THE EFFECT OF THE ARIZONA AIMS SCHOLARSHIP ON UNDERGRADUATE STUDENT OUTCOMES

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ABSTRACT

THE EFFECT OF THE ARIZONA AIMS SCHOLARSHIP

ON UNDERGRADUATE STUDENT OUTCOMES

LACINDA SMOOT LEWIS

This study examined the effect of the Arizona Instrument to Measure Standards (AIMS) Scholarship on college cohort retention, college cohort completion, and college cohort time to completion—important student performance markers in an era of fiscal accountability. Over the six-year span (2006 – 2012) of this one year, renewable) full-tuition (waiver) merit-based award, a total of 25,357 Arizona high school graduates received this scholarship to attend one of Arizona's three public universities—at a cost of $153.6 million.

This quantitative research study followed Mesa Public School (MPS) graduates from 2009-2011 academic years. They were matched with Arizona State University (ASU) student directory information. The anonymized file provided student-level data from MPS through the students ASU careers. To estimate the causal effect of the AIMS Scholarship on undergraduate student performance outcomes, the researcher employed a quasi-experimental design to match students who received the AIMS Scholarship with those who did not on all the pre-treatment characteristics such as gender, minority status, socioeconomic status (SES), high school Grade Point Average (GPA), American Collee Testing (ACT) Composite, and the AIMS requirements. The only difference between the two groups (122 per group) was that one received the AIMS Scholarship, and one did not. This quasi-experimental design reduced the potential for omitted variable bias (i.e., individual motivation, familial support, etc.) and allowed for estimating the true causal effect of the AIMS Scholarship.

The results of this research indicated that receiving the AIMS Scholarship appeared to have no effect on the likelihood of retention for women but had a strong positive effect on the likelihood of retention for men—a predictor for graduation. In addition, the AIMS Scholarship had a strong positive effect on the likelihood of retention for high and low SES students, but a much stronger effect for those with low SES than those with high SES. Lastly, receiving the AIMS Scholarship appeared to have no effect on the number of semesters taken to graduate for women, but appeared to increase the time to graduation for men by approximately 1.6 semesters—all important effects in an era of increased accountability for undergraduate performance outcomes and fiscal accountability.

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In June of 2018, Dr. Joseph O'Reilly shared the idea to use Mesa Public School's (MPS) student-level data to study the AIMS Scholarship. As the former Director of Research and Evaluation at MPS, his interest in my success was appreciated. The support of Dr. Michael Cowan, MPS Superintendent in 2018 and Holly Williams, the Assistant Superintendent was invaluable. Dr. Robert Carlisle, MPS's current Director of Research and Evaluation was not only instrumental in gathering the MPS data but correlating the ASU data as well. His willingness to work with me from far (Cambodia) and near (Arizona) was appreciated.

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TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

LIST OF FIGURES

FIGURE PAGE

DEDICATION

I dedicate this effort to my family. My parents, Doug and Marian Smoot, raised me and my three sisters, Analee, Michelle, and Mindy, with a love of learning. From an early age, I had a desire to earn a doctoral degree and my parents encouraged me throughout my decades of living. Six months before my dad's passing (former Dean of Engineering at Brigham Young University ([BYU), he edited an early draft of my dissertation while on a 20-hour flight to Cambodia to visit me and my husband, John. I will always cherish my dad's handwritten notes. At the time, we were serving as President and Companion for the Cambodia Phnom Penh Mission of The Church of Jesus Christ of Latter-day Saints (2018-2021).

I wish to express my love and affection for my husband, John, who supported this deep desire of my heart. He read and edited a plethora of class papers and many early drafts of my dissertation. I also express my abiding love for our children, *the eight great wonders of the world,* and their spouses including Lauren (Stephen), Ben (Paige), Douglas (Annie), Diana (Adam), CJ (Taryn), Jennie (Steven), Charles, and Kelvin plus our twenty-five grandchildren and counting. Special thanks go to my sisters and many of our children who also read and edited various papers and dissertation drafts. Over the duration of my schooling, they did not complain about my need to study at night while visiting them.

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CHAPTER ONE: INTRODUCTION

Chapter One of this study addresses the impetus and the importance for researching, analyzing, and reporting undergraduate student performance outcomes for an Arizona undergraduate merit-based aid—Arizona's Instrument to Measure Standards (AIMS) Scholarship. The overarching concerns that drive this study center on merit-based education policy, the alignment of this policy to Arizona's public universities' goals for students, and the effect of the AIMS Scholarship on undergraduate student performance outcomes—college cohort retention, college cohort completion, and college cohort time to completion. This chapter provides an introduction and background for the research problem and the purpose of the study. The specific research questions, null and alternate hypotheses are listed followed by a discussion on the significance of the study. In addition, the operational definitions are delineated, the abbreviations are described, the assumptions, limitations, and delimitations are discussed followed by a summary.

Background of the Study

The relationship of government and institutions of higher learning has changed from a centuries-old, self-regulatory process to one of accountability for increased fiscal and operational efficiency and effectiveness for undergraduate student performance outcomes (Alexander, 2000; Conner & Rabovsky, 2011; Crow & Dabars, 2015; Kezar, 2014). With external stakeholders' involvement in higher education (Kezar, 2014), there are increased demands for institutions to respond to national needs for trained and educated employees, and to improve undergraduate student performance outcomes of college cohort retention and college cohort completion (Alexander, 2000; Conner & Rabovsky, 2011; Kallison & Cohen, 2010; Kezar, 2014; Tinto, 2011). It is within this age of academic accountability and demands for fiscal responsibility that

the Arizona Board of Regents (ABOR)—the governing body for Arizona's three public universities— established the AIMS Scholarship. It is a merit-based aid in the form of a scholarship—as stated by Paula Gates, the manager of ABOR's constituent communications (personal communication, March 25, 2019). Arizona's high school graduates who exceeded the standards on the AIMS Test and met all the other qualifications and earned the full tuition AIMS Scholarship had the choice to apply to an Arizona public university including Arizona State University (ASU), the University of Arizona (UA), and Northern Arizona University (NAU) (Upton, 2016). The AIMS Scholarship provided a financial incentive to encourage Arizona's high school students to pass the AIMS Test—Arizona's high-stakes graduation exam (Stephenson, 2007). The benefits included the flow of federal dollars and the potential for increased retention of Arizona's brightest students at ASU, UA, and NAU (Stephenson, 2007).

Statement of the Problem

Education policy influences state aid for higher education. While some scholars, education advocates, and policymakers focused their research on the trend away from need-based financial aid (Chen & DesJardins, 2010; Douglass, 2010; Umbricht, 2016), other researchers examined the negative social consequences of reduced state budget allocations on higher education (Ikpa, 2016; Johnson et al., 2011; Kallison & Cohen, 2010; McLendon et al., 2009). In this climate of policy fluctuations and financial aid changes (Chen & DesJardins, 2010; Douglass, 2010; Martinez & Turner, 2015; Umbricht, 2016)**,** increased higher education tuition **(**Avery & Turner, 2012; Jacobs & Whitfield, 2012; Johnstone, 2004; St. John et al., 2005; Taylor et al., 2016; Umbricht, 2016), reduced state budget allocations (Ikpa, 2016; Johnson et al., 2011; Kallison & Cohen, 2010; McLendon et al., 2009), and stakeholder accountability (Crow &

Debars, 2015; Kezar, 2014), that state-run, incentive-driven, merit-based aid policy came to fruition (Upton, 2016).

Shifts in financial aid public policy began a movement toward rewarding high school students' academic achievements with the financial incentive of a generous undergraduate scholarship (Ness, 2007). Across the nation, as key stakeholders increased demands for improved higher education completion rates (Coley et al., 2016; Conner & Rabovsky, 2011; Kuh et al., 2008; Page & Scott-Clayton, 2016; Spradlin et al., 2010; Tinto, 2011), merit-based aid in the form of a scholarships became one way to retain in-state high school graduates with academic acumen (Stephenson, 2007) with the potential for improved graduation rates (Burd, 2015).

Specifically, Sjoquist and Winters (2015) investigated five research projects and their specific merit-based scholarship programs as they related to undergraduate student performance outcomes. Three separate study teams researched merit-based scholarship using data from their state agencies to examine Georgia (Henry et al., 2004), West Virginia (Scott-Clayton, 2011), and Tennessee (Bruce & Carruthers, 2014), respectively. According to Sjoquist and Winters (2015) who reviewed the three studies (Bruce & Carruthers, 2014; Henry et al., 2004; Scott-Clayton, 2011), merit-based scholarships increased college completion. In the other two studies reviewed by Sjoquist and Winters (2015), the conclusions were mixed. As reviewed by Sjoquist and Winters (2015), both Dynarski (2008) and Sjoquist and Winters (2012a) utilized two thousand Census data to explore the relationship between merit-based scholarships and college completion. Dynarski (2008) posited that merit-based scholarships had a positive effect on college completion for higher education graduates in Arkansas while Sjoquist and Winters

(2012a) found no relationship between the Hope Scholarship—a merit-based award, and college completion in Georgia.

At this critical public policy juncture, ABOR established the AIMS Scholarship for "the purpose of recognizing high school students for outstanding academic achievement, as demonstrated through test scores"—specifically, the AIMS Test (ABOR, 2004b, p. 54, Item 7 section). The AIMS's Test was a K-12 high-stakes exam for high school students and was developed as higher education state appropriations were fluctuating for Arizona's three public universities. Arizona's high school students who exceeded the standards on the AIM Test and met all other requirements, earned the AIMS Scholarship. The scholarship was a one-year (renewable), full-tuition (waiver) for qualifying Arizona's high school graduates to use at one of Arizona's three public universities (Upton, 2016).

From the beginning of the AIMS Scholarship dissemination, and until the fall of 2011, high school students were given three chances—separate attempts over several years—to pass the AIMS Test (Pallack, 2010a). The student demand to take the AIMS Test, a second and a third time, was a surprise to ABOR, educators, and policymakers as were the burgeoning numbers of students who exceeded the standards on the AIMS Test and met all of the other AIMS requirements and earned the AIMS Scholarship (Academic Affairs Committee, 2010; Pallack, 2010b). Over the six-year span of the full-tuition, merit-based award, a total of 25,357 students received the AIMS Scholarship at a cost of $153.6 million (P. Gates, personal communication, March 25, 2019).

