time spent away from a structured learning environment. These academic deficiencies may be a result of decisions some adults make that adversely affects their academic careers. According to Hardin (2008), these poor choices make adult students unprepared rather than underprepared for college. By examining the factors that predict adult literacy levels, institutions of higher learning will be more responsive to the needs of students, which could potentially reduce attrition rates and increase retention and student success.

Adults are enrolling in higher education in increasing numbers due to a variety of reasons. Many have lost jobs due to the economic downturn experienced in the United States since 2008 (Wlodkowski, 2003). Others seek a degree because they are frustrated by low wages and long hours, and others have been mandated by employers to seek a degree in higher education in order to remain employed. More than six million students (25 years and older) pursue higher education to develop their careers and obtain new knowledge and skills needed to compete in a global society where their life spans are likely to be longer than workers of the past (Wlodkowski, 2003).

Despite the variety of circumstances that bring adults to college for the first time or even as a second attempt from when they were younger, a lack of literacy skills by new adult students and returning adult students plagues our nation and causes significant challenges. As adults begin college courses, they quickly realize the reading demands, and are often easily discouraged when their skills prevent them from successfully navigating the material. The skills required to read a college textbook are very different from the skills adults apply to non-academic reading tasks such as newspapers, technical manuals, reports, or even popular fiction novels (Kenner & Weinerman, 2011). Depending on how much time has passed since students have earned their GED or high school diplomas, the gap in their academic development process may be significant (Kenner & Weinerman, 2011).

Developmental education has proven to be an option for many students seeking a college degree despite skill deficits. According to Hall & Ponton (2005), there are an increasing number of students entering college who lack the prerequisite academic skills necessary to successfully navigate post-secondary education. The National Association for Developmental Education (2010) defines developmental education as “a comprehensive process that focuses on the

intellectual, social, and emotional growth and development of all students” (p. 1). Statistics indicate 78% of universities that enroll freshmen offer developmental courses; that number increases to 100% for public two-year institutions (Aycaster, 2001; Boylan & Bonham, 2007). Based on these figures, two-year institutions are enrolling large numbers of students who require developmental education courses.

Rather than continue to develop and acquire academic knowledge and skills, non-traditional students “have increased the development of practical knowledge in the workplace” (Kenner & Weinerman, 2011, p. 91). Sternburg and Caruso (1985) define practical knowledge in the workplace as “procedural knowledge that is useful in one’s everyday life (p. 134). Research has offered some explanation for these skill deficits as well. Factors such as ethnicity, age, and levels of education have been shown to affect adult literacy rates (Kirsch et al., 1993; NAAL, 2006). Understanding the challenges of adult literacy at the post-secondary level requires an examination of the historical and theoretical foundations.

Theoretical Framework

Although adult learning originated in the 19th century, Malcolm Knowles’ (1984) research in the 20th century recognized the distinct needs and characteristics of these learners and the resulting theory as andragogy. Andragogy is a term derived from the Greek word *agoge*, meaning the activity of leading and the stem “*andr*” meaning man not boy. This theory was built on organizational development (OD) theory and identified adult learners according to four principles: (a) adult learners are autonomous and take responsibility for their own actions; (b) they have extensive experience which forms the foundation of their self-identity; (c) they are ready to learn; (d) they are goal oriented and task motivated (Knowles, 1984). As non-traditional students, their characteristics are distinctly different than those of traditional students within the

context of higher education. Adult learners face challenges such as full-time employment, family circumstances, feelings of anxiety associated with the absence from formal education for a lengthy period of time, along with the standard fears of reentering the learning environment (Cleary, 2008; Heuer & King, 2004). Adults may “experience academic difficulties because they have been away from an academic setting for an extended period of time” (Hardin, 2008, p. 54). Although these challenges represent the obstacles and limitations adult learners face, they also reinforce the qualities that differentiate them such as self-disciplined, intrinsically motivated, realistic and experiential (Moore & Kearsley, 2005).

These unique qualities make adult learners an important population to study. Since the 1980’s, the face of higher education has changed dramatically as more adults students have entered or reentered college (Hardin, 2008). The National Center for Education Statistics (2001) reported 41 percent of students enrolled in degree-granting institutions of higher learning in the fall of 1998 were adults (Wlodkowski, 2003). Historically, adult learners have garnered more attention within the context of community colleges than other institutions for higher learning (Guidos & Dooris, 2008). Universities seeking ways to meet the needs of these adult students need to understand the factors that affect the ways in which these students access and succeed in higher education. Currently the amount of research conducted on degree seeking adult learners at four-year colleges and universities has been limited (Guidos & Dooris, 2008).

The term non-traditional is often used to describe adult learners because of the specific characteristics they possess that set them apart from traditional students. The National Center for Education Statistics estimated more than 60 percent of students enrolled in U.S. institutions of higher learning were considered nontraditional, which rose to 75 percent in 2002 (Hardin, 2008; Wlodkowski, 2003). NCES projects enrollments in higher education for 2007-2018 will remain

constant or potentially increase for students over the age of 25 (Hussar & Bailey, 2009). Delaying enrollment in higher education until adulthood, working full-time, being financially independent and financially responsible for others, having family responsibilities, and academic deficiencies are all potential barriers for nontraditional students (Hardin, 2008). Cross (1981) used the term nontraditional to describe this type of learner more than 20 years ago, but the “social and economic forces that have led to adults’ increased participation in higher education in the decades since...are not likely to abate in the near future” (Ross-Gordon, 2011, p. 26). When considering the challenges and opportunities these students face, it is important to understand how these circumstances affect the ability of nontraditional students to successfully navigate and complete a degree in higher education. While juggling various responsibilities, adults are forced to establish new identities as they navigate the transition to college (Hardin, 2008).

Institutions of higher learning must endeavor to remove the barriers adult learners face. In early research on adult education, Pinkston (1987) found students faced environmental, procedural, psychological, and financial barriers to college success. In the past three decades, research on adult education has revealed more information regarding the challenges adult students face. According to Compton, Cox, and Laanan (2006), the factors that impede the success of adult students fall into four broad categories: (a) institutional, (b) situational, (c) psychological, and (d) educational. Although each category represents a variety of issues, some are within the control of the learners and others are not.

The Council on Adult and Experiential Learning found many institutions of higher learning “have struggled to adjust to the changing demographics on their campuses” (as cited in Hardin, 2008, p. 51). Often adult students come to institutions of higher learning unprepared academically. There are a variety of reasons students are not equipped to meet the academic

demands of college. The most common reason for academic deficiencies in adult students is due to a decision or decisions they made that has adversely affected their academic futures (Hardin, 2008). The two reasons Hardin (2008) cites for this lack of preparedness are not enrolling in college preparation courses in high school and dropping out of high school. “Many of these students eventually earn a general education development (GED) diploma and enroll in college with a false sense of security about their academic ability” (Hardin, 2008, p. 54). Adults do not often consider the purpose of the GED. A GED measures a student’s ability to complete basic high school course work. It does not measure a student’s ability to be successful in college. In spite of these academic deficiencies, institutions of higher learning must be willing to provide support and assistance if adult students are going to be successful. In order to determine the best course of action for these kinds of programs or processes, colleges and universities need to understand the characteristics and qualities of their learners.

The adult learner has changed dramatically from the past and the population of adult literacy learners has most recently been described as “heterogeneous” (Lesgold & Welch-Ross, 2012). According to Brookfield (1986), up until the 1980’s, the typical adult learner was “a relatively affluent, well-educated, white, middle class individual” (p. 5). Today’s adult students come from communities which are culturally and socially diverse within urban and rural settings (Hawkins, 2003).

Related Literature

Adult students bring a range of prior experiences to the classroom. Many of them are first generation college students and they lack the support of families that traditional students often receive (Marschall & Davis, 2012). Nontraditional students do not begin college with the same preparedness as traditional students, which means they typically make smaller gains on

standardized reading tests (Terenzini, Yeager, Pascarella, & Nora, 1996). “The diversity of their backgrounds and current life situations means generalizations about adult students may be even less reliable than those about “traditional” undergraduates” (Cleary, 2008, p. 114).

Nevertheless, colleges and universities must acknowledge the needs of this increasingly prevalent population whose “goals, motivation, knowledge, accessed skills, interests, neurocognitive profiles, and language background” vary and strive to meet their academic needs (Lesgold & Welch-Ross, 2012, p. 4). For institutions to effectively recruit and retain adult students, they must seek ways to address the various needs these learners possess. Developmental education is one such program and exists to assist students who lack the necessary skills to be successful in college.

Developmental Education

Development education originated as a means of helping learners remediate skills. As far back as the nineteenth century, universities in the United States created “preparatory departments” to assist enrolled students with college-level coursework (Conforti, Sanchez, & McClarty, 2014). Many institutions at the time required a liberal arts curriculum consisting of Latin, Greek, mathematics, philosophy, and literature, and often incoming freshmen were not prepared with the knowledge and skills necessary to navigate these courses (Conforti et al., 2014). In the earliest part of the 20th century, some of the departments developed into junior colleges to provide the skills necessary for men to be successful in four-year degree programs (Conforti et al., 2014). By 1940, junior colleges were already regarded as institutions better suited for lower skilled students while traditional four-year institutions were more appropriate for the “educational elite” (National Center for Developmental Education, 2010).

The end of World War II brought a dramatic shift in the demographics of students across the United States and significantly impacted developmental education (Conforti, Sanchez, & McClarty, 2014). The Servicemen's Readjustment Act of 1944, better known as The G.I. Bill, provided an opportunity for men returning from war to pursue post-secondary education rather than returning to their former livelihoods (*Reader's Companion*, 1991). They were now afforded a chance to advance socioeconomically by earning a college degree because stipends for tuition and living expenses were provided for veterans who attended college or trade schools (*Reader's Companion*, 1991). Additionally, for the first time in American history, women sought post-secondary education as well (Conforti et al., 2014). This avenue emerged because manufacturing allowed women to provide support for the American war effort (Conforti et al., 2014). Women gained a greater perspective of post-secondary educational opportunities that resulted from their increased participation in more municipal roles during the war (Hosp, 1944).

The Civil Rights Movement of the 1960's is also credited for opening the door for racial and ethnic minorities to pursue a college education (Conforti et al., 2014). In response to the influx of diverse students, universities created open-enrollment policies within junior colleges and universities to allow students from various backgrounds to pursue higher education (Conforti et al., 2014). Although inclusive, these policies placed an unintentional burden on institutions to provide support because many students now enrolling in higher education had not received sufficient academic preparation for post-secondary programs (Bailey & Cho, 2010). In addition to open-enrollment policies, institutions of higher learning developed remedial and compensatory education services and deemed them "developmental education" collectively (Dotzler, 2003). "By synthesizing interventions and pedagogical approaches from multiple

fields, developmental education seeks not only to “fill gaps” in student learning, but to also give students the skills necessary to succeed in more advanced topics” (Conforti et al., 2014, p. 4).

Traditionally, the focus of remedial reading and writing courses is understood to be drilling and practicing small sub skills that do not necessarily connect to the literacy assignments required by college curriculum (Grubb, 2010). “There is also a considerable variability across types of higher education institutions about the level of writing and reading proficiency that necessitates remediation” (Lesgold & Welch-Ross, 2012, p. 82).

The fundamental method for increasing skills in college is developmental education (Kozeracki & Brooks, 2006). According to Bailey & Cho (2010), more than fifty percent of community college students enroll in at least one developmental education course for the purpose of remediating low skills. In a study conducted with more than 250,000 students from 57 colleges in seven states who were first time enrollments from fall 2003 to 2004, 59 percent were referred for remedial instruction and 33 percent were specifically referred for reading (Bailey & Cho, 2010). According to Perin and Charron, (2006), the exact number of students enrolled in college who are underprepared is unknown. Estimates indicate about 60% of community college students and 20 percent of freshmen at four-year institutions enroll in at least one developmental education course (Bailey & Cho, 2010). These statistics support the obvious fact that a large number of students have not mastered the pre-requisite skills to be successful in post-secondary programs when they enroll in college. They also raise an important issue concerning the enrollment requirements of colleges and universities.

Developmental education is an avenue for adults to increase their employability and earning potential (Aycaster, 2001). Therefore, providing remediation for students with skill deficits is an important function for colleges and universities to help these individuals realize

their full potential. Remediation, however, is not without its challenges. A study, *Achieving the Dream*, was conducted with more than 250,000 students from 57 colleges in 7 states (Bailey, Jeong, & Cho, 2008). Community Colleges Count initiative, found that half of the students enrolled in remedial courses never finished the first course and of these students more than a third never enrolled in another college course (Bailey et al., 2008).

The percentage of students who never enrolled in a college course rose to more than 40% for students who were assigned to remediation three levels below college level (Bailey et al., 2008). Bailey et al. (2008), examined the characteristics of students who successfully completed developmental courses and identified several factors. Students, who identified themselves as African American men, attended school part-time, were less likely to progress through remedial courses as compared to women, students identifying themselves as Caucasian and enrolled full-time (Bailey et al., 2008). This study illustrates the impact individual characteristics of adult learners have on remediation of skills (Bailey et al., 2008).

Due to skill deficits, many students enrolled in developmental courses do not persist, and therefore often become discouraged and leave the classroom (Conforti et al., 2014). Through their research, Wadsworth, Husman, Duggan & Pennington (2007) have identified specific instructional practices that have proven to be more effective with adult students enrolled in developmental programs. Developmental education provides possible solutions to the issue of adult literacy, but as research suggests, there are still many obstacles within this context to overcome (Conforti, et al., 2014). Low levels of adult literacy continue to plague institutions of higher learning and demonstrate a lack of college readiness (Conforti et al., 2014).

