

REMEDICATION AND PERFORMANCE IN STANDARDIZED TESTING: ACCUPLACER  
PREPARATION AND PLACEMENT OUTCOMES AT A LARGE COMMUNITY COLLEGE

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## **Abstract**

This dissertation examines the efficacy of a remedial education program on placement outcomes. Specifically, it asks whether exposure to a Preparing for ACCUPLACER Workshop in a large community college system impacts placement outcomes for students who have attended the workshop. While focused on a narrower pilot program, this question is answered within the broader theoretical context of the relevance of preparatory programs on performance on standardized tests, a locus that enjoys a long tradition of scholarship in education research. That is, do preparatory programs improve performance on standardized tests? Beyond this theoretical imperative, the research is also relevant to the question of educational access. Students who cannot score high enough on standardized tests but are placed in regular classes may encounter motivational problems, which may imperil perseverance and retention, and lead to school dropout. The dissertation explores the impact of test preparation by examining preparation in conjunction with other demographic and foundational factors known to impact performance, such as ethnicity, gender, grade point average (GPA), socioeconomic status (SES), age, and quality of school.

## DEDICATION

I would like to dedicate this dissertation to seven very special people in my life. Three are no longer with us, but their spirits guide me and keeps me safe.

To my mother Barbara J. McIntosh,

You gave me the foundation for success. You loved me unconditionally and supporting me even when you were on your dying bed, and for that I will forever be grateful. This one's for you mom. I love and miss you, your son

To my second mother Kola Alexander,

You never gave up on me and never allowed me to give up on myself. I remember when I was in high school and you paid for my books and supplies, just for me to return them the same day and spend the money, calling myself dropping out of school. When you found out about it, you did not scold me, all you said was "you are going to finish high school and that's it. I will take you to register tomorrow morning". Because of your love for me and your passion for education I know, I would not be where I am today if it had not been for the love, patience, and believing in me when I did not believe in myself, and for that I will always love you. Rest in peace, your son.

To my aunt Addie Colter,

Thank you for being there for me and loving and caring for me. I remember when I was a senior in high school and I told you that I did not understand how to write a paper for my class. It was love and devotion that really moved me, but what came next really blew me away. I remember you asking your next-door neighbor (Eddie) if she would help me with my homework, and she

did. I was moved at your willingness to make sure I had what I needed to complete high school. If it was not for you I am not sure I would have completed high school. I know this was special, because in all these years you never shared this story with anyone, well it's time for you to be recognized for the loving and generous person you are. Now the world will hear this story. I love you, auntie, and miss you immensely. Love your nephew

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Thank you for giving up your life to keep us all from being split up after the passing of our mother. You have never complained about the sacrifices you made in raising most of us, while raising three girls of your own. I know it had to be hard, but you found a way to do it for all of us. If it had not been for your love, and caring ways for me I would not be where I am today. I am not sure how to thank you, but let me start by saying, I love you and thank you from the bottom of my heart.

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To my sons Steve and Chase,

Thank you for your love and support

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## **CHAPTER 1: Introduction to the Study**

### **Background of the Study**

In 2014, the researcher attended Linkin Institute's Middle Management Conference for African Americans in Higher Education organized by the National Council of Black American Affairs (NCBAA), an affiliate of the American Association of Community Colleges (AAC), held in San Francisco, California. To his surprise, he learned at the conference that, of the 1,462 community colleges in the country (Digest of Education Statistics, 2001), only two community colleges—Miami County Dade and Bronx, New York—offered workshops to prepare students for the ACCUPLACER, the standardized test used to determine the appropriate levels of placement for students admitted to community colleges. This information was a matter of great interest given that he had spoken to one of his college's department chairs who complained that for three consecutive semesters, students had to be reassigned to courses whose initial test scores had incorrectly placed them in classes higher than their skills would support. Upon his return from the conference, the researcher shared information with college administrators and at least three department chairs and was informed that they were interested in a workshop to help students better prepare and understand the ACCUPLACER placement test. The researcher was asked to develop a proposal to address the problem of students' lack of preparation and understanding of the test. This proposal led to the development of a formal ACCUPLACER placement workshop, which has been in place for two years. To date several students have completed the workshop. The workshop focuses on preparation for the three tests used for placement testing. The first is the Writeplacer which is used to place students in the appropriate English class. The Reading Comprehension test is used to place students in the correct reading level course. The third test is a Math test to place students in the appropriate

math course. There are three levels to the Math test: Arithmetic, Elementary Algebra, and College Math.

This dissertation allows the researcher an opportunity to explore the success of the AACUPLACER workshop by placing it in the broader theoretical context of the impact of remediation on both success in standardized testing and academic accomplishment. Specifically, the dissertation asks the following question: What impact does participation in the Preparing for ACCUPLACER Workshop have on placement outcomes for students who have attended the workshop? Although narrower, this question locates within the broader literature exploring whether preparation affects performance on standardized testing. This question has a rich and enduring tradition within both testing performance and success circles. Practically, the question touches upon a compelling question about educational access, especially for students who are coming from disadvantaged backgrounds and may not have the wherewithal to score high enough to gain placement in college. Where college placement is based squarely on student performance on tests such as the ACCUPLACER, the type of workshop being addressed in this dissertation may well become the difference between scoring high enough to be placed at levels that encourage perseverance, retention, and completion, or frustration and desertion.

### **Statement of the Problem**

While the issues raised above about testing are important, the one that raises the most anxiety and theoretical question is this: Does participation in the Preparing for ACCUPLACER Workshop lead to high performance in placement testing? Some argue that performance is innate, linking ability to DNA and all, where one is either born “with or without it” (Sparkman, et al. 2012). This school of thought is that no amount of preparation can change this “destiny” (Weaver, 2011). The second school of thought insists that performance is like everything else in human life:

“practice makes perfect” (May 2013). That is, if one prepares oneself well, one will do well on such tests. A corollary of this preparation paradigm holds that both general standardized test preparation and, specifically, preparation for placement tests yield positive results. Naturally, this latter position has led to the growth of a “cottage industry” in test preparation workshops. One question remains, though: what difference does preparation for placement tests make? This is quite different from the perennial question of whether placement testing captures level of knowledge. This paper centers on the first question.

### **Purpose of the Study**

The purpose of this dissertation is to determine if the students who participated in the community college Preparing for ACCUPLACER Workshop perform better than those who do not on the English, Reading, and Mathematics placement tests.

### **Research Questions and Hypotheses**

The research questions and hypotheses guiding this study include:

1. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the English ACCUPLACER than those who do not?

Ho1. There is no statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not.

H1. There is a statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not.

2. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the English ACCUPLACER than those who do not by ethnicity?

- H<sub>0</sub>2. There is no statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by ethnicity.
- H<sub>2</sub>. There is a statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by ethnicity.
3. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the English ACCULACER than those who do not by gender?
- H<sub>0</sub>3. There is no statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by gender.
- H<sub>3</sub>. There is a statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by gender.
4. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the English ACCULACER than those who do not by HSGPA?
- H<sub>0</sub>4. There is no statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by HSGPA.
- H<sub>4</sub>. There is a statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by HSGPA.

5. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the English ACCULACER than those who do not by SES?

H<sub>0</sub>5. There is no statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by SES.

H<sub>1</sub>. There is a statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by SES.

6. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the English ACCULACER than those who do not by age?

H<sub>0</sub>6. There is no statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by age.

H<sub>6</sub>. There is a statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by age.

1. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Math ACCULACER than those who do not?

H<sub>0</sub>1. There is no statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not.

- H1. There is a statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not.
2. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the English ACCULACER than those who do not by ethnicity?
- H02. There is no statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by ethnicity.
- H2. There is a statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by ethnicity.
3. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Math ACCULACER than those who do not by gender?
- H03. There is no statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by gender.
- H3. There is a statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by gender.
4. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Math ACCULACER than those who do not by High School Grade Point Average (HSGPA)?

- H<sub>0</sub>4. There is no statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by HSGPA.
- H<sub>4</sub>. There is a statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by HSGPA.
5. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Math ACCULACER than those who do not by SES?
- H<sub>0</sub>5. There is no statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by SES.
- H<sub>1</sub>. There is a statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by SES.
6. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Math ACCULACER than those who do not by age?
- H<sub>0</sub>6. There is no statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by age.
- H<sub>6</sub>. There is a statistically significant difference in the Math ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by age.



1. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Reading ACCULACER than those who do not?

H<sub>0</sub>1. There is no statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not.

H<sub>1</sub>1. There is a statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not.

2. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the English ACCULACER than those who do not by ethnicity?

H<sub>0</sub>2. There is no statistically significant difference in the English ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by ethnicity.

H<sub>2</sub>2. There is a statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by ethnicity.

3. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Reading ACCULACER than those who do not by gender?

H<sub>0</sub>3. There is no statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by gender.

- H3. There is a statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by gender.
4. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Reading ACCULACER than those who do not by HSGPA?
- H<sub>0</sub>4. There is no statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by HSGPA.
- H4. There is a statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by HSGPA.
5. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Reading ACCULACER than those who do not by SES?
- H<sub>0</sub>5. There is no statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by SES.
- H1. There is a statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by SES.
6. Do students who participate in the Preparing for ACCUPLACER Workshop score better on the Reading ACCULACER than those who do not by age?

H<sub>0</sub>6. There is no statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by age.

H<sub>6</sub>. There is a statistically significant difference in the Reading ACCUPLACER scores of students who participate in the Preparing for ACCUPLACER Workshop and those who do not by age.

### **Significance of the Study**

A critical step on the higher education pathway is the placement of students as they enter community college. Placement testing could be interpreted as an issue for open-admissions community colleges because students do not understand the importance of test preparation or participating in a workshop before taking the ACCUPLACER. Thus, the significance of this research is to gather data that may lead to proof that testing preparation does make a difference, as opposed to "...no amount of preparation can change this destiny" (Weaver, 2011).

### **Delimitations**

1. Only those high school students that understand the importance of the ACCUPLACER scores and the remedial classes offered with no college credit.
2. The number of female high school students could be significantly higher than the number of male high school students who participate in the Preparing for ACCUPLACER Workshop.
3. The study included only those high schools that matched the selection criteria established for the study.

## Assumptions

1. The sample studies will be all Arizona high school students which is representative of the total population of incoming students.
2. All high school students will identify themselves as one or the other gender.
3. All high school students will identify as one race as opposed to a mix of two or more.

## Definition of Terms

**Bias methods:** describes the measurement error that is compounded by the sociability of respondents who want to provide positive answers

**Cottage industry:** any relatively small-scale business operation carried on as from the home

**Cut scores:** test scores required for placement into one course over another course

**Educational or academic achievements:** “Include grades, strength of curriculum, and admission test scores—constitute the most important factors in the admission decision” (NACAC, 2016)

**Entrance exams:** Examinations that higher educational institutions use to select students for admission. These exams may be administered prior to entering college or at the graduate or post graduate levels.

**High performance:** succeeding above and beyond standard norms over the long-term

**High stakes testing:** Although high-stakes testing had been part of the American educational system for more a century, the purpose has changed significantly in the last decade. High-stakes tests were formerly used as indicators of basic competency. Now they are benchmarks for high standards of learning

**Institutions of higher education:** Usually considered universities, academies, community colleges, seminaries, and institutes of technology. Sometimes these institutions will include college-level vocational schools, trade schools, and other career colleges that award academic degrees or professional certifications

**Mega-national exams:** Standardized tests are linked to large-scale tests administered to large populations of students

**Placement Testing:** Assessments that lead to decision-making. An example is the ACCUPLACER, which is an integrated system of computer-adaptive assessments designed to evaluate students' skills in writing, reading, and mathematics and is used by the community college in the study. It is used to assess student preparedness for introductory credit-bearing college courses

**Remedial programs:** Conceived to help struggling learners increase their basic knowledge skills to qualify to enroll in 100 level and above courses. These skills are in the areas of English, reading or math. They are also known as developmental courses and are usually found in the community colleges.

**Situational ethics:** a theory of ethics according to which moral rules are not absolutely binding but may be modified in the light of specific situations.

**Standardized tests:** a test that is developed using standard procedures and is administered and scored in a consistent manner for all test takers

**Test validity:** the validation of a test, meaning validating the use of a test in a specific context, e.g., placement into a course

**Test bias:** In the development of many tests, a minority review panel examines each item for content that may be offensive to one or more groups.

## **Acronyms Used**

DIF: Differential Item Functioning

ETA: Educational Testing Service

SES: Socioeconomic Status

## **Organization of the Study**

The remainder of the study is organized into five chapters, a bibliography, and appendixes. Chapter 2 presents a comprehensive review of the related literature dealing with standardized testing, placement testing, how community colleges can improve placement policies, and if there is a link between standardized tests and socioeconomic or ethnic characteristics. Chapter 3 discusses in detail his chosen methodology, the research design, and the possible limitations to the study. Chapter 4 delivers the results and draws conclusions from the study. Chapter 5 relates the deductions, recommendations and the next steps for the study.

## Chapter 2: Review of the Literature

### Standardized Testing and Placement Testing

Standardized tests play a crucial role in all kinds of placement activities throughout the educational process. In fact, they are the singular factor of placement outcomes in many institutions of learning at all levels. At the college level, use of these tests becomes even more potent. They are used to make admissions and placement decisions. In the past, standardized tests and preparation for these tests has been scrutinized from all angles. Some scrutiny focuses on their accuracy in assessing knowledge. Some explore their fairness vis-à-vis different populations. This literature review will discuss these issues, but the reference point for this dissertation is the use of these tests as a mechanism for determining level of academic placement.

The notion that standardized tests produce varying results for different populations is no longer disputed. What has occupied analysts for years now is how to explain that outcome. For instance, Zwick (2002) suggested that the “fairness” of the SAT is closely tied to its validity. According to Zwick, score differences researched on both sides of the bias argument can offer reliable data to support opposing positions. In an article in the *American Psychologist Journal*, Frederickson (1984) argued that the use of multiple choice tests does not measure what students should be taught, suggesting that the “real test bias” is mainly the influence of tests on teaching and learning. Frederickson concluded that an important task for educators and psychologists would be to develop instruments that better echo the sphere of educational goals and to find ways to use them in refining the educational process (Frederickson, 1984).

In their highly acclaimed and recommended book, *Methods for Identifying Biased Test Items*, Camilli & Shepard (1994), focus on how to disclose item bias detection methods, so that they can be applied to real test questions. Helping researchers to comprehend how item bias

methods work, this book provides advice and detailed information on the methods for choosing testing situations. Opening with a review of early bias methods and the fairness issues connected with the subject of test bias, the authors explained the reason of each method in terms of how differential item functioning (DIF) was defined by the method--and how well the method could be expected to work in various situations. The authors concluded with a set of principles for deciding when differential item functioning could be construed as evidence of bias (Camilli & Shepard, 1994).

Questions persist about whether standardized tests provide sufficient benefits to justify their continued use, considering their correlation with socioeconomic status (SES), race/ethnicity, and gender. However, before determining whether the existence of a link between standardized tests and socioeconomic or ethnic characteristics justifies an elimination of the current placement tests, it is important to consider other factors that may contribute to test score differences among these groups, and this is discussed in the study by Geiser. Such discrepancies, states this researcher from the Center for Studies in Higher Education at the University of California, Berkeley, may have roots in the unbalanced allocation of public education funding (Geiser, 2007).

In an article written by Sackett, Kuncel, Anreson, Cooper, and Waters (2009), they criticized that socioeconomic status (SES) has a false effect on test scores which leads to the assertion that when paired together—higher test scores and superior academic performance—have a high correlation. They investigated SES questionnaires completed by students at the time they took the SAT to discover if SES inflated the test scores of high-SES students and deflated test scores of low-SES students. The conclusion by these researchers is that the association between SAT scores and college grades is independent of a student's socioeconomic status (Sackett, et al., 2009).



In 2007, research was conducted to review gender, racial or ethnic, language, and SES performance differences on the SAT over the past two decades from 1987 to 2006 (Kobrin, Sathy, & Shaw, 2007). Theories on the existence of subgroup differences on the SAT are examined. Since significant modifications to the SAT were made in 1994 and in 2005, an assessment of these revisions was needed. The trends were compared to those documented for other standardized tests and high school grade point averages (HSGPAs). The report also identified trends in these performance differences. The writers agreed that future researchers should focus on the development and evaluation of programs or strategies designed to improve achievement outcomes for disadvantaged students. (Kobrin, et al., 2007).

To understand the differences in test scores, Garcia and Fleming addressed an issue in their study that focused on the premise that standardized tests were unfair to African American students because of the extreme disparity in predictive validity as well as problems with under prediction and over prediction. Post-secondary institutions should be aware that test score differences persist among under-served populations. Their research was set to determine whether standardized tests such as SAT are fair to African Americans and other minorities, and to consider the test bias focus and whether different items on the tests produce inconsistent results across ethnic groups. Reliable results suggested that the predictive ability of standardized tests depended on the gender and whether students are in white or black colleges (Garcia & Fleming, 1998).