According to Doyle (2006), Sjoquist and Winters (2012b), and Upton (2016), Arizona was among a group of states to establish a scholarship based upon academic merit for all AIMS qualified, in-state high school graduates. Although the AIM's scholarship was not part of

Doyle's (2006) research on fifteen state-driven, merit-based scholarship programs costing a collective 1.2 billion dollars, he concluded that a shift had occurred in education policy—a shift away from need-based aid to rewarding students' academic performances through generous merit-based scholarships. In another study—the only study to analyze Arizona's AIMS Scholarship—Upton (2016) analyzed the effect of multiple merit-based scholarships on enrollment with the completion question as an aggregate. Upton (2016) reported that the AIMS Scholarship increased student undergraduate enrollment but found no evidence of students' second-year retention. The important completion question was addressed as an aggregate while time to completion was not analyzed (Upton, 2016).

Concurrently with merit-based aid (awards and scholarships) discussions on college campuses, demands by stakeholders for improving college cohort completion rates were fomenting (Coley et al., 2016; Conner & Rabovsky, 2011; Kuh et al.; 2008; Page & Scott-Clayton, 2016; Spradlin et al., 2010; Tinto, 2011). This push led to the development and implementation of college and university strategic goals for student success. By 2004, ABOR established six long-term *Strategic Directions* including student performance outcome goals as noted in the following:

> The quality of life and improvement in the social, economic, and environmental health of Arizona's citizens is directly related to the education, research and public service provided by Arizona's public universities. Access to a university education for Arizona citizens, particularly for the fast-growing number of first generation, time- and place-bound students, is critical to social stability, meeting workforce needs, and having citizens who are responsible stewards of the state's legacies and resources. (ABOR, 2004a, p. 82)

ABOR's six long-term *Strategic Directions* provide a broad focus for its planning and are a guide for university strategic planning. They are to:

1. Increase Student Participation in University Education.
2. Enhance the Quality of Student Education.
3. Increase Affordable Education for Students.
4. Provide an Educated, Competitive Workforce.
5. Enhance Research and Impact Economic Development.
6. Optimize University Resource Acquisition and Work Environment. (ABOR, 2004a, p. 82)

The alignment to ABOR's 2004 *Strategic Direction* goals to increase student participation and improve affordability (particularly for first-generation students) for undergraduate student performance outcomes tied to the AIMS Scholarship have yet to be determined. According to Barrow et al. (2014), there is increased interest in analyzing incentive awards and scholarships to stimulate improved undergraduate student performance outcomes; thus, researching, analyzing, and reporting on the effect of the $153.6 million AIMS Scholarship education policy venture is vital and timely. It is expected that the results of this research will:

1. Add to the body of knowledge regarding improved undergraduate student performance outcomes.
2. Inform education policymakers pertaining to state merit-based scholarships for undergraduate students.
3. Benefit Arizona's university administrators, educators, and students in understanding the nexus between education policy, the alignment of university goals, and undergraduate student performance outcomes.

Purpose of the Study

Through education policies and the pivotal *National Defense Education Act* of 1965, government played a key role in creating public policies for student financial aid opportunities. The goal was to spur the college access especially for underrepresented student populations (St. John et al., 2005; Tinto, 2004). However, as the number of students attending college more than doubled (Cataldi et al., 2018; Kuh et al., 2011; Tinto, 2011), from nine million students in 1980 to 20 million in 2011 (Tinto, 2011), the completion rate remained at about 50% (Bound et al., 2010; Kuh et al., 2008; Radford et al., 2010; Supiano, 2011).

Tinto (2004), among a host of other researchers (Conner & Rabovsky, 2011; Kuh et al., 2008; Page & Scott-Clayton, 2016; Spradlin et al., 2010; Tinto, 2011), emphasized the vital importance of college cohort retention towards college cohort completion for the student personally as well as the important and positive societal and economic impact that an educated population has on communities, states, and the nation. Tinto (1998) posited that increasing access without continued student participation toward completion is senseless.

When combining access, with stagnated completion rates (Conner & Rabovsky, 2011; Kuh et al., 2008; Page & Scott-Clayton, 2016; Spradlin et al., 2010; Tinto, 2011)**,** decreased federal funding (Umbricht, 2016), decreased state appropriation (Alexander et al., 2010; Ikpa, 2016; Johnson et al., 2011; Kallison & Cohen, 2010; McLendon et al., 2009; Mortenson, 2012) and increased accountability demands (Alexander, 2000; Conner & Rabovsky, 2011; Crow & Dabars, 2015; Kezar, 2014), colleges and universities sought ways to retain students with college cohort completion as their goal (Coley et al., 2016 ; Page & Scott-Clayton, 2016; Tinto & Pusser, 2006).

In recent years, state legislative appropriations for higher education declined across the nation (Ikpa, 2016; Johnson et al., 2011; Kallison & Cohen, 2010) relative to increased college enrollments and institutional budgets (Duderstadt & Womack, 2004; McLendon et al., 2009). Historically, higher education in Arizona had public support, as determined by sufficient state and local appropriations (Hoffman & Rex, 2016). As the wave of the *Great Recession* adversely impacted Arizona's citizens, businesses (employers and employees) which constituted Arizona's tax base, the Arizona Legislature simultaneously slashed millions of dollars for education appropriations to balance the state's budget (Hoffman & Rex, 2016). By the end of the fiscal decline in 2015, Arizona's state and local appropriations were 19% lower than the national average with a ranking of forty-one out of 50 (Hoffman & Rex, 2016**).** During this same time of declining state funding and increasing enrollment for ASU, UA, and NAU, Arizona educators and policymakers established the AIMS Test (Lawton, 2011)—a precursor to the AIMS Scholarship.

The AIMS Test was intended for all of Arizona K-12 students, and it was in response to President George W. Bush's K-12 federal law known as *No Child Left Behind* (NCLB) (Lawton, 2011). For an Arizona high school graduate to receive the AIMS Scholarship, the student met a set of predetermined qualifying standards. The standards included completing all high school core classes with a B average or better; earning a GPA of 3.5 in all core classes or a top 5% ranking in their graduating class; and exceeding the standards on all three portions of the AIMS Test including reading, writing and mathematics (Upton, 2016, p. 239). In addition to the benefits of high school students' testing successes, Arizona received the flow of federal dollars while the three public universities benefited from increased enrollments at Arizona's three public universities (Stephenson, 2007).

While more students than expected were taking and passing the AIMS Test and benefiting financially from the AIMS Scholarship (ABOR, 2010b; Pallack, 2010a), tuition at all three public universities soared as state appropriations declined (Pallack, 2010b). By the time, the *Great Recession* had significantly diminished the state's budget (Ryman, 2010; Schwarz, 2010), the cost of the AIMS Scholarship for the universities was unsustainable (ABOR, 2010b). In response, ABOR's Academic Affairs Committee met in 2010 and recommended altering the AIMS Scholarship by reducing the amount from 100% to 25% (ABOR, 2010c, p. 218, Item 25 section). This change to the parameters of the AIMS Scholarship was made effective by fall semester of 2013 (ABOR, 2010c; Pallack, 2010b; Ryman, 2010).

Education public policy is at the center of student financial aid programs. The focus of this study details a specific Arizona merit-based scholarship policy for undergraduate students. The purpose of this study is to research, analyze, and report the effect of the AIMS Scholarship on undergraduate student performance outcomes. The details of the AIMS Scholarship and the subsequent performance outcomes of college cohort retention, college cohort completion, and college cohort time to completion have yet to be examined. In addition, research is needed in the important aspect of fiscal accountability regarding $153.6 million awarded to 25,357 of Arizona's undergraduate student population is vital and timely.

Research Questions and Hypotheses

The three main research questions effectively framed this study and include:

1. Does receiving the AIMS Scholarship impact college cohort retention?

   H_o1. There is no statistically significant difference in college cohort retention between AIMS Scholarship recipients and non-recipients.

H1. There is a statistically significant difference in college cohort retention between AIMS Scholarship recipients and non-recipients.

a. Does college cohort retention differ by gender among AIMS Scholarship recipients?

H_o1a. There is no statistically significant difference in college cohort retention by gender between AIMS Scholarship recipients and non-recipients.

H1a. There is a statistically significant difference in college cohort retention by gender between AIMS Scholarship recipients and non-recipients.

b. Does college cohort retention differ by minority status among AIMS Scholarship recipients?

H_o1b. There is no statistically significant difference in college cohort retention by minority status between AIMS Scholarship recipients and non-recipients.

H1b. There is a statistically significant difference in college cohort retention by minority status between AIMS Scholarship recipients and non-recipients.

c. Does college cohort retention differ by socioeconomic status (SES) among AIMS Scholarship recipients?

H_o1c. There is no statistically significant difference in college cohort retention by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

H1c. There is a statistically significant difference in college cohort retention by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

2. Does receiving the AIMS Scholarship impact college cohort completion?

   H_o2. There is no statistically significant difference in college cohort completion between AIMS Scholarship recipients and non-recipients.

   H2. There is a statistically significant difference in college cohort completion between AIMS Scholarship recipients and non-recipients.

   a. Does college cohort completion differ by gender among AIMS Scholarship recipients?

      H_o2a. There is no statistically significant difference in college cohort completion by gender between AIMS Scholarship recipients and non-recipients.

      H2a. There is a statistically significant difference in college cohort completion differ by gender between AIMS Scholarship recipients and non-recipients.

   b. Does college cohort completion differ by minority status among AIMS Scholarship recipients?

      H_o2b. There is no statistically significant difference in college cohort completion by minority status between AIMS Scholarship recipients and non-recipients.

H2b. There is a statistically significant difference in college cohort completion by minority status between AIMS Scholarship recipients and non-recipients.

c. Does college cohort completion differ by socioeconomic status (SES) among AIMS Scholarship recipients?

H_o2c. There is no statistically significant difference in college cohort completion by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

H2c. There is a statistically significant difference in college cohort completion by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

3. Does receiving the AIMS Scholarship impact college cohort time to completion?

H_o3. There is no statistically significant difference in college cohort time to completion between AIMS Scholarship recipients and non-recipients.

H3. There is a statistically significant difference in college cohort time to completion between AIMS Scholarship recipients and non-recipients.

a. Does college cohort time to completion differ by gender among AIMS Scholarship recipients?

H_o3a. There is no statistically significant difference in college cohort time to completion by gender between AIMS Scholarship recipients and non-recipients.

H3a. There is a statistically significant difference in college cohort time to completion by gender between AIMS Scholarship recipients and non-recipients.

b. Does college cohort time to completion differ by minority status among AIMS Scholarship recipients?