College Readiness

“The policies and regulations that govern eligibility for enrollment in credit-bearing courses, as well as student assessment and placement, pedagogy, staffing, and completion vary from state to state, college to college, program to program” (Lesgold & Welch-Ross, 2012, p. 82). Presently, a universally accepted definition of college readiness does not exist (Lesgold & Welch-Ross, 2012). Reid and Moore (2008) studied the concept of college readiness in a seminal qualitative study of 13 first generation college students consisting of six men and seven women who had attended the same urban high school. The study was aimed at examining perceived strengths and weaknesses of college preparation (Reid & Moore, 2008). All of the students maintained a GPA of 2.5 or higher and most reported taking at least one AP (Advanced Placement) course (Reid & Moore, 2008). The results of Reid and Moore’s (2008) study indicated even good high school students struggled much like nontraditional students studied by Byrd and MacDonald (2005) to make the transition to college (Koch, Slate & Moore, 2012).

Barnes, Slate & Rojas-LeBouef (2010) defined college readiness as study skills in addition to academic preparedness along with emotional maturity among other factors. Conley (2008) hypothesized college readiness consist of four key components: cognitive reasoning skills, academic knowledge and skills, academic behavior, and contextual skills (Koch et al., 2012). Conley (2008) also concluded college-ready students possessed problem-solving abilities, research skills, along with the ability to accurately interpret information. All of these skills are essential to literacy skills.

Byrd and MacDonald (2005) completed a qualitative study of non-traditional, first-generation college students with the purpose of examining the construct of college readiness. The participants consisted of a group of eight students older than 25 who were classified as either

juniors or seniors enrolled in a liberal arts program and had previously earned associate degrees from community colleges (Koch et al., 2012). Remediation is required for students admitted into college with inadequate skills, so they can develop the skills necessary skills to meet their long-term educational goals (Boylan & Boham, 2007). The results of the study corresponded to Conley's (2008) findings which acknowledged the importance of "prerequisite academic skills" (Koch et al., 2012, p. 65).

Another approach for remediating skills which offers a complimentary opportunity for students includes "college success" courses, however these courses are not necessarily designed to teach literacy skills (Pan, Guo, Alikonis, & Bai, 2008; Zeidenburg et al., 2007). Defining a more inclusive definition of college readiness is important, yet K-12 research does not provide an appropriate model for supporting adults seeking a college degree, especially first-time students (Zafft, 2008). These adults are at a greater risk when it comes to persisting and experiencing success in college (Adelman, 1999). Numerous researchers (Barnes & Slate, 2011; Conley, 2007) "have argued that a substantial difference exists between college eligibility and college readiness (Koch et al., 2012, p. 66). College eligibility suggests students have met minimum admissions requirements, while college readiness implies students are sufficiently prepared to navigate college coursework successfully.

In order to accurately identify and categorize the college readiness skills, the National Governors Association Center for Best Practices and the Council of Chief State School Officers coordinated the Common Core State Standards (CCSS) initiative in 2010 ("English Language," n.d.). Currently 46 states have adopted for K-12 programs. The CCSS were developed through research from a variety of sources including student performance data, assessment data, academic research, and results of large scale surveys of post-secondary instructors and

employers (“English Language,” n.d.). Because of these various sources of research, a major difference between these standards and those of the past is their grounding in the expectations of perspective employers and educators. “Indeed, standards were selected only when the best available evidence indicated that their mastery was needed for college and career readiness” (Pimentel, 2013, p.5).

Through the creation of the Common Core State Standards (CCSS), a more stable and consistent definition of college readiness emerged known as the College and Career Readiness (CCR) standards. The CCR standards are being used to guide adult basic education and post-secondary programs in determining the skills adult students need to be successful in college and careers. As adult educators work to incorporate these new standards into their programs, there are inherent challenges. One significant challenge pertains to time. Adult students do not have an equal amount of time to devote to their studies as students in K-12 courses. According to the Adult Education Program Survey, the average time adult learners spend on their program coursework is less than 100 hours in a year (Pimentel, 2013). The demands of the CCSS as they were originally written do not account for the variety of life experiences adult learners possess as well as their previous schooling experiences making some of the content unnecessary. Due to the aforementioned challenges for adult educators to incorporate the CCSS into their programs, a panel of experts from a range of contexts including adult education, community colleges, career and technical training, and the military was convened to adapt the standards to adult learners. Within a nine month timeframe, these panelists were tasked with determining the relevance of the CCSS for adults with regards to college and career readiness. The results of their work included three significant shifts in instruction required by CCSS for English Language Arts and Literacy in History/Social Studies, Science and Technical Subjects (Pimentel, 2013). “The

rationale for this interdisciplinary approach is based on extensive research establishing the need for students to be proficient in reading complex informational text independently in a variety of content areas” (Pimentel, 2013, p 11). Colleges and workforce training programs require reading that is primarily informational in nature with challenging content (“English Language,” n.d.).

These three shifts are (a) complexity, (b) evidence and knowledge; (c) complexity pertaining to levels of text and academic language, evidence regarding the ability to use textual evidence from informational and literary texts, and lastly knowledge built through nonfiction texts that are content-rich (Pimentel, 2013). In addition to these shifts, the panel grouped the standards according to levels which correlated to grade levels. These groupings known as Common Core Bands are as follows, (a) Beginning Adult Basic Education Literacy (A), (b) Beginning Basic Education (B), (c) Low Intermediate Basic Education (C), (d) High Intermediate Basic Education (D), and (e) Low Adult Secondary and High Adult Secondary Education (E) and reflect levels of learning adult education (Pimentel, 2013).

The table below indicates the Common Core Bands correlated to The Lexile Framework for College and Career Readiness Anchor Standard 10: Read and comprehend complex literary and informational texts independently and proficiently.

Table 1

Associated Quantitative Measure of Text Complexity (Pimentel, 2013)

Common Core Band	The Lexile Framework
2 nd - 3 rd (B)	420-820
4 th - 5 th (C)	740-1010
6 th - 8 th (D)	925-1185
9 th - 10 th (E)	1050-1335
11 th - CCR (E)	1185-1385

It is important to understand the basis of The Lexile Framework and its relevance to the College and Career Readiness standards. The Lexile Framework for Reading (Lennon & Burdick, 2014) is a research based, scientific approach to reading and text measurement. For more than thirty years, Lexile measures have been the subject of continuous research designed to predict a text's level of difficulty in relation to reading comprehension. These measures are the most frequently utilized of all the available reading measures including works by more than 450 publishers and over 100 million articles, books, and websites (Lennon & Burdick, 2014). Additionally, a majority of the standardized reading assessments and several instructional reading programs report Lexile measures. The Framework is designed to promote reading success at all levels of proficiency.

The term Lexile represents a reader's ability and a text's difficulty by a numeric value (Lennon & Burdick, 2014). When the reader and text are accurately paired, the reader comprehends at a rate of 75 percent. This rate provides a balance between skill and challenge which fosters reading proficiency (Lennon & Burdick, 2014). Educators can utilize Lexile levels

to determine which level of the Common Core band in the chart above a student is reading (Lennon & Burdick, 2014). “A unique feature of the Lexile Framework is that both student ability and text difficulty are measured on the same scale in the same units” (Lennon & Burdick, 2014, p. 2). By providing a measurement for both the student ability and text complexity, The Lexile Framework is relevant to the demands of the College and Career Readiness Standards. “The complexity of text that students are able to read is the greatest predictor of success in college and careers” (Pimentel, 2013, p. 9).

Adult Literacy

The Committee on Learning Sciences: Foundations and Applications to Adolescent and Adult Literacy define literacy as “the ability to read, write, and communicate using a symbol system (in this case English) and using appropriate tools and technologies to meet the goals and demands of individuals, their families, and U.S. society” (Lesgold & Welch-Ross, 2012, p. 2). The committee’s focus is to improve the literacy of those ages 16 and older that are not enrolled in K-12 education, which is consistent with the eligibility requirements for federally funded adult education programs. Similar to the field of adult learning in general, researchers who also study adult literacy...often focus on the obstacles adults face while trying to access educational classes (Merriam, Caffarella & Baumgartner, 2007). Forty-three percent of adults in the U.S. lack the basic knowledge and skills necessary to “search, comprehend, and use information from continuous texts” (NAAL, 2006, p. 2). Seventy-nine percent of these adults are between the ages of 16 and 64 which indicate a significant reading skills deficit exists within the current and future workforce (NAAL, 2006).

From the definition of literacy established by The Committee on Learning Sciences, literacy skills include but also incorporate a larger range of proficiency than basic skills.

Literacy skills are essential for economic, civic and cultural stability which provides strong support for attention and resources from the scientific research community (Mellard & Fall, 2012). Adults with literacy deficits possess a variety of characteristics, learning needs, and learning goals (Lesgold & Welch-Ross, 2012). Although the need for increasing adult literacy skills is evident, most of the existing literature on literacy research and theory addresses developing readers (Kruidenier, 2002).

The National of Assessment of Adult Literacy (NAAL) indicated approximately 56 million adults in the U.S. possessed a basic or below basic prose literacy skills (White, 2003). These findings are very similar to the National Adult Literacy Survey (NALS) in 1992 showing little progress was made between 1992 and 2003 (Lesgold & Welch-Ross, 2012; U.S. Department of Education, 2005). In reality this data may actually represent the significance of the problem. “Literacy demands are increasing because of the rapid growth of information and communication technologies, while the literacy assessments to date have focused on the simplest forms of literacy skill” (Lesgold & Welch-Ross, 2012, p. 12). Employers are seeking individuals with higher levels of basic literacy skills. Adults who lack proficiency in reading skills receive literacy instruction from two sources. The first source is adult education programs. The largest source of federal funding for these kinds of programs comes from the Workforce Investment Act, Title II, and the Adult Education and Family Literacy Act (AEFLA) (Senate Resolution 220, 1998).

The second source is developmental education courses offered within colleges designed for academically underprepared students. The unfortunate reality is many of the adults enrolled in these programs show insufficient gains in order to demonstrate functional literacy (Tamassia, Lennon, Yamamoto, & Kirsch, 2007).

Research suggests a variety of demographic characteristics impact both reading ability as well as the opportunity to read which can shape reading practices (Mellard, Patterson & Prewett, 2007). Mellard et al. (2007) identified the relationship of age, gender, education level, reading level, self-reported learning-disability (LD) status, and employment with reading practices of individuals attending adult basic education (ABE) and secondary education (SE) programs. According to the U.S. Department of Education (2010), approximately 2.4 million adults attend federally funded programs such as ABE and SE. Both ABE and SE programs function as part of a larger entity known as Adult Education (AE). These programs are funded by federal, state, city, and community entities which cover the costs for adults to receive instruction for the advancement of their literacy skills.

Adults who participate in these programs are a distinct group because they have chosen to improve their reading skills by attending these AE programs (Comings, 2007). “A more specific understanding of the reading practices of this population could benefit adult educators as well as others interested in addressing adult literacy needs” (Mellard et al., 2007, p. 188). Individuals attending AE programs nationally are typically under 25 years of age with lower levels of education (Moore & Stavrianos, 1995; Tamassia et al., 2007). This statistic aligns with additional research from the 2003 NAAL survey that showed 55% of adults 16 years of age and older who scored below basic in reading proficiency did not graduate from high school (Lesgold & Welch-Ross, 2012).

Kennedy-Manzo (2006) identified an inability to read college textbooks as a major problem for all college students. An informal study of 50 adult students from the University of Maryland University College and Barry University School of Adult and Continuing Education enrolled in English and Orientation courses substantiate these observations (Kennedy-Manzo,

2006). Only 10% of students reported having no problems reading college textbooks (Marschall & Davis, 2012). “There is a surprising lack of rigorous research on effective approaches to adult literacy instruction” (Lesgold & Welch-Ross, 2012, p.2).

This lack of information is especially unusual in light of the significant history of federal funding for adult education programs and the dependence on the nation’s community colleges to cultivate and increase adult literacy skills (Lesgold & Welch-Ross, 2012). Quigley added to the “descriptive knowledge of how low literate adults are portrayed in popular culture and political discourse, but to date, there has been no systemic analysis of the research literature to synthesize description of adult literacy learners (as cited in Belzer & Pickard, 2015, p. 251).

Despite the obvious gap in the literature, research has yielded some information regarding adult literacy practices. Smith (1996) recognized reading practices as an important factor in adult’s proficiency in reading (Mellard et al., 2007). In this groundbreaking study, Smith (1996) described the literacy practices of 24,842 adults, 19 years old and older revealing the more proficient the subject was as a reader, the more frequently he/she read. The study’s conclusion linking reading practice and literacy connected education, a setting commonly associated with reading, as a predictor of literacy proficiency (Rodrigo, Greenberg, & Segal, 2014). From a historical perspective, Street (1984) presented the concept that literacy constructs are socially derived and facilitated by culture, history, and factors such as socioeconomic status (Belzer & Pickard, 2015). Based on this concept, the conclusion can be drawn that literacy is influenced by what the reader/writer brings to the task and equally important is the social context in which the literacy events occur (Belzer & Pickard, 2015).

The Committee on Learning Sciences was established to examine and review the literacy research to develop a strategic plan to strengthen adult literacy education in the United States

(Lesgold & Welch-Ross, 2012). The work of this committee consisted of a 36-month study by 15 experts from various disciplines with partnerships that included the National Institute for Literacy (NIFL) and the U.S. Department of Education, and the National Research Council (NRC) (Lesgold & Welch-Ross, 2012). They reviewed research from a plethora of fields including literacy, learning, cognitive science, neuroscience, behavioral and social science, and education (Lesgold & Welch-Ross, 2012).

The results of the committee's work consisted of four central recommendations: the first and second were directed to federal and state policy makers regarding the expansion of the infrastructure of adult literacy education and professional development and technical assistance for adult literacy instructors (Lesgold & Welch-Ross, 2012). The third recommendation included policy makers, literacy program providers and researchers and was focused on collaboration of these groups to facilitate persistence for adults in literacy programs (Lesgold & Welch-Ross, 2012). Finally, the fourth recommendation was a general directive to local, state, and federal governments to promote optimal progress of adult literacy learners through coordinated efforts of improvement, evaluation, and further research (Lesgold & Welch-Ross, 2012).