Charles Murray (2012), stated that predictive validity must be compared within different groups because there could be a tendency for standardized tests to over predict not under predict the performance of some minority students (Murray, 2012, p. 69). He follows with maintaining that the purpose of the SAT is to predict college performance. If the SAT is biased against members of a group, then applicants from that group will do better than their scores predict if they

are given the opportunity to show their real ability in a college classroom. He stresses the importance for researchers to determine whether a test is biased, it must be linked to its predictive validity for different groups. While this has been done for the SAT in multiple studies; the results have shown that the SAT predicts college performance as well for poor test-takers as for rich test-takers, as well for ethnic minorities as for whites, and as well for women as for men. The standardized test tends to overpredict, not under predict the academic performance of African Americans, because it shows that they will do better than they really do (Murray, 2012).

The strong convictions expressed in the article by Chenoweth (1997) published in *Diverse Issues in Higher Education* dealt with the admissions information from data distributed by The College Board. The findings used to address issues when high school grades and HSGPAs are correlated with first-year college grades measured at a 48% success rate, when combined, the SAT and high school grades used to predict freshman year grades; the data revealed that 55% of the students were successful at their first year of college (Chenoweth, 1997). Although test scores could be misused and misunderstood, they are reliable for predicting freshman grades but only when the analysis is made within one racial group. (Chenoweth, p.1) The College Board acknowledged that test scores should not be viewed in isolation from other information about students (Chenoweth, 1997).

Aguinis, Culpepper, and Pierce (2016) introduced a concept termed differential prediction generalization within the framework of college placement testing. These researchers calculated the degree to which predicted first-year community college GPA based on HSGPA and SAT scores was dependent on a student's ethnicity and gender. They studied 257,336 females and 220,433 male students between the years 2006-2008. Overall, the sampling results showed a lack of differential prediction generalization because of the unpredictability of the variables. They

concluded that future research should be designed at recording the contextual reasons for the lack of differential prediction generalization (Aguinis, et al., 2016).

In 1970, R. L. Flaugher reviewed and discussed some controversial issues that involved the use of objective tests by institutions of higher education. He found evidence that indicated that since admission committees relied only on a test score to predict students' college performance, more supplementary research would have to be conducted to ensure that minority groups would not be discriminated against. Historically, three potential sources of bias against minorities were identified: irrelevant test content, insufficient testing preparation programs, and the overall use of the test results (Flaugher, 1970).

The Educational Testing Service has since conducted numerous studies to rectify these issues. Linn and Werts (1971) discussed two issues in their study of test bias. The first addressed the effect of unreliability of the predictors and the second investigated the effect of excluding a predictor in which there were preexisting group differences. Linn was the Director of the Developmental Research Division for the Educational Testing Service (ETS), and Werts was a research psychologist working for ETS, at the same decade in history, so this may explain why they shared the same point of view (Linn & Werts, 1971).

In *Rethinking the SAT: The Future of Standardized Testing in University Admission* (2004) edited by Rebecca Zwick, it is confirmed that the controversy surrounding the implications of standardized tests for college admissions is widespread. As a former University of California president, Richard Atkinson stated that curriculum standards should be well-defined, because students are held to those standards, and then standardized tests should be used to assess whether the standards have been met. The standards, according to Atkinson, "should help admissions officers evaluate the applicant's readiness for college-level work." (Atkinson in Zwick, 2004). The

book mostly focuses on the controversy regarding the SAT and compiles the thoughts of individuals from testing authorities and higher education institution administrators. The contributors in the book discuss very important topics like race, gender, and class issues that are linked to standardized testing (Zwick, 2004).

Rebecca Zwick's attempt to answer tough questions surrounding the use of standardized admissions tests in higher education in her book, *Fair Game*, revealed a view of the politics of education by convincingly arguing the questions of college assessment with the issues of race- and gender-based test discrimination. In her second chapter, Zwick discussed a major point that academic performance should not count for everything, but the controversy remained about what other factors should be considered. It was noted that this book is an essential read for educators seeking a workable understanding of the past and future of admissions testing. The long-standing debate: the standardized testing argument about the unpredictability among high schools in both grading standards and academic diligence lessens the value of high school transcripts in calculating college preparedness; and, opponents of standardized tests contend that these tests are biased regarding race, gender, and socioeconomic status (Zwick, 2002). Although the testing industry made conscientious efforts to ensure that these tests are not biased, many in the academic circles still concluded that students of color who, for example, may possibly be the first in their family to attend college, remained at a disadvantage (Zwick, 2002).

“The validity of test scores relies on all available evidence relevant to the technical quality of a testing system” (Shaw, 2015, p. 17). This primer prepared by E. J. Shaw describes a valuation of the technical qualities of standardized testing. This researcher focused on the fairness quality for all test takers. The document represents a summary of much of the recent validity research on the SAT. The association between SAT scores and college grades, retention, and graduation are

emphasized and defined. Information regarding the content on the SAT and a focus on the test's fairness are explained. This research paper may help provide the community with a better understanding of the SAT and its strengths as an educational tool (College Board, 2015).

Dorner and Hutton (2002) remarked that numerous studies found that the Scholastic Assessment Test in Mathematics (SAT-M) combined with evidence from high school records are a better predictor of success in college level mathematics courses than the SAT-M alone. They concluded that the purpose of the SAT-M placement tests should be used to determine the freshman level math course because it is very likely that students will be successful with a suitable amount of hard work (Dorner & Hutton, 2002).

In a literature review of college community students, the reviewer discusses student assessment and placement, student success, and retention (Bryant, 2001). Further discussions about how to serve the diverse community college student population, concluded that institutions must be cognizant of student needs when developing policies. Women, minorities, nontraditional age, and part-time students have increased enrollments on community college campuses in the past decades. In this review, a discussion of the impact of recent trends on admissions standards was examined. It also analyzed certain community college policies such as assessment, tracking, and retention efforts (Bryant, 2001).

The high-school grade point average (HSGPA) is viewed as an unreliable measure for college admissions because of the differences in grading standards across high schools. Although at the same time, standardized tests are providing a more uniform assessment for student ability and achievement. This study conducted by Saul Geiser and Maria Veronica Santelices, (2007) challenged that conventional view. The researchers found that HSGPA was consistently the best predictor not only of freshman grades in college, but of four-year college success. Because

freshman grades provided only a short-term measure of college performance, the study tracked four-year college outcomes, including cumulative college grades and graduation. Significant findings were that the HSGPA was consistently the strongest predictor of four-year college outcomes, the predictive weight associated with HSGPA increased after the freshman year, and as an admissions measure, HSGPA had less adverse impact than standardized tests on disadvantaged and underrepresented minority students (Geiser & Santelices, 2007).

In their article, “Measuring Academic Readiness for College”, two researchers, Porter and Polikoff discuss amplified attention given to the high school–college transition. These researchers state it is because students are enrolling into college in record numbers but are also being required to take increasing number of remedial courses during their first year. Questions addressed in this article include, how do colleges create a measure of academic readiness? Do they focus on either building and validating a new assessment or should the attention be focused on validating and repurposing an existing assessment? (2012). The authors identify four strategies that might be used to create a readiness assessment (Porter & Polikoff, 2012).

David T. Conley (2007) suggests that college readiness could be defined as the level of preparation needed to enroll and succeed— without remediation—in a credit-bearing general education course at a postsecondary institution (Conley, 2007, p.5). Most researchers agree that incoming students need to understand what it means to be college-ready. Conley emphasizes in his article that they need to recognize what they must do as well as what the college level educational system expects of them. Incoming students need to take responsibility and utilize the information accessible to them on community college academic and financial requirements. Since not all students have support from family members; they should be encouraged to interact with community college leaders who can guide them. Conley states, “Given the knowledge-intensive

system of college readiness, admission, and financial aid that the US has developed, this component of personal support and student initiative cannot be overlooked in the college readiness equation.” (Conley, 2007, p. 28). If the college-ready student can understand what is expected in a college course; they are more likely to succeed. In addition, the student is prepared to get the most out of the college experience by understanding the culture of postsecondary education (Conley, 2007).

According to David T. Conley of the University of Oregon’s Center for Educational Policy Research, placement tests include only a small amount of diagnostic information about the specific academic deficiencies that students may have. “In other words, while a test may identify deficiencies, Conley says, it is not particularly useful in helping to fix them.” (Conley, 2014, p.36). He also wrote that the crucial reason that changes to admission methods are necessary is that students do not need to be merely admitted to college; they need to be ready to succeed. He recommended that college admissions collect more information directly related to “college success” in entry-level college courses. But what, constitutes “more information” for students and admission officers to accurately assess how to prepare students to succeed in postsecondary education? Why do we need new measures of college and career readiness? Doesn’t the current system work? Isn’t it sufficient to know which courses students took, the grades they received, their standing relative to others in their class, and maybe a score on an admission test? What’s changing that requires more information about students? Some of these questions were answered in his research article. He stated that the only way the admission process could help students be ready to succeed, and not just qualified to attend, was by collecting more information directly related to succeeding in entry-level college courses. This information would allow admission offices to make better decisions about student readiness, but it would also indicate to students, in

more detail, what they need to do to prepare for the challenges that they will encounter in higher education. Admission officers at institutions should have a clear understanding of the significance of predictive value of HSGPA to ensure they are used appropriately in the admission process. The increasing cost of college tuition raised the stakes for students to succeed. This factor and others demand that higher education institutions collaborate on the development of new methods to utilize a broader selection of information to inform key decision-makers and thus maximize student success (Conley, 2014).

Complete College America is a national nonprofit with one main goal. The staff and partners work together with most U. S. states to help colleges record an increase in the number of American students who will complete career certificates or college degrees. They also work closely with the traditionally underrepresented populations to reach the same goal. The focus of this paper compiled in 2012 is to inform the states about the what steps are next to achieve the goal. The staff at Complete College America remarked that colleges have a responsibility to fix the disjointed remedial system that hinders so many incoming students from completing career certificates or college degrees. Recommendations are for community colleges to align high school curriculum to first-year college courses, and form support programs to help students make a smooth transition to college. The staff researched the need to reduce college remediation altogether, by requiring community colleges to better align entry-level college courses with requirements for high school graduation, then high school graduates could be better prepared for credit-bearing college courses. To succeed in a college course, new students should have tutoring and additional instruction time set up in advance. Community college leaders should encourage students to enter tutoring programs when they first enroll. These researchers concluded from their study, “Remediation: Higher Education’s Bridge to Nowhere”, that students are twice as likely to graduate if they complete at least three credit-bearing



courses in their selected programs in their first year. “Unprepared students can achieve this significant milestone for success if the early college-level courses required in their programs of study have embedded help.” (Complete College America, 2012, p. 12). Community colleges can develop programs that guarantee that students are college ready and prepared for their placement tests. The staff documented that current college placement assessments are not predictive so possibly should not be used for recommendations for first year courses. Complete College America comments that all students that take placement exams should first receive a testing guide and practice test. In other words, students should take time to review and prepare before testing (Complete College America, 2012).

Susan Headden, a senior writer and editor at Education Sector, wrote an article for the Washington Monthly about placement tests at community colleges, and the consequences it has on prospective students’ lives (Headden, 2011). In her article, she recommends that many community colleges place students into the remedial courses using only the results of a multiple-choice test, and that this process may be questionable to say the least. Most Americans think of the SAT as the ultimate high-stakes college admissions test, but the Accuplacer has taken the place of high-stakes tests given to incoming college students. The remedial placement process could be the root cause of rising non-completion rates at community colleges. Headden also states, “If the nation is going to make any headway in helping more students graduate from college, it will have to completely repair the way students enrolling in open-access colleges are tested for college readiness...” (Headden, 2011, p.33). She based this view on the research that states that the majority of test takers were unaware that their performance on the Accuplacer would determine what classes they would be able to take and that they would not receive credit for those remedial classes when enrolled. She wrote that possibly since students don’t understand the importance of the placement

tests, most students don't prepare for the tests, even though studies have shown that a preparation class can raise scores enough to place students at a higher level or keep them out of remedial courses altogether. She commented that in recent research commissioned by The College Board, there is a moderate to strong correlation between Accuplacer test scores and subsequent course performance (Headden, 2011).

When Bailey and his colleagues, Dong Wook Jeong and Sung-Woo Cho ran a study (Bailey, Jeong, & Cho, 2010) that looked at thousands of community college students who scored low on placement tests, and then ignored the advice or instruction from academic counselors to take remedial classes. The students enrolled in for-credit coursework and were successful. A full 71 percent passed the for-credit course. This is a bit surprising according to other research in this review (Bailey, et al., 2010).

Students entering college do not understand how their performance on a placement test could influence their first year of coursework. This could lead them to prepare less or not at all for the test (Venezia, Bracco, & Nodine, 2010). The research conducted in California to examine college readiness standards; increase enrollment programs; and implement other approaches to improve students' readiness and success was completed and recorded. This report focuses on assessment, placement processes and strategies to decide which level of coursework students will be placed when they begin community college. The rate of under-placement from results of the placement tests suggested the possibility that some students could score better if they had a chance to prepare or attend a preparation workshop. One strategy is to help students prepare in advance of taking the assessment. Another approach is to offer refresher courses for students who took the placement test and scored below college level on the first attempt. According to many staff and

faculty members at the colleges, students do not usually take the test seriously, and student test scores are often affected by test anxiety, lack of sleep, test fatigue, and lack of preparation. Because many students are surprised by their lower-than-expected placement results, test preparation and retesting policies are a critical component of the assessment process (Venezia, et al.,2010).

This report focuses on assessment and placement policies and practices in California community college students and discussions among policy makers. The researchers made recommendations for improving access to and success in higher education. The hope to ‘map the terrain’ and initiate and facilitate conversations among college personnel interested in taking action for change. College personnel expressed different viewpoints on the question of whether students should be encouraged or even allowed to prepare for placement tests. One community college counselor spoke about the high-stakes nature of assessment and the lack of student knowledge concerning placement tests. Although some community colleges discourage retesting, at one college retesting was found to be beneficial to student success. The testing administrator at this college cited data showing that 80% of students who retested were placed into a higher level the second time they took the test. These students had higher success and persistence rates than students who took the placement test only once, leading the college to provide more opportunities for students to retest. Also, the researchers stated that since the college was cognizant of the costs associated with retesting, so they strongly encouraged students to prepare for taking the tests the first time.

“The testing and placement process in community colleges represents high stakes, especially for first-generation college students, linguistic and cultural minorities, and academically underprepared students.” (p. viii)

Bunch and team commented that placement tests are not designed to be high-stakes, and thus test preparation and retesting are not crucial (Bunch, et al. 2011).

In 2008, The National Association for College Admission Counseling Testing Commission Report (NACAC), reported that a future direction for college admission tests is adoption of tests that reflect subject matter from high school courses. These placement tests could, the report concluded, provide valuable information for admission purposes; however, such tests must be designed to measure a proficiency level that is more aligned with college success measures than minimum aptitude. (NACAC, 2008) Studies that examined the validity of placement tests for first year college coursework, identified the percentage of students who were correctly placed. This ‘placement’ allowed the college to recognize the student’s readiness for college-level academics and to guide the student towards the courses that are appropriate for their current knowledge level (NACAC, 2008).

The factors that admission officers use to evaluate incoming students has remained mostly the same for the past 20 years. Students’ academic achievements—which include grades (HSGPA) and admission test scores—establish the most important factors in the admission decision according to the NACAC (National Association for College Admission Counseling) (2016). Changing admissions standards effects first-year college students of varying ages, gender composition, and racial and ethnic identities. The use of multiple admissions criteria is often confusing for these incoming students. Because of several admission options utilized by colleges

in the United States, incoming students and parents must consult college admission counseling professionals to be advised of the requirements necessary for admission at that particular college. NACAC believes institutions must clearly state policies, and counselors are advised to assist students to eliminate as much confusion as possible (NACAC, 2016).

Community colleges should regularly be assessing the use of standardized test scores or placement test scores relative to the goals of higher education. Pronounced concerns about accurate placement have recently led community colleges across the country to consider using other measures to understand placement decisions. The findings proposed by the current literature demonstrated that community colleges should improve placement accuracy and increase access to higher-level courses by considering multiple measures of student preparedness in their placement policies. Valid research endorses that high school grades are better indicators of grades beyond the freshman year in college than test scores (Sparkman, et al., 2012).

The debate on the validity of placement tests and how they are utilized by the colleges was the focus of this working research paper (Belfield & Crosta, 2012). The findings proposed that placement test scores are not particularly good predictors of course grades in developmental education classes. These findings are not restricted to one specific test or one subject but pertain to all placement tests. Placement tests are associated with high error rates; three out of every ten test takers are either assigned to developmental education, despite being predicted to get at least a B in college-level English, or assigned to college-level English, despite being predicted to fail the course (Belfield & Crosta, 2012). The relationship between HSGPA and college GPA is so predominant that it would seem important for colleges to consider this measure in deciding on placement. However, there are limitations to the study. Highlighted in their conclusion, the validity of the placement tests depended on how they are utilized by the colleges. It was found that

this usage may not be consistent across test takers or tests, and this inconsistency undermined the research and prevented identification of clear patterns. Many students took developmental courses for non-credit in at least one subject, even though they had high HSGPAs. These students may have succeeded with fewer developmental courses, but they had not established which developmental courses should be waived (Belfield & Crosta, 2012).