H_o3b. There is no statistically significant difference in college cohort time to completion by minority status between AIMS Scholarship recipients and non-recipients.

H3b. There is a statistically significant difference in college cohort time to completion by minority status between AIMS Scholarship recipients and non-recipients.

c. Does college cohort time to completion differ by socioeconomic status (SES) among AIMS Scholarship recipients?

H_o3c. There is no statistically significant difference in college cohort time to completion by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

H3c. There is a statistically significant difference in college cohort time to completion by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

Significance of the Study

Although access to higher education for all student populations increased in the last half of the 20th Century, so did the pressure for students to achieve success in the academic environment as measured by college cohort retention, college cohort completion, and college

cohort time to completion across all student populations (Kuh et al., 2008; Snyder et al., 2016). Through an examination of the literature, there is just one research study that analyzed the AIMS Scholarship and the effect on undergraduate student performance outcomes. Upton's (2016) research dealt with the effect of multiple merit-based scholarships, from different states, on enrollment with the college completion question as an aggregate. Given the limited research to date on a $153.6 million public policy that impacted 25,357 undergraduate students, this study will address:

1. The important student outcomes of college cohort retention, an important aspect for underrepresented students (Jobe et al., 2016; Kuh et al., 2008; Rendon et al., 2000; Spradlin, et al., 2010; Ziskin et al., 2006).
2. College cohort completion—an equally timely topic in the current atmosphere of academic accountability and fiscal responsibility for student performance outcomes (Alexander, 2000; Conner & Rabovsky, 2011; Crow & Dabars, 2015; Kezar, 2014).
3. Cohort time to completion is especially important for students in the lowest income quartile—just 9% graduate with a four-year degree by the age of twenty-four as compared with 77% of students in the top income quartile (The Pell Institute, 2015, p. 6).

The results of this research study may better inform institutional leaders, educators, and policymakers of the benefits and unintended consequences of a costly merit-based scholarship policy as it relates to undergraduate student performance outcomes.

Definitions of Terms

College cohort retention: is defined as a student who persists beyond the freshman year with continuous enrollment. Research revealed that student engagement and a variety of support

measures including financial aid influences student persistence rated beyond their freshman year (Brock, 2010; Deming & Dynarski, 2010; Stewart et al., 2015, Tinto, 2004). This research question pertains to whether the AIMS Scholarship will aid student retention beyond the freshman year. College cohort retention as dichotomous variable are operationalized (1 = retention beyond the freshman year with continuous enrollment and 0 = otherwise).

College cohort completion: is defined as a student who persists until they are finished and receive a four-year degree (Hagedorn, 2006). Given that 44% of all students (2015-2016) do not graduate with a four-year degree within 48 months (National Center for Education Statistic [NCES], 2022, p. 1), examining this research question as it pertains to students who utilize the AIMS Scholarship is timely and vital. College cohort completion as dichotomous variable are operationalized (1 = graduated from college with a four-year degree and 0 = otherwise).

College cohort time to completion: is defined as the number of years it takes for a student utilizing the AIMS Scholarship to graduate from ASU—one of Arizona's three public universities. Accentuating the importance of graduating, students who obtain college loans but fail to graduate are three times more likely to default than those students who graduate (Federal Student Aid, 2014). According to the National Student Clearinghouse (NSCH) Research Center, "the overall national six-year completion rate for the fall 2010 cohort was 54.8 percent which counts all first-time students, regardless of institutional sector or enrollment intensity" (NSCH, 2010, p. 4). In addition, for the students in the lowest income quartile, just 9% graduate with a four-year degree by the age of twenty-four as compared with 77% of students in the top income quartile (The Pell Institute, 2015, p. 6). College cohort time to completion as dichotomous variable are operationalized (1 = Graduated from college with a degree within four-years and 0 = otherwise).

Receipt of the AIMS Scholarship: is defined by those students who were Arizona residents, graduated from one of the MPS high schools, qualified for the AIMS Scholarship, and were accepted and enrolled in at least one semester at ASU during the 2006-2012 academic years (duration of full tuition). The receipt of the AIMS Scholarship as a dichotomous indicator variable are operationalized (1 = Received AIMS Scholarship and 0 = otherwise).

Acronyms Used

For the purposes of this dissertation, the following abbreviations were used:

ABOR: Arizona Board of Regents

ACT: American College Testing

ADE: Arizona Department of Education

AIMS: Arizona's Instrument for Measuring Standards

ASU: Arizona State University

ARRA: American Reinvestment and Recovery Act

AG: Attorney General

AYP: Average Yearly Progress

AZ LEARNS: Arizona LEARNS

CBPP: Center on Budget and Policy Priorities

CSS: College Scholarship Service

CV: Control Variable

DV: Dependent Variable

ESEA: Elementary and Secondary Education Act

ESSA: Every Student Succeeds Act

FSEOG: Federal Supplemental Educational Opportunity Grant

FY: Fiscal Year

GI: Government Issue

GPA: Grade Point Average

IASA: Improving America's School Act

MOOC: Massive Open Online Course

MPS: Mesa Public Schools

NAU: Northern Arizona University

NCES: National Center for Education Statistics

NCLB: No Child Left Behind

NSCH: National Student Clearinghouse

PBF: Performance Based Funding

PIDT: Policy Innovation and Diffusion Theory

RHHE: Regents High Honors Endorsement

RTT: Race to the Top

SAT: Scholastic Assessment Test

SES: Socioeconomic Status

SSIGP: State Student Incentive Grant Program

FSEOG: Supplemental Educational Opportunity Grant

US: United States

USDoE: US Department of Education

UA: University of Arizona

Assumptions

Beginning with the researcher's desire to investigate the AIMS Scholarship, it is assumed that merit-based awards will continue to be a timely and relevant topic for higher education policy related to undergraduate student performance outcomes. Important to the study is the undergraduate college cohort retention, college cohort completion and college cohort time to completion for a slice of Arizona's undergraduate student population. Also assumed is that undergraduate student performance outcomes will continue to be important to education stakeholders. Specific to this study, the assumptions are that:

1. Mesa Public Schools (MPS) students who received the AIMS Scholarship were more likely to attend one ASU.
2. MPS students who received and retained the AIMS Scholarship were more likely to graduate from ASU.
3. Minority students who received the AIMS Scholarship were enrolled at higher rates at ASU than minority students who did not earn the AIMS Scholarship.

It is also assumed that the data collection process at ASU, MPS, and NSCH and the correlation of those data files were accurate—meaning that all available data meeting the study parameters were accurately collected and properly de-identified or anonymized.

Limitations

The limitations for this study began with the decision to select just one of the many districts from around Arizona. Though MPS is the largest and most diverse in student population, it may not be representative of other districts around the state. The variables for this study were limited to include the AIMS Scholarship—the categorical, independent variable (IV); college cohort completion (the second-year retention rate), college cohort completion rate (graduation

with a degree), and college cohort time to completion (a four-year degree earned in four years) are the continuous, dependent variables (DV); and the following are control variables (CV) to rule-out any alternative explanations:

1. Gender
2. Minority Status
3. SES
4. High school GPA
5. SAT/ACT score
6. AIMS scores/requirements

The results generated from this study may not apply to students who attend other Arizona public (district/charter) or private high schools.

Delimitations

The delimitations or scope of this study defined the boundaries which began with the researcher's topic choice of state merit-based scholarships. The delimitations extended to the study's research questions, variables, theories, population, and research methodology—all choices that were within the researcher's control. First, the AIMS Scholarship was selected because it impacted 25,357 of Arizona's undergraduate students, and cost $153,6 million (P. Gates, personal communication, March 25, 2019). In addition, there was just one study on the AIMS Scholarship—an important education policy topic (Upton, 2016). The researcher selected three main research questions with sub-questions that dealt directly with college cohort retention, college cohort completion, and college cohort time to completion. To ground the study in theory, the Bennett Hypothesis was selected to help explain the correlation between increasing student financial aid and increasing college tuition. On a subtopic under the broad umbrella of student

financial aid, the researcher chose to apply the Policy Innovation and Diffusion Theory (PIDT) to explain the clustering (by neighboring states) proliferation of state-driven merit-based scholarships (Dye, 1990).

Pertaining to the sample, there are a plethora of public-school districts and charter schools in Arizona, but the researcher chose to request archival data from the MPS district. It is the largest district in Arizona and has a bimodal student population that is representative of Arizona's growing Hispanic population. The MPS 2017-2018 statistical distribution of students included the White student population at 43.4% and the Hispanic student population at 43% (MPS, n.d.b, p. 72). Once the MPS data was received, it was vital to follow the MPS graduates who enrolled at ASU through their university careers. Specifically, ASU student-level data (de-identified) was correlated with NSCH data and MPS archival student-level data (anonymized) to measure the treatment group and control group variables. In addition, the boundaries for the student sample included only those students who attended MPS during the academic years of 2005-06 through 2011-2012 and met all additional study parameters.

Summary

ABOR, the governing body for all three public universities in Arizona, declared that *Strategic Directions* for Arizona's universities were to increase student participation and improve affordability—particularly for first-generation students (ABOR, 2004a). During this same period, and under the auspice of ABOR, the AIMS Scholarship was developed and disseminated to thousands of Arizona's undergraduate students who enrolled at one of Arizona's three public universities; yet the effect on undergraduate student performance outcomes for this $153.6 million costly public policy has not been the subject of substantive research pursuits.

A thorough examination is needed in the important aspect of fiscal accountability regarding millions of dollars related to the undergraduate student performance outcomes of college cohort retention, college cohort completion, and college cohort time to completion. “With greater expectations being placed on it, higher education is being obliged to examine itself or be examined by others" (Barnett, 1992, p. 16). It is time for the AIMS Scholarship to be closely examined and explained for the benefit of effective education policy creation and implementation that promulgates the goals of ABOR—college access and affordability access all of Arizona’s undergraduate student populations.

Organization of the Study

Contained in the remaining four chapters is information that is study specific. In Chapter Two, a review of the literature as it pertains to the broad picture of student financial aid narrows to the specific issue of merit-based aid. In Chapter Three, a restatement of the problem and purpose are explained, the research questions and hypotheses are listed, the variables are detailed, the research methodology and design, population and sample, the instrumentation, and data analysis and procedures are identified. Chapter Four describes the results and summary of the research while Chapter Five is an overview of the study which includes the summary of results and conclusion, recommendation for practical applications and future research, and implications followed by a summary.