Research has suggested various views of adult learners, but much of the analysis of descriptions of these students "have not been grounded in research" (Belzer & Pickard, 2015, p. 254). Ilsley and Stahl (1994) and Sticht (2005) used metaphors to communicate about the problem of adult literacy and specifically low literacy adults. The metaphors were essentially negative suggesting low literacy learners lacked self-esteem and were unable to help themselves. "All of these metaphors are, at worst, infantilizing or dehumanizing and, at best take a deficit view that negates learners' resources, knowledge, and experience" (Belzer & Pickard, 2015, p. 254). Christoph (2009) examined three of the most common adult literacy curriculum series and

found the materials supported a view of adult literacy learners as “childlike and needing to be led through a predetermined curriculum that ignores their interests, goals, perspectives, and day-to-day experiences” (Belzer & Pickard, 2015, p. 254).

In addition to these factors affecting success, additional challenges exist within the context of adult literacy research. Adult literacy education is offered in a variety of programs that definitively lack coordination as well as consistency in regards to literacy development objectives and instructional methods (Lesgold & Welch-Ross, 2012). The last national survey of adult literacy in the United States was conducted in 2003. Recommendations for research include the characteristics of adult literacy learners in order to determine the best instructional approaches (Lesgold & Welch-Ross, 2012).

In previous studies including low literacy students enrolled in AE programs, age and education were common predictors of learning outcomes (Mellard et al., 2007). These statistics can inform researchers regarding the impact of demographics on adult learners, but they do not sufficiently describe the experiences, the disadvantages, and challenges these learners possess that may augment or diminish their learning (Belzer & Pickard, 2015). They believe “failure to attend to a more descriptive understanding of learners’ characteristics...will detract from the field’s capacity to meet their needs and help them improve their ability to use literacy fully (Belzer & Pickard, 2015, p. 251).

The Committee on Learning Sciences concluded that due to the lack of research with adults whose literacy levels are low, “it is reasonable to apply findings from the large body of research on learning and literacy with other populations...with some adaptations to account for the developmental level and unique challenges of adult learners” (Lesgold & Welch-Ross, 2012, p. 2). In their research, Snow and Strucker (2000) revealed adult learners were located “in a gray

area between childhood and adulthood” (Belzer & Pickard, 2015, p. 256). By synthesizing the research on emergent reading in early literacy learners, Snow and Strucker (2000) applied this information to adult literacy learners and determined childhood and adulthood factors can influence reading ability in adults.

Due to the lack of research on adult literacy, research with younger populations can be used to guide the development of instructional approaches for adult students based on two considerations. The first pertains to the potential neurocognitive declines experienced by some adults and the second stems from the varied life experiences, knowledge base, and motivation for learning adults possess (Lesgold & Welch-Ross, 2012). “A large body of research with K-12 students provides the principles and practices of literacy instruction that are equally important to developing and struggling adult learners” (Lesgold & Welch-Ross, 2012, p. 3). From a historical perspective, conceptual frameworks have been developed for teaching reading to adolescents and children (Marschall & Davis, 2012). Much of the language used in formal K-12 education settings is universal to research on adult literacy (Belzer & Pickard, 2015).

Research depicting characteristics of adult students as similar to younger students perpetuates a belief that adolescent literacy instruction can be applied to adult literacy instruction. “Though it may be convenient and efficient to draw on this work when the field suffers from a paucity of research...for adults, the reliability of doing so has not been established” (Belzer & Pickard, 2015, p. 260). Conversely, some adult literacy intervention strategies have been successful with children (Greenberg, Wise, Morris, et al., 2011; Hock & Mellard, 2011; Sabatini et al., 2011). According to Marschall and Davis (2012) “certain elements of these frameworks when combined with adult learning theory, can provide a useful structure for teaching critical reading to adult learners” (Hardin, 2008, p. 65). Practitioners in the

field of adult literacy should not solely depend on adolescent literacy curriculum when determining the best interventions because more research needs to be conducted to determine the most effective approach for adult learners (Belzer & Pickard, 2015).

Literacy and Age

Research suggests education level has a tendency to affect reading practices and ability (Corcoran, 1995; Finn, 2001; Guthrie, Seifert, & Kirsch, 1986; Kirsch et al., 1993). Research by Smith (1996) and Kirsh et al. (1993) recognized literacy proficiency increases with age until 55, when literacy levels begin to decrease. The National Assessment of Adult Literacy report of 2006 indicated 46% of individuals with below basic prose literacy skills were over the age of 50. Moore and Stavrianos (1995) reported younger adults are more likely to participate in AE programs, but older adults are more likely to persist in these same programs. Additionally, younger adults who have spent less time away from school may have an advantage when it comes to literacy and achievement (Mellard et al., 2007). Greenburg et al. (2011), indicated students were more likely to persist in AE literacy programs if they were over the age of 30. As a general theory, “older adults having more life experience, have potentially more exposure to literacy materials and opportunities to engage in reading and other literacy practices” (Sheehan-Holt & Smith, 2000, p. 232).

Through their examination of 213 subjects whose literacy levels varied from low-intermediate through high school, Mellard et al. (2007) studied various types of reading materials and the frequency of reading. Their results indicated reading practice by age showed a greater likelihood of success with reading books and work related materials in older participants as compared to younger participants. “Reading practice by age showed that as age increased, the participants more often read newspapers, books, and work manuals, while the younger

participants more often read magazines (Rodrigo et al., 2014, p. 74-75). Similarly, age showed a negative effect in a sample size of more than 250,000 students enrolled in developmental reading courses (Bailey et al., 2008).

Comings, Parella, and Soricone (1999) interviewed 150 adults with reading levels between fifth and eighth grade enrolled in adult literacy programs. Their research revealed 67 percent of students were still enrolled four months later. Furthermore, adults who were over the age of 30 were more likely to persist in the adult literacy programs (Greenberg, Wise, Frijters et al., 2013). Additional research supports the connection with age, literacy and persistence. Sabatini et al. (2011) studied three different interventions for supplementary reading with 300 adults with reading levels below seventh grade. Their study examined the age and literacy skills of students who completed at least ten sessions of instruction. By comparing age and post-test scores of students, Sabatini et al., (2011) found that older students were more likely to complete with an average age of 42, while the noncompleters averaged 35 years of age.

The 2003 National Assessment of Adult Literacy (NAAL), a survey conducted by the National Center for Education Statistics (NCES) to assess the functional literacy of adults within the United States, examined the relationship between age and literacy. The following categories were used for age: 16-18; 19-24; 25-39; 40-49; 50-64; and 65+. The results indicated adults age 65 and older had the lowest average of prose, document, and quantitative literacy (Kutner et al., 2007). Adults 25-39 scored the highest of all age groups on prose and document literacy. Overall, the comparison of these results to those of the 1992 National Adult Literacy Survey (NALS) indicated a general decrease in the average of skills by age (Kutner et al., 2007). Adults 65 and older showed the highest level of below basic reading skills and the lowest level of proficiency followed by adults age 50-64 (Kutner et al., 2007). In the case of remedial reading

courses, older students are less likely to progress to a higher developmental level than younger classmates (Bailey et al., 2008). In order to better understand the decline of literacy level with age, it is important to consider educational attainment.

Literacy and Educational Attainment

The results of the 1992 NALS indicate a parallel relationship to the differences in literacy proficiency, therefore, it can be concluded that some of the decrease in literacy skills across the age cohorts can be attributed to fewer years of schooling. (NCES, 2001). According to the 2003 NAAL study, 55 % of individuals with below basic prose literacy skills did not graduate from high school or obtain a GED (NAAL, 2006). The NALS results implied education level had an especially strong association with literacy proficiency levels (Mellard et al., 2007). Adults who completed college degrees were more likely to score in the highest two levels of proficiency as compared to 10% to 13% of high school graduates (Kirsch et al., 1993). 80% of adults who did not complete high school and 95% of adults who did not begin high school demonstrated prose proficiencies in the lowest two levels (Mellard et al., 2007). These statistics support the connection between educational attainment and literacy.

According to NCES (2001), “one of the strongest findings of the NALS is that education is vitally important for literacy proficiency” (p. 99). Similarly, Smith (1996) indicated “education level can help predict literacy proficiency stating, poorly educated adults who do not read perform worse than educated adults who do not read” (p. 215). Smith’s analysis of the NALS data identified a statistically significant interaction between level of education and reading practices (Mellard et al., 2007). The 2003 NAAL survey indicated adults with higher levels of education demonstrated higher levels of proficiency for prose, document, and quantitative literacy and showed proficiency levels increased as level of education increased.

(Kutner et. al, 2007). Thirty-one percent of adults who graduated from a 4-year college or university demonstrated proficient literacy skills as compared to 19 percent who completed a 2-year degree; 11 percent who completed some college, and 5 percent who took vocational classes after high school but did not attend college (Kutner et. al, 2007). The relationship between education and literacy is evident from these results.

“Level of education attained in the United States has the strongest relationship with demonstrated literacy proficiency” (NCES, 2001, p. 25). Scales and Rhee (2001) reported demographic factors such as education, gender, and race were significant predictors of how frequently and how proficiently literate adults read. According to the research, educational attainment shows a strong connection to literacy, but race is also an important factor.

Literacy and Ethnicity

According to Smith (1996), whites varied from other racial groups in selected reading practices and demonstrated significant differences among racial groups with regard to reading proficiency. D’Amico (2004) and Horsman (1990) identified inequalities such as poverty, race, and gender as significantly “limiting learners’ opportunity to become fully literate” (Belzer & Pickard, 2015, p. 257). The large number of participants in both the NALS (1992) and NAAL (2003) allowed for more detailed reporting of ethnicity as it relates to literacy than had been done in the past (Belzer & Pickard, 2015). In the 2003 NAAL, 70% of the participants were White, 12% were Black, 12% were Hispanic, and 4% were Asian/Pacific Islander (NAAL, 2006). Of those groups, the percentages of adults scoring below basic proficiency levels were as follows: 37% White, 20% were Black, 39% were Hispanic, and 4% were Asian/Pacific Islander.

These results confirm the observations of Sabatini et al. (2011), that adults scoring below basic levels of proficiency were more likely to be African American or Hispanic. Although the

percentages of Caucasian, Blacks, and Asians/Pacific Islanders with below basic literacy skills collectively decreased between 1992 and 2003, the percentage of Hispanic participants below basic literacy skills increased between 1992 and 2003 (NAAL, 2006). Whites and Asians/Pacific Islanders scored significantly higher with proficient literacy than Blacks and Hispanics (NAAL, 2006). The connection between literacy and ethnicity is clearly supported by these statistics.

“The average prose literacy of White adults is 26 to 80 points higher than that of any of the other nine racial/ethnic groups” (NCES, 2001, p. 32). Regarding the 1992 NALS, the average differences in proficiencies between White and Black adults for prose and document literacy, were 49 and 50 points, respectively (NCES, 2001). Hispanics were more likely than African Americans to have proficiency in document and prose literacy (NAAL, 2006). Scales and Rhee (2001), compared reading habits among white adult Americans and Asian Americans and found that education, gender, and race were significant predictors of how well and how often literate adults read. In remedial reading courses, students of African American decent are less likely to progress to higher developmental level than Caucasian students (Bailey et al., 2008). As the composition of the United States continues to become more diverse, the connection between adult literacy and ethnicity can only increase.

Summary

“For U.S. society to continue to function and sustain its standard of living, higher literacy levels are required of the U.S. population in the 21st century for economic security and all other aspects of daily life” (Lesgold & Welch-Ross, 2012, p. 9). Literacy can be considered currency within society (NCES, 2001). As the United States grows more diverse in terms of age and ethnicity, so did the results from the 1992 to 2003 adult literacy surveys (Kutner et al., 2007). The results indicated a significant number of adults are not reading at basic levels of literacy

proficiency (Sabatini et al, 2011). “The 2003 NAAL report that some 30 million U.S. adults (about 14% of the adult population) scored below basic in prose literacy skills, that is the skills needed to search, comprehend, and use continuous texts” (as cited in Sabatini et al., 2011, p. 118).

Despite the funding allocated from federal, state, city and community sources for Adult Education programs, these initiatives are not addressing the literacy needs of adults who have completed high school either through a traditional diploma or GED program or even completed some college because they do qualify. Statistics on adult literacy clearly identify the significant deficits that exist within the United States. Alarming numbers of adult students are not prepared for post-secondary programs which ultimately impact the workforce. As many as forty percent of all college students take one remedial course at the cost of approximately 1 billion dollars to taxpayers (Venezia, Callen, Kirst, & Usdan, 2006).

Developmental education courses are another avenue by which adults with low literacy levels can improve their skills, but even these programs are wrought with inconsistencies and challenges. Despite the many supporters of the philosophy of developmental education programs, in its current structure, there are some criticisms (Conforti et al., 2014). College readiness requirements vary from state to state and many students are currently leaving high school without necessary skills. Considering the same dilemma exists for adults who left high school decades ago regarding college readiness skill deficits, the problem is obviously present for a significant number of students. Kirst & Venezia (2004) cite the misalignment between K-12 education and higher education as a reason for this lack of college readiness. Low levels of adult literacy continue to be a hindrance for adult learners seeking post-secondary degrees.

Other demographic factors such as age, level of educational attainment and ethnicity have proven to relate to adult literacy.

Even within this large number of adults lacking literacy skills, a wide range of abilities are present. Adults scoring below basic proficiency ranged from non-literate in English to reading skills limited to finding basic recognizable information in simple texts (Sabatini et al, 2011).