Per Karp and Bork (2012), low college success rates are usually linked to students' lack of academic preparation for college and their need for developmental instruction. Their research suggests that even many students who are considered "college-ready" per their placement test scores or completion of developmental coursework still do not earn a degree. Their findings indicated that by introducing success strategies, such as 'the flexibility of the role' can be beneficial. But without guidance to show them, young college students are likely to find it challenging to know how to succeed at the college level. They may also have a difficult time recognizing whether they are meeting the demands of an incoming college student. Finally, because the college student's role is considerably different from the other roles in their lives, they have fewer knowledgeable resources to rely on as they develop their own explanations of a successful role of a college student. (Karp & Bork, 2012) What is essential according to Karp and Bork is setting up a network so for community college students to acknowledge the expectations of community college life.

"Even though, these expectations are understood by some college instructors, they are not clearly expressed to new community college students. If they are communicated at all, they are generally referred to in vague and incomplete language—leaving students with little real guidance about the expectations to which they are held." (Karp, 2012, p.38)

So, if these expectations were provided, these researchers claim it would go a long way in improving student readiness for incoming community college students. They agree that the next step is finding ways to communicate these expectations to students at the beginning of their community college life. Although, Karp and Bork explain in their article that it will not be easy for several reasons, namely; the simple fact that many students who are entering community college are coming from outside of the education system. No matter the obstacles, they conclude that community college leaders should deliberate on finding ways to open the lines of communication so that incoming students can exhibit more success (Karp & Bork, 2012).

Community colleges are supposed to be open-access institutions, but so far access to college-level courses at such institutions is not certain (Scott-Clayton, 2012). Scott-Clayton states in the introduction of the CCRC Working Paper No. 41 that many two-year colleges administered exams to entering students that determine their placement into either college-level or remedial education. Per Judith Scott-Clayton (2012), not enough research investigating whether such exams are valid for their intended purpose, or whether other measures of readiness would be more effective. This researcher contributed to the literature by analyzing the predictive validity of one of the most frequently used assessments, ACCUPLACER. Using measures of placement accuracy and error rates, she determined that placement exams can predict improved achievement in Math courses more often than in English. This researcher states that there is reasonable amount of agreement regarding the role of assessment in community colleges in terms of continuing open access to the institution while ensuring that students meet minimum standards before continuing forward to college-level courses. For most students at community colleges, the implication of assessment testing is placement into remediation in at least one subject. A recent study of over 250,000 students at 57 community colleges found that 59 percent were referred to remedial math

and 33 percent were referred to remedial English (Bailey, Jeong, & Cho, 2010). In most community colleges, incoming students are assigned to different levels of remedial education based on their performance on placement tests. The remedial education process is confusing and from an incoming community college student's perspective especially. If a student has low academic skills and no real prior success in school, it may seem to be a requirement of unanticipated obstacles involving several assessments, classes in more than one subject area, and groups of remedial courses before the student is considered prepared for college-level work (Bailey, Jeong, & Cho, 2010). Fifty percent of incoming students at community colleges are placed into remedial courses in at least one subject, determined by scores from these assessments, yet recent research fails to find evidence that placement into remediation improves student outcomes (Scott-Clayton, 2012). Since students pay tuition for remedial courses, but the credits they earn do not count toward graduation requirements, the financial impact could be significant. Some students who are assigned courses based on these assessments decide that the costs of remediation outweigh the desire to continue. If student readiness is too low for college-level success, students cannot be expected to succeed, with or without remediation (Scott-Clayton, 2012).

As this researcher has determined from the study, placement exams are high-stakes assessments that limit many students from continuing to follow their college paths. This has incited debate about the value of remedial coursework, although researchers have concluded another possibility; the assessment process itself may need to be evaluated along with the remedial courses. Scott-Clayton remarked that there is a history of research into the predictive validity of college entrance exams; however, only a handful of studies have examined high-stakes college placement exams. Decisions about community college assessment policy and remediation policy is



insufficient without a fuller understanding of the role of assessment scored by the high-stakes college placement exams. There is a high degree of variation in the tests that are used, how tests are administered, whether placement recommendations are voluntary or mandatory, and when remediation must be completed (Scott-Clayton, 2012).

In the *College Board Research Report No. 2009-2*, Mattern and Packman (2009) maintained that the goal of placement testing is to enroll students in courses that are challenging to their current knowledge level so as not to bore the incoming student, which can lower the desire to succeed. In addition, this report emphasized that placement testing policies needed to be continuously reviewed and evaluated to ensure that students are being placed into courses that will maximize the likelihood of their success. In 2008, around 1,300 institutions used *ACCUPLACER* tests and nearly seven million exams were administered per statistics in the College Board Research Report No. 2009-2. Outcomes showed a satisfactory relationship between *ACCUPLACER* scores and course success, demonstrating that *ACCUPLACER* test scores was reliable in terms of placing students into courses in which they are likely to succeed. The study provided an insignificant amount of evidence about the placement validity of *ACCUPLACER* tests. Unlike the SAT, which has thousands of articles dedicated to scrutinizing its validity; not much was known about placement tests, specifically *ACCUPLACER* tests in 2008. It is essential for researchers to examine the validity of placement scores in predicting college success, as well as retention and graduation rates to determine whether colleges that use placement testing have higher graduation rates than institutions that do not use placement testing (Mattern & Packman, 2009).

The *ACCUPLACER* diagnostic test for Elementary Algebra (EA) skills produced a reasonable prediction of future success in college-level math courses. It was noted in this journal

article that when incoming students are required to take one or more developmental non-credit courses it could quickly put them behind schedule for graduation and would increase the costs of their college education. Additionally, further research showed that retention and graduation rates decreased as the number of developmental courses that students took increased (Complete College America, 2012). The purpose of their study was to examine the relationship of *ACCUPLACER*-Elementary Algebra (EA) test scores with grades in college-level courses and to compare the predictive ability of the *ACCUPLACER* test scores to other measures such as students' HSGPAs and SAT scores. Research written on the use of the tests for *ACCUPLACER* diagnostic purposes is limited. Although, the study by Mattern and Packman (2009) which is available from the College Board indicated that the *ACCUPLACER* Elementary Algebra (EA) assessment correctly placed students in courses in which they earned at least a C average. This raised the question of whether math placement decisions could be better made using information from a student's college application. An additional question which needed to be addressed, is whether any combination of information could be used to identify those students who without some math instruction or workshop would most likely fail at college-level math. It is also suggested that a different math skills diagnostic test might prove to be more effective in placing freshmen into appropriate math courses. It was discussed that students who scored low and progressed through the developmental sequence could improve their skills to such a degree that the *ACCUPLACER* scores are no longer predictive of their performance in college-level math courses. Finally, researchers, Mattern and Packman (2009) concluded that these results do not overturn the use of the *ACCUPLACER*-Elementary Algebra (AE) diagnostic test for placement decisions. Still, for incoming college students, the current use of the test may not be any more useful than an analysis of students' high school transcripts and SAT scores. They also recommended a follow-up this study with an

examination of high school math performance to see if the use of actual math grades from the high school transcript rather than HSGPA provided a better predictive outcome (Mattern & Packman, 2009).

Institutions that use *ACCUPLACER* scores for course placement are encouraged to conduct placement validity studies to determine whether their placement policies are appropriate for the students at their institutions. Specifically, the validity of cut scores, which are the test scores required for placement into one course over another course. When decided, those cut scores are used to place students. So, based on *ACCUPLACER* scores, some students can enroll in a college level class and others would need to take remedial courses. The College Board argues that steps are taken to guarantee fairness of *ACCUPLACER* tests to assess information about levels of achievement, and that the test scores appropriately reflect the knowledge and skills of students. Since it has been determined that test bias occurs when test questions contain “construct-irrelevant” material that prevent identifiable groups of students from demonstrating relevant knowledge and skills, the College Board is committed to ensuring that *ACCUPLACER* test questions are subjected to internal and external fairness reviews and statistical analyses to ensure that they are as fair as possible to all populations of students (Mattern & Packman, 2009).

Past research examined the validity of several methods designed for predicting community college student’s success. High school record, standardized test scores, HSGPAs and combinations of all three have historically been successful predictors. However, standardized test scores are less effective for placing students in lower level mathematics courses; placement exams such as *ACCUPLACER* have taken their place, especially in community colleges where no standardized test scores are necessary for admissions. This researcher focused on predicting community college student success as well as the issues surrounding their high school mathematics proficiency. The

researcher found a lack of connection to college readiness. High school transcripts were analyzed to determine their influence on the need for remedial mathematics as determined by the mathematics portion of the *ACCUPLACER* placement exam (Kowski, 2013).

The first college mathematics course that a community college student takes is determined by a placement test in most community college settings. Yet validity evidence of mathematics placement tests remained limited, so this study expanded on the research by considering whether a nationally standardized college mathematics placement (*ACCUPLACER*) test contributes to the prediction of enrollment and success in remedial mathematics courses. Results from a sample of more than 1,300 students from 20 postsecondary institutions suggested that *ACCUPLACER* does not contribute to either the prediction of enrollment or success in mathematics courses. (Medhanie, Dupuis, LeBeau, Harwell, & Post, 2012) Examining a student's prior skills in mathematics in addition to the mathematics placement tests score may specify a better calculation of student success. (Medhanie, et al., 2012)

There is a concern about how to increase college completion rates. This researcher commented that colleges are investigating ways of accelerating students' progress by shortening their time in developmental courses. Consequently, her results indicated an outlook for a fast-tracked system that would have fewer exit points and, therefore, less of a chance for student disengagement. The results from Burdman's study summarized that exposure to more demanding coursework early on may help motivate students to finish college. Additional concerns were discussed about findings that many students are under-placed. The findings applied to both math and English placement assessments. Besides the limitations of tests for measuring students' competency in math and English, much of the evidence suggested that the structure of placing students had turned away from its proposed goals. The tests should align with both the higher

education curriculum as well as the state's high school curriculum. Placement exams are weak predictors and with the evidence collected, there was already significant questioning about common practices for remedial placement. Also, studies have found that community colleges major criticism about assessments is that they provide no diagnostic information to assist instructors understand students' strengths and weaknesses. According to Burdman (2012), this leads to two important questions for future researchers: Is the placement test (ACCUPLACER) more predictive of student performance than the standardized tests of the past? Do efforts to better prepare students and increase awareness of the high-stakes nature of placement tests lead to higher scores and better predictive validity? (Burdman, 2012).

How could colleges improve developmental education assessment and placement when most colleges adhere to a traditional procedure for assessment and placement? This question was addressed by Michelle Hodara, Shanna Smith Jaggars, and Melinda Mechur Karp (2012). A possible "overhaul" of developmental course structures and curriculum could be the answer suggested this team of researchers. A wide-ranging transformation to assessment and placement that addresses multiple limitations of the traditional process. During thorough examination of the developmental placement policy at a community college system, they identified three areas of contention: efficient versus effective assessment, system-wide consistency versus institutional autonomy, and supporting student progression versus maintaining academic standards (Hodara, et al., 2012) Evidence based on their study samples as well as innovative ideas for experimenting with new approaches to assessment and placement, they proposed three recommendations for improving course placement accuracy and for generating dependable standards of college readiness. In addition, a final recommendation for implementing comprehensive change to assessment and placement was offered to improve the academic success of students. Answers to

questions such as, how should colleges implement an effective developmental curriculum and before they do that, how should they accurately evaluate whether the current placement exam is appropriately referring students to the right developmental courses included suggestions about how to encourage students to enter programs of study for which they may not yet qualify; and then conceivably, colleges could devise clear pathways for each program of study while assuring students that they have the flexibility to change paths if they later change their mind regarding their program of study. They recommended an approach to support student advancement without threatening academic quality with the use of an acceleration model. They proposed that variations to the developmental curriculum should be accompanied by a thorough examination of assessment. And overall student success could be strengthened by reforms to developmental education that both improve course placement accuracy and create more consistent standards of college readiness. They stated that the assessment process is an important interaction with students, that provides an opportunity to identify crucial areas of academic and non-academic strengths and weaknesses to which appropriate interventions and coursework could be offered. Through more precise assessment and appropriate follow-up, colleges could help students be successful in their initial courses. Providing students with the preparation needed to succeed, would empower them to maintain standards of academic quality and diligence in completing their upper-level courses (Hodara, et al., 2012).

Why should community college students be placed in remedial math courses based on the results of a single placement test? This is the question that Ngo and Kwon (2014) attempted to answer. Their study, examining accurate placement, asked colleges across the country to consider using other measures to explain placement decisions. These two researchers questioned whether using multiple measures or a single placement test should determine placement decisions. Using

the compiled data, they found that students who were placed into higher-level math due to these multiple measures performed no differently from those that scored higher on the placement tests. Their findings also indicated that these two measures can be methodically used to improve course placement decisions. Using them in conjunction with test scores can increase placement accuracy. The conclusions suggest that community colleges can improve placement accuracy in remedial math courses and increase access to higher-level courses by considering multiple measures of student preparedness in their placement policies (Ngo, F., & Kwon, W. 2014).

Altering placement policy may help to improve remedial education and student outcomes in community colleges, but there is little research that has been completed on the changes. These researchers decided to compare the effects of math remediation under different policy frameworks. Some colleges that participated in the study, either switched from using math diagnostics to using computer-adaptive tests or raised placement cutoffs. The findings concluded that switching to a computer-adaptive test worsened the problem of remediation for borderline students and resulted in more placement errors. In addition, raising placement cutoffs had no substantial effect on improving student outcomes (Ngo, F., & Melguizo, T. 2016).

Katherine L. Hughes and Judith Scott-Clayton (2011) wrote a review of the literature on community college assessment policy. They argued that the debate about remediation policy is incomplete without a better understanding of the role of assessment. They examined the extent of agreement concerning the role of developmental assessment and the validity of the most common assessments currently in use. They also reviewed the latest developments in assessment policy and practices. They deduced that many students are placed into developmental education because of their scores on reading, writing, and mathematics assessments, even though there is evidence in studies that this placement does not improve these students' capacity to be successful in college.

Although the findings indicated that the placement assessments currently administered have some usefulness, they are inadequate in terms of providing sufficient information to determine the appropriate course of action that will lead to academic progress and success for the vast range of underprepared students. Hughes and Scott-Clayton (2011) proposed that this may be because students enter colleges underprepared in numerous ways, but not necessarily just academically. Tests such as the *ACCUPLACER* cannot help community colleges assess whether students might be disadvantaged from the lack of ‘college readiness’ potential. The review of the literature does not agree what additional measures might lead to better placement and student progress, or the expectations for incoming students to succeed when colleges rely on single test scores for placement in English, reading, and math may be too high. (Hughes & Scott-Clayton, 2011) In the review of the literature, evidence confirmed that using multiple measures for student assessment and placement could result in course placement that would match students’ individual needs. Basically, Hughes and Scott-Clayton (2011) maintained from the review of the literature that there is a need for a change to placement policies to improve college graduation success rates. Their remarks after reviewing the literature also included placement recommendations that result from the use of assessment scores but that do not improve student outcomes. Mostly, the assessment (*ACCUPLACER*) which is currently in use at community colleges is reasonably good at predicting which students are likely to obtain passing grades in a college-level course. One conclusion from the review-if assessments could identify precisely what students need to be successful in addition to identifying the level of skills and knowledge that they have at the time of the assessment, it would be a more effective tool. One recommendation is to experiment with different measures such as accelerated remediation. Hughes and Scott-Clayton commented that the *ACCUPLACER* seems to be a reasonably valid predictor of students’ grades in “college level”



coursework, although the placement recommendations that result from the use of these assessment scores is not consistent. In addition, there are questions in published research about how consistently the tests are administered. This suggests a misalliance between the remediation and the assessment. Diagnostic exams that offer more detailed information about which skills students are lacking could possibly identify students who may be struggling. Another possible concern, however, is that the typical community college may not have the resources to use this additional information effectively. From the review of the literature uncovered evidence supporting the necessity for improvement and questions about what modification would work best. Hughes and Scott-Clayton commented that they perceive a consensus around the need for a change to improve graduation rates as well as improving assessments and remedial coursework. “Since students’ first experiences with community colleges are with the assessment and placement process, this is where change should begin.” (Hughes, 2011, p. 28). In their conclusions, these researchers determined that the paths for implementing assessment and placement policy needed further study (Hughes & Scott-Clayton, 2011).

One of the multiple uses of *ACCUPLACER* tests are to assist with determining if students are prepared for a college-level course or if they would benefit from a developmental course (*ACCUPLACER* Program Manual, 2016). This statement summarized from the manual is a partial explanation of the *ACCUPLACER* System. Although it may have been originally designed to assist colleges to make placement decisions, the College Board states that the *ACCUPLACER* tests could also be used to evaluate the college readiness of students in high school. They claim that the most effective college-readiness programs are those in which the local colleges partner with local high schools. So, to enhance the college readiness programs, administering the *ACCUPLACER* enables high school students to compare their *ACCUPLACER* scores with those required by the

college to evaluate their readiness in basic skills areas of writing, reading and mathematics.

Ideally, these assessment scores give the high school student the chance to enroll in additional high school college-preparatory courses (The College Board, 2016).