CHAPTER TWO: LITERATURE REVIEW

Higher Education: A Brief History

Historically, an American education was tailored for the upper class and deemed appropriate for White men who had charge of the nation's wealth (Chomsky, 2012; Tierney, 1992). These few reaped the rewards of property and position with privileged power given to their heirs (Harper, 2012). In modern times, governments, individuals, students, and their families came to understand the positive effects of an education which had value for those who spent their time and money on this important pursuit. The economic benefits of higher education are well documented (Kuh et al., 2008; Johnson et al., 2016; Taylor et al., 2016; Tinto, 2011) as are the emotional, mental, and social rewards for individuals and society (Baum et al., 2013; Kuh et al., 2008; Ma et al., 2016; Steinberg et al., 2009; Tandberg & Griffith, 2013). Considerable research revealed that college degree recipients gave more personal time and resources and participated in the political process—all beneficial to society (Baum et al., 2013; Galston, 2001; Schlozman et al., 1999; Tinto, 2004).

Higher Education: The Benefits

Many external stakeholders value a degree earned by a persevering student and a potential employee (Grinstein-Weiss et al., 2016; Kallison & Cohen, 2010). Culturally, a four-year college degree is a measure of upward mobility (Greenstone et al., 2013) as increased income accumulates over the degree recipient's lifetime (Grinstein-Weiss et al., 2016; Kuh et al., 2008). St. Johns and Parsons (2005) stated that there is a "tighter linkage than ever before between advanced education and individual and societal economic prospects" (p. 79). As noted by Tandberg and Griffith (2013), an educated workforce benefits local, state, and national economies. Recent data revealed that a college graduate with a four-year degree, earned,

annually, $21,000 more than a high school graduate (Baum et al., 2013); thus, for decades, federal and state governments have provided funding mechanisms to encourage student access and improve affordability for a college or university education (Dynarski & Scott-Clayton, 2013; Kallison & Cohen, 2010; Landry & Neubauer, 2016).

Higher Education: Student Financial Aid

Federal and state governments have a shared responsibility to fund education. According to Evans and Nguyen (2017), substantive research indicated that college enrollment rates would decline without these sources of student financial aid (Deming & Dynarski 2010; Dynarski & Scott-Clayton 2013). A growing body of evidence also suggested that the investment in federal and state grant aid enhanced persistence and degree completion among enrolled students (Deming & Dynarski 2010; Dynarski & Scott-Clayton 2013). Due to these and other research-based positive undergraduate student performance outcomes, billions of dollars in federal and state student financial aid are allocated annually to "improve human capital investment in postsecondary education" (Evans & Nguyen, 2017, p. 3).

Student Financial Aid—The Definition

Federal education funding is money that is given either directly to students by the federal government, in the form of grants and loans, or through work-study opportunities (Dynarski & Scott-Clayton, 2013). Education policies made at the federal level are best suited for need-based aid for lower- and middle-income students (Kerr, 1991). Governments institute programs to analyze student financial aid, examine the costs associated with educating students, and then apply financial aid to reduce these costs (Gillen, 2010). In addition, education funding is also legislatively allocated as state appropriations for public colleges and universities within each state (Gillen, 2010). State governments not only allocate state appropriations for institutions but

are primarily responsible for the many students' financial aid through state-run programs (Kerr, 1991).

Financial aid is the fulcrum of any important discussions made about access to higher education for all students (Dynarski, 2002; Scott-Clayton, 2011). According to Gillen (2010), the goals for higher education stakeholders are to promote access through the enrollment of increased numbers of students, defray the cost of college by giving aid directly to the students, and provide a path for more traditionally underrepresented students to attend college—minority and low- and middle-income. Kane (1995) revealed that decreasing college tuition costs increased student attendance. Providing students with financial aid increased college completion presumably because it decreased the cost of college for the tuition paying students and the families (Sjoquist & Winters, 2012a). Also presumed is that lowered college costs allow students to work less and focus more on their studies (Sjoquist & Winters, 2012a).

Theoretically, subsidizing the actual costs of students' education should improve college affordability, access, and equality (Gillen, 2010). However, evidenced-based research indicated that the rising costs of college and the broken financial aid system created a costly venture for students and their families by burdening them, in many cases, with insurmountable student debt (Gillen, 2010). As students and their families scramble to pay for college, institutions reacted to the plethora of grants and loan options by raising college costs as reflected in increased tuition, fees, and living expenses (Gillen, 2010).

A Student Financial Aid Theory—The Bennett Hypothesis

With the changes in fiscal support of higher education and increased accountability demands for improved undergraduate student outcomes, theories abound (Tandberg & Griffith, 2013). One such theory compared increased student financial aid with the increased cost of

college. William Bennett, the former Secretary for Education during the Reagan Administration, set forth a theoretical concept known as the Bennett Hypothesis. In 1987, Bennett made a connection between increasing dollars for undergraduate student financial aid and exploding college costs (tuition and fees) across the nation (Robinson, 2017).

Bennett hypothesized that the main goals for institutions of higher learning centered on "excellence, prestige, and influence" (Robinson, 2017, p. 5). Bennett stated that "there is no limit to the amount of money colleges and universities can spend" since universities are not financially obligated to shareholders (p. 5). College and university officials are not required to account for the dollars spent; thus, the revenues that are raised, in part, with tuition dollars can produce "qualitative and reputational improvements" (Robinson, 2017, p. 5). Robinson (2017) reviewed a decade of research utilizing the Bennett Hypothesis and concluded that the evidence of increasing financial aid tied to increasing tuition was plausible.

Student Financial Aid Policy

Education policies are inherently political. As in the past, the political pendulum swings from the left lane to the right ridge with the victorious implementing their preferred policies**.** For each election cycle, the education policies change as frequently as the newly elected federal and state leaders creating a conundrum in classrooms across the country. The success of a degree-receiving student is a product of a complex system of interactions with demands and expectations forming education policies with expectation for improved undergraduate student performance outcomes. Many education entities including (1) the federal government; (2) state governments; (3) institutions of higher learning; (4) higher education students and their parents; and (5) external stakeholders such as the US taxpayer have roles to fulfill in accomplishing higher education goals of college cohort retention towards completion in a timely manner.

However, sometimes the role that each stakeholder assumes does not necessarily accomplish the stated goals leaving a warped reality, in some cases, of unintended consequences, underfunded financial aid programs, and unmet expectations for improved student cohort retention and completion outcomes.

Higher Education: The Role of the Federal Government

Federal Funding Public Policy

Since education is important for society, the federal government places a priority on education funding to facilitate college access and improve affordability—goals for higher education stakeholders (Swail, 2003). The former Chancellor of the University of California at Berkeley, Clark Kerr (1991), documented important federal-level education policy developments in his book titled, *The Great Transformation in Higher Education, 1960-1980.* Kerr (1991) stated that the lasting impact on higher education began with the passage of the Morrill Act of the 19th Century which created land grant colleges first for White students in 1862 and then for African American students in 1892.

Following World War II, the creation of the National Science Foundation increased funding for science-oriented research (Kerr, 1991), and the G.I. Bill provided the impetus for the higher education enrollment explosion of soldier turned student following the war (Page & Scott-Clayton, 2016). Additionally, major federal initiatives including the *National Defense Education Act* of 1958, the *Higher Education Facilities Act* of 1963, the *Higher Education Act* of 1965, and the Education Amendment of 1972 all positively impacted student access to higher education opportunities (Kerr, 1991). By providing student grants like the Pell Grant (Dynarski & Scott-Clayton, 2013; Scott-Clayton, 2011) and loan-based financial aid like the Stafford Loan (Dunlop, 2013; Dynarski & Scott-Clayton, 2013; Martinez & Turner, 2015**;** Scott-Clayton, 2011), the

education policies of the federal government increased student access and affordability which impacted underrepresented students on college and university campuses (Tinto, 2004).

Federal Pell Grants—The Perks

Federal grants are free for qualifying students (Robinson, 2017). According to Loury (2000), poverty and race are inextricably connected. Grant aid like the Pell Grant, the Federal Supplemental Educational Opportunity Grant (FSEOG), TEACH Grant, and Iraq and Afghanistan Service Grants (Robinson, 2017) have expanded student enrollment (McPherson & Shapiro, 1999) and diversity within higher education (Mundel, 2008; Steinberg et al., 2009). In 2005-2006, 86% of dependent undergraduates using Pell Grants came from families making less than $40,000 (Steinberg et al., 2009, p. 239). As noted by Umbricht (2016), low- and middle-income students have been the recipients of this important, federal government expenditure totaling $31 billion dollars (p. 25).

Since the birth of the Pell Grant program, rigorous studies have documented the fruits of both minority and low-income student Pell Grant prevalence correlated with student persistence to degree completion (Dynarski & Scott-Clayton, 2013; Steinberg et al., 2009). Between 1996 and 2005, Mundel (2008) concluded that among low-income high school graduates, Pell Grant recipients increased participation rates at public colleges, while documented increases in college graduation rates among this same group of students were noted (Umbricht, 2016). Currently, Pell Grants account for 18% of "student aid from all sources and, although the purchasing power has declined over the past several decades, the Pell Grand remains a staple for many low-income and minority students" (Umbricht, 2016, p. 26).

Federal Loans—The Perks

In a close examination of minority and first-generation students, the sedimentation of racial inequality exists based upon the student's advantages or financial disadvantages of the previous generation (Jackson & Reynolds, 2013; Oliver & Shapiro, 2006). Specifically, Black students' greater financial need correlated with their parents' education level, income, and wealth accumulation—circumstances that are less obvious (Shapiro et al., 2013). Research by Jackson and Reynolds (2013) indicated that student loans stand to increase college attendance and completion among Black young adults with the potential to narrow the gap in degree attainment between Black and White students. The researchers posited that since Black students are more likely to come from low-income families, the ability to access loans is beneficial. Finally, "loans help make up for the racial gaps in parental socioeconomic status and increase Black young adults' access to college, bringing them within reach of a college degree and its potential benefits for their future" (Jackson & Reynolds, 2013, p. 358).

Higher Education and the Federal Government: A Reality Check

The federal government's role as student financial aid regulator, distributor, and collector shapes education through public policies for funding, accreditation, and accountability for student access and affordability (Waldman, 2015). While there is no doubt that federal government programs have increased diversity within the student population, and improved access, affordability, and success for many students—through grants, loans, and work-study opportunities—the reality of each stakeholders' role, in some instances, reveals a problematic pattern (Engle & Tinto, 2008).