“Below basic adults were more likely than the general population to be African American (20 vs. 12%) or Hispanic (39 vs. 12%), and to be older than 65 (26 vs. 15%) and report multiple disabilities” (Sabatini et al., 2011, p. 118). Only 45 percent of the adults scoring below basic proficiency graduated from high school (Sabatini et al., 2011). Adults scoring below basic proficiency on the 2003 NAAL are similar to the adult population being served by the nation’s Adult Basic Education programs (Tamassia et al. 2007).

This population is “a more diverse and disadvantaged population in terms of age, race/ethnicity, place of birth, and educational attainment than the U.S. population as a whole (as cited in Sabatini, 2011, p. 118). Within the substantial number of adults who demonstrated low levels of literacy according to the NALS and NAAL data, are those adults seeking college degrees in order to be more competitive in the global market. Community colleges are not the only institutions striving to meet the needs of these students. Institutions of higher education granting two-year and four-year degrees seek to provide opportunities for adults to improve their socio-economic status through programs in the business, education, and medical fields.

More research is needed to determine the relationship between levels of literacy of these adult students pertaining to the characteristics of these learners through demographic data such as age, ethnicity, race and levels of education. These factors will also be important as higher education institutions continue offering developmental education courses as part of their

remediation strategies. By investigating the levels of literacy for adults seeking a college degree in relation to their age, ethnicity, race and level of education, institutions of higher learning operating with open enrollment policies may be more responsive to students' needs and potentially impact their students' success in a positive way.

CHAPTER THREE: METHODS

Design

This study utilized a correlational predictive research design. This type of correlational design was appropriate because the purpose is to predict the future status of one of more dependent variables. In correlational research, data is collected or records are searched to ascertain the relationship of the variables (Gall, Gall, & Borg, 2007). In this case, the criterion variable is literacy level, specifically Lexile level, determined by Pearson's MyReadingLab Pre-Assessment. Literacy is defined as "the ability to use printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential" (Kirsch et al., 2001, p. 70).

The predictor variables were age, ethnicity, race and levels of education. Age was measured in years old, race was defined as Caucasian, African American, Asian, and Native American/Alaskan Native, ethnicity was defined as Non-Hispanic/Latino, Hispanic/Latino and Not Reported, and education level was measured according to the level of education completed including high school diploma/GED certificate, 1-15 college credit hours completed or 1 semester, 16-30 credit hours or 2 semesters, 31-45 credit hours or 3 semesters, 46-60 credit hours or 4 semesters, 61-75 credit hours or 5 semesters, 76-90 credit hours or 6 semesters, 91-105 credit hours or 7 semesters, 106-120 credit hours or 8 semesters, and 121 plus or 9 or more semesters of college credit hours completed.

Research Question

RQ1: How accurately can adult reading ability be predicted from a linear combination of age, ethnicity, and levels of education among non-traditional college students?

Null Hypothesis

H₀1: No significant predictive relationship exists between the criterion variable adult reading ability (as measured by Pearson's MyReadingLab Pre-Assessment) and the linear combination of predictor variables (age, ethnicity, and levels of education) for non-traditional college students.

Participants and Setting

Archival data was used in this study. The participants used in this study were non-traditional students who were enrolled in the Associate of Science Business program (ASB) at a Midwestern private Christian university on January 2014. Students were at least 20 years old with a minimum of two years full-time work experience in any field. In accordance with the requirements of their program, ASB students were enrolled in an orientation course introducing college success skills. Students were given the option to take the MyReadingLab Lexile Locator diagnostic test. The assessment was not required, but students were encouraged to complete it. Since the assessment was included as part of the course, data was archived as part of the university's private data sets.

The university setting consists of more than 18 regional campuses across the United States along with online students representing all 50 states. This institution began offering programs to non-traditional college students in 1985. The ASB program was one of the earliest programs offered. Currently, the university serves approximately 15,000 non-traditional students across the United States and throughout six world areas offering programs in business, education, nursing, liberal arts, ministerial studies, counseling, and health sciences.

As part of the admissions process, students were required to complete an application, but were not required to complete a college entrance exam or meet any specific academic

requirements for the ASB program. Proof of a high school diploma or GED equivalent was a pre-requisite for admission.

The total population of students enrolled in the ASB program from January 2014 to December 2014 was 1,159. The sample consisted of 694 non-traditional students enrolled in the Associate of Science in Business program (ASB) who completed the Pearson's MyReadingLab Assessment which was embedded in the orientation and introduction to college success course between January 2014 and December 2014. The course was completed in both onsite and online formats throughout the 18 regional campuses as well as throughout the United States. All assessments were completed online through the course learning management system platform.

Since the sample size consisted of approximately 47% of the total population, the sample size is significantly large in proportion to the population. Gall et al. (2007) recommend a sample size of at least 15 participations for each variable when using a multiple regression (p. 361). The power of correlational analysis increases as the sample size increases (Gall et al., 2007). This sample includes students from both onsite and online campuses across the United States. Participants' ages ranged from 20-60, and ethnicities included 63.1% Caucasian, 33.9% African American, 1.3% Native American/Alaskan Native, and .3% Asian. 35% of the students were male and 46% of the students were female. Students were enrolled in the Associate of Science in Business (ASB) program. 54.6% of students completed a high school diploma/GED certificate, 17.9% completed 1-15 college credit hours, 14.7% completed 16-30 hours, 6.3% completed 31-45 hours, 2% completed 46-60 hours, 1.7% completed 61-75 hours, .6% completed 76-90 hours, .4% completed 91-105 hours, 1% completed 106-120 hours, and .7% completed 121 hours or more of college credit.

Instrumentation

Pearson's MyReadingLab Assessment was the instrument used to measure students' literacy levels. See Appendix A for instrument. This assessment consisted of a series of 45 multiple-choice questions designed to determine a student's Lexile level. The Lexile framework is a scientific approach to reading and text measurement (MetaMetrics, 2015.) Two types of Lexile measurements exist, one for the reader and one for the text. Pearson's MyReadingLab Assessment also known as the Lexile Locator is for the reader and measures a person's reading ability according to the Lexile scale. The coefficient for the Lexile Test of Reading Comprehension has been measured by alternate form reliability which is .95 (Stenner, Smith, Horabin, and Smith, 1987).

In MyReadingLab, the Lexile system diagnoses a student's reading ability over time and assigns an initial Lexile measure (MetaMetrics, 2015). This program was designed specifically for developmental college reading students. The MyReadingLab program uses the Lexile system to diagnose students' reading ability. Students complete the Lexile Locator that generates a score ranging from 400 to 1490. A score of 400 indicates a grade equivalency approximation of first grade. College and career materials are averaging scores between 1200 and 1400 (Stenner, Koons, & Swartz, 2009).

With the Lexile measurement, grade levels are not an exact science but rather an approximate range. In any given classroom, readers possess a range of reading abilities depending on the complexity of the material (Daggett, 2003). Numerous studies have been conducted to determine typical ranges of scores correlated to grade levels (MetaMetrics, 2015). Table 1 below illustrates the middle 50% of reader measures for each grade. The range is called the interquartile range (IQR). The lower number in each range marks the 25th percentile of

readers and the higher number in each range marks the 75th percentile of readers (MetaMetrics, 2015).

Table 2

Lexile Reader Measures by Grade Level

Grade	Lexile Reader Measures, (Middle 50% of students-the interquartile range-at mid-year)
1	Up to 300L
2	140L to 500L
3	330L to 700L
4	445L to 800 L
5	565L to 910L
6	665L to 1000L
7	735L to 1065L
8	805L to 1100L
9	855L to 1165L
10	905L to 1195L
11 and 12	940L to 1210L

The instrument uses a variety of texts and multiple choice questions to assess a student's reading comprehension level which becomes a Lexile. "The Lexile scale is designed to produce a normative and criterion-referenced interpretation of a measure" (Stenner, 1996, p. 19). As a person's Lexile measure surpasses the Lexile measure of the text, reading comprehension increases; conversely, as the Lexile measure of a text surpasses the reader's Lexile measure, comprehension decreases (Stenner, 1996). According to Chall & Dale "the Lexile framework while undergirded by highly sophisticated statistical procedures, stands firmly in the tradition of classic readability formulas with its emphasis on comprehension as a function of semantic and syntactic components (as cited in Stenner, 1996, p. 23). Validity is the "extent to which a test measures what its authors or users claim it measures; specifically, test validity concerns the appropriateness of inferences that can be made on the basis of test results" (Salvia and

Ysseldyke, 1998). For the Lexile Framework, which measures reading as a skill, construct validity is the most applicable.

Pearson's MyReadingLab's (MRL) Initial Lexile Locator is administered electronically within MRL's internet based software program. There is no set time limit for the assessment. Students read passages and answer multiple-choice comprehension questions at their own pace. The assessment is included as a component of the initial course in the ASB program. The university that served as the setting granted permission to use the data collected from the instrument. See Appendix B for permission to use this data.

Procedures

A request was submitted to Liberty University for Institutional Review Board (IRB) approval to conduct the research. Subsequently, upon receiving this approval, a request was submitted to the IRB of the university which served as the research setting to use their archival data. See Appendix C for IRB approval. Both the criterion and predictor variables in the study were comprised of archival data. The predictor variables, age, ethnicity, race and levels of education were recorded as part of the application process. The criterion variable, students' Lexile levels were collected from January 2014 to December 2014 as part of the initial orientation course in the ASB. Student identification numbers were linked to their scores on the MRL Lexile Locator assessment which allowed the demographic data to be connected as well.

As part of their program requirements, ASB students were enrolled in an orientation college success skills course where they were given the option to take the MyReadingLab Lexile Locator assessment. The assessment was not required, but students were encouraged to complete it for extra credit. Since the assessment was included as part of the course beginning in January 2014, data was archived as part of the university's private data sets.

The predictor variables, age, ethnicity, race and levels of education exist as demographic data included in student's records and therefore are also classified as archival records. Private records include data that was not collected for the purpose of research but as part of information on the individual. The university that served as the research setting maintains student records within their Student Services Department.

The Lexile levels are housed inside the MRL program and were extracted from this source by running a report. The report included student identification numbers (ID's) which were linked to the demographic data. Using the student ID's, the researcher contacted the university's Student Services department to access the demographic data. The data was organized in an Excel Spreadsheet that included the headings Age, Ethnicity, and Level of Education. Since age is a numerical value and classified as a continuous variable, it was represented as such. In order to represent the categorical variable of race as a numerical value, the following values were assigned. White/Caucasian = 1; Black/African American = 2; Native American/Alaskan Native = 3, Asian = 4, Other = 5. The other category includes students who identify as more than one race. In order to represent the categorical variable of ethnicity as a numerical value, the following values were assigned. Non/Hispanic/Latino = 1, Hispanic/Latino = 2, and Not Reported = 3. The other category for ethnicity includes students who did not report ethnicity. Level of education was classified as an ordinal variable and divided the following. GED/High School Diploma = 1; 1- 15 transfer credits = 2; 16-30 transfer credits = 3; 31-45 transfer credits = 4; 46-60 = 5; 61-75 = 6, 76-90 = 7; 91-105 = 8; 106-120 = 9, and over 120 = 10.

Data Analysis

The archival data was analyzed through a quantitative correlational design with the purpose of investigating the relationship between Lexile levels and age, ethnicity, and levels of education in order to predict future Lexile scores. Commonly used in educational research (Elmore & Woehlke, 1996), multiple linear regression (MLR) analysis is ideal for research involving one or more predictor variables on a criterion variable. A multiple regression analysis of the data will be conducted. Since the variables exist simultaneously in the hypothesis, performing a simultaneous MLR was appropriate (Vessey, DeMarco, & DiFazio, 2011).

Data screening was conducted on all the variables to test the assumptions of multiple linear regression. The first assumption of a multiple linear regression requires a continuous dependent variable. The second assumption is the presence of two or more independent variables which can be continuous or categorical. The third assumption requires an independence of observations which will be tested using the Durbin-Watson statistic. The fourth assumption requires a linear relationship between the dependent variable and each independent variable will be tested by running a scatter plot between each of the predictor variables (x) age, ethnicity, and levels of education and the criterion variable (y) adult reading ability as determined by Pearson's MyReadingLab Lexile assessment. The fifth assumption requires evidence of homoscedasticity which will be tested by plotting the standardized residuals against the unstandardized predicted values. In order to meet the sixth assumption, multicollinearity must not be present. Scatter plots were also used to test the seventh assumption which requires no extreme outliers. Lastly, the Shapiro-Wilks (SW) test was used to test for normality in order to assume a normal distribution for each variable which is required by the eighth assumption. According to Razali & Wah (2011), the SW test is appropriate for any n range between 3 and

5000. The sample size of 694 is appropriate for this test. If all assumptions were met, regression model coefficients were calculated to determine which variables best predict reading ability; effect size was also calculated. If all the assumptions were met, SPSS Statistics software package was used to conduct a regression analysis to address the research question and hypothesis.

CHAPTER FOUR: FINDINGS

Overview

This chapter provides a restatement of the purpose, research question, and hypothesis along with an explanation of the data analysis conducted for this study. As previously noted, the purpose of this correlational study was to determine if a predictive relationship exists between the predictor variables age, ethnicity, race and educational attainment and the criterion variable, adult literacy as measured by the Pearson MyReadingLab Pre-Assessment.

Research Question

RQ1: How accurately can adult reading ability be predicted from a linear combination of age, ethnicity, race, and educational attainment among non-traditional college students?

Null Hypothesis

H₀1: No significant predictive relationship exists between the criterion variable adult reading ability (as measured by Pearson's MyReadingLab Pre-Assessment) and the linear combination of predictor variables (age, ethnicity, race and educational attainment) for non-traditional college students.