In 2003, the *Harvard Educational Review* published a controversial article written by Roy Freedle that documented cultural bias against African American students taking the SAT. Freedle's work motivated media attention and encountered an attack of criticism from experts at the Educational Testing Service (ETS), the agency responsible for the development of the SAT. Santelices and Wilson (2010) took the debate one step further with research that explored differential item functioning (DIF) in the SAT. By addressing some of the technical criticisms from the ETS, Santelices and Wilson (2010) confirmed that SAT items do look differently for the minorities. The crack between blacks' and whites' performance on the SAT is clear (Freedle, 2003). The existence of racial patterns on SAT scores is hardly original states Freedle, as reconfirmed by Santelices and Wilson (2010). The significance of their findings that supported the 2003 study claimed that the SAT treated African American minorities unfairly and showed that the SAT, a high-stakes test with substantial value for the educational opportunities, favored one ethnic group over another. (Santelices & Wilson, 2010) Testing agencies defend the fact that scores are reliable predictors of college performance but only when students are compared to others within the same racial group. Should the fault be placed on the differences in family income and culture or on the standardized test or lack of test preparation or preparation workshops? (Santelices & Wilson, 2010).

Joseph Soares (2012a), editor of *SAT Wars: The Case for Test-Optional Admissions*, wrote in an article adopted from this book, that in the past 20 years, one third of the four-year colleges have adopted the test-optional version in their policies for admissions. He remarked that in the past

there has been a “false sense of scientific precision” submitted by the test industry, and that this resulted in an injustice to college-bound students. Quoted from a discussion on the future of college admissions, “The more one relies on standardized tests, the more social disparities unfavorable to racial minorities, women, and low socioeconomic status (SES) students are passed along.” (Soares, p. 66) He concluded that the latest claim of the College Board is that the SAT only predicts first year grades, and although he commented that this is true, he stated it is not a reliable predictor and should be discontinued for considerations by admission administrators (Soares, 2012b).

In *Completing College: Rethinking Institutional Action*, Vincent Tinto wrote that colleges must be more diligent to ensure that a greater number of students succeed, which he defines as ‘college completion’. He emphasizes throughout the book that it must be about improving college institutions’ policies, not fixing students. In Chapters 2-5, he discusses four conditions for student success (college completion): expectations, support, assessment and feedback, and support. To expand on these conditions: (1) student expectations of themselves; (2) support of several types- academic, social and financial; (3) assessment and feedback that allows students and staff to change their behaviors to better promote student success; and (4) involvement, or engagement, both academically and socially, with staff and peers. The author describes each of these conditions in detail then identifies policy that is essential to support these conditions (Tinto, 2012).

“Even as the number of students attending college has more than doubled in the past forty years, it is still the case that nearly half of all college students in the United States will not complete their degree within six years.” (Tinto, 2012, p.4)

Tinto offers college administrators a clear outline with which to develop and implement programs to encourage college completion. A strategic framework for action is proposed. Completing

College examines the latest research and converts it into concrete steps that college administrators can use to improve student success (Tinto, 2012).

## Chapter 3: Research Methodology

### Introduction

Because of its designation as the “great equalizer” in our social system (equalizing meaning both offering people the opportunity to uplift themselves out of poverty and into the middle class and closing the gap between the rich and poor), education remains the subject of considerable social and policy debate across communities (Bloome, 2015). In short, education is recognized as the most potent ingredient of social mobility (Bloome, 2015). In recent times, the benefits of education have extended to citizenship. The literature suggests that educated persons make better citizens: they earn more and pay more in taxes (Berliner, 2013); they are less likely to engage in anti-social behavior or commit crime (Berliner, 2013); they more readily accept government and obey laws, reducing the cost of government (Berliner, 2013); they are less likely to depend on public assistance (Allen, 1998); and above all, they are more likely to participate in government and community governance through voting and sundry civic activities (Allen, 1998). Education is considered so important that Arizona’s state Constitution mandates “Equal Educational Opportunity” for all residents. Moreover, education is one of the major items on the state’s annual budget.

With education designated as this important, it is no surprise that practically all segments of a multiethnic and racial community are paying attention to it (Arboleda, 2015). In Arizona, for instance, one basic political issue is the use of property taxes to fund K-12 education (Arboleda, 2015). The argument has been made that such a policy does not provide sufficient funds to schools in poor school districts, in violation of the state’s mandate that all residents receive equal education. Those on the opposite side of this argument state that educational achievement has absolutely nothing to do with amount of money available to school districts (Arboleda, 2015).

This debate is important because of its implications for the distribution of community resources. This sets the stage for this research study. Given the importance of education to social mobility in the United States, associated with what is known as the “American Dream”, the link between level of expenditure (input) and learning (output) will remain a significant issue for some time. It will continue to affect peoples’ notions of the fairness of the social contract.

Testing is a major component of formal education in the United States and around the globe. In many cases, especially in considering K-12 education and high school, testing is the singular mechanism for determining educational achievement. In turn, major decisions are made that affect the course of one’s life based on test scores (Conley, 2014). These decisions include what kind of school or program one can get into (Conley, 2014), whether one gets a scholarship and the level of the scholarship (Trujillo, 2012), and the kind of employment one secures after school (Trujillo, 2012). For those completing professional schools in law and medicine that must pass professional exams for licensing, the stakes are even higher as failure in these exams means the difference between practice and no practice. With so much at stake with testing, testing becomes a significant part of our social contract and preparation of young adults for professional life. In places like India, Japan, and China with large populations and fewer opportunities to get into institutions of higher education and the professions, if one does not do well in standardized tests, then high rates of suicides are recorded seasonally following announcements of results of these mega-national tests (Liu et al., 2014).

## Research Question

While the issues raised above about testing are important, the one that raises the most anxiety and theoretical question is this: Does participation in the Preparing for ACCULACER Workshop lead to change in placement outcomes? That is, does participation in the program lead to higher scores in the placement test and, thus, placement outcome? This is the primary research question guiding this dissertation. As noted above, this question links into the broader theoretical question of whether preparation can change performance in standardized tests significantly, as to change students' percentile placement.

## Research Design

The research design being utilized in the dissertation is a quasi-experimental design that allows for correlation of the effects of the workshop and performance in the ACCUPLACER, controlling for factors known to impact performance in standardized tests. A quasi-experimental design is the more appropriate design given that ethically, students cannot be assigned to control groups that cannot get a treatment that could supposedly benefit them. Practically, the design is a variant of what Campbell and Stanley (1963) designate as the Pretest-Posttest Control Group Design without Randomization, as follows:

$$\begin{array}{ccc} O_1 & X & O_2 \\ \hline & & O_2 \end{array} \quad \begin{array}{l} (1) \\ (2), \end{array}$$

Where group 1 (1) are students who did not do well in the placement test initially and had to take the test a second time around, after completing the workshop. Thus,  $O_1$  becomes their pretest,  $X$  is the treatment or workshop, and  $O_2$  is their score after completing the workshop. The second group are students who did not complete the workshop but simply took the placement test.

There are two kinds of control in this research design. The first is the effect of testing controlled for by  $O_2$  for group (2), the second is offered by the independent variables specified in the regression models. The first effect will be captured with a fixed-effects model. This is will explicated in the model specification below.

### **Population and Sample**

The population will be all Arizona high school students taking the ACCUPLACER to get placement in community college courses. Depending on the total population, random samples may be drawn from each high school in such a way that each student is given equal chance of being chosen into the final sample. Since sampling is occurring only at the school level, simple random samples can be taken after dividing the students into two groups by gender and sampling within each gender group. Depending on the population characteristics of each high school; it may also become necessary to stratify groups of students along other lines such as race/ethnicity, etc. A second population and sampling procedure available and preferable is to first determine what school's students who participate in the workshop are coming from. Instead of widening the net of students to use as comparison groups to all schools, simply limit it to schools where the workshop participants are coming from. This should make it possible to compare apples to apples and provide a more concrete basis for comparisons.

The workshop is advertised on the internet and at testing centers and feeder high schools. Although students can be apprised of the benefits and encouraged by advisers and other counselors to take workshop, the decision to actually participate is voluntary by the student. Regardless of their academic status, no students are rejected for the workshop. Moreover, the workshop is free to students. Thus, fee payment is not a barrier to participation.



### **Instrumentation/Sources of Information**

The Preparing for ACCUPLACER Workshop is a one-and a half-hour long program. Each subject area, English, Reading, and Mathematics has 30 minutes of instruction delivered by a faculty expert on the subject. The curriculum is provided by ACCUPLACER for each area. Each 30-minute session is an interactive session where students can ask questions and listen to answers as given by the conductors of the workshop. The workshops are more content oriented; not simply the process of taking the tests. Each student is given a posttest to gauge level of learning. The size of an ACCUPLACER class is determined by the number of students who register.

### **The Dependent Variable of Primary Interest.**

There are several groups of students. First, there are students who take the ACCUPLACER placement test without participating in the workshop. Second, there are students who participate in the workshop, and then take the ACCUPLACER placement test. Third, there are students who attend the workshop after taking the ACCUPLACER placement test and then retest. These are students whose test scores do not permit access to a certain level of placement. Information about the veracity of the test will come from all three groups of students. In all cases, the dependent variable of primary interest will be performance in the ACCUPLACER placement test.

### **The Independent Variable of Primary Interest**

The singular instrument, in this case the independent variable, to be used in the study will be the preparation workshop for ACCUPLACER placement test. The preparation deals with both content and strategy for taking the ACCUPLACER placement test.

## **Control variables**

The literature lists several variables that are associated with performance on standardized tests; the same factors to be operational with the ACCUPLACER placement test. These factors are both demographic and foundational, including ethnicity, gender, GPA, SES, age, and quality of school. These factors will be used as the control variables in the study.

## **Hypotheses**

The following hypotheses will be tested in the study:

**Hypothesis #1: Major Research Hypothesis.** Participation in the Preparing for ACCULACER Workshop will lead to change in placement outcomes. Students who participate in the program will score higher in the placement test and, thus, placement outcome. Thus, participation will increase score.

**Derivative Hypothesis #1:** Anglo students will score higher on the ACCUPLACER placement test than students from minority backgrounds. This hypothesis comes from the broad literature of testing (see e.g., Jencks and Phillips, 1998).

**Derivative Hypothesis #2:** Male students will score higher on the ACCUPACER placement test than female students. This hypothesis comes from the broad literature of testing (see, e.g., The National Center for Fair and Open Testing, 2007).

**Derivative Hypothesis #3:** Students with higher grade point averages (GPA), as evidence of superior academic preparation and achievement, will score higher on the ACCUPACER placement test than students with lower GPAs. This hypothesis comes from the broad literature of testing (see, e.g., Batzel, 2001).

**Derivative Hypothesis #4:** Students coming from higher socioeconomic backgrounds will score higher than students from lower socioeconomic backgrounds. This hypothesis comes from the broad literature of testing (see, e.g., Hays, 2015).

**Derivative Hypothesis #5:** Older students will score higher than younger ones, age being a measure of maturity. This hypothesis comes from the broad literature of testing (see, e.g., Larrabee and Crook, 1994).

**Derivative Hypothesis #6:** Students coming from schools rated higher in academic quality will score higher than their counterparts from lower academic quality schools. This hypothesis comes from the broad literature of testing (see, e.g., Eide and Showalter, 1997).

### **Data Collection Procedures**

Data for the study will be coded from two sources. One is student files, the other will be records as developed from the ACCUPLACER workshop. Students will be guaranteed anonymity in terms of access to their individual files. Only data necessary to compile the results and report general statistics will be coded. Thus, identifying information such as name, social security number, etc. will not be coded.

### **Data Analysis**

Both simple and inferential statistics will be used to measure the effects of the treatment (participation in the Preparing for ACCUPLACER Workshop). These will include tables showing how the groups compare to one another along with narrative discussions. Regression analysis will be used to estimate disparate effects of particular factors, say race, gender, etc. The regression model will include:

$$\text{ACCUPLACER}_{\text{iscore}} = \Phi + \beta_1 \text{ACWORKSHOP}_{\text{attend}} + \beta_2 \text{VECTOR}_i + e_i,$$

(Where,  $ACCUPLACER_{i\text{score}}$  is the  $i$ th student's score on the ACCUPLACER placement test;  $\Phi$  is the intercept that measures the placement score in the absence of all independent and control variables,  $ACWORKSHOP_{i\text{attend}}$  measures whether or not the  $i$ th student has attended the preparation workshop;  $VECTOR_i$  is the vector of all control variables for the  $i$ th student, and  $e_i$  is the random error component for the  $i$ th student). Model 1 can then be estimated for the three categories of students:

a) Those students who take the ACCUPLACER placement test without taking the workshop:

$$ACCUPLACER_{i\text{score}} = \Phi + \beta_1 ACWORKSHOP_{i\text{attend}} + \beta_2 VECTOR_i + e_i,$$

b) Those students who take the workshop and then take the ACCUPLACER placement test:

$$ACCUPLACER_{i\text{score}} = \Phi + \beta_3 ACWORKSHOP_{i\text{attend}} + \beta_4 VECTOR_i + e_i,$$

c) Those who attend the workshop after taking the ACCUPLACER placement test and then retest:

$$ACCUPLACER_{i\text{score}} = \Phi + \beta_5 ACWORKSHOP_{i\text{attend}} + \beta_6 VECTOR_i + e_i,$$

Once estimated, each model will account for the effect of the workshop for each category of students holding the effects of the control variables constant.

## Limitations

The most significant limitation of the study is with external validity. That is, the extent the results of the study can be generalized to students beyond the study's origin. This limitation is driven by funds to collect data, not the limitation of the researcher himself to perform more far-reaching analysis. With more funds, the researcher can extend the research and make the results more generalizable to a larger audience of students.

Table 1 presents the variables and a summary of the expected effects for all independent variables.

Table 1. Measures and Predicted Effects

Variable	Measurement	Predicted Effect
ACCUPLACER Score	Students' Actual Scores	-
ACWORKSHOP	Dummy Variable: 1 if a student attended, 0 otherwise	+
High School GPA	Student's Actual GPA	+
Quality of School	Measured 8, 9, or 10	+
Age	Actual Age of Student	+
Gender	Coded 1 if male, 0 if female	+
Socioeconomic Status	Family Income (Annual)	+
Race/Ethnicity	White, Black, Hispanic, Other	+

## Chapter 4

### Summary, Expected Findings, Implications, and Limitations

#### Summary

This dissertation questions whether remedial preparation for standardized tests influences performance outcomes. Specifically, the study examines whether a preparation workshop for the college ACCUPLACER placement test influences students' performance on the test and, thus, placement outcomes. Theoretically, the study rests in the broader literature of aptitude, preparation, and performance in standardized tests. As noted above, there is a body of work which suggests that performance in such tests is driven primarily by aptitude, implying that short-term preparation will not change scores significantly. If this is really the case, then there must be questions over the veracity of the millions that are invested each year by students and families preparing for these tests. Moreover, this has implications for the role of testing in higher education, especially as it pertains to students coming from less endowed socio-economic backgrounds, whose future may be tied directly to testing. If one does not have the aptitude and preparation, their performance should not change. What meaning does this have for these groups of students?

The study is based on an ACCUPLACER preparatory workshop implemented at one of Arizona's largest community college systems. Data was drawn from students who attended the workshops. Other data was taken from comparable students from high schools preparing the students for the ACCUPLACER workshops. Given the nature of data, a quasi-experimental/ANOVA design has been proposed. This kind of design is appropriate in situations when the researcher does not have complete control of the dependent variable, which is this case, is performance on the ACCUPLACER test. The researcher could not generate a control group of

students who were qualified but are denied entry into the workshop. This is the essence of the quasi-experimental/ANOVA design. Regression analysis is used to offer systematic estimation of the effect of the workshop. This type of analysis both addressed the question and the difference the workshop made and what variables actually impacted the test score.

### **Expected Findings**

There is the expectation that preparation will impact performance on the test. All things equal, the researcher expects participation in the workshop to improve students' performance on the test.

This may occur for several reasons. One is learning the mechanics of the test. Another is being more relaxed with the knowledge that one knows approximately how the test is designed. Other explanations are hypothesized in regards to gender, race, socio-economic status, age, Grade Point Average(GPA), and high school attendance.

### **Implications**

A finding that test preparation significantly influences test scores has enormous implications for test performance. First, it will challenge the theory that aptitude, as opposed to preparation, drives the test score. Secondly, it will speak to the utility of the resources invested in test preparation and whether such resources are well spent.

### **Limitations**

The most relevant limitation is external validity. The study is based on a small geographical area in Arizona. The results may not be readily generalizable to students. Yet, the establishment of a relationship between preparation and testing is significant.

## Description of the Data

The final sample used in the dissertation consisted of 300 students from 37 different high schools.

These high schools are listed in Appendix A. The average student was

approximately 24 years of age (Mean age = 23.77); the youngest was 18 years old, while the oldest was 60. One hundred and fifty-two of the 300 students (50.7%) are female, while 141 (47.0%) are male.