Federal Pell Grants—The Problems

Federal student financial aid programs began a transformation in the 1980s (Clinedinst, 2004) away from need-based aid like the Pell Grant to transferring the burdensome cost for a college education to students and their families (Umbricht, 2016). Pell Grants and other forms of aid have been beneficial to diversify student populations; however, the Pell Grant has not kept pace with rising tuition dollars. Umbricht (2016) posited that tuition outpaced financial aid with Pell Grants diminishing in power as compared to the college costs—this trend adversely impacted students with fewer resources. In 1985, the Pell Grant award covered "150 percent of tuition and fees at an average, four-year institution, but by 2014, the award covered just 62 percent of tuition and fees" at similar institutions (Umbricht, 2016, p. 25).

During the Reagan Administration, as a billion dollars were cut from Pell Grants and other student aid, states replicated the trend of increasing student loan debt resulting in enrollment decreases for minority- and first-generation students at elite institutions (Carlson, 2016). Umbricht (2016) posited that financial aid has different effects on student dropout rates across racial groups. Among students not receiving a Pell Grant, the risk of dropping out of college was higher for minority students than for White students (Chen & DesJardins, 2010). Furthermore, when the students received larger Pell Grants, the White student dropout rate changed little while the Black student dropout rate declined (Chen & DesJardins, 2010, p. 202). Umbricht (2016) succinctly summed up the problem by stating that with increased tuition, decreased state support for higher education, coupled with the reduced purchasing power of the Pell Grant, students obtained loans to pay the cost of a higher education degree.

Federal Loans—The Problems

For minority and low-income students, loan accessibility was the upside; yet the downside for Black students, according to Heller (1997), was that decreased financial aid correlated with declining enrollment (McPherson & Schapiro, 1999). In addition, Cunningham and Santiago's (2008) research revealed that Black students borrowed more than their White, Asian, and Hispanic peers and had a higher default rate on their student loans (Volkwein et al., 1998). Compared to White students, Jackson and Reynolds (2013) concluded that Black students had higher loan amounts, defaulted on their loans at higher rates, and paid a significant financial price to pursue a college degree.

Higher Education: The Role of State Government

State Funding Policy

Though the federal government plays a pivotal role in student grant-related decisions and dissemination, the state governments are the primary purveyors of student financial aid (Kerr, 1991). Funding for higher education has primarily been a state-level responsibility as states are positioned to adjust to the varying regional needs (Kerr, 1991). By the middle half of the 20th Century, "an egalitarian spirit" for education access swept the nation helping students in need with the cost of college (Bell et al., 2008, p. vii). With the promises of matching federal funds from the federal State Student Incentive Grant Program (SSIGP), states rushed to provide need-based aid for their respective student populations (Bell et al., 2008). State financial aid for students attending colleges and universities became the largest source of education subsidies and varied from state-to-state (Deming & Dynarski, 2010). Woo and Choy (2011), citing statistics from the National Association of State Student Grant and Aid Programs for 2008, confirmed that

most state aid for higher education was need-based aid and totaled $8 billion for undergraduate students.

Higher Education and State Government: A Reality Check

Pressures

Traditionally, state funding for public education was once about equity, valuing education, and allocating sufficient resources; however, the 2007-2009 *Great Recession* placed economic pressures resulting in reduced state support for education (Ikpa, 2016). With less personal wealth, labor shortages combined with the housing collapse, state tax-based revenues fell drastically (Campbell & Sances, 2013). As state revenues decreased, the cost for services like Medicaid and education increased, but unlike health and K-12 spending, higher education funding did not receive matching federal dollars (Barr & Turner, 2013). Hovey (1999) suggested that because higher education had revenue options unlike other statutory appropriation requirements like incarceration and healthcare, education programs were vulnerable to budget cuts. Between the years 2008 and 2011 spending cuts for K-12 occurred in thirty-four states while forty-three states cut spending for higher education (Johnson et al., 2011). Since education competes for funding, and public support for higher education shifted, it is plausible to conclude that "the life chances for many individuals will decline" (Ikpa, 2016, p. 470).

Some researchers questioned whether there was a correlation between increased federal aid and decreased state budgets. Scott-Clayton (2011) posited that though there was limited research to date on this important topic, there was evidence that state government officials looked at increased federal aid due to the *Great Recession* before setting their higher education budgets. Alexander et al., (2010) researched the 2009 *American Reinvestment and Recovery Act* (ARRA) which stipulated that states were to fund post-secondary education at the same levels as

in 2006 to receive federal stimulus dollars. Research revealed that most states chose to balance their budgets by reducing higher education allocations to the minimum amount as specified by the ARRA stimulus package (Alexander et al., 2010).

Priorities

As a national priority, many federal and state politicians voiced their support for education; yet proposals remain underfunded while the two parties played a contentious game of partisan politics (Ikpa, 2016). The political push and pull of partisanship challenged an already pillaged financial aid system accentuated by the *Great Recession.* Ikpa (2016) concluded that adequate funding remained a public value, but the disparities in funding poor and affluent schools presented challenges. When comparing the per-pupil expenditures between 1999-2009, private universities recorded an increase of nearly $14,000 (per-pupil) as compared to a $1 increase for community colleges (2009 dollars) (Century Foundation, 2013, p. 5). Carlson (2016) concluded that institutions serving White students received more of their money from the state, while the colleges serving minority students were forced to rely on tuition dollars for support. For example, the state funding per undergraduate at the University of Tennessee, with a 93% White student body, received $19,500 per student (Carlson, 2016, p. 4). In comparison, Tennessee State, with a 71% Black student body, received just $5,600 per student during this same time (Carlson, 2016, p. 4). From this research, Carlson (2016) concluded that White students attended predominantly revenue-rich colleges and universities while minority students struggled on college campuses with fewer resources.

Problems

In the past, federal and state governments worked together in a symbiotic relationship to meet student financial aid needs. Heller and Marin (2002) examined the critical changes in the

funding of higher education by individual states at the expense of our nation's most vulnerable students. The challenges centered on declining state appropriations and increasing tuition, combined with changing financial aid programs, demographic shifts, recent technology demands, and accountability requirements (Heller & Marin, 2002). Mitchell et al. (2019) argued that "deep state cuts in funding for higher education over the last decade have contributed to rapid, significant tuition increases and pushed more of the costs of college to students, making it harder for them to enroll and graduate" (p. 1).

Barr and Turner (2013) described the juxtaposition of the *Great Recession,* with increased student enrollment, at the same time state budgets allocations declined (McLendon et al., 2009) accelerating the shift from taxpayer subsidies to students paying an ever-increasing portion for higher education costs (Avery & Turner, 2012; Heller & Rogers, 2006; Jacobs & Whitfield, 2012; St. John et al., 2005). Adding to the complexity during this chaotic time, state appropriations decreased when the minority student populations were rapidly growing (Carlson, 2016). The institutional recruitment process for college students also changed. One goal for administrators was to produce more graduates by enrolling students with academic acumen but accomplishing this goal negatively impacted underrepresented students (Burd, 2017; Carlson, 2016). In addition, the shift away from grants, which do not need to be repaid, to burdensome loan debt decreased minority and first-generation student enrollment at elite institutions (Burd, 2017; Carlson, 2016).

Higher Education: The Role of the Institution

Student Access

At the beginning of the 20th century, just 500,000 students were attending institutions of higher learning across the globe and by the year 2000, the worldwide student population had

exploded to nearly one hundred million (Schofer & Meyer, 2005). Colleges and universities are in the business of producing degree-earning students while students are in the business to pay for a good school, a valued degree, and a high paying job (Kallison & Cohen, 2010). With increased access, a goal of the post-war 20th century, minority, low- and middle-income, and female students dramatically increasing these student populations (Guri-Rosenblit et al., 2007). In 1960, 65% of bachelor's degrees in the United States went to men; by 1982, 50% of bachelor's degrees went to women, rising to 58% in 2004. The gender gap for African Americans is wider with 67% awarded to women (Leicht et al., 2007, p. 2).

As student access expanded on college and university campuses, institutional leaders evaluated student demographics to accelerate admissions and improve success (Hurtado, 2007; Rendon et al., 2000). Many administrators developed programs, prior to the students' freshmen year, to assist underrepresented students to better prepare them for the rigors of college life and academics (Kezar, 2000; Law, 2014; Sablan, 2014). Proactive leaders understood the relationship to higher levels of minority and low- and middle-income access coupled with student financial aid as critical factors in persistence to completion among underrepresented student populations (Umbricht, 2016). Given these support systems, college attendance more than doubled in the past several decades (Cataldi et al., 2018; Kuh et al., 2011; Tinto, 2013) from nine million students in 1980 to 20 million in 2011 (Tinto, 2012, p. 2).

Student Affordability

Public, private, and for-profit colleges and universities are in the business to educate their students—the products of their business. The goal of institutions is to produce educated students (quality products) with the objective of retaining their students to the point of awarding occupational certificates or degrees for professional disciplines (Koshal & Koshal, 1999). At

higher education institutions in the United States, undergraduate and graduate students are considered two types of education products (Koshal & Koshal, 1999). There are increased expenses and costs associated with the production of graduates; these expenses may impact the total cost to educate students (Koshal & Koshal, 1999). In addition to the student being the product, the student is also a consumer who pays for the educational experience including tuition, fees, room, and board. To improve affordability for underrepresented students, help from the federal and state governments, in the form of grants and loans, was vital in defraying the student's out-of-pocket educational expenses (Umbricht, 2016).

Student Achievement

Billions of dollars are spent yearly to educate students. Positive undergraduate student performance outcomes are a measure of institutional quality and effectiveness (Cook & Pullaro, 2010). In a USDoE report, "Degree completion is the true bottom line for college administrators, state legislatures, parents, and most importantly**,** the students;" it is not just retention to the second year or student persistence without earning a degree (Adelman, 1999, p. v). Of importance is the U.S. college and university enrollment and completion rates which has substantially increased across all income groups and gender (Bailey & Dynarski, 2011). These increases reflect improved high school graduations rates and preparedness for post-secondary institutions (Bailey & Dynarski, 2011).