Descriptive Statistics

Adult students enrolled in the introductory business course in an accelerated program enrolled in an Associate of Science in Business (ASB) at a Midwestern private Christian university from January 2014 to December 2014 served as the population for this study. The sample size was 694. Within this sample, 67% (466 students) were female and 33% (228 students) were male. The age of the students ranged from 20 to 60. Lexile scores ranged from 273 (grade equivalency of 1st/2nd grade) to 1367 (beyond 11th/12th grade). Table 3 shows minimums and maximums for Lexile and age within the sample.

Table 3

Minimums and Maximums for Lexile and Age

Variable	N	Minimum	Maximum	SD
Lexile	694	273	1367	132.383
Age	694	20	69	9.164

It is important to note Table 4 reflects Lexile scores for students age 20 to 60 because 61, 62, 64, and 69 were only represented by 1 student. The sample did not include any students age 63, 65, 66, 67, or 68. The notation “a” means multiple modes exist. The smallest value is shown.

Table 4

Descriptive Statistics for Lexile and Age

Variable	Mean	Median	Mode	SD
Lexile	1099.47	1108.00	1182	132.383
Age	35.01	33.00	26 ^a	9.164

Table 5 shows the frequency for each age from 20-60 as well as the mean, minimum, maximum and standard deviation for ages 20-60. The chart below contains important descriptive statistics for the sample which allows additional information to be gleaned from the sample.

Table 5

Descriptive Statistics of Lexile by Age Range

Age	Frequency	Mean	Minimum	Maximum	SD
20	6	1073.33	869	1229	148.854
21	7	1068.43	568	1287	239.798
22	12	1137.42	909	1287	118.187
23	21	1071.29	849	1287	134.204
24	25	1075.08	273	1367	195.070
25	22	1112.86	909	1367	127.981
26	36	1075.06	753	1287	105.092
27	35	1080.17	811	1367	123.339
28	36	1118.53	772	1367	151.052
29	32	1071.09	715	1367	142.352
30	34	1113.62	791	1367	140.888
31	19	1089.68	889	1287	95.922
32	33	1113.30	772	1287	111.481
33	32	1082.88	889	1287	104.506
34	26	1127.81	909	1287	112.906
35	27	1055.81	715	1287	141.726
36	31	1100.23	849	1287	125.575

Table 5 – Continued

Age	Frequency	Mean	Minimum	Maximum	SD
37	25	1107.36	753	1367	158.397
38	14	1118.43	909	1287	116.532
39	22	1133.50	930	1287	107.518
40	17	1062.94	791	1287	128.588
41	17	1099.00	889	1287	121.076
42	19	1119.00	869	1367	151.632
43	14	1146.93	951	1367	105.264
44	20	1161.50	974	1287	73.487
45	14	1086.86	849	1287	149.442
46	13	1082.77	889	1229	97.737
47	14	1160.43	951	1367	112.650
48	6	1107.67	974	1182	88.038
49	8	997.00	715	1143	138.863
50	9	1157.56	1048	1287	83.436
51	4	1086.00	997	1182	90.336
52	6	969.00	434	1182	276.151
53	6	1133.33	909	1229	119.778
54	5	1092.80	791	1287	207.227
55	6	1132.17	997	1229	97.134
56	6	1148.67	974	1367	148.832
57	5	1064.60	951	1108	68.613

Table 5 – Continued

Age	Frequency	Mean	Minimum	Maximum	SD
58	2	1186.00	1143	1229	60.811
59	2	977.00	772	1182	289.914
60	2	1036.50	930	1143	150.614

Table 6 shows the frequency for race as well as the percentage of each category for White, Black, Native American/Alaskan Native, Asian, and Other. This information is important because it further describes the sample.

Table 6

Frequency - Race

Race	Frequency	Percent
White	438	63.1
Black	235	33.9
Native American/Alaskan Native	9	1.3
Asian	2	.3
Other	10	1.4
Total	694	100.0

Table 7 shows the descriptive statistics for race including the mean, minimum, maximum and standard deviation for White, Black, Native American/Alaskan Native, Asian, and Other.

Table 7

Descriptive Statistics of Lexile for Race

Race	Mean	Minimum	Maximum	SD
White	1108.36	273	1367	132.739
Black	1082.09	715	1367	132.136
Native American/ Alaskan Native	1147.22	997	1229	73.608
Asian	1110.00	1077	1143	46.669
Other	1073.40			141.809

Table 8 shows the frequency for ethnicity as well as percentage for each category of ethnicity including Non-Hispanic/Latino, Hispanic/Latino, and Not Reported. This information is pertinent to further analysis of the sample.

Table 8

Frequency - Ethnicity

Ethnicity	Frequency	Percent
Non-Hispanic/Latino	656	94.5
Hispanic/Latino	31	4.5
Not reported	7	1.0
Total	694	100.0

Table 9 shows the descriptive statistics for ethnicity including the mean, minimum,

maximum and standard deviation in terms of Non-Hispanic/Latino, Hispanic/Latino, and Not Reported. This information is important to comparing Lexile scores with regard to ethnicity.

Table 9

Descriptive Statistics of Lexile for Ethnicity

Race	Mean	Minimum	Maximum	SD
Non-Hispanic/Latino	1100.42	273	1367	133.505
Hispanic/Latino	1095.29	869	1287	104.481
Not Reported	1029.00	830	1182	133.651

Table 10 displays frequencies and percentages for credits earned. In this study, educational attainment was recognized as the number of college credit hours completed. More than half of the sample had not completed any college credit. Besides completing a high school diploma/GED, some students in the sample completed as few as one hour of college credit and as many 121 hours or more. This table is important because it shows the educational composition of the sample.

Table 10

Frequency – Educational Attainment

Educational Attainment	Frequency	Percent
HS Diploma/GED	379	54.6
1-15 (1 semester)	124	17.9
16-30 (2 semesters)	102	14.7
31-45 (3 semesters)	44	6.3
46-60 (4 semesters)	14	2.0
61-75 (5 semesters)	12	1.7
76-90 (6 semesters)	4	.6
91-105 (7 semesters)	3	.4
106-120 (8 semesters)	7	1.0
121 + (9+ semesters)	5	.7
Total	694	100.0

Table 11 includes the descriptive statistics for educational attainment including the mean, minimum, maximum and standard deviation. This information is pertinent because it shows the differences in Lexile scores for each level of educational attainment.

Table 11

Descriptive Statistics of Lexile for Educational Attainment

Educational Attainment	Mean	Minimum	Maximum	SD
HS Diploma/GED	1096.47	273	1367	138.756
1-15 (1 semester)	1090.23	791	1367	123.420
16-30 (2 semesters)	1099.40	753	1367	127.708
31-45 (3 semesters)	1145.27	930	1367	108.173
46-60 (4 semesters)	1094.79	715	1287	158.504
61-75 (5 semesters)	1107.67	849	1367	152.280
76-90 (6 semesters)	1184.00	1143	1229	35.185
91-105 (7 semesters)	1058.33	889	1143	146.647
106-120 (8 semesters)	1097.14	909	1182	95.353
121 + (9+ semesters)	1107.60	1022	1182	68.777

Results

A multiple linear regression (MLR) analysis was chosen to examine the predictor variables including age, ethnicity, race, and educational attainment on the criterion variable adult reading ability as measured by Pearson's MyReadingLab Lexile Locator. This statistical model is designed to determine if a predictive relationship exists between the criterion variable (adult reading ability) and the linear combination of predictor variables (age, ethnicity, race and educational attainment) for non-traditional college students. Since the variables exist simultaneously in the hypothesis, performing a simultaneous MLR was appropriate (Vessey et al, 2011).

Hypothesis

H₀₁: No significant predictive relationship exists between the criterion variable adult reading ability (as measured by Pearson's MyReadingLab Pre-Assessment) and the linear combination of predictor variables (age, ethnicity, race and educational attainment) for non-traditional college students.

Assumption Tests

Data screening was conducted on all the variables to test the assumptions of multiple linear regression. The first assumption of a multiple linear regression requires a continuous dependent variable. Lexile is a continuous dependent variable because it is measured by the Pearson MyReadingLab Assessment. The second assumption is the presence of two or more independent variables which can be continuous or categorical. This assumption was met because age is classified as continuous while ethnicity, race, and the number of transfer credits can be classified as categorical. The third assumption requires an independence of observations which will be tested using the Durbin-Watson statistic. According to SPSS, The Durbin-Watson statistic was 2.157. Therefore, we can assume an independence of observation.

The fourth assumption requires a linear relationship between the dependent variable and each independent variable. The scatterplot shows the criterion variable, Lexile and the predictor variable, age illustrating a nonlinear relationship. (See Figure 1). The remaining variables are categorical dummy variables. The only potential source of nonlinearity between a continuous and a dummy variable is the interaction term of a regression equation. In order for an interaction term to occur, the effect of an independent variable would gradually change as another independent variable changes. In essence, an African American student's Lexile would have to gradually change as a Caucasian student's Lexile score changed. Since that is not the case, there

is no need for any interaction terms in this regression model. As a result, the fourth assumption can be confirmed for Lexile and the categorical dummy variables.

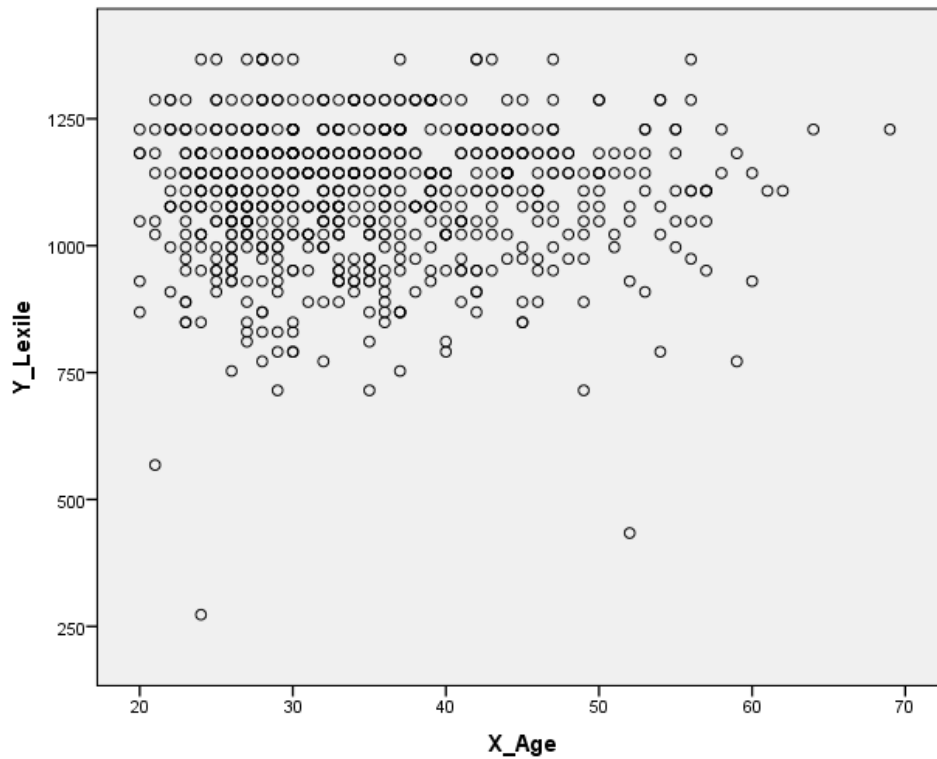


Figure 1. Linearity between Lexile and age.

The fifth assumption requires evidence of homoscedasticity which was tested by plotting the standardized residuals against the unstandardized predicted values. By visually inspecting the plot in Figure 2, the variance of Lexile shows consistency for all the predictor values which results in homoscedasticity. In order to meet the sixth assumption, multicollinearity must not be present. For each combination of independent variables, the collinearity statistic (VIF) value was less than three, therefore multicollinearity was not present. Scatter plots were also used to test the seventh assumption which requires no extreme outliers. However, the scatterplot in Figure 2 shows evidence of extreme outliers.

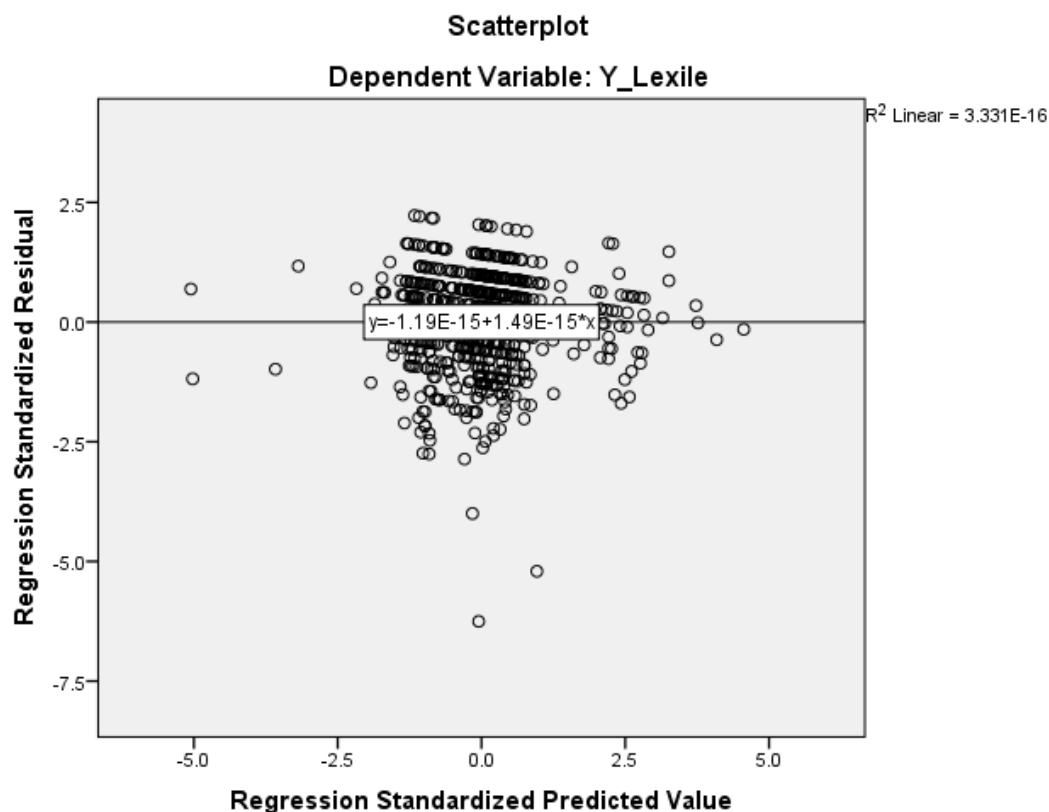


Figure 2. Scatterplot for Lexile

Lastly, the Shapiro-Wilks (SW) test was used to test for normality in order to assume a normal distribution for each variable which is required by the eighth assumption. The results from the SW test indicated a significance of less than .05 which means a normal distribution is not present. According to Razali & Wah (2011), the SW test is appropriate for any n range between 3 and 5000. The sample size of the study is appropriate for this test.