The sex of seven students (2.7%) is unknown. One hundred and twenty-eight of the students (42.7%) are white, 99 (33.0%) are Hispanic, while 66 (22.0%) is classified as other. The data in Appendix B specifies the categories and numbers of students classified within this category of Other race. This classification became necessary because of the small number of students within each category, which will not permit separate analyses. There are obvious limitations with lumping Blacks and Asians in a single group in an analysis of this kind given the wide differences in educational achievement reported between the groups. However, the operation is necessary in this case given the limited circumstances. Only 90 of the students (30%) qualified for Pell Grant (financial assistance) in the review period, while 210 (70%) did not qualify. Among those qualifying, 32 (10.7%) are male, while 59 (18.0%) are female. White students received 9.3% (N=28), Hispanic students received 10.7% (N=32), while the category classified as other received 8.7% (N=26).

Three categories of students are in the data set with regard to both testing and workshop status. Divided evenly into 100 students each and consisting of 33.3% of the total sample are students who took their test without ever taking the Accuplacer workshop/video; students who took the test, did not do well enough, took the Accuplacer workshop/video, and then retook the test; and students who simply took the workshop/video first and then took their placement tests.



Table 2. Descriptive Statistics

Variable	Mean %	N	Min	Max
Sample		300		
Never Took Workshop	33.3	100		
Took Workshop the Test	33.3	100		
Took test, Workshop, Test	33.3	100		
Age	23.8	300	18	60
Gender				
Male	47.0	141		
Female	50.7	152		
Race				
White	42.7	128		
Hispanic	33.0	99		
Other race	22.0	66		
Pell Grant (Financial Aid)	30.0	90		
Test Status/Male				
Never Took Workshop	34.0	48		
Workshop, then Test	36.2	51		
Test, Workshop, then Test	29.8	42		
Test Status/Female				
Never Took Workshop	33.6	51		
Workshop, then Test	30.3	46		
Test, Workshop, then Test	36.2	55		
Race/Testing Status				

White				
Never Took Workshop	35.2	45		
Workshop, then Test	35.6	46		
Test, Workshop, then Test	28.9	37		
Hispanic				
Never Took Workshop	26.3	26		
Workshop, then Test	24.2	24		
Test, Workshop, then Test	39.4	39		
Other Race				
Never Took Workshop	42.4	28		
Workshop, then Test	21.2	14		
Test, Workshop, then Test	36.4	24		
High School Rating	125.5	300		
High School Score	47.1	300		
Testing Performance				
Mathematics (Pre-or No Workshop)	54.0		16	111
Mathematics (Post-Workshop)	55.2		22	119
English (Pre- or No Workshop)	14.0	279		
English (Post-Workshop)	3.92	99		
Reading (Pre- or No Workshop)	81.3		27	116

Reading (Post Workshop)	70.8		30	11 9
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What becomes insightful are the numbers as classified by race and gender. Fifty one of the 152 female students (33.6%) in the sample took their tests without encountering the workshop whatsoever, 46 (30.3%) took the workshop/video first and then the test, while 55 (36.2%) took the test, took the workshop/video, and then retested. Forty-eight of the 141 males (34.0%) did not encounter the workshop, 51 (36.2%) took the workshop/video first, and then tested, while 42 (29.8%) took the test, the workshop/video and then retested. Regarding race, 46 of the 128 white students (35.9%) took the workshop/video first before testing, 37 (28.9%) took the test, the workshop/video and then retested, while 45 (35.2) did not encounter the workshop/video whatsoever. Twenty-four of the Hispanic students (24.2%) took the workshop/video and test, 39 (39.4%) took the test, the workshop/video, and then retested, while 26 (26.3%) never encountered the workshop/video. Finally, among the students categorized as other race, 14 (21.2%) took the workshop/video, and then the test, 24 (36.4%) took the test, the workshop, and then retested, while 28 (42.4%) never encountered the workshop/video.

The performance of the students across the different tests are displayed in Table 1. Looking at the data, students who took Mathematics without taking the workshop scored 54.0 on the average, with their scores ranging from a low of 16 to a high of 111. Those who took the workshop and retested scored 55.20 on the average, with a low of 22 points and a high of 119 points. Overall, there is a differential of just 1.2 points between those who took the workshop before testing for Mathematics and those who did not.

## Data Diagnoses

The purpose of data diagnosis is for a researcher to understand the basic interrelationships among his or her variables before undertaking advanced statistical work. In this dissertation, such diagnoses were carried out looking at both graphical relationships of the kind presented in the two scatters reported below and the correlation metrics showing inter item correlation. The inter item correlation are moderate.

### Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	.																	
2	-.04	.																
3	.03	-.95*	.															
4	.15*	-.07	.06	.														
5	-.19*	.04	-.02	-.61*	.													
6	.02	.03	-.04	-.46*	-.37*	.												
7	-.09	-.15*	.12*	-.15*	.04	.11	.											
8	-.19*	-.04	.06	-.23*	.29	-.07	.21*	.										
9	-.17*	-.05	.04	.11	-.04	-.07	-.02	-.17*	.									
10	-.14*	.05	-.09	-.03	.01	.05	-.12*	-.06	-.04	.								
11	.08	-.33*	.31*	-.09	-.07	.17	.07	.07	-.03	-.15*	.							
12	.31*	-.02	.03	.16*	-.15*	-.02	-.14*	-.12*	.06	-.05	.15*	.						
13	-.18*	-.06	.09	.09	-.12*	.04	-.19*	-.13*	.17*	.30*	.08	.37*	.					
14	-.08	.14*	-.15*	.16*	-.05	-.11	-.18*	-.10	.12*	.23*	.05	.05	.33*	.				
15	.07	.06	-.09	.34*	-.13*	-.26*	-.08	-.26*	.27*	.168	.09	.41*	.37*	.69*	.			
16	.22*	.01	.01	.03	-.11	.10	-.14*	-.11	-.10	.05	C	.12*	c	.08	c	.		
17	.09	.06	-.07	.05	.06	-.14	-.05	.22*	.03	-.09	c	.17*	c	-.02	c	-.50*	.	

18	.31*	-.07	.06	-.08	.10	.03	.10	.20*	.08	.04	c	-.27*	c	-.06	c	-.50*	-.50*	.
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1=Age; 2=Male; 3=Female; 4=White; 5=Hispanic; 6=Other Race; 7=Pell Grant; 8=School Rating;  
 9=School Score; 10=Math1; 11= Math2; 12=Eng1; 13=Eng2; 14=Reading1; 15=Reading2; 16=Never  
 Took Workshop; 17=Workshop Then Test; 18=Test/Workshop/Test.

### The Regression Results

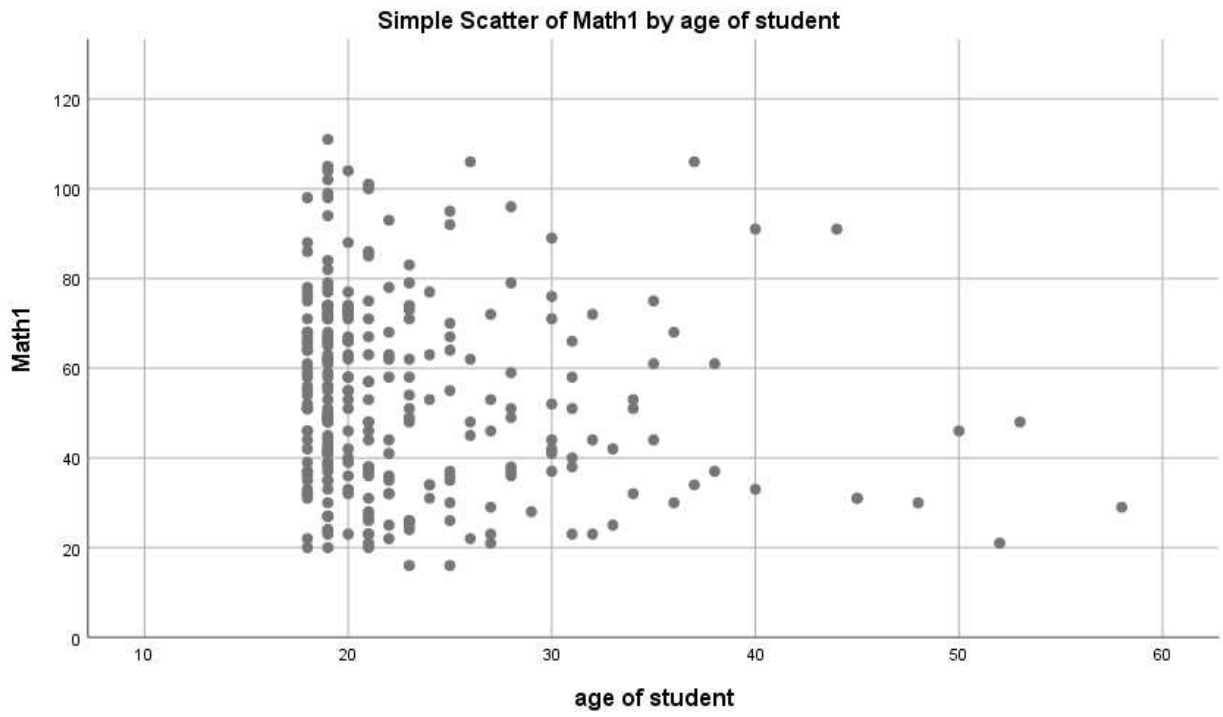
The regression analyses performed specified test scores as dependent variables. Since test scores are continuous variables, Ordinary Least Squares (OLS) regression were performed. The models sought to explain individual scores using the independent variables as explanatory factors. The NW group took the tests without experiencing the workshop. The WT group took the workshop and then the test. Although the TWT group took the test twice, only their pre-test featured in the regression analyses. NW, WT, and TWT are entered the regression models as dummy variables with the NW group as reference category. Thus, test 1's (Mathematics, English, and Reading) for the NW group are compared to the results for the WT group. If the workshop made any difference in Mathematics, English, or reading, the dummy coefficient measuring WT for that subject should be positive and statistically significant. These results are presented in Tables 3, 4, and 5 below.

Looking at Table 3 below with the results of the mathematics placement test, one sees that the coefficient for WT is not significant. Thus, the workshop did not make any difference for mathematics in comparison to those who did not take the workshop before taking the test. Instead the results suggest that the age of the student and the financial aid status are the only factors affecting mathematics scores. Both coefficients are negative. Thus, older students and students of lower social economic status (by virtue of qualifying for financial aid) performed less well on the mathematics test. The results for the English

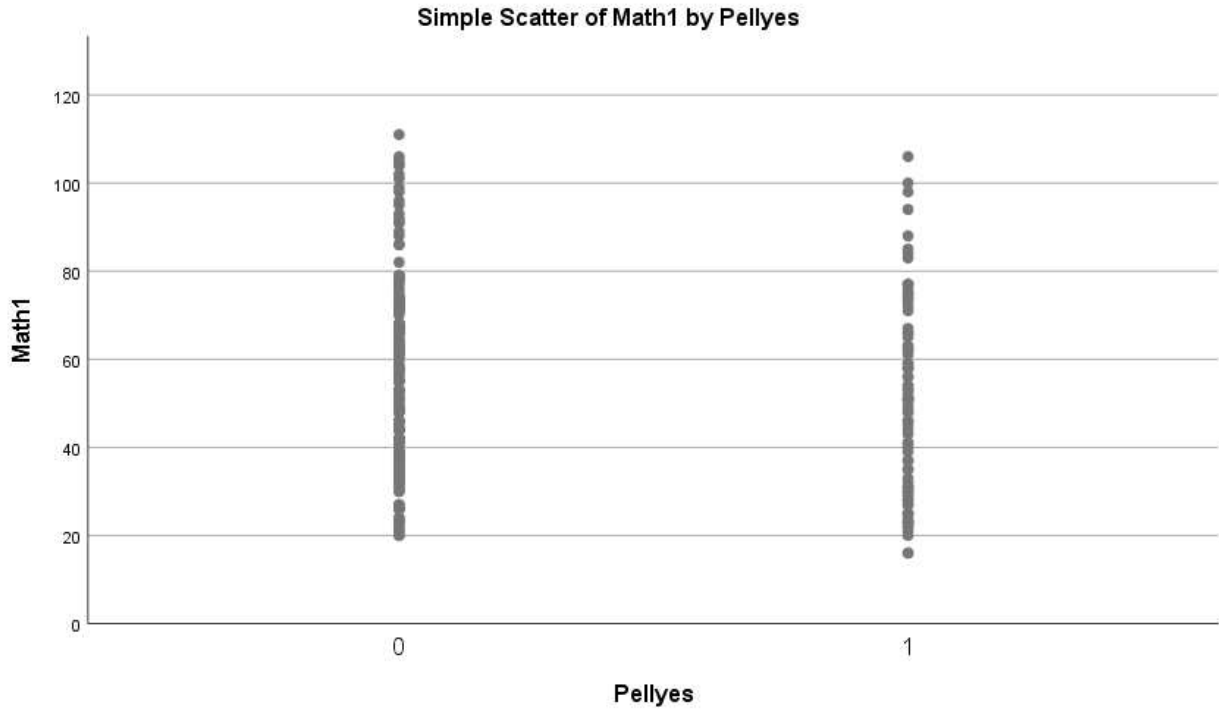
placement test are presented in Table 4. Again, these results do not show a significant difference between the English test scores between the students who did not take the workshop and those who took the workshop. Instead, the results suggest that the age of the student, financial status, and race/ethnicity are significant factors. Unlike mathematics, where older students did less well, older students did better in English. Financial aid maintained its negative effect, while Hispanic students did less well than whites. That Hispanic students would fair less well in the English test than white students is easily explained. This result for English is predictable and speaks to the ability of the analysis to confirm what is already known. Finally, for the reading placement test, (Table 5), the results reconfirm that the comparison between those who did not take the workshop and those who did is not statistically distinct. Instead, the results show that older students did less well in reading. Women did less well in reading. Hispanics and members of other race did less well in reading, while financial aid retained its negative effects. Based on these analyses, it is apparent that the workshop did not affect test scores significantly, while the analyses confirmed much of what we already know in the literature.

**Table 3. Student Performance on Placement Tests**

		Mat h1	Math2	EN G1	E N G 2	RD G1	RDG2
N	Valid	279	93	280	100	276	70
	Missing	21	207	20	200	24	230
Mean		54.03	55.20	13.97	3.88	81.33	70.76
Minimum		16	22	0	0	27	30
Maximum		111	119	120	8	116	119







**Findings**

Table 4. Mathematics 1

Variable	Slope	Standar d Error	Bet a	t- Statisti c	Sign ifica nce
Age	-0.46*	0.20	- .14	2.28	.05
Gender (Male=1) <sup>a</sup>	1.24	2.59	.03	0.45	N.S.
Race <sup>b</sup>					
Hispanic	0.56	2.94	.01	0.19	N.S.

Other Race	3.39	3.40	.07	0.99	N.S.
Financial Aid (Pell)	-5.95*	2.82	- .13	2.11	.05
Testing Status <sup>c</sup>					
Workshop/Tested	-3.79	3.22	- .09	1.18	N.S.
Test/Workshop/Te st	-1.34	3.33	- .03	0.40	N.S.
Intercept	66.81** *	6.02		11.09	.000
R-Squared	.048				
Adj. R-Squared	.023				
F-Ratio	1.93*				.05
N	279				

<sup>a</sup>Female is reference category.

<sup>b</sup>White is reference category.

<sup>c</sup>Never took Workshop is reference category.

Table 5. English 1

Variable	Slope	Standard Error	Beta	t-Statistic	Significance
Age	0.87** *	0.22	.23	3.92	.000
Gender (Male=1) <sup>a</sup>	-1.83	2.83	-.04	0.65	N.S.
Race <sup>b</sup>					
Hispanic	-6.25*	3.21	-.12	1.95	.05
Other Race	-3.13	3.71	-.05	0.84	N.S.
Financial Aid (Pell)	-5.54*	3.08	-.10	1.80	.05
Testing Status <sup>c</sup>					
Workshop/Tested	0.34	3.52	.01	0.09	N.S.
Test/Workshop/Testing	-9.18	3.61	-.18	2.54	.05
Intercept	2.54	6.49		0.39	N.S.
R-Squared	.156				

Adj. R-Squared	.134				
F-Ratio	7.18** *				.000
N	280				

<sup>a</sup>Female is reference category.

<sup>b</sup>White is reference category.

<sup>c</sup>Never took Workshop is reference category.

Table 6. Reading 1

Variable	Slope	Standard Error	Beta	t-Statistic	Significance
Age	-0.34*	0.19	-.11	1.84	.05
Gender (Male=1) <sup>a</sup>	5.26*	2.43	.13	2.16	.05
Race <sup>b</sup>					
Hispanic	-5.30*	2.75	-.12	1.92	.05
Other Race	-7.11*	3.22	-.14	2.21	.05

Financial Aid (Pell)	-5.96*	2.64	- .14	2.26	.05
Testing Status <sup>c</sup>					
Workshop/Tested	-4.07	3.04	- .09	1.34	N.S.
Test/Workshop/Te st	-4.18	3.13	- .09	1.34	N.S.
Intercept	94.99** *	5.53		17.18	.000
R-Squared	.082				
Adj. R-Squared	.058				
F-Ratio	3.40**				.01
N	278				

<sup>a</sup>Female is reference category.