College and university graduation rates are an important measurement of institutional accountability (Alexander, 2000); thus, institutions place significant emphasis on retaining students so the students can persist to completion (Tinto, 2010). Enterprising university leaders sought ways to expand an ever-widening circle of projects with public and private entries, as the push to perform and transform influenced higher education (Crow & Dabars, 2015; Kostalena,

n.d.). While some universities enroll students selectively, others embrace social justice with student admittance and achievement as the measurement of success (Forbes, 2018). Seidman (2012) posited that this is best done as institutions help students identify their goals while assisting them in achieving their personal and academic ambitions.

Higher Education and the Institution: A Reality Check

Student Access

Colleges and universities have become selective in their policies regarding admissions with desires for better rankings and bigger endowments (Baum & Lee, 2019). In addition to student selectivity, higher education is also considered a product and students are the consumers (Slaughter & Rhoades, 2016). The market-based educational delivery system tends to favor the middle- and upper- class students while creating segmented categories of underrepresented students—low-income, first generation, minority, and immigrant—who are increasingly underserved (Slaughter & Rhoades, 2016). Hurtado (2007) argued that inequality within American institutions continues to be "elusive in higher education and absent from the nation's agenda" (p. 186).

Student Affordability

The 21st Century higher education dilemma is about affordability. An education costs money and with federal and state governments "besieged by other pressing public needs," students pay the price, in higher tuition and fees, for this educational product (Johnstone, 2004, p. 403). Since many students cannot afford the full tuition and fees, the cost to educate a student is shared by the government (the taxpayer/businesses) and the students—often with the support of their parents (Johnstone, 2004); however, as enrollments across the United States burgeoned, colleges and universities raised their tuitions, as governments (taxpayer) retracted their

investment in education leading to a shift in cost-sharing to the students and their families (Johnstone, 2004).

According to Umbricht (2016), in the past 30 years, college tuition and fees have been "expanding at twice the rate of healthcare and four times the rate of inflation" (p. 25). As the cost of tuition and fees skyrocketed, Umbricht (2016) posited that the 2016 "data from the College Board indicates that tuition and fees have increased 139% at private, 141% at public two-year institutions; and an incredible 222% at public four-year institutions since 1985" (p. 85). For many, decreased funding and increased tuition decrease opportunities for students to afford college—the students who can least afford to miss a chance at a better life (Heller, 1997; Tinto, 2011). Faced with significant tuition increases, more students and their families turn to loans (Avery & Turner, 2012; Jacobs & Whitfield, 2012; St. John et al., 2005; Taylor et al., 2016). According to Chopra (2012, p. 1):

> Unlike other consumer credit products, student debt keeps growing at a steady clip. Students borrowed $117 billion in just federal student loans last year. And students continue to borrow private student loans, which lack the income-based repayment and deferment options of federal student loans.

On average, "students who graduated from college in 2012 borrowed $29,400 over the course of their studies" (Institute for College Access and Success, as cited in Grinstein-Weiss, et al., 2016, p. 166).

Student Achievement

Tinto (1998) stated that increasing access without continued student participation toward completion is feeble and foolish. In a study conducted by Chen and DesJardins (2010), the findings indicated that serious educational challenges remained for minority and low-income

higher education students resulting in racial disparities. Some students new to higher education lack resiliency traits to overcome negative conditions they bring to the college classroom which impacts their academic success (Linde & Arthur, 2015). Combining increased access, stagnating completion rates, decreased federal (Umbricht, 2016) and state appropriation (Mortenson, 2012), and external demands for accountability (Alexander, 2000; Kezar 2014), institutions sought ways to retain students and encourage persistence (Kuh et al., 2008; Spradlin et al., 2010; Terenzini et al., 1994).

Higher Education: The Student's Role and Reality

Pay—Tuition and Fees

Within higher education, students make value judgments regarding education, and the bottom line for students—how to pay for college—is often the top priority and more important than institutional reputation (Levitz, 2016). When students and their families discuss access to higher education, it generally relates to the actual cost of college. Rarely does the conversation lead to how college has become unaffordable for those students who can least afford to miss the opportunity (Ikpa, 2016; Sacks, 2009). A sizable barrier for minority students' prevalence and persistence on college campuses is the inability for many to afford college (Long & Riley, 2007; Sacks, 2009; Werth et al., 1988). Less often discussed is the "reward to risk ratio based on the race/ethnicity of the degree seeker" and subsequent educational inequality as it relates to the cost of college for minority students (Jackson & Reynolds, 2013, p. 335). Research on educational debt-levels by race and family income revealed that lower-income students, including Black students, accumulated more debt than White and upper-income students (Grinstein-Weiss et al., 2016; Houle, 2014).

Persist—To Completion

Tinto (2004) and a plethora of other academic researchers (Baum, et al., 2013; Galston, 2001; Grinstein-Weiss, et al., 2016; Ma, et al., 2016; Schlozman, et al., 1999; Schneider & Yin, 2012; Spradlin et al, 2010; Steinberg, et al., 2009; Titus, 2006) stressed the critical importance of student persistence to degree completion for the student personally as well as the positive societal impact that an educated population has on the community, state, and national economies. As access for all student populations increased in the last half of the 20th Century, so has internal and external stakeholder pressures placed on undergraduate student performance outcomes like retention and persistence to degree completion across all student populations (Coley et al., 2016; Snyder et al., 2016). While the number of students attending college has more than doubled in the past several decades (Cataldi et al., 2018; Kuh et al., 2011; Tinto, 2013), the completion rate has remained at about 50% (Bound et al., 2010; Radford et al., 2010; Supiano, 2011). Data revealed that nearly half of American students who began college failed to graduate and departed with insurmountable student debt (USDoE, 2015b). In addition, for all full-time freshmen students who began a four-year degree, approximately 25% departed after the first year **(**Hanson, 2022, p. 1).

Higher Education: The Role of Stakeholders

Citizens—The Taxpayers

Education is inextricably connected to government through acts, bills, funding, mandates, and regulations. While some view the role of education as a significant factor in growing the nation's economy and helping graduates find better paying jobs (Carnevale et al., 2013; Kallison & Cohen, 2010) others believe that education's role is one of public good (Kezar et al., 2015; Marginson, 2011; Pusser, 2002; Slaughter & Rhoades, 2016). What is undisputed is the role of

the public—the taxpayer who funds education through laws that levy taxes—constitutionally-written, legislatively-driven, or voter-approved (Spring, 2011).

State appropriation for higher education is allocated by those who are elected to serve the public, but the funds that are appropriated each year come from the U.S. taxpayer. Archibald and Feldman (2006) posited that reductions in state spending for education were due in part to a citizenry that became tax- and spend-averse—a movement that began in the 1970s. One example of a voter-approved measure that altered the funding of education included California's Proposition 13. In 1978, California voters approved limiting the sales tax to 1% of the assessed value of each property and to limit annual increases in assessed values to the lesser of 2% or the increase in the cost of living for the year (Haberman, 2016). This restriction of tax revenue starved education in California (Carlson, 2016).

Business and Industry Owners and Employees—The Taxpayers

Business and industry owners and their employees are taxpayers who want their elected officials to represent their opinions and business interests—especially when it comes to regulations and control. Business and industry drive the economy and the employee pipeline while demanding policies that are beneficial to their enterprises (Century Foundation, 2013; Kezar, 2014). Harmon and Cielinski (2014) reported that to access higher paying careers to meet the nation's specialized employment demands, undergraduate student performance outcomes were closely monitored and reported to improve transparency and ensure accountability for the taxpayer. Regardless of party affiliation, public policies and businesses influenced the global and local education agenda in the manufacturing of human capital (Carnevale et al., 2013; Spring, 2011). Eyring and Christensen (2011) and other researchers posited that the DNA of higher

education must transform to meet workforce demand and to maintain a global competitive advantage (Noe et al., 2017; Sperling, 2017).

Governments—The Disseminators of Aid

The federal Pell Grant program serves as an excellent example of the federal government giving funds in exchange for demanding academic accountability for improved undergraduate student performance outcomes. The billion-dollar Pell Grant program and need-based aid was given directly to students and totaled $5,500 per qualifying student in 2015 (Martinez & Turner, 2015, p. 56). These grant gifts were not gratis but came with increased governmental oversight and outside stakeholder demands for improved student access, affordability, and achievement as measured by college degree completion rates (Kezar, 2014). The scrutiny was intended to improve student retention to degree completion (Harmon & Cielinski, 2014).

Higher Education: Public Policies Implications

The Demands

Internal and external stakeholders closely monitored higher education using a magnifying glass (Alexander, 2000; Conner & Rabovsky, 2011: Kezar, 2014). Increasingly, there was low tolerance for higher education ignoring accountability and transparency demands for improved undergraduate student performance outcomes—from registration to graduation (Alexander, 2000). Barnett (1992) succinctly described the demanding environment and changing expectations for higher education leaders, “With greater expectation being placed on it, higher education is being obliged to examine itself or be examined by others” (p. 16).

The Disruptions

There remains an ongoing educational debate between maintaining the traditional academe or transforming higher education into a business enterprise. The traditional university

has a voracious appetite that was unsustainable in an age of disruptive technologies and competition from educational purveyors (Eyring & Christensen, 2011). The ceremonial college competition—the coin toss at the 50-yard line—evolved to competition for students as consumers (Kezar, 2014). The bottom-line became the top-priority for institutions as the enterprise model disrupted the higher education highway leaving some institutions in the dark (Crow & Dabars, 2015; Eyring & Christensen, 2011; Kezar, 2014).

The Delivery

Advancing technologies accelerated the need for trained employees which resulted in greater institutional accountability for improved undergraduate student performance outcomes (Halverson & Collins, 2009; Forbes, 2018; Kezar, 2014). Improving outcomes required higher education administrators and faculty to transform traditional institutions to meet the 21st century needs of students and employers (Crow & Dabars, 2015). Technology, for example, disrupted the traditional educational delivery system—from a classroom at school to a computer room at home (Halverson & Collins, 2009). With many increasing and varying accountability demands, administrators sought ways to improve student enrollment, performance outcomes, and identify barriers for student persistence to completion (Padilla, 1999). The expanded avenue of knowledge delivery included eLearning, blended learning, massive open online courses (MOOC). These local and global online class offerings from undergraduate to doctoral programs have improved access to education (Bonk & Graham, 2012; Yuan & Powell, 2013).

Higher Education and Student Financial Aid: Shifting Education Policies

Educational changes are inevitable and defined as “those intentional acts where a particular leader drives or implements a new direction” (Kezar, 2014, p. xii). For example, NAU’s doctoral program in the College of Education is for practicing professionals from near

and far who seek to understand and practice leadership locally and globally. Coursework is delivered through flexible hybrid models, enabling students to continue with their professional careers while remaining a student (NAU, n.d.). While educational expansion was one policy development, a shift in policy related to student financial aid was yet another.