Because the assumptions of a multiple linear regression were not met, regression coefficients could not be calculated. Although regression coefficients could not be calculated, Pearson correlation coefficients were calculated for Lexile and age and Lexile and educational attainment as a continuous variable. See Tables 12 and 13. In order for a correlation to show statistical significance, the correlation coefficient needs to be as close to 1 as possible. For age,

the value $r = .052$ and for education attainment, $r = .042$. For both variables, age and educational attainment, the p-value is less than .5 meaning there is no statistically significant relationship between Lexile and these variables.

Table 12

Pearson Correlation Coefficients for Lexile and Age

	Lexile	Age
Pearson Correlation	1.00	.052
Sig (2-tailed)		.173

Table 13

Pearson Correlation Coefficients for Lexile and Educational Attainment

	Lexile	Educational Attainment
Pearson Correlation	1.00	.042
Sig (2-tailed)		.270

Since race does not increase as Lexile increases which is measured by Pearson Correlations, it was necessary to run Eta Correlations for the remaining categorical variables of race, ethnicity, and educational attainment as a categorical variable. (See Table 14). Eta is a measure of association used with a nominal variable and a variable measured at the scale level.

Table 14

Eta Correlations for Race, Ethnicity, and Educational Attainment

	Eta	Partial Eta Squared
Race	.105	.011
Ethnicity	.054	.003
Educational Attainment	.108	.012

Eta Squared is the Sum of Squares Between divided by the Sum Squares Total, and Partial Eta Squared is the Sum of Squares between divided by the Sum of Squares total plus the Sum of Squares error. For one way ANOVA, the value of Eta squared and Partial Eta Squared is equal. Eta Squared is a measure of effect size, so the values in the table above can be examined according to the guidelines of .02 as small, .13 as medium, and .26 is large for effect size. The categorical variables of race, ethnicity, and educational attainment do not show a statistically significant effect size. After running these correlational tests, the null hypotheses could not be rejected. Therefore, the analysis failed to reject the null hypothesis.

Summary of Findings

In order to determine if a predictive relationship existed between the criterion variable, Lexile and the predictor variables age, race, ethnicity, and educational attainment, seven assumptions were required. These seven assumptions could not be met, therefore a multiple linear regression could not be calculated which resulted in failure to reject the null hypothesis.

Correlation coefficients were calculated, however, to determine if any correlational relationship existed between Lexile and each of the predictor variables. Pearson coefficients were calculated for Lexile and age and Lexile and educational attainment because age and educational attainment were continuous variables. For age, the value $r = .052$ and for education attainment, $r = .042$. For both variables, age and educational attainment, the p-value is less than .5 meaning there is no statistically significant relationship between Lexile and these variables. Eta correlations were calculated for Lexile and race, Lexile and ethnicity, and Lexile and educational attainment as categorical variables. The results of these calculations produced the values .011, .003, and .012 respectively, which are not statistically significant. The results of this study indicate there is no predictive relationship between the criterion variable Lexile and the predictor variables age, ethnicity, race, and educational attainment.

CHAPTER FIVE: CONCLUSIONS

Overview

In order for the United States to continue to operate at its current standard, increased literacy skills are essential not only for economic security but for all facets of life (Lesgold & Welch-Ross, 2012). This final chapter provides a description of the purpose and brief overview of this study on adult literacy, a discussion of the results, implications and limitations of the study and lastly recommendations for further research.

Discussion

The purpose of this correlational study is to determine if a predictive relationship exists between the predictor variables age, ethnicity, race and educational attainment and the criterion variable, adult literacy as measured by the Pearson MyReadingLab Pre-Assessment. More specifically, the research question was designed to determine how accurately adult reading ability can be predicted from a linear combination of age, ethnicity, race, and educational attainment among non-traditional college students. The original intention was to answer the question through a multiple linear regression (MLR). Upon initial screening of the data set, the seven assumptions required by a MLR were not met, so Pearson and Eta correlations were calculated separately with the dependent variable, reading ability and each independent variable: age, race, ethnicity and educational attainment (See Tables 12, 13, & 14). Pearson correlations could not be calculated for all predictor variables against the criterion variable because the variables of race, ethnicity, and educational attainment were measured on a categorical scale.

College Readiness for Non-traditional Students

As enrollment of adult students in colleges and universities increases, institutions of higher learning must adapt to meet the diverse needs of this population. The Council on Adult

and Experiential Learning found colleges and universities have struggled to adapt to the diverse demographics of these adult learners (Pimentel, 2013). From the sample of 694 students age 20 to 60 in this study, the average Lexile score was 1099. According to Pimentel (2013) this equates to a grade equivalency of a freshman in high school. The lowest Lexile score belonged to a 24 year-old student which was 273 and equates to approximately a first grade equivalency. Hardin (2008) cites two reasons for lack of college-readiness skills which include students not enrolling in college preparation courses in high school and dropping out of high school. More than half of the students in the sample, 54.6 percent only held a high school diploma or GED. 17.9 percent of the sample completed one semester of college prior to enrolling in the introductory course of the Associates of Science in Business, and 14.7 percent completed two semesters. Less than 13 percent completed three or more semesters of college before enrolling in this program. This data confirms the need for more resources and action plans to assist adult students enrolling in college who lack the college readiness skills to be successful. Considering the average Lexile score of the sample was below the level of college readiness, a recognizable problem exists. Lesgold & Welch-Ross (2012) identified various factors that affect this population including “goals, motivation, knowledge, accessed skills, interests, neurocognitive profiles, and language background (p. 4). The results of this research suggest institutions of higher learning must seek ways to address the needs of these learners which affect their readiness for college. These results also illuminate the problem that exists between the concepts of college eligibility and college readiness.

The Council on Adult and Experiential Learning found colleges and universities “have struggled to adjust to the changing demographics on their campuses” (Hardin, 2008, p.51). The sample in this study included four specific categories of race, White (63.1%), Black (33.9%),

Native American/Alaskan Native (1.3%), Asian (.3) and a fifth category known as Other (1.4). Ethnicity was identified by two categories, Non-Hispanic/Latino (94.5%) and Hispanic/Latino (4.5%), and one percent of the sample was not reported for ethnicity. These percentages would suggest some diversity in the population of adult learners which illustrates the term “heterogeneous” used by Lesgold & Welch-Ross (2012) to describe the population of adult learners.

Non-Significant Correlations of Lexile Scores

All four of the predictor variables in the study were not found to be correlated to the criterion variable. Age, race, ethnicity, and educational attainment showed no predictive or correlational relationship to Lexile scores as measured by the MyReadingLab pre-assessment. For age, the Pearson correlation was .052 which indicates a lack of significance. The same can be said for educational attainment when analyzed as a nominal variable. The Pearson Correlation was .042 resulting in no correlation. For the categorical variables of race, ethnicity and educational attainment, the Eta correlations were not significant at .011, .003, and .012 respectively. These results do not support previous findings that a variety of demographic characteristics impact reading ability (Mellar, Patterson, & Prewett, 2007).

For the variable age, research suggests that literacy proficiency increases with age until 55 (Kirsh et al., 1993; Smith, 1996). Table 5 shows the mean, minimum and maximum Lexiles for students age 20 to 60. There were nine 50 year-old students whose Lexile average was 1157.56, six 55 year-old students whose mean Lexile was 1132.17, six 56 year-old students whose Lexile average was 1148.67, and two 58 year-old students whose Lexile averaged 1186.00. In this study, the mean Lexile increased for some students as age increased. These results do not support the aforementioned findings and overall there is no proof from this sample

that literacy proficiency decreases after age 55.

For the variable educational attainment, research suggests that education level had an especially strong association with levels of literacy proficiency (Mellard et al., 2007). According to Table 8, educational attainment levels varied accordingly. The mean Lexile for students completing a high school diploma or GED was 1096.47. For educational attainment, the highest mean Lexile was 1184.00 for students completing 6 semesters of college or 76-90 credit hours suggesting that Lexile does increase as level of education increases. Overall, this study supports the 2003 NAAL survey results which indicated adults with higher levels of education demonstrated higher levels of reading proficiency (Kutner et al., 2007). In addition to age and educational attainment, race and ethnicity were also significant predictors of adult reading proficiency (Scales and Rhee, 2001).

According to D'Amico (2004) and Belzer & Pickard (2015), inequalities such as poverty, race, and gender significantly limited the opportunity for learners to become fully literate. In this study, the mean Lexile for White students (63.1 percent of the sample) was 1108.36 while the mean Lexile for Black students (33.9 percent of the sample) was 1082.09. The lowest Lexile score was actually a White student and the highest Lexile score, 1367, was earned by Black and White students. The Native American/Alaskan Native students only accounted for 1.3 percent of the sample and the Lexile mean for this population was 1147.22. Only two students, or .3 percent of the sample in this study identified themselves as Asian and the Lexile mean for this group was 1110.00. This study does not support the results of NAAL (2006) that indicated Whites and Asians scored significantly higher with literacy proficiency than Blacks and Hispanics.

Implications

With the current economic climate in the United States, adults are enrolling in post-secondary institutions at a significantly high rate. Many are seeking better wages, better hours, and better working conditions in general, and many have experienced employment change or loss as a result of not having completed a degree. Although these non-traditional learners can be described with such positive qualities as self-disciplined, intrinsically motivated, experiential and realistic, they also face the challenges of full-time employment, family circumstances, and the standard fears of reentering the learning environment (Huer & King, 2004, Clearly, 2008, & Moore & Kearsley, 2005). A vast majority of these non-traditional students ages 20 to 60 are not products of the current P-12 educational system which has experienced massive reform with regard to standards of career and college readiness. Although the results of this study indicate the level of reading proficiency for many adult learners is below the level of college readiness, there is an upside to the absence of a predictive or correlational relationship between Lexile, age, race, ethnicity, and educational attainment. For nearly 700 students enrolled in an Associate's program whose age, race, ethnic, and educational backgrounds varied significantly, there was no apparent relationship between their Lexile or reading proficiency and these factors. Reading ability in this study was not limited by age, race, ethnicity, or educational attainment. Older students did not consistently perform lower than younger students. Minority students did not consistently perform lower than non-minority students, and students with only a high school diploma or GED did not consistently perform worse than those who earned college credits prior to enrolling in their program.

These results do indicate, however, more resources need to be made available to adult students pursuing post-secondary education in the area of literacy instruction and remediation.

According Lesgold and Welch-Ross (2012), “there is a surprising lack of rigorous research on effective approaches to adult literacy instruction” (p. 12). This study illuminates the lack of college readiness and the need for more options for adult learners in the way of literacy instruction. Although some colleges and universities offer development course and remediation options, there is a lack of coordination and consistency among programs (Lesgold & Welch-Ross, 2012).

Limitations

This study utilized archived data which deemed it non-experimental in nature. As such, controlling internal validity is not a priority with this kind of research because it is generally very low. This research design was used to determine what if any differences existed between Lexile scores and a variety of factors including age, race, ethnicity, and educational attainment. Since no significant relationship between the predictor variable Lexile and the criterion variables of age, race, ethnicity, and existed in this study, the internal validity is essentially non-existent.

External validity on the other hand, is typically higher in a non-experimental study. In this case, the degree to which these findings can be generalized to other groups of adult learners is regarded as high because the scores were generated from a reading assessment given as part of a college course and the study did not involve various treatments. The study, however, is not without limitations or threats to external validity. The setting of this study was a post-secondary institution offering two and four year degrees, more specifically, a Midwestern private Christian university. If the setting were to change and the research was conducted in a community college, career and technical college or other secular institutions, the results may differ. The scores used as the archived data set in this study was extracted from an Associate of Science Business

program (ASB). Some threats to external validity may exist if scores were extracted from different programs.

Recommendations for Future Research

Although the field of adult literacy research has virtually been untapped and a scarcity of investigative studies exist, low levels of adult literacy continue to be a hindrance for adult learners seeking post-secondary degrees. After a thorough and exhaustive search to determine the current state of adult literacy research, a critical gap emerged. After the 2003 National Assessment of Adult Literacy (NAAL), the body of research virtually disappeared. A systematic analysis of the research literature to synthesize description of adult literacy learners has not been conducted and additional research should be conducted to determine the most effective approach for adult literacy learners (Belzer & Pickard, 2015). Specifically, the areas where more research should be conducted are as follows:

1. A current description of adult literacy learners pursuing post-secondary degrees. The characteristics of adult learners continue to evolve. Currently, a systematic analysis of literature to describe adult learners has not be completed (Belzer & Pickard, 2015). Research needs to explore the current state and descriptions of these learners in order to better serve them.
2. An investigation of the most effective reading remediation and intervention models for post-secondary institutions. (Boylan & Bonham, 2007; Bailey & Cho, 2010). Additional research can explore the options for remediation to better prepare adult learners who do not possess the literacy skills to be successful.
3. A comparison of current college readiness standards against college eligibility requirements for non-traditional adult students. College entrance and eligibility

requirements differ significantly from state to state and a universal definition of college readiness does not currently exist (Lesgold & Welch-Ross, 2012).