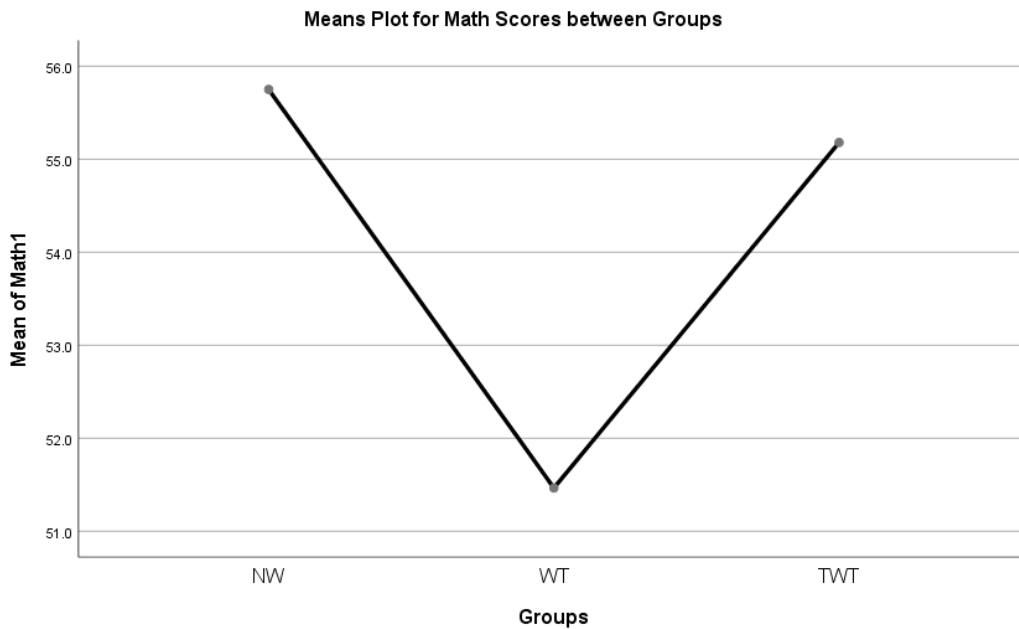
<sup>b</sup>White is reference category.

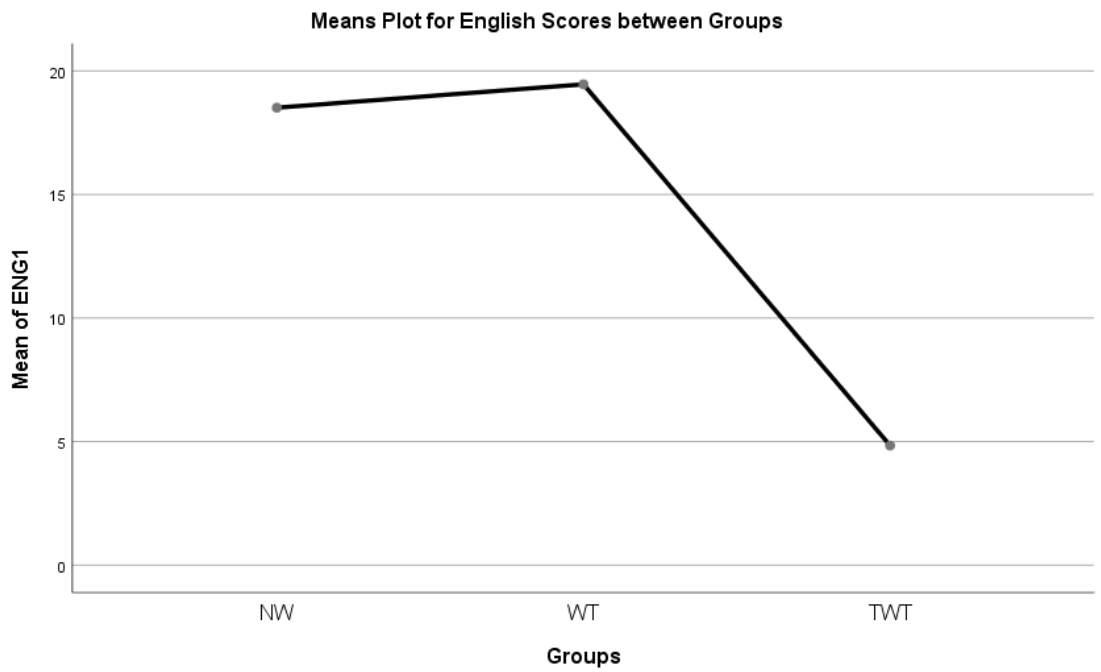
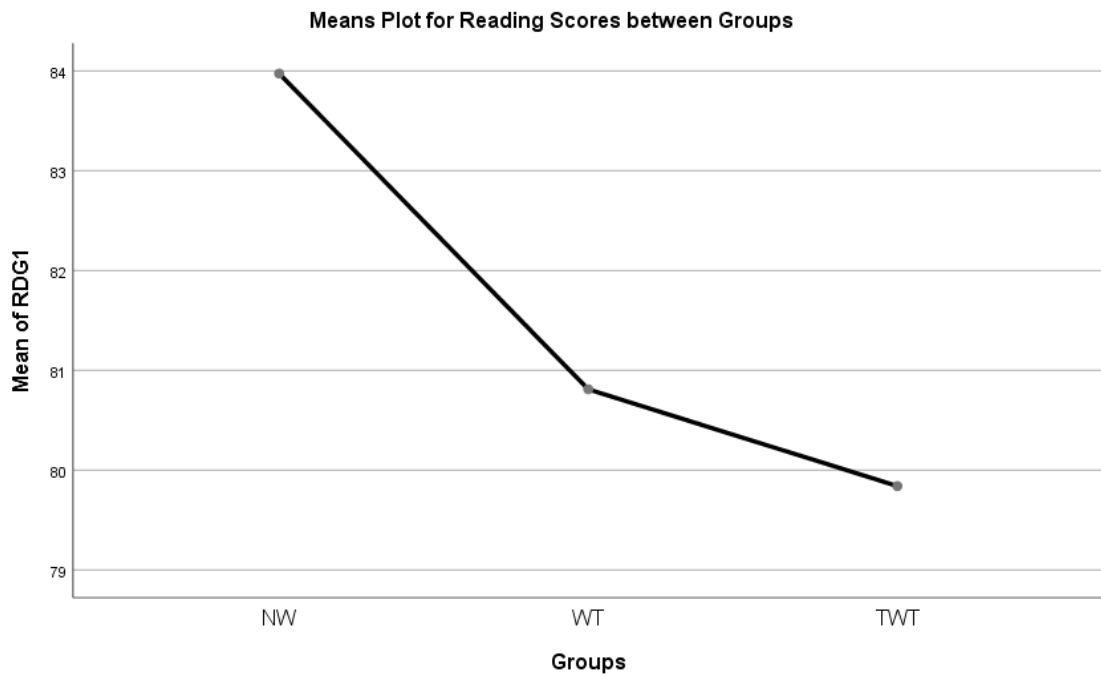
<sup>c</sup>Never took Workshop is reference category.

Three one-way ANOVAs were analyzed to see if there was a significant difference in performance for Mathematics, English and Reading among participants who never took the workshop (NW), participants who took the workshop before taking the test (WT), and participants who took the test and the workshop before taking the test again (TWT). It was found that there was no significant difference in performance for Mathematics between the NW group (M = 55.75,

SEM = 2.52), the WT group (M = 51.47, SEM = 1.93), and the TWT group (M = 55.18, SEM = 2.25) as  $F(2, 276) = 1.12, p = .33$ .

It was also found that there was no significant difference in performance for Reading between the NW group (M = 83.97, SEM = 2.35), the WT group (M = 80.81, SEM = 2.06), and the TWT group (M = 79.84, SEM = 2.00) as  $F(2, 273) = .94, p = .39$ . However, there was a significant difference in performance for English between the NW group (M = 18.51, SEM = 3.39), the WT group (M = 19.46, SEM = 2.96), and the TWT group (M = 4.84, SEM = .13) as  $F(2, 117.55) = 20.21, p = .00$  and  $\hat{\omega}^2 = .12$ . Post hoc analysis using the Tukey HSD test showed that the TWT group had significantly lower scores in comparison to both the NW and WT groups, but that there was no substantial difference between the NW and WT groups.





### Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Math1	NW	80	55.750	22.5442	2.5205	50.733	60.767	16.0	106.0
	WT	99	51.465	19.2356	1.9332	47.628	55.301	21.0	106.0
	TWT	100	55.180	22.4533	2.2453	50.725	59.635	20.0	111.0
	Total	279	54.025	21.4025	1.2813	51.503	56.547	16.0	111.0
ENG1	NW	80	18.51	30.278	3.385	11.77	25.25	2	120
	WT	100	19.46	29.561	2.956	13.59	25.33	1	119
	TWT	100	4.84	1.277	.128	4.59	5.09	0	8
	Total	280	13.97	24.836	1.484	11.05	16.89	0	120
RDG1	NW	76	83.97	20.508	2.352	79.29	88.66	30	116
	WT	100	80.81	20.558	2.056	76.73	84.89	27	114
	TWT	100	79.84	20.001	2.000	75.87	83.81	27	115
	Total	276	81.33	20.340	1.224	78.92	83.74	27	116

### Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Math1	Based on Mean	1.100	2	276	.334
	Based on Median	1.175	2	276	.310
	Based on Median and with adjusted df	1.175	2	268.512	.310
	Based on trimmed mean	1.133	2	276	.324
ENG1	Based on Mean	55.062	2	277	.000
	Based on Median	11.168	2	277	.000
	Based on Median and with adjusted df	11.168	2	178.178	.000
	Based on trimmed mean	34.523	2	277	.000
RDG1	Based on Mean	.183	2	273	.833
	Based on Median	.145	2	273	.865
	Based on Median and with adjusted df	.145	2	271.782	.865
	Based on trimmed mean	.173	2	273	.841

### ANOVA



		Sum of Squares	df	Mean Square	F	Sig.
M a t h 1	Between Groups	1020.438	2	510.219	1.115	.329
	Within Groups	126322.386	276	457.690		
	Total	127342.824	278			
E N G 1	Between Groups	13000.443	2	6500.222	11.318	.000
	Within Groups	159094.268	277	574.348		
	Total	172094.711	279			
R D G 1	Between Groups	780.219	2	390.110	.943	.391
	Within Groups	112986.777	273	413.871		
	Total	113766.996	275			

### Robust Tests of Equality of Means

		Statistic <sup>a</sup>	df1	df2	Sig.
M a t h 1	Welch	1.212	2	176.699	.300
E N G 1	Welch	20.205	2	117.547	.000
R D G 1	Welch	.937	2	174.886	.394

a. Asymptotically F distributed.

### Multiple Comparisons

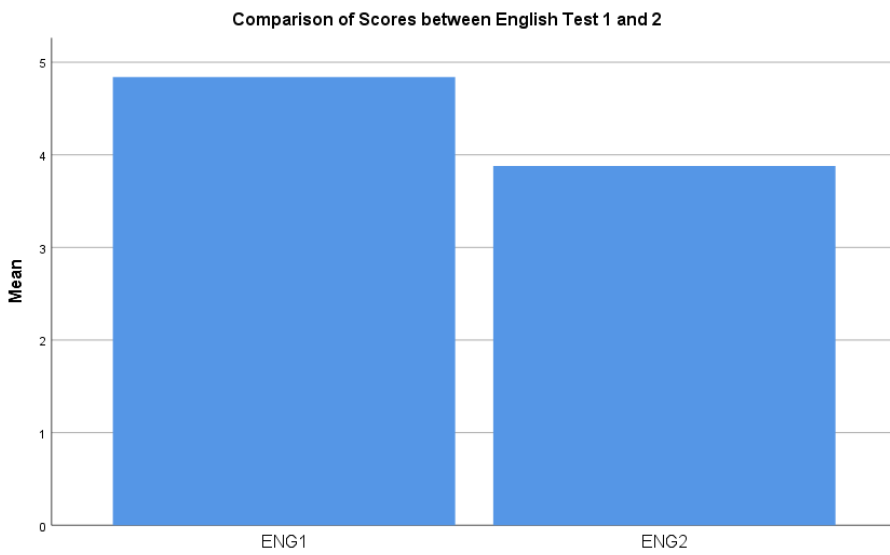
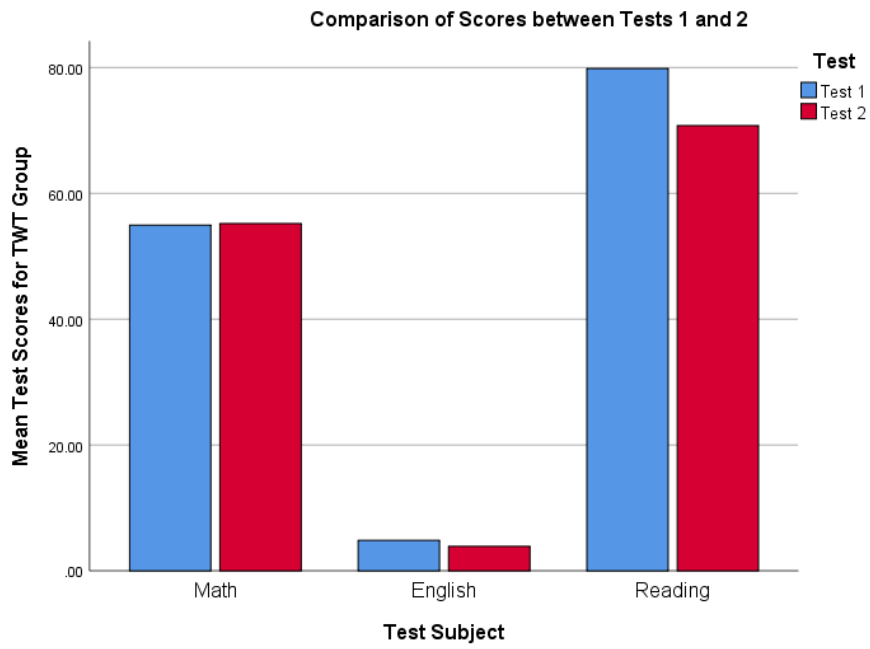
Tukey HSD

Dependent Variable	(I) TestingLabels	(J) TestingLabels	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Math1	NW	WT	4.2854	3.2162	.378	-3.294	11.864
		TWT	.5700	3.2091	.983	-6.992	8.132
	WT	NW	-4.2854	3.2162	.378	-11.864	3.294
		TWT	-3.7154	3.0332	.439	-10.863	3.432
	TWT	NW	-.5700	3.2091	.983	-8.132	6.992
		WT	3.7154	3.0332	.439	-3.432	10.863
ENG1	NW	WT	-.948	3.595	.962	-9.42	7.52
		TWT	13.673*	3.595	.001	5.20	22.14
	WT	NW	.948	3.595	.962	-7.52	9.42
		TWT	14.620*	3.389	.000	6.63	22.61
	TWT	NW	-13.673*	3.595	.001	-22.14	-5.20
		WT	-14.620*	3.389	.000	-22.61	-6.63
RDG1	NW	WT	3.164	3.096	.564	-4.13	10.46
		TWT	4.134	3.096	.377	-3.16	11.43
	WT	NW	-3.164	3.096	.564	-10.46	4.13
		TWT	.970	2.877	.939	-5.81	7.75
	TWT	NW	-4.134	3.096	.377	-11.43	3.16
		WT	-.970	2.877	.939	-7.75	5.81

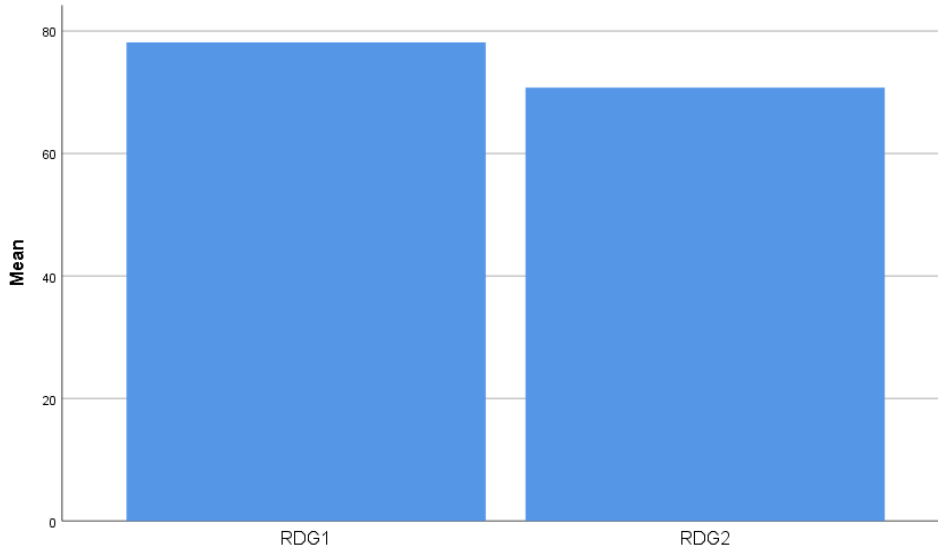
\*. The mean difference is significant at the 0.05 level.

Three paired-samples t-tests were also conducted to see if there was a significant difference within the TWT group between test 1 and test 2 on Mathematics, English, and Reading. It was found that there was a significant difference in English scores between test 1 ( $M = 4.84$ ,  $SEM = .13$ ) and test 2 ( $M = 3.88$ ,  $SEM = .11$ ) as  $t(99) = 7.29$ ,  $p = .00$ ,  $\alpha = .05$ ,  $\omega^2 = .34$ , and 95% CI [.70, 1.22].