Taylor et al., (2016) posited that as the federal public policies for financing undergraduate education shifted from the taxpayers to federally supported, bank-based student loans. Tandberg and Griffith (2013) reported that funding levels determined student access and the quality of the experience. However, in recent years, and with the lack of resources and increased emphasis on the privatization of education, state appropriations for higher education waned (Tandberg & Griffith, 2013). The billion dollars cut from Pell Grants and other student aid along with legislative cuts to higher education are manifestations of changing education policy developments (St. John & Parsons, 2005).

These deliberate developments in financial aid policy (Chen & DesJardins, 2010; Douglass, 2010; Umbricht, 2016) are a result of many fluctuating factors. The following four changes added pressure to a fractured financial aid system concluded Heller and Marin (2002). These changes included:

1. Reduced state budget allocations for higher education (Johnson et al., 2016; McLendon et al., 2009).
2. National demographic shifts with increased numbers of minority students attending college (Terenzini, & Pascarella, 1998).
3. New technology developments and demands (Becker, et al., 2017; Garrison, & Kanuka, 2004; Goldin, & Katz, 2018; Hanna, 1998; Johnson et al., 2016; Pucciarelli & Kaplan, 2016).

4. Internal and external accountability requirements (Alexander, 2000; Conner & Rabovsky, 2011; Crow & Dabars, 2015; Kezar, 2014) in the past several decades (Chen & DesJardins, 2010; Douglass, 2010; Umbricht, 2016).

As state subsidies declined while education costs increased, many students could no longer afford college (Avery & Turner, 2012). According to Burd (2017), students were filtered based upon a parent's paycheck with many institutions seeking students with brains and a bank account (Quirk, 2005). In addition, as higher education tuition was increasing, state appropriations were decreasing commensurate with a growing minority student population (Carlson, 2016). Across higher educational administrators, policymakers, and legislatures devised a plan to improve college and university graduation rates while reducing tuition. This financial student aid plan shifted state funding from assisting financially needy students to rewarding academically astute students (Bell et al., 2008). However, some states blended the two programs (need and merit) with the promise of "aid and affordability" (Bell et al., 2008, p. vii). It is within this demanding educational and public policy environment of increased accountability for undergraduate student performance outcomes and decreased state appropriations that modern merit-based awards and scholarships were conceived.

Higher Education: The Birth of Merit-Based Scholarships

The History of Merit-Based Scholarships

According to McPherson and Schapiro (1999), Philip G. Wick, the director of financial aid at Williams College, provided a substantive report on the history of financial aid. Noting details of Wick's report (as cited in McPherson & Shapiro, 1999), the first student aid with the creation of an intuitional scholarship in the amount of one hundred pounds was given to Harvard College in 1643. By 1897, Williams College had created terms for scholarship aid that required

an application and of the 113 applicants, eighty-two received scholarship aid (Wick, 1993, as cited in McPherson & Schapiro, 1999). By 1954, a 95-member coalition of institutional leaders, established the College Scholarship Service (CSS) for the purpose of reducing competition for students and agreeing upon policy for dissemination of financial aid for students in need (Wick, 1993, as cited in McPherson & Schapiro, 1999). Though CSS was influential in standardizing financial aid policy, merit-based scholarships continued at a steady pace based upon the student's academic merit alone (McPherson & Schapiro, 1999).

The Policy and Theory for Merit-Based Scholarships

Performance Based Funding (PBF) models for institutions of higher learning are accountability policies that yoke money to measurements (Nisar, 2015). PBF is a broad public policy that has resulted in narrowing the matriculation of less desirable students (those who may not graduate) while recruiting students who are more likely to graduate (Umbricht et al., 2017). The PBF models dictate the direct linkage of funds to product outputs or student measurements like retention to completion in a timely manner (Hillman et al., 2015; McLendon et al., 2006). The Policy Innovation and Diffusion Theory (PIDT) (Dye, 1990) is one theory that provides a framework to explain increasing trends toward PBF models and merit-based aid adoption.

The PIDT theory is a federalist-style political philosophy and is grounded in the belief that the fifty states act individually in a complex social system but within an expansive ethos of both intrastate and interstate behavioral interactions (Dye, 1990). In seminal research, Walker (1969) defined PIDT by studying the states known for innovation in public policies and the replication of similar policies by policymakers in neighboring states. The idea of borrowing the best is a simplified approach to what could otherwise be an arduous policymaking process (Ingle et al., 2007; McLendon et al., 2006).

The Role of Merit-Based Scholarship Policy

Financial aid for academic performance, also known as merit-based aid (Dynarski, 2000) or meritocracy, is an education policy strategy (McPherson & Schapiro, 1999). The dissemination of merit-based aid has ballooned and is an ongoing policy discussion among politicians and legislators, policymakers, administrators, educators, researchers, and education advocates (Zhang & Ness, 2010). Given that the modern merit-based aid policy innovation (financial awards on academic merit alone) originated with Georgia's Hope Scholarship and then diffused to other surrounding southeastern states provides an example of the PIDT **(**Ingle et al., 2007). According to Ingle et al. (2007), the innovative merit-based aid policy process in Georgia eventually spread to more than twelve southeastern states—all adopting a form of the Hope Scholarship. The researchers also concluded that the drive to compete for education funding and student enrollment led to the adoption of merit-based aid expansion across the nation (Ingle et al., 2007)

Nationally, as key stakeholders increased demands for improved higher education completion rates (Coley et al., 2016; Conner & Rabovsky, 2011; Kuh et al., 2008; Page & Scott-Clayton, 2016; Spradlin et al., 2010; Tinto, 2011), merit-based scholarships became one way to retain in-state high school graduates with academic acumen (Stephenson, 2007) while simultaneously recruiting high achieving out-of-state students to improve graduation rates (Burd, 2017). According to Liu (2011), the rewarding of merit-based aid is about social mobility, justice, and opportunity. It is a financial incentive to encourage student performance at the high school level (McPherson & Schapiro, 1999) and to recognize high-achieving graduates (Akers, 2013; Clark, 2015). The goal of increased college graduation rates (Dynarski & Scott-Clayton, 2013; Henry et al., 2004) is to improve the university's prestige and rankings (Volkwein, &

Sweitzer, 2006) while retaining the state's best students (Zhang & Ness, 2010)—important goals for internal and external stakeholders. "For the deserving students, the main effect of earning a merit-based scholarship results in the reduction of the net price for a higher education degree" (McPherson & Schapiro, 1999, p. 114).

The Reality of Merit-Based Scholarship Policy

In general, need and merit-based aid compete for the same dollars from the same state budgets (Akers, 2013). Over the past several decades, both institution-based student aid and merit-based aid have risen sharply in some educational markets due to enrollment declines and increases in public-sector price competitions (McPherson & Schapiro, 1999). The cost for awarding a student with a merit-based scholarship is on the rise especially with public and private sector institutions that are less selective in their enrollment strategies (McPherson & Schapiro, 1999). Research by McPherson and Schapiro (1999) concluded that for all institutional aid, non-need-based grant aid accounted for 56% in the 1991-92 academic year—up 44% from the previous eight-year period (p. 126). A 2011 report by the USDoE's NCES revealed that in the 1990s, most of the state aid was directed towards students with financial needs. Woo and Choy (2011) reported that by 2008, 27 states had awarded aid that was tied solely to a student's meritorious effort (p. 3). A decade later, students receiving merit-based aid became the larger share (Burd, 2017). One role of merit-based aid is to reward deserving academically meritorious students; yet it is also viewed as "buying students from more prestigious schools" (McPherson & Schapiro, 1999, p. 110). This process of funding relocation has the unintended consequences of taking need-based aid from lower SES students and giving merit-based aid to students with higher SES (Umbricht et al., 2017).

Higher Education: Merit Scholarship Research

In general, state financial aid programs have been the focus of considerable research; yet the effect of increased merit-based aid on increased student enrollment has dominated the literature (Akers, 2013; Hawley & Rork, 2013; Sjoquist & Winters, 2012b; Upton, 2016; Zhang & Ness, 2010). According to Barrow et al., (2014), there is increased interest in analyzing incentive awards and scholarships to stimulate improved undergraduate student performance outcomes. Research by Orsuwan and Heck (2009) concluded that to lower student migration for workforce retention needs, states adopted merit-based education policies. When comparing GPA and SAT scores, McPherson and Schapiro (1999) discovered that an increase in SAT scores for the high school freshmen and higher GPAs for the high school seniors correlated with increases in merit-based awards. In addition, at four-year universities, female students comprised 51.9% of the student body; yet earned 60.2% of the merit-based awards (McPherson & Schapiro, 1999, p. 136).

Monks (2009) addressed a viable argument against scholarships and determined that money for merit-based awards goes to students from families who were already planning to pay for their student's college career. Researchers McPherson and Schapiro (1999) concurred noting that students receiving merit-based scholarships came from more affluent families with a greater "disproportionate share of the nation's wealth" (p. 114). To this point, Clark (2015) concluded that merit-based scholarships did not assist students who needed the most help. Woo and Choy (2011) collected data from the NCES revealing that during the 2007-2008 academic year, only 30% of students from low-income households received scholarships based upon the student's academic merit as compared to 55% of students from middle-class families. Further, the merit-

based scholarships for low-income students were $800 less than for students from families with financial means (Woo & Choy, 2011).

In 1993, Georgia's HOPE Scholarship was the first of its kind merit-based scholarship (Cornwell et al., 2006; Henry et al., 2004) with many states following the merit-based scholarship milieu—the giving of awards based only on academic merit (Doyle, 2006; Sjoquist & Winters, 2012b; Upton (2016). Cornwell et al., (2006) concluded that student attendance increased by four to six percentage points for every $1000 in financial aid and reduced student emigration to other states—what Zhang and Ness (2010) referred to as the "brain drain" (p. 162). Sjoquist and Winters (2015) investigated five research projects, including the Hope Scholarship (Cornwell et al., 2006) and their specific merit-based scholarship programs and the impact on undergraduate student performance outcomes. Three separate study teams, researching three different state merit-based scholarships, used data from each state's agency to examine Georgia's (Henry et al., 2004), West Virginia's (Scott-Clayton, 2011), and Tennessee's (Bruce & Carruthers, 2014) merit-based scholarship programs, respectively. According to the review of these three studies, Sjoquist and Winters (2015) explained that merit-based scholarships increased college completion (Bruce & Carruthers, 2014; Henry et al., 2004; Scott-Clayton, 2011).