4. A comparison of the persistence of adult learners in the community college setting versus two and four-year institutions with and without development education options Courses. The goal of developmental education is not just to recover academic deficiencies, but to improve student success in college (Conforti et al., 2014). Additional research needs to explore the benefits and challenges of developmental education offerings in post-secondary institutions.

The issue of funding is a limitation as well. The cost of remediation is high and literacy funding provided to colleges and universities is low. Adult literacy is an issue post-secondary institutions must set as a priority for research and investigation. The Enrollment and Retention Offices within higher learning institutions that offer programs for non-traditional should be concerned about the literacy levels of their students. Colleges and universities need to be responsive to the needs of their adult students and more research is certainly needed. As the population in the United States continues to be “more diverse and disadvantaged in terms of age, race/ethnicity, place of birth, and educational attainment,” literacy proficiency will continue to be a currency by which people can improve their socio-economic status (as cited in Sabatini, 2011, p. 118; NCES, 2001).

References

- Adelman C. (1999). Answers in the tool box. Academic intensity, attendance patterns, and bachelor's degree attainment (Report No. PLLI-1999-8021). Washington, DC: National Institute on Postsecondary Education, Libraries, and Lifelong Learning. (ERIC Document Reproduction Service No. ED431363)
- Aycaster, P. W. (2001). Factors impacting success in community college developmental mathematics courses and subsequent courses. *Community College Journal of Research and Practice*, 25, 403–416. <https://doi.org/10.1080/10668920175019225>
- Adults falling behind. (2013). *Phi Delta Kappan*, 95(4), 6.
<https://doi.org/10.1177/003172171309500402>
- Allington, R. L. (2009). If they don't read much . . . 30 years later. In E. H. Hiebert (Ed.), *Reading more, reading better* (pp. 30–54). New York, NY: Guilford.
- Bailey, T. & Cho, S. (2010, September). *Issue brief: Developmental education in community colleges*. Retrieved from
<http://ccrc.tc.columbia.edu/media/k2/attachments/developmental-education-community-colleges.pdf>
- Bailey, T., Jeong, D. W., & Cho, S. (2008). *Referral, enrollment, and completion in developmental education sequences in community colleges* (CCRC Working Paper No. 15).. Retrieved from http://ccrc.tc.columbia.edu/media/k2/attachments/referral-enrollment-completion-developmental_V2.pdf
- Barnes, W., & Slate, J. R. (2014). College-readiness rates in Texas: A state-wide, multiyear study of ethnic differences. *Society and Urban Education* 46(1), 59–87.
<https://doi.org/10.1177/0013124511423775>

- Barnes, W., Slate, J. R., & Rojas-LeBouef, A. (2010). College-readiness and academic preparedness: The same concepts. *Current Issues in Education*, 13(4), 1–31. Retrieved from <https://cie.asu.edu/ojs/index.php/cieatasu>
- Belzer, A., & Pickard, A. (2015). From heroic victims to competent comrades: Views of adult literacy learners in research literature. *Adult Education Quarterly: A Journal of Research and Theory*, 65(3), 250–266. <https://doi.org/10.1177/0741713615580015>
- Belzer, A., & St. Clair, R. (2003). *Opportunities and limits: An update on adult literacy education*. Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education. (ED482336)
- Boylan, H. R., & Bonham, B. S. (2007). Thirty years of developmental education: A retrospective. *Journal of Developmental Education*, 30(3), 2-4. Retrieved from <https://ncde.appstate.edu/publications/journal-developmental-education-jde>
- Brenner, D., Hiebert, E. H., & Tompkins, R. (2009). How much and what are third graders reading? Reading in core programs. In E. H. Hiebert (Ed.), *Reading more, reading better* (pp. 118–140). New York, NY: Guilford.
- Brookfield, S. D. (1986). *Understanding and facilitating adult learning*. San Francisco, CA: Jossey-Bass:
- Byrd, K. L., & Macdonald, G. (2005). Defining college readiness from the inside out: First-generation college student perspectives. *Community College Review*, 33(1), 22-37. <https://doi.org/10.1177/009155210503300102>
- Cassidy, J. & Ortlieb, E. (2011). Literacy: The first decade of the new millennium. *Reading Horizons*, 51(2), E3. Retrieved from http://scholarworks.wmich.edu/reading_horizons/

- Christoph, J. N. (2009). Each one teach one: The legacy of evangelism in adult literacy education. *Written Communication*, 26, 77–110.
<https://doi.org/10.1177/0741088308327478>
- Cleary, M.N. (2008). What WPAs need to know to prepare new teachers to work with adult students. *Journal of the Council of Writing Program Administrators*, 32(1/2), 113–128.
Retrieved from
- Comings, J. P. (2007). Persistence: Helping adult education students reach their goals. Retrieved from http://www.ncsall.net/fileadmin/resources/ann_rev/comings-02.pdf
- Comings, J. P., Parella, A., & Soricone, L. (1999). *Persistence among adult basic education students in pre-GED classes*. Cambridge, MA: National Center for the Study of Adult Learning and Literacy, Harvard Graduate School of Education.
- Compton, J. I., Cox, E., & Laanan, F. S. (2006). Adult learners in transition. *New Directions for Student Services*, 2006(114), 73–80. <https://doi.org/10.1002/ss.208>
- Conforti P., Sanchez J., & McClarty, K.L. (2014). *Developmental education: New approaches for the 21st century*. Paper presented at the National Association for Developmental Education Annual Conference: Dallas, TX. Retrieved from https://www.pearson.com/content/dam/one-dot-com/one-dot-com/global/Files/efficacy-and-research/he/issues-he-2-Developmental_Education_Draft_030314_PAC.pdf
- Conley, D. T. (2007). The challenge of college readiness. *Educational Leadership*, 64(7), 1–6.
Retrieved from <http://www.ascd.org/publications/educational-leadership.aspx>
- Conley, D. T. (2008). Rethinking college readiness. *New England Journal of Higher Education*, 22(5), 24–26. <https://doi.org/10.1002/he.321>

- Corcoran, M. (1995). Rags to rags: Poverty and mobility in the United States. *Annual Review of Sociology*, 21, 237-267. <https://doi.org/10.1146/annurev.so.21.080195.001321>
- Cross, P. (1981). *Adults as learners: Increasing participation and facilitation learning*. San Francisco, CA: Jossey Bass.
- Daggett, W, R. (2003). School counselors and information literacy from the perspective of Willard Daggett. *Professional School Counseling*, 6(4), 238–242. Retrieved from <https://www.schoolcounselor.org/school-counselors-members/publications/professional-school-counseling-journal>
- D’Amico, D. (2004). Race, class, gender, and sexual orientation in adult literacy: Power pedagogy, and programs. In J. Coming, B. Garner & C. Smith (Eds.), *Review of adult learning and literacy* (Vol. 4, pp.. 17–69). Mahwah, NJ: Lawrence Erlbaum
- Dann-Messier, B., & Kampits, E. I. (2004). Community-based programs play a role in introducing learners to college and in helping them persist. *Focus on Basics*, 6(D), 22–25. Retrieved from <http://www.ncsall.net/index.html?id=185.html>
- Dotzler, J. (2003). A note on the nature and history of post-secondary developmental education in America. *Mathematics & Computer Education*, 37(1), 121-125. Retrieved from <http://www.macejournal.org>
- Elmore, P.B. & Woehlke, P. L. (1996). *Basic statistics*, New York, NY: Longman.
- English language arts standards. (n.d.). Retrieved from <http://www.corestandards.org/ELA-Literacy/>
- Finn, J. D. (2001). School noncompletion and literacy. In C.F. Kaestle, A. Campbell, J.D. Finn, S.T. Johnson, & L.J. Mikulecky (Eds.), *Adult literacy and education in America: Four*

- studies based on the National Adult Literacy Survey* (pp. 41–71). Washington, DC: Office of Educational Research and Improvement, U.S. Dept. of Education
- Gall, M., Gall, J., & Borg, R. (2007). *Educational research: An introduction* (8th ed.). New York, NY: Pearson Education.
- Goncalves, S. A., & Trunk, D. (2014). Obstacles to success for the nontraditional student in higher education. *Psi Chi Journal of Psychological Research*, 19, 164-172. Retrieved from https://www.psichi.org/?page=journal_main#.WM3_KVXyupo
- Gooden, S., Matus-Grossman, L., Wavelet, M., Diaz, M., & Seupersad, R. (2002). *Opening doors: Students' perspectives on juggling work, family, and college*. New York, NY: MDRC.
- Greenberg, D., Wise, J., Frijters, J., Morris, R., Fredrick, L., Rodrigo, V., & Hall, R. (2013). Persisters and nonpersisters: Identifying the characteristics of who stays and who leaves from adult literacy interventions. *Reading & Writing*, 26(4), 495–514. <https://doi.org/10.1007/s11145-012-9401-8>
- Greenberg, D., Wise, J. C., Morris, R., Fredrick, L., Nanda, A. O., & Pae, H. K. (2011). A randomized control study of instructional approaches for struggling adult readers. *Journal of Research on Educational Effectiveness*, 4, 101–117. <https://doi.org/10.1080/19345747.2011.555288>
- Grubb, W. N. (2010). *The quandaries of basic skills in community colleges: Views from the classroom* (NCPR Working Paper). New York, NY: Columbia University, Teachers College, National Center for Postsecondary Research.

- Guidos, M., & Dooris, M. J. (2008). Correlates of adult learner degree completion in a research university. *Journal of Continuing Higher Education*, 56(2), 45–51.
<https://doi.org/10.1080/07377366.2008.10400152>
- Guthrie, J. T., Seifert, M., & Kirsch, I. S. (1986). Effects of education, occupation, and setting on reading practices. *American Educational Research Journal*, 23, 151–160.
<https://doi.org/10.3102/00028312023001151>
- Hall, J. M., & Ponton, M. K. (2005). Mathematics self-efficacy of college freshman. *Journal of Developmental Education*, 28(3). 26–33. Retrieved from
<https://ncde.appstate.edu/publications/journal-developmental-education-jde>
- Hardin, C. J. (2008). Adult students in higher education: A portrait of transitions. *New Directions For Higher Education*, (144), 49–57. <https://doi.org/10.1002/he.325>
- Hauser, R. M., Edley, C. J., Koenig, J. A., Elliott, S. W.. (2005). *Measuring literacy: Performance levels for adults*. Washington, D. C.: National Academies Press.
- Hawkins, J. (2003). Critical inquiry and the multicultural college population. *The Delta Kappa Gamma Bulletin*, 69(2), 25–29, 33. Retrieved from <https://www.dkg.org/>
- Heuer, B. P. & King, K. P. (2004). Leading the band: The role of the instructor in online learning for educators. *Journal of Interactive Online Learning*, 3(1). Retrieved from
<http://www.learntechlib.org/p/158286>
- Hiebert, E. H., & Martin, L. A. (2009). Opportunity to read: A critical but neglected construct in reading instruction. In E. H. Hiebert (Ed.), *Reading more, reading better* (pp. 3–29). New York, NY: Guilford.

- Hock, M. F. & Mellard, D. F. (2011). Efficacy of learning strategies instruction in adult education. *Journal of Research on Educational Effectiveness*, 4, 135–153.
<https://doi.org/10.1080/19345747.2011.555291>
- Horsman, J. (1990). *Something in my mind besides the everyday*. Toronto, Ontario: The Woman's Press.
- Hosp, H. M. (1944). Education for women. *Educational Leadership*, 1(5), 288–291. Retrieved from <http://www.ascd.org/publications/educational-leadership.aspx>
- Hussar, W. & Bailey, T. M. (2009). *Projections of education statistics to 2018*. Washington, DC: National Center for Education Statistics.
<http://nces.ed.gov/programs/projections/projections2018/>.
- Ilsley, P. J., & Stahl, N. A. (1994). Reconceptualizing the language of adult literacy. In J. C. Radenich (Ed.), *Adult literacy: A compendium of articles from the journal of reading* (pp. 4–12). Newark, DE: International Reading Association.
- Jacobson, E. (2011). Examining reading comprehension in adult literacy. *Adult Basic Education & Literacy Journal*, 5(3), 132–140. Retrieved from <http://www.coabe.org/journal/>
- Kennedy-Manzo, K. (2006). Graduates can't master college text. *Education Week*, 25(25), 1–6. Retrieved from <http://www.edweek.org/ew/index.html>
- Kenner, C., & Weinerman, J. (2011). Adult learning theory: Applications to non-traditional college students. *Journal of College Reading & Learning*, 41(2), 87–96.
<https://doi.org/10.1080/10790195.2011.10850344>
- Kirsch, I., Braun, H., Yamamoto, K. & Sum A. (2007). *America's perfect storm: Three forces changing our nation's future*. Princeton, NJ: Educational Testing Service.

Kirsch, I. S., & Jungeblut, A (1986). *Literacy: Profiles of America's young adults. Final report.*

Retrieved from https://www.ets.org/Media/Research/pdf/LITERACY_PROFILES.pdf

Kirsch, I. S., Jungeblut, A. Jenkins, L. & Kolstad, A. (1993). *Adult literacy in America: A first look at the results of the National Adult Literacy Survey (NALS)*. Washington, DC: U.S. Department of Education.

Kirsch, I., Yamamoto, K., Norris, N., Rock, D., Jungeblut, A., O'Reilly, P., . Baldi, S.. .. (2001, January). *Technical report and data file user's manual for the 1992 National Adult Literacy Survey*. Retrieved from <https://nces.ed.gov/pubs2001/2001457.pdf>

Kirst, M. W. & Venezia, A. (2004). *From high school to college: Improving opportunities for success in postsecondary education*. San Francisco, CA: Jossey-Bass

Knowles, M. S. (1984). *Andragogy in action*. San Francisco, CA: Jossey Bass.