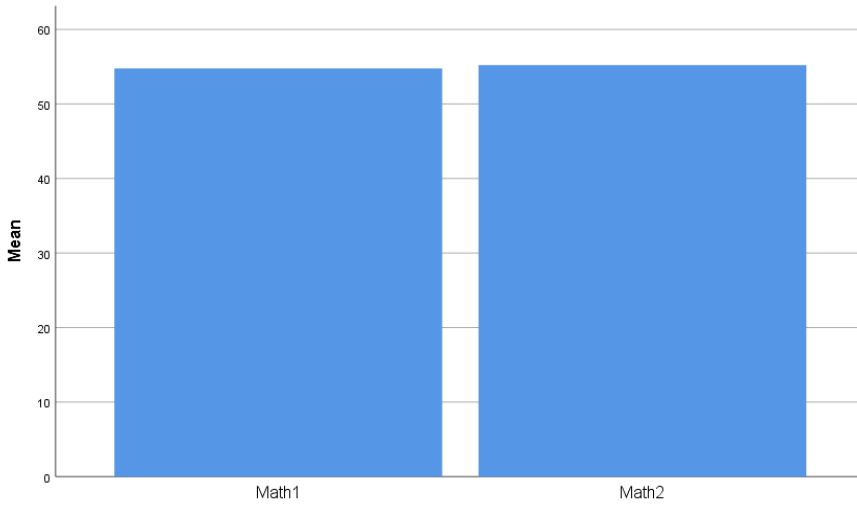
Furthermore, there was a significant difference in Reading scores between test 1 ( $M = 78.13$ ,  $SEM = 2.22$ ) and test 2 ( $M = 70.76$ ,  $SEM = 1.99$ ) as  $t(69) = 4.39$ ,  $p = .00$ ,  $\alpha = .05$ ,  $\omega^2 = .21$ , and 95% CI [4.02, 10.72]. However, there was not a significant difference in Math scores between test 1 ( $M = 54.77$ ,  $SEM = 2.38$ ) and test 2 ( $M = 55.20$ ,  $SEM = 2.46$ ) as  $t(92) = -.12$ ,  $p = .91$ ,  $\alpha = .05$ , and 95% CI [-7.72, 6.86].



Comparison of Scores between Reading Test 1 and 2



Comparison of Scores between Math Test 1 and Test 2



### Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Math1	54.774	93	22.9551	2.3803
	Math2	55.20	93	23.682	2.456
Pair 2	ENG1	4.84	100	1.277	.128
	ENG2	3.88	100	1.047	.105
Pair 3	RDG1	78.13	70	18.606	2.224
	RDG2	70.76	70	16.633	1.988

### Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Math1 & Math2	93	-.151	.148
Pair 2	ENG1 & ENG2	100	.371	.000
Pair 3	RDG1 & RDG2	70	.687	.000

### Paired Samples Test

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Math1 - Math2	-.4301	35.3859	3.6693	-7.7177	6.8575	-.117	92	.907
Pair 2	ENG1 - ENG2	.960	1.317	.132	.699	1.221	7.287	99	.000
Pair 3	RDG1 - RDG2	7.371	14.057	1.680	4.020	10.723	4.387	69	.000

## **Chapter 5**

### **Summary, Conclusions, and Recommendations**

#### **Introduction**

This dissertation examined the efficacy of a remedial education program on placement outcomes. Specifically, it asked whether exposure to a Preparing for ACCUPLACER Workshop in a large community college system impacts placement outcomes for students who have attended the workshop. While focused on a narrower pilot program, this question is answered within the broader theoretical context of the relevance of preparatory programs on performance on standardized tests, a locus that enjoys a long tradition of scholarship in education research. The dissertation explored the impact of test preparation by examining preparation in conjunction with other demographic and foundational factors known to impact performance, such as ethnicity, gender, socioeconomic status (SES), age, and quality of school.

#### **Summary**

Two major categories of analyses are conducted in order to answer the question of what difference the workshop made. The first one is ANOVA, it tests the means to determine whether differences in the scores of those who took the workshop differed from those who did not. The second type of analysis is regression, it attempts to both address the question of the difference the workshop made and what variable impacted test scores. The results of both groups of analysis are reported.

#### **Conclusions**

Based on the findings, students who took Mathematics without taking the workshop scored 54.0 on the average, with their scores ranging from a low of 16 to a high of 111. Those who took

the workshop and retested scored 55.20 on the average, with a low of 22 points and a high of 119 points. Overall, there is a differential of just 1.2 points between those who took the workshop before testing for Mathematics and those who did not. What becomes insightful are the numbers as classified by race and gender. Fifty one of the 152 female students (33.6%) in the sample took their tests without encountering the workshop whatsoever, 46 (30.3%) took the workshop/video first and then the test, while 55 (36.2%) took the test, took the workshop/video, and then retested. Forty-eight of the 141 males (34.0%) did not encounter the workshop, 51 (36.2%) took the workshop/video first, and then tested, while 42 (29.8%) took the test, the workshop/video and then retested. Regarding race, 46 of the 128 white students (35.9%) took the workshop/video first before testing, 37 (28.9%) took the test, the workshop/video and then retested, while 45 (35.2) did not encounter the workshop/video whatsoever. Twenty-four of the Hispanic students (24.2%) took the workshop/video and test, 39 (39.4%) took the test, the workshop/video, and then retested, while 26 (26.3%) never encountered the workshop/video. Finally, among the students categorized as other race, 14 (21.2%) took the workshop/video, and then the test, 24 (36.4%) took the test, the workshop, and then retested, while 28 (42.4%) never encountered the workshop/video.

Three one-way ANOVAs were analyzed to see if there was a significant difference in performance for Mathematics, English and Reading between participants who never took the workshop (NW), participants who took the workshop before taking the test (WT), and participants who took the test and the workshop before taking the test again (TWT). It was found that there was no significant difference in performance for Mathematics between the NW group.

## **Recommendations**

Suggestions for future research of this study would focus on repeated measures analyses. Although it was seen that test scores for both English and Reading were significantly higher for students in the TWT group before they took the workshop, and then tested again, it would be interesting to follow the students' progress for longer periods of time with further workshop interventions. Specifically, instead of just one workshop, the researcher proposes the idea of a repeated measures ANOVA that would consist of several workshops that students would attend throughout the school year and additional years following. The purpose of this proposal would be to see if there would be an improvement in students' scores for English, Reading, and Mathematics; if they were exposed to multiple workshops that covered these materials. Even more so, the researcher would be interested in a repeated measures ANOVA that would consider possible confounding variables that students may be experiencing while in these workshops.

For instance, it could be seen that students in the TWT group scored significantly lower in the first English test in comparison to the students that didn't take the workshop before testing and those students that did take the workshop beforehand. It would be interesting to note if these students in the TWT group had pre-existing difficulties regarding English subject matter. The academic standing and personal academic difficulties of these students would both be crucial variables to consider for future studies because of the role they play in students' ability of learning new material. Of a similar vein, the researcher would be interested in seeing how much confusion and anxiety students felt about the test and how its questions were presented in addition to the amount of confusion students felt about the presentation of materials in the workshop. These variables would be crucial in distinguishing students' actual understanding of the material as well as how helpful and clear they found the workshops to be.



The researcher also suggests that, in addition to further repeated measures analyses, future research should investigate other crucial variables that could impact the academic improvement of students, and it is suggested that this be done using subjects between designs, as well as designs that incorporate multiple factors. For example, it was mentioned earlier that participants' race was categorized as either White, Hispanic, or Other with the category of Other including a vast variety of races such as Blacks and Asians. It is then suggested that future studies include larger samples of different racial and ethnic minorities in addition to Whites and Hispanics so that they can be compared appropriately.

In addition to this, socio-economic status of these samples should also be considered and used to help further distinguish specific categories of race based on individuals' socio-economic statuses. Only 90 of the students (30%) qualified for Pell Grant (financial assistance) in the review period, while 210 (70%) did not qualify. Among those qualifying, 32 (10.7%) are male, while 59 (18.0%) are female. White students received 9.3% (N=28), Hispanic students received 10.7% (N=32), while the category classified as other received 8.7% (N=26). Once these categories have been established, two-factor ANOVAs comparing English, Mathematics and Reading scores respectively can then be used to see if there is a difference across these groups of racial socio-economic status and their randomly selected exposure to workshops and if there is an interaction between the two factors. Furthermore, two-factor ANOVAs can also be used to see if there is difference in scores based on an interaction between racial socio-economic status and the level of financial aid that the participants receive. Both are extremely important factors when considering students' academic success because of the huge role they play in the available resources that these students need to get help.

Additionally, it would also be of interest to use ANOVAs further to see if there is a difference in English, Mathematics, and Reading scores across groups based on types of workshops that are given to the participants. In the case of this study for instance, it would be particularly motivating to see if there was a difference in scores between participants that received the workshop or participants that received instruction in a video format. The Mathematics, English and Reading Councils (Department Chairs), one from each of the ten colleges, would devise a curriculum in video format for each discipline. The video instruction would cover what each Council thought is most important for students to know in preparing for the ACCUPLACER placement tests. Furthermore, this can be taken a step further including different types of workshops that are based on instructor feedback or student feedback and are specifically catered to the students' needs and learning styles. These are important factors to consider because they readily address students' concerns and confusion over the material, include methods that focus on the students' ability to absorb new material, and further engage students in the material that they will be learning.

To address the findings of the significant differences in English and Reading scores, an intervention process is recommended to create a boot camp in the summer for those students who tested into one or more remedial courses in English and Reading. This boot camp would consist of a Reading and English component and offered to students free of charge. Any students will be welcome to attend although the target population will be those students who tested into one or more remedial courses in English and Reading. The Reading element will be a beginning reading course designed to improve basic reading skills. Including

- Word recognition
- Interdisciplinary vocabulary development

- Recognizing patterns of organization
- Interpreting inference
- Interpreting graphic materials.
- Emphasis on identifying main ideas and related details.

The English component of the boot camp will consist of

- Explain informal and formal purposes for writing to a specific audience.
- Apply appropriate reading strategies to understand texts related to writing tasks.
- Describe and apply a process approach to writing including prewriting, writing, and editing.
- Organize well-crafted sentences and paragraphs to relate to a central idea.
- Produce coherent and grammatically correct writing using proper conventions in writing.
- Explain the purpose of feedback in writing and apply feedback to improve written work.
- Write sentences that vary in complexity in response to a prompt or text
- Use available resources to acquire feedback and assistance for improving writing
- Use technology as a tool to facilitate the writing process and generate written texts

- Demonstrate an understanding of the role of source materials in the writing process and familiarity with campus resources for source materials

The boot camp will consist of 4 days a week for a five-week span. Students will attend 4 hours per day and will be divided into a 2-hour reading instruction block and a 2-hour English instruction block. Mandatory attendance will be the expectation to successfully complete the boot camp. The findings from the study showed students who received financial aid assistance scored lower on the English and Reading test. So, after the completion of the English and Reading portions of the boot camp, all students will be required to participate in a two-week, Monday-Thursday for 2 hours a day, college level- college success course (CPD 150--Strategies for College Success). This course will be paid for by federal aid for those students who qualify. Other students will be offered scholarships or grants providing they qualify. The course will consist of

- Identify and describe campus support services
- Identify and apply time-management strategies.  
Identify and apply goal-setting strategies.
- Identify preferred learning strategies and describe the relationship to teaching and learning.
- Identify and utilize interpersonal communication skills.
- Identify and utilize strategies to organize study materials.
- Identify and utilize note-taking strategies.
- Identify and utilize course materials and reading strategies.

- Identify and utilize test-taking strategies.
- Identify and utilize strategies to improve memory.
- Identify and utilize strategies for critical and creative thinking.
- Describe the process of educational and career planning.
- Describe current occupational trends and outlooks.
- Utilize career planning resources.
- Develop an educational plan
- Financial Literacy

If students complete the five-week boot camp and the two-week college success course, then students will be eligible to register into college level courses. After completing the first year of college courses, it is recommended that a regression and an ANOVA analysis is ran again, to see if there is a significant difference between those students who attended the boot camp versus those who did not. In conducting these analyses other variables such as participants' race that was categorized as either White, Hispanic, or Other, with the category of Other including a vast variety of races such as Blacks and Asians. It is then suggested that future studies include larger samples of different racial and ethnic minorities in addition to Whites and Hispanics so that they can be compared appropriately. The results of the regression and an ANOVA analysis will allow the colleges to better utilize resources to retain students to completion of their certificate or degree programs. It is imperative to measure the outcome of the effectiveness of the intervention (Boot Camp) as it relates to students' success.

. Placement testing is an issue for open-admissions community colleges because students do not understand the importance of test preparation or participating in a workshop before taking the ACCUPLACER. Thus, the significance of this research was to gather data that lead to proving that testing preparation does make a difference. The recommendations for future research and intervention are (1) focus on repeated measures analyses, (2) future research that investigates crucial variables that could impact the academic improvement of students including larger samples of different racial and ethnic minorities, (3) a study that would be particularly motivating to see if there was a difference in scores between participants that received the workshop or participants that received instruction in a video format, and (4) a recommended intervention process to create a boot camp in the summer for those students who tested into one or more remedial courses in English and Reading. These recommendations for future research and intervention are necessary to measure the effectiveness of student outcome.

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## APPENDIX A: Sample High Schools

---

Mountain View	Desert Ridge (Gilbert)
Gilbert	William Field
Chandler	McClintock
Skyline	Dobson
Mesa	Tempe
Westwood	Corona Del Sol
Mountain Point	Mesquite
Desert Ridge (Gilbert)	Hamilton
Highland	Red Mountain Sequoia
Marco De Niza	
North	Desert Vista
Sunrise Mountain	Bradshaw Mountain
Deer Valley	Apache Junction
Sun Valley	Basha
Primavera on-line	Metro Tech
Horizon	Valley Christian
Heritage	Round Valley
Tri-City Christian	Verrado
Higley	

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**APPENDIX B: Race of Student**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Am. Indian	7	2.3	2.3	2.3
	Asian	19	6.3	6.3	8.7
	Black	19	6.3	6.3	15.0
	Hawaiian	3	1.0	1.0	16.0
	Hispanic	99	33.0	33.0	49.0
	Not Specified	15	5.0	5.0	54.0
	Two/More	10	3.3	3.3	57.3
	White	128	42.7	42.7	100.0
	Total	300	100.0	100.0	





**To:** Dwayne McIntosh, 3 Masters  
**From:** NAU IRB Office  
**Approval Date:** December 4, 2017

**Project:** Remediation and Performance in Standardized testing Accuplacer preparation and placement outcomes at a large community college in the southwest

**Project Number:** 1128793-1

**Submission:** New Project

**Review Level:** Exempt Review

**Action:** EXEMPT

**Project Status:** Exempt

**Review Category/ies:** **Exempt Approval 45 CFR 46.101(b)(1)(i):** Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as research on regular and special education instructional strategies.

**Exempt Approval 45 CFR 46.101(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.

This submission meets the criteria for exemption under 45 CFR 46.101(b). This project has been reviewed and approved by an IRB Chair or designee.

- Northern Arizona University maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00000357).
- All research procedures should be conducted in full accordance with all applicable sections of the guidance.
- Exempt projects do not have a continuing review requirement.
- This project should be conducted in full accordance with all applicable sections of the guidance and you should notify the IRB immediately of any proposed changes that affect the protocol.