Koch, B., Slate, J. R., & Moore, G. (2012). Perceptions of students in developmental classes. *Community College Enterprise*, 18(2), 62–82. Retrieved from

<http://www.schoolcraft.edu/a-z-index/community-college-enterprise#.WM8d6lXyupo>

Kozeracki, C. A., & Brooks, J. B. (2006). Emerging institutional support for developmental education. *New Directions for Community Colleges*. (136), 63–73.
<https://doi.org/10.1002/cc.260>

Kruidenier, J. (2002). *Research-based principles for adult basic education reading instruction*. Portsmouth, NH: RMC Research Corporation.

Kutner, M., Greenberg, E., Jin, Y., Boyle, B., Hsu, Y., & Dunleavy, E.,. (2007, April). *Literacy in everyday life: Results from the 2003 National Assessment of Adult Literacy* (NCES 2007-480). Retrieved from https://nces.ed.gov/Pubs2007/2007480_1.pdf Lennon, C. & Burdick. H. (2014). *The Lexile framework as an approach for reading measurement and*

- success*. Retrieved from
https://cdn.lexile.com/cms_page_media/135/The%20Lexile%20Framework%20for%20Reading.pdf
- Lesgold, A. M., & Welch-Ross, M. (2012). *Improving adult literacy instruction: Options for practice and research*. Washington, D. C.: National Academies Press.
- Marschall, S., & Davis, C. (2012). A conceptual framework for teaching critical reading to adult college students. *Adult Learning*, 23(2), 63–68.
<https://doi.org/10.1177/1045159512444265>
- McShane, M. (2005). *Applying research in reading instruction for adults*. Louisville, KY: National Center for Family Literacy.
- Mellard, D. & Patterson, M. B. (2008). Contrasting adult literacy learners with and without specific learning disabilities. *Remedial and Special Education*, 29(3), 133–144.
<https://doi.org/10.1177/0741932508315053>
- Mellard, D., Patterson, M. B., & Prewett, S. (2007). Reading practices among adult education participants. *Reading Research Quarterly*, 42(2), 188–213.
<https://doi.org/10.1598/RRQ.42.2.1>
- Mellard, D. F., & Fall, E. (2012). Component model of reading comprehension for adult education participants. *Learning Disability Quarterly*, 35(1), 10-24.
<https://doi.org/10.1177/0731948711429197>
- Mellard, D. F., Fall, E., & Mark, C. (2009). Reading profiles for adults with low-literacy: Cluster analysis with power and speeded measures. *Reading and Writing: An Interdisciplinary Journal*, 22(8), 975–992. <https://doi.org/10.1007/s11145-008-9136-8>

- Merriam, S. B., Caffarella, R. S., & Baumgartner, L. M. (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Francisco, CA: Wiley.
- MetaMetrics. (2015). Lexile measure. Retrieved January 10, 2015, from <https://lexile.com/about-lexile/lexile-overview/lexile-measures-details/>
- Miller, B., McCardle, P. & Hernandez, R. (2010). Advances and remaining challenges in adult literacy research. *Journal of Learning Disabilities*, 43; 101–107.
<https://doi.org/10.1177/0022219409359341>
- Moore, M. & Stavrianos, R. (1995). *Review of adult education programs and their effectiveness: A background paper for reauthorization of the Adult Education Act*. Washington, DC; Mathematics Policy Research.
- Moore, M. G., & Kearsley, G. (2005). *Distance education: A systems view* (2nd ed.). Belmont, CA: Wadsworth.
- National Assessment of Adult Literacy. (2006). *A first look at the literacy of America's adults in the 21st century* (NCES 2006-470). Retrieved from <https://nces.ed.gov/NAAL/PDF/2006470.PDF>
- National Association for Developmental Education, (2010). *2010 Fact sheet: Responses to frequently asked questions*. Goodyear, AZ: Author.
- National Center for Education Statistics. (1993). *New study to look at literacy in the United States*. Washington, DC: National Center for Education Statistics, U.S. Department of Education.
- National Center for Education Statistics (2001). *Digest of education statistics 2000*. Washington, D.C.: U.S. Government Printing Office.
- National Center for Education Statistics. (2009). Digest of educational statistics 2009.. Retrieved from https://nces.ed.gov/pubs2010/2010013_0.pdf

Organization of Economic Cooperation and Development. (2013). *OECD skills outlook 2013*.

Retrieved from <http://skills.oecd.org/skillsoutlook.html>

Pan, W., Guo, S., Alikonis, C., & Bai, H. (2008). Do intervention programs assist students to succeed in college?: A multilevel longitudinal study. *College Student Journal*, 42(1), 90–98. Retrieved from http://www.projectinnovation.biz/college_student_journal

Perin, D., & Charron, K. (2006). “Lights just click on every day:” Academic preparedness and remediation in community colleges. In T. Bailey & V. S. Morest (Eds.), *Defending the community college equity agenda* (pp. 155–194). Baltimore, MD: Johns Hopkins University Press.

Pimental, S. (2013). College and career readiness standards for adult education. Berkeley, CA: MPR Associates.

Pinkston, R. A. (1987). *University support programs, academic achievement, and retention*. (ED283441)

Razali, N. M., & Wah, Y. B. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics*, 2(1), 21–33. Retrieved from http://www.de.ufpb.br/~ulisses/disciplinas/normality_tests_comparison.pdf

The reader's companion to American history. (1991). Boston, MA: Houghton Mifflin Harcourt.

Reid, M. J., & Moore, J. L. (2008). College readiness and academic preparation for postsecondary education: Oral histories of first-generation urban college students. *Urban Education*, 43(2), 240–261. <https://doi.org/10.1177/0042085907312346>

- Rodrigo, V., Greenberg, D., & Segal, D. (2014). Changes in reading habits by low literate adults through extensive reading. *Reading in a Foreign Language*, 26(1), 73–91. Retrieved from <http://nflrc.hawaii.edu/rfl/>
- Roller, C. M.,. (2001). *Learning to teach reading: Setting the research agenda*. Newark, DE: International Reading Association.
- Ross-Gordon, J. M. (2011). Research on adult learners: Supporting the needs of a student population that is no longer nontraditional. *Peer Review*, 13(1), 26–29. Retrieved from <https://www.aacu.org/publications-research/periodicals/research-adult-learners-supporting-needs-student-population-no>
- Sabatini, J. P. (2002). Efficiency in word reading of adults: Ability group comparisons. *Scientific Studies of Reading*, 6, 267–298. https://doi.org/10.1207/S1532799XSSR0603_4
- Sabatini, J. P., Shore, J., Holtzman, S., & Scarborough, H. S. (2011). Relative effectiveness of reading intervention programs for adults with low literacy. *Journal of Research on Educational Effectiveness*, 4, 118–133. <https://doi.org/10.1080/19345747.2011.555290>
- Salvia, J., & Ysseldyke, J. E. (1998). *Assessment*. (7th ed.) Boston, MA: Houghton Mifflin.
- Scales, A. M., & Rhee, O. (2001). Adult reading habits and patterns. *Reading Psychology*, 22(3), 175–203. <https://doi.org/10.1080/027027101753170610>
- Sheehan-Holt, J. K., & Smith, M. C. (2000). Does basic skills education affect adults' literacy proficiencies and reading practices?. *Reading Research Quarterly*, 35(2), 226–243. <https://doi.org/10.1598/RRQ.35.2.2>
- Shore, J. R., Sabatini, J. P., Lentini, J., & Holtzman, S. (2013). Changes in Reading Practices and Perceptions in Low-Literacy-Level Adult Learners. *Reading Psychology*, 34(6), 550-568. doi:10.1080/02702711.2012.660371

- Smith, M. C. (1996). Differences in adults' reading practices and literacy proficiencies. *Reading Research Quarterly*, 31(2), 196-219. <https://doi.org/10.1598/RRQ.31.2.5>
- Snow, C. & Strucker, J. (2000). Lessons from preventing reading difficulties in young children for adult learning and literacy. In J. Coming, B. Garner & C. Smith (Eds.), *Review of adult learning and literacy* (Vol. 1, pp. 25–73). San Francisco, CA: Jossey-Bass.
- Stenner, A. J. (1996). *Measuring reading comprehension with the lexile framework*. Paper presented at the California Comparability Symposium, Burlington, CA. Retrieved from <https://lexile.com/research/12/>
- Stenner, A. J., Koons, H. H., & Swartz, C. W. (2009). Closing the text complexity gap: Reconceptualizing the text complexity continuum. Durham, NC: MetaMetrics.
- Stenner, A. J., Smith, D. R., Horabin, I. & Smith, M., (1987). The lexile test of reading comprehension. Durham, NC: MetaMetrics.
- Sternberg, R. J., & Caruso, D. R. (1985). Practical modes of knowing. In Eisner, E. W. (Ed.), *Learning and teaching the ways of knowing*, Chicago: IL, University of Chicago Press.
- Sticht, T. G. (2005). Medical metaphor for adult literacy education. Retrieved from <http://lists.literacytent.org/pipermail/aaace-nla/2005/002203.html>
- Street, B. V. (1984). Literacy in theory and practice. Cambridge, United Kingdom: Cambridge University Press.
- Tamassia, C., Lennon, M., Yamamoto, K., & Kirsch, I. S. (2007). *Adult literacy in America: A first look at results from the Adult Education Program and Learner Surveys*. Princeton, NJ: Education Testing Service.

Terenzini, P. T., Yeager, P., Pascarella, E., Nora, A. (1996). Work-study program influences on college students' cognitive development. Albuquerque, NM: Association for Institutional Research.

U.S. Department of Education. (2010). Fiscal year 2010 budget summary. Retrieved from <http://www2.ed.gov/about/overview/budget/budget10/summary/edlite-section3c.html>

U.S. Department of Education, National Center for Education Statistics. (1996).. Nontraditional undergraduates: Trends in enrollment from 1986 to 1992 and persistence and attainment among 1989-90 beginning post-secondary students. Washington D.C.: U. S. Government Printing Office.

U.S. Department of Education, National Center for Education Statistics (2005).. *Digest of education statistics, 2005* (NCES 2006-030). Washington, DC: U.S. Government Printing Office.

U.S. Department of Education. (2010). Fiscal year 2010 budget summary. Retrieved from <http://www2.ed.gov/about/overview/budget/budget10/summary/edlite-section3c.html>

U.S. Department of Education, National Center for Education Statistics. (2016). *Digest of education statistics, 2014* (NCES 2016-006, Chapter 3). Washington D.C.: U.S. Government Printing Office.

Venezia, A., Callan, P. M., Kirst, M. W., & Usdan, M. D. (2006, April). *The governance divide: A case study for Georgia*. Retrieved from

http://www.highereducation.org/reports/governance_divide/GA/GA_case_study.pdf

Vessey, J. A., DeMarco, R. F., & DiFazio, R. L. (2011). Bullying, harassment, and horizontal violence in the nursing workforce. In A. Debiesette, & J. Vessey *Annual review of nursing research* (Vol. 28, Chap. 7). New York, NY: Springer .

- Wadsworth, L. M., Husman, J., Duggan, M. A., & Pennington, M. N. (2007). Online mathematics achievement: Effects of learning strategies and self-efficacy. *Journal Of Developmental Education*, 30(3), 6-14. Retrieved from Retrieved from <https://ncde.appstate.edu/publications/journal-developmental-education-jde>
- White, S. (2003). The 2003 National assessment of adult literacy (NCES 2003-495r).. Washington, DC: U.S. Department of Education, National Center for Education Statistics.
- Wlodkowski, R. J. (2003). Accelerated learning in colleges and universities. *New Directions for Adults and Continuing Education*, 2003 (97), 5. <https://doi.org/10.1002/ace.84>
- Wlodkowski, R.J., Mauldin, J.E. and Gahn, S. W. (2001). Learning in the fastlane: Adult learners' persistence and success in accelerated college programs, Indianapolis, IN: Lumina Foundation for Education.
- Wlodkowski, R .J., & Westover, T. (1999). Accelerated courses as a learning format for adults. *Canadian Journal for the Study of Adult Education*. 13(1), 1–20. Retrieved from <http://cjsae.library.dal.ca/index.php/cjsae/index>
- Workforce Reinvestment Act of 1998. S. Res. 220, 105th Cong., 1220 Cong. Rec. 935 (1998) (enacted).
- Zafft, C. K. (2008). Bridging the great divide: Approaches that help adults Navigate from adult education to college. *Adult Learning*, 19(1-2), 6–11. <https://doi.org/10.1177/104515950801900102>

Appendix A

July 27, 2016

Mrs. Angela Castleman
1483 Woodside Drive
Florence, KY 41042

Dear Mrs. Castleman:

One of our fundamental goals at IWU is to help ensure that students are successful in their selected degree program by identifying critical skills that students need, and by assisting them in remediating deficits when necessary. By assessing students reading levels, we will be able to better serve them. In addition, we have collected demographic data to help as we meet the needs of all learners.

This letter provides permission to access the Lexile scores and demographic data pertaining to your research study. We expect the privacy of student personal information will be maintained during your research. If you have questions or need additional assistance, please do not hesitate to contact me.

Sincerely,

Dr. Harry Hall
Director of Academic Planning and Evaluation,
College of Adult and Professional Studies,
Indiana Wesleyan University
1900 W. 50th St, Marion IN 46953
765-517-1539

Appendix B

LIBERTY UNIVERSITY

INSTITUTIONAL REVIEW BOARD

8/17/2016

Angela Castleman

IRB Exemption 2605.081716: Investigating the Predictive Relationship between Adult Reading Ability and Age, Ethnicity, and Educational Attainment

Dear Angela Castleman,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(4), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Please note that this exemption only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP

Administrative Chair of Institutional Research
The Graduate School