- Amendments to exempt projects that change the nature of the project should be submitted to the Human Research Subjects Protection Program (HRSP) office for a new determination. See the guidance Exempt Research for more information on changes that affect the determination of exemption. Please contact the HRSP to consult on whether the proposed changes need further review.
- You should report any unanticipated problems involving risks to the participants or others to the IRB.
- All documents referenced in this submission have been reviewed and approved. Documents are filed with the HRSP Office. If subjects will be consented, the approved consent(s) are attached to the approval notification from the HRSP Office.
- Exempt projects are maintained in HRSP for five (5) years from approval. An updated application is required every five (5) years.-----

Personnel Information ..... 1

Subject Population ..... 1  
1

Study Location ..... 2

General Checklist ..... 3

Funding ..... 3

Expedited Paragraphs ..... 4

Purpose, Study Procedures, Background ..... 6

Subject Population ..... 7

Subject Population ..... 8

Risks	9
Benefits, Procedures to Maintain Confidentiality	10
Potential Conflict of Interest	11
Informed Consent	12
Assent Background	12
Attachments	13
Obligations	13
Event History	14

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1

**\*\*\* Personnel Information \***  
**\*\***

**Principal Investigator**

**Name of Principal  
Investigator**

**Degree: (MS/PhD)**

**Title**

**(Faculty, Staff or Postdoc)**

McIntosh, Dwayne

Master Educational Counseling

PI

<b>Email</b>	<b>Phone</b>	<b>Fax</b>
dwayne.mcintosh@mesacc.edu	480-461-7598	480-461-7907
<b>Department Name</b>	<b>Mailing Address</b>	<b>Institution</b>
525	2915 E. Harwell Road Gilbert, Arizona 85234	Mesa Community College

<a href='http://phrp.nihtraining.com/users/login.php' target=\_blank > Human

**Subjects Training Completed?**

Y

**Co-Principal Investigator**

<b>Name of Co-Principal Investigator</b>	<b>Degree: (MS/PhD)</b>	<b>Title</b>
Delecki, Walter	PhD	co-PI

<b>Email</b>	<b>Phone</b>	<b>Fax</b>
walter.delecki@nau.edu	480-540-7000	

<b>Department Name</b>	<b>Mailing Address</b>	<b>Institution</b>
Education	145 N. Centennial Way	Northern Arizona University

<a href='http://phrp.nihtraining.com/users/login.php' target=\_blank > **Human Subjects Training Completed?**

No training data is available.
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**\*\*\* Subject Population \*\*\***

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### Subject Population(s) Checklist

Select All That Apply :

Children under 18 years of age

Individuals with mental disabilities

Prisoners

**Economically disadvantaged**

**Elderly**

**Individual with physical disabilities**

**Employees**

X **Students**

**None of the above Other, specify**

---

**\*\*\* Study Location \*\*\***

**Study Location(s) Checklist**

**Select All That Apply - Note: Check "Other" and input text: 1. If your location is not listed, or 2) If you would like to list details of your already-checked location (e.g., specific school within a school district)**

**CG**

**EM**

**GW**

**GC**

X **MC PC PV RS SC**



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**SM**

**DO**

**Other (Specify other study location)**

-----

**\*\*\* General Checklist \*\*\***

**General Checklist**

Select All That Apply :

Cooperating/Collaborating Institution(s) -Institution

where recruitment will occur OR Institution where  
Collaborating PI will conduct associated research.

Federally Sponsored Project

Training Grant

Program Project Grant

Subjects will be compensated for participation

Behavioral observation

Deception

Human blood, cells, tissues, or body fluids

Interview

Study of existing data

Survey/questionnaire

X Thesis or Dissertation Project Waiver of consent  
Other (clarify in text box to the right)

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**\*\*\* Funding \*\*\***

**Funding Checklist**



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**X NONE**

**NOTE: If applicable, Grant Application must be attached in the Attachment Section (#11).**

**Funding - Other**

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**\*\*\* Expedited Paragraphs \*\*\***

**PLEASE READ:** The criteria for expedited review are listed below. Please review these criteria to evaluate if your protocol meets the expedited-review criteria. For expedited review, a protocol must be no more than minimal risk (i.e., "not greater than those ordinarily encountered in daily life") AND must only involve human subjects in one or more of the following numbered paragraphs. If none of the expedited criteria are appropriate for your project, please move to the next screen without selecting any of these criteria; your protocol will be reviewed by the full IRB. Note: The IRB will make the final determination if your protocol is eligible for expedited review.

**Expedited Criteria:**

- 1. Clinical studies of drugs and medical devices only when condition (a) or (b) is met.**
  - a) Research on drugs for which an investigational new drug application (21 CFR Part 312) is not required. (Note: Research on marketed drugs that significantly increases the risks or decreases the acceptability of the risks associated with the use of the product is not eligible for expedited review.)**
  - b) Research on medical devices for which**
    - i) An investigational device exemption application (21 CFR Part 812) is not required; or**
    - ii) The medical device is cleared/approved for marketing and the medical device is being used in accordance with its cleared/approved labeling.**
- 2. Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture as follows:**
  - a) From healthy, nonpregnant adults who weigh at least 110 pounds. For these subjects, the amounts drawn may not exceed 550 ml in an 8-week period and collection may not occur more frequently than 2 times per week; or**

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- b) From other adults and children, considering the age, weight, and health of the subjects, the collection procedure, the amount of blood to be collected, and the frequency with which it will be collected. For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8-week period and collection may not occur more frequently than 2 times per week.
3. Prospective collection of biological specimens for research purposes by non- invasive means.
  4. Collection of data through non-invasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications.)

**Examples:**

- a) **Physical sensors that are applied either to the surface of the body or at a distance and do not involve input of significant amounts of energy into the subject or an invasion of the subject's privacy;**
  - b) **Weighing or testing sensory acuity**
  - c) **Magnetic resonance imaging**
  - d) **Electrocardiography, electroencephalography, thermography, detection of naturally occurring radioactivity, electroretinography, ultrasound, diagnostic infrared imaging, doppler blood flow, and echocardiography;**
  - e) **Moderate exercise, muscular strength testing, body composition assessment, and flexibility testing where appropriate given the age, weight, and health of the individual.**
5. **Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis). (NOTE: Some research in this paragraph may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(4). This listing refers only to research that is not exempt.)**
6. **Collection of data from voice, video, digital, or image recordings made for research purposes.**
- X 7. **Research on individual or group characteristics or behavior(including, but not limited to, research on**

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perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.)

-----  
**\*\*\* Purpose, Study Procedures, Background \*\*\***



Original Protocol Number (e.g., 07-226H)

Title (Please indicate if the protocol title is different from the proposal title)

REMEDICATION AND PERFORMANCE IN STANDARDIZED TESTING: ACCUPLACER PREPARATION AND PLACEMENT OUTCOMES AT A LARGE COMMUNITY COLLEGE

Project Start Date

02/05/2018

Project End Date

05/18/2018

Complete Sections 1 - 11. Specify N/A as appropriate. Do not leave any sections blank.

1. Purpose of the study

- a) Provide a brief lay summary of the project in < 200 words. The lay summary should be readily understandable to the general public.

The purpose of this dissertation is to determine if the students who participated in the community college Preparing for ACCUPLACER Workshop perform better than those who do not on the English, reading, and mathematics placement tests.

- b) What does the Investigator(s) hope to learn from the study?

The investigator hope to learn does participation in the Preparing for ACCULACER Workshop lead to high performance in placement testing?

2. Study Procedures (If this is a student project, the Methods Section of the thesis or dissertation proposal must be attached in section #11 - Attachment Section.)

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**Protocol  
Title:**

REMEDICATION AND PERFORMANCE IN STANDARDIZED  
TESTING:

ACCUPLACER PREPARATION AND PLACEMENT OUTCOMES  
AT A

LARGE COMMUNITY COLLEGE

**Protocol  
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Submitted:**

**Draft**

**Approval  
Period:**

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- a) **Describe all study procedures. Please note: The box below is for text only. If you would like to add tables, charts, etc., attach those files in the Attachment section (#11).**

This dissertation allows the researcher an opportunity to explore the success of the AACUPLACER workshop by placing it in the broader theoretical context of the impact of remediation on both success in standardized testing and academic accomplishment. Specifically, the dissertation asks the following question: What impact does participation in the Preparing for ACCUPLACER Workshop have on placement outcomes for students who have attended the workshop?

- b) **State if audio or video taping will occur. Describe how the tapes will be maintained during and upon completion of the project. Describe what will become of the tapes after use (e.g., shown at scientific meetings, erased, etc.).**

students will have the option of attending the workshop in person or by video

- c) **State if deception will be used. If so, provide a rationale and describe debriefing procedures. Submit a debriefing script in the Attachment section (#11).**

No

### 3. Background/Rationale

- a) **Briefly describe past findings leading to the formulation of the study, if applicable.**

Does participation in the Preparing for ACCULACER Workshop lead to high performance in placement testing? Some argue that performance is innate, linking ability to DNA and all, where one is either born "with or without it" (Sparkman, et al. 2012). This school of thought is that no amount of preparation can change this "destiny" (Weaver, 2011). The second school of thought insists that performance is like everything else in human life: "practice makes perfect" (May, 2013). That is, if one prepares oneself well, one will do well on such tests. A corollary of this preparation paradigm holds that both general standardized test preparation and, specifically, preparation for placement tests yield positive results. Naturally, this latter position has led to the growth of a "cottage industry" in test preparation workshops. One question remains, though: what difference does preparation for placement tests make? This is quite different from the perennial question of whether placement testing captures level of knowledge. This paper centers on the first question.

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**\*\*\* Subject Population \*\*\***

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**4. Subject Population - In the space below, please describe the participants that you are requesting to recruit (include requested participant number and description of each group requested).**

**a) Requested Participant Description (Include number that you plan to study and description of each group requested, if applicable).**

The researcher is requesting to

**b) What is the rationale for studying the requested group(s) of participants?**

- c) **If applicable, state the rationale for involvement of potentially vulnerable subjects to be entered into the study, including minors, pregnant women, economically and educationally disadvantaged, and decisionally impaired people. Specify the measures being taken to minimize the risks and the chance of harm to the potentially vulnerable subjects.**
  
  - d) **If women, minorities, or minors are not included, a clear compelling rationale must be provided. Examples for not including minors: participant must be a registered voter; the drug or device being studied would interfere with normal growth and development; etc.**
  
  - e) **State if any of the subjects are students, employees, or laboratory personnel. They should be presented with the same written informed consent. If compensation is allowed, they should also receive it.**
  
  - f) **Describe how potential subjects will be identified for recruitment. Examples include: class rosters, group membership, individuals answering an advertisement, organization position titles (i.e., Presidents, web designers, etc.). How will potential participants learn about the research and how will they be recruited (e.g., flyer, email, web posting, telephone, etc.)? Attach recruitment materials in the Attachment section (#11). Important to remember: subjects cannot be contacted before IRB approval.**
- 

**\*\*\* Subject Population \*\*\***

**4. Subject Population (continued)**

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- g) Identify the inclusion and exclusion criteria.
  
- h) Compensation. Explain the amount and schedule of compensation, if any, that will be paid for participation in the study. Include provisions for prorating payment.
  
- i) Estimate the probable duration of the entire study. This estimate should include the total time each subject is to be involved and the duration the data about the subject is to be collected (e.g., This is a 2-year study. Participants will be interviewed 3 times per year; each interview will last approximately 2 hours. Total approximate time commitment for participants is 12 hours.)

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**\*\*\* Risks \*\*\***

**5. Risks (Input N/A if not applicable)**

US Department of Health & Human Services (HHS) Regulations define a subject at risk as follows: "...any individual who may be exposed to the possibility of injury, including physical, psychological, or social injury, as a consequence of participation as a subject in any research, development, or related activity which departs from the application of those accepted methods necessary to meet his needs, or which increases the ordinary risks of daily life, including the recognized risks inherent in a chosen occupation or field of service."

**a)**

For the following categories, include an estimate of the potential risk. Input N/A if not applicable.

**Physical well-being.**

**Psychological well-being.**

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**Political well-being.**

**Economic well-being.**

**Social well-being.**



- b) In case of overseas research, describe qualifications/preparations that enable you to evaluate cultural appropriateness and estimate/minimize risks to subjects.
- c) Discuss plans for ensuring necessary medical or professional intervention in the event of a distressed subject.
- d) If audio/video taping will be used, state if it could increase potential risk to subject's confidentiality.

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**\*\*\* Benefits, Procedures to Maintain Confidentiality \*\*\***

**6. Benefits**

- a) Describe the benefits and/or any compensation that the participating individuals can expect.
- b) Describe the gains in knowledge that may result from the project.

**7. Procedures to Maintain Confidentiality**

- a) Describe the procedures in place that will protect the privacy of the subjects and maintain the confidentiality of the data. If a linked list is used, explain when the linked list will be destroyed. Provide a sample of the code that will be used, if applicable.

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- b) If information derived from the study will be provided to the subject's personal physician, a government agency, or any other person or group, describe to whom the information will be given and the nature of the information.
  
- c) Specify where and under what conditions study data will be kept, how samples will be labeled, who has access to the data, and what will be available and to whom. Federal Regulations require that study data and consent documents be kept for a minimum of three (3) years after the completion of the study by the PI. For longitudinal projects, the PI may be required to keep the data and documents for a longer time period.

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**\*\*\* Potential Conflict of Interest \*\*\***

**8. Potential Conflict of Interest**

Although you have already submitted MCCC'D's official Conflict of Interest form (COI/COC) to the University, It is the IRB's responsibility to ensure that conflicting interests related to submitted protocols do not adversely affect the protection of participants or the credibility of the human research protection program at MCCC'D. Please answer questions a-d below. Please note that if you indicate that you have a potential conflict of interest in relation to this protocol, your MCCC'D COI/COC Reporting Form must reflect this potential conflict. Link to MCCC'D's Conflict of Interest policy: <a href=http://www.maricopa.edu/legal/blc/coi\_emplsubj.htm target=\_blank > http://www.maricopa.edu/legal/blc/coi\_emplsubj.htm

- a) **In connection with this protocol, do you or any of the protocol investigators or their immediate family members (i.e., spouse and legal dependents, as determined by the IRS) have a potential conflict of interest?**
- b) **If you do have a potential conflict of interest, is this reported in your current COI/COC?**
- c) **If you do have a potential conflict of interest, is there a management plan in place to manage this potential conflict?**
- d) **If you do have a potential conflict of interest, is this potential conflict of interest included in your consent document (as required in the Management Plan)?**

**If you have reported a possible conflict of interest, the IRB will forward the title of this protocol to your Research**

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**Associate Dean to complete your COI file.**

For more information on MCCC'D's policy on Conflict of Interest, please see the Maricopa County  
Community College District Academic Faculty and Administrative Professional Manual Sections D.7.6 &  
D.7.7:<a href=http://www.maricopa.edu/legal/blc/coi\_emplsubj.htm target=\_blank >  
http://www.maricopa.edu/legal/blc/coi\_emplsubj.htm

Link to MCCC'D's Conflict of Interest policy:<a href=http://www.maricopa.edu/irb/forms.php target=\_blank >  
http://www.maricopa.edu/irb/forms.php

**\*\*\* Informed Consent \*\*\***

**9. Informed Consent** See sample consent forms at <http://www.maricopa.edu/irb/forms.php>

NOTE: In order to complete this protocol, you must upload either a Consent Form or an Alteration of Consent Form (i.e., Cover Letter or Verbal Script) OR (if neither of those apply to your project) you must complete the Waiver of consent information.

In the space below, provide consent process background information, for each Consent Form, Alteration of Consent Form (i.e., Cover Letter or Verbal Script), or Waiver of consent. You will not be able to submit this protocol without completing this information.



**\*\*\* Assent Background \*\*\***

**10. Assent Background**

All minors must provide an affirmative consent to participate by signing a simplified assent form, unless the Investigator(s) provides evidence to the IRB that the minor subjects are not capable of assenting because of age, maturity, psychological state, or other factors.

See sample assent/consent forms at <http://www.maricopa.edu/irb/forms.php>

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If applicable, provide assent process background information for each Assent Form, Alteration of Assent Form (i.e., Cover Letter or Verbal Script), or Waiver.

-----  
**\*\*\* Attachments \*\*\***

**11. Attachments**

Attach relevant documents here. These could include: Human Subjects Protection training certification; Collaborating Investigator's IRB approval and approved documents; Conflict of Interest information;

Debriefing Script; Grant/Sub-contract; HIPAA Authorization or Waiver Form from HIPAA-covered entity; Interview/Focus Group Questions; Investigator's Brochure; Letters of Agreement/Cooperation from organizations who will help with recruitment; Methodology section of associated Thesis or Dissertation project; Questionnaires; Radiation Control Office approval material; Recruitment Material (e.g., flyers, email text, verbal scripts); Sponsor's Protocol; Surveys; Other files associated with protocol (can upload most standard file formats: xls, pdf, jpg, tif, etc.) Please be sure to attach all documents associated with your protocol. Failure to attach the files associated with the protocol may result in this protocol being returned to you for completion prior to being reviewed. Students: Be sure to attach the Methods Section of your thesis or dissertation proposal. All PIs: If this protocol is associated with a grant proposal, please remember to attach your grant.

To update or revise any attachments, please delete the existing attachment and upload the revised document to replace it.

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**\* \* \* Obligations \* \* \***

**Obligations (Researcher's Responsibilities)**

**In making this application, I certify that:**

- 1) I have successfully completed the IRB required human subjects research training and have attached a certificate of completion.**
- 2) I have read the protocol and method of obtaining informed consent, as outlined by the MCCCD IRB Handbook, and will follow it during the period covered by this research project.**

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**3) I agree to comply with the letter and spirit of MCCCCD IRB Policies.**

**4) I agree to comply with federal, state, and local laws regarding the protection of human participants in research.**

**5) I will submit any future changes to the research project to the IRB for review and approval prior to implementation, as these may alter the exempt status of the project**

**6) I agree that any new findings that develop during the course of this study that may affect the risks and benefits to participants will be promptly reported to the IRB in writing.**

**7) I agree that any adverse events that occur in the course of this study will be promptly reported to the IRB in writing.**



8) I agree and understand that records of the participants will be kept for at least six (6) years after the completion of the research.

9) I understand the IRB review is in effect for one year, unless changes are made to the study/project. If I plan to continue my research for more than one year, I will submit a Continuing Research Review form to the IRB.

10) I may begin research when the IRB gives notice of its approval.

11) I accept responsibility for the conduct of this research.

12) I understand that I will need to obtain institutional approval from all participating colleges before this protocol will be reviewed by the IRB.

**The Principal Investigator has read and agrees to abide by the above obligations.**

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**\* \* \* Event History \* \* \***

**Event History**

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**Status**

**View Attachments**

**Letters**

10/09/2017

NEW FORM CREATED