Related to the important college completion question, the other two studies reviewed by Sjoquist and Winters (2015), utilized the 2000 Census data to explore the relationship between merit-based awards and college completion (Dynarski, 2008; Sjoquist & Winters, 2012a). The results of these two separate studies were mixed as Dynarski (2008) posited that merit-based scholarships had a positive effect on college completion for higher education graduates in Arkansas; yet Sjoquist and Winters (2012a) found no relationship between the Hope Scholarship

and college completion in the State of Georgia. According to Sjoquist and Winters (2012b), research on merit-based scholarships, as they pertain to student completion and time to completion, are needed.

Researchers Doyle (2006), Sjoquist and Winters (2012b) and Upton (2016), stated that Arizona was among a group of states to establish a scholarship based upon academic merit for qualifying in-state high school graduates. While Doyle's (2006) research did not include Arizona's AIMS Scholarship, the 15-state, 1.2-billion-dollar merit-based aid investment represented the shift from need-based aid to rewarding students' academic performances. Upton (2016), the only study to analyze the AIMS Scholarship, studied the effect of multiple merit scholarships on enrollment with college completion question as an aggregate. Specifically, the one-year (renewable), full-tuition (waiver) AIMS Scholarship was awarded to thousands of students over a six-year period (2006-2012) at a cost of millions of dollars (P. Gates, personal communication, March 25, 2019; Lawton, 2011; Pallack, 2010b); yet, only one study researched and reported a statistically significant positive effect on the AIMS Scholarship and increased student enrollment (Upton, 2016). Lastly, in Upton's (2016) research on the AIMS Scholarship, there was no evidence of students' second-year retention, and the important completion question was addressed as an aggregate while time to completion was not analyzed.

Higher Education: The Framing of Merit-Based Aid Legislation

Eric Ness (2007) implemented three theoretical frameworks that described and analyzed the political process of merit-based aid and funding allocations. Ness (2007) borrowed the theoretical frameworks from political science and public policy scholars. It is within this context of fluctuating funding and the financing of higher education that he examined and delineated the political process of merit-based scholarship inception, the funding mechanisms, and student

eligibility requirements. This examination, Ness (2007) posited, had yet to be analyzed. Institutions, lawmakers, and policymakers created merit-based scholarships, in this climate of higher tuition and fees with the subsequent student loan increases, decreases in grant options, and stakeholder demands for accountability and improved undergraduate student performance outcomes (Ness, 2007).

Within this political landscape, Ness (2007) researched and authored the book titled, *Merit Aid and The Politics of Education*—a detailed description of the transition away from need-based aid toward financial aid based upon merit. Ness (2007) examined how three states determined student eligibility for newly legislated merit-based scholarships through a qualitative case study and interviews with governors, politicians, and education policymakers. Of Ness' (2007) research, fifteen states had created bills to provide for merit-based scholarships; yet Ness examined only laws governing scholarships that met specific research criteria for the qualitative study.

The three-state merit-based scholarships that met the criteria were New Mexico, West Virginia, and Tennessee. In addition, Ness (2007) implemented three theoretical frameworks to explain the process of bill creation from the germination of the idea to the Governors' signatures of approval. The three theoretical frameworks included the advocacy coalition framework by Sabatier & Jenkins-Smith (1993), the multiple streams framework (McLendon, 2003), and the electoral connection framework (Ness, 2007).

Ness (2007) identified the advocacy coalition framework (Sabatier & Jenkins-Smith, 1993) as the coalescing of stakeholders around a central policy issue that is aligned with the stakeholders' political beliefs—beliefs that are subject to the changes in election outcomes and the ebb and flow of public opinion. Within the multiple streams' framework (McLendon, 2003),

Ness (2007) described the process of recently elected governors in the states of New Mexico and West Virginia and their ability, through newly minted political influence, to guide the merit-based aid bills and the funding process. Lastly, the electoral connection framework dealt with reelection-based decision making that influenced the legislative process or when legislators desired to please their dominant constituent base in their Legislative Districts (Ness, 2007). Ness (2007) used the example of the Tennessee's merit-based aid law and the caucus of Black legislators who shaped the bill to benefit students living in their Legislative Districts.

K-12 Education: The Role of the Federal Government

K-12—Measurements and Mandates

The policies and the people at the federal level wield strong and powerful influences on the direction of education. The Elementary and Secondary Education Act (ESEA) of 1965 occurred at a pivotal period as the federal government's influence increased at an unprecedented scale in the K-12 arena (Fritzberg, 2004). The ESEA came to fruition during President Lyndon B. Johnson's tenure (Fritzberg, 2004; St. John et al., 2005). As an important piece of civil rights' legislation, the ESEA was intended to ensure access to a quality education across all student populations (Haller et al., 2016). There was consensus that the federal government had a "role to play" (St. John et al., 2005, p. 545) with the goal for equal access to a quality education for all students (Haller et al., 2016). During this period, while the USDoE had the authority to create and fund vital programs, the individual states were charged with administering the programs (Haller et al., 2016).

The centerpiece of the ESEA legislation was known as Title I and comprised 50% of the expected federal expenditures (Fritzberg, 2004, p. 8). Within the ESEA mandates, individual states were to create and implemented goals for Title I students—those who were disadvantaged

educationally and economically, or students who suffered from mental or physical challenges (Jennings, 2000). All states were to identify failing schools with a plan for improvement; yet the accountability for improving failing conditions was negligible and without enforcement (Fritzberg, 2004). Of the 1965 ESEA legislation, the intent was for Congress to evaluate the educational environment every three to five years and make the necessary changes reflective of the current educational needs and conditions (Haller et al., 2016).

K-12—Regulations

The era of regulatory reform in education began in the 1970s with the governors of states demanding accountability through standards that were measured via testing (Peterson, 2016). In 1983, with the blessing of the Reagan Administration, *A Nation at Risk*, a report by the National Commission on Excellence in Education, sounded a clarion call for change (DeBray, 2005). The report directly connected American's declining educational status in the world and the nation's economic success to student performance outcomes (DeBray, 2005). *A Nation at Risk* spurred internal and external education stakeholders to coordinate reforms in schools from coast-to-coast (Peterson, 2016). These reforms were backed by businessmen and governors (DeBray, 2005).

The ESEA was reauthorized in 1988 with improvements in the law as policymakers agreed to maintain assessments but left the testing decisions to the states (Fritzberg, 2004). In the 1990s, the Clinton administration was lax in the enforcement of the 1994 Improving America's Schools Act (IASA) (DeBray, 2005). According to DeBray, (2005), Robert Dole, the Republican's choice for president in 1996 embraced the party's multibillion-dollar platform of moral values teaching and voucher program for private K-12 schools (DeBray, 2005). Just a few years later, between 1999 and 2002, a change occurred in both the Republican and the Democratic parties as the federal role in education followed suit (DeBray, 2005).

K-12—Accountability

At the beginning of the 21st Century, educational equality in the United States remained disparate as international education rankings slipped behind other first-world countries (Peterson, 2016). President Bush sought to address the local and global scenarios through the increased regulation of education (Peterson, 2016). Congress established a "new equilibrium in education policy in 2001" with Republicans and Democrats working in a bi-partisan way to reform and regulate education (DeBray, 2005, p. 45). During this period of Congressional cooperation regarding education, the teachers' unions backed the Democratic platform while businesses and governors backed the traditional Republican positions (DeBray, 2005). A result of the bi-partisan law left the collective voices of urban school supporters diluted by socially conservative groups advocating for local control (DeBray, 2005).

K-12: The No Child Left Behind Act

No Child Left Behind—Accountability

As undergraduate student college success, as defined by college graduation, became the mantra for external stakeholders across the nation, federal legislation requiring accountability for K-12 student performance outcomes was taking shape. In 2001, Congress reauthorized the ESEA under a new title, *No Child Left Behind* (NCLB) (Haller et al., 2016). With the aid of Democrat Ted Kennedy, this bi-partisan law was "the first reform-minded federal regulator in education" (Peterson, 2016**,** p. 22). By 2002, Congress passed the NCLB which legislatively set a goal for the 2013-2014 school year requiring all children in the U.S. to attain academic proficiency (Davenport, 2006). The purpose of the new law was to address the growing achievement gap and to establish exacting standards with arduous accountability requirements (Haller et al., 2016). The NCLB law was a "comprehensive, bipartisan response to a failing and inequitable public-

education system—a system that held no one accountable for student learning, and as a result, consistently failed its most vulnerable charges" (Bush et al., 2017, p. 55). The debate was not about the need for accountability but instead the argument rested on who was responsible for establishing the academic achievement goals and how should the goals be measured and evaluated (Fritzberg, 2004).

Highlighting accountability, President George W. Bush altered education in the United States:

> The first principle is accountability. Every school has a job to do. And that's to teach the basics and teach them well. If we want to make sure no child is left behind, every child must learn to read. And every child must learn to add and subtract. So, in return for federal dollars, we are asking states to design accountability systems to show parents and teachers whether children can read and write and add and subtract in grades three through eight. The fundamental principle of this bill is that every child can learn, we expect every child to learn, and you must show us whether or not every child is learning. No longer is it acceptable to hide poor performance. No longer is it acceptable to keep results away from parents. We trust parents to make the right decisions for their children. Any school that doesn't perform, any school that cannot catch up and do its job, a parent will have these options — a better public school, a tutor, or a charter school. We do not want children trapped in schools that will not change and will not teach. (Kalantzis & Cope, n.d., p. 1)

No Child Left Behind (NCLB)—Mandates without Money

Education policy in early 2000 was of interest for both political parties but the NCLB accomplishment was tempered by accountability demands in the wake of reduced funding

resources (DeBray, 2005). The accountability factors within the NCLB were important steps forward; yet the requisite support was not provided to accomplish the standards (Pepper, 2010). Although NCLB "raised the accountability bar" for standards-based reform (Fritzberg, 2004, p. 11), there was discontinuity as the federal government required 100% accountability with only 8% budgetary allocations (DeBray, 2005, p. 46). For example, while the federal NCLB set new accountability demands, federal programs designed to assist underachieving students such as Head Start were cut by $40 billion (DeBray, 2005, p. 29).

No Child Left Behind (NCLB)—Mandates with Measurements

In the *one-size fits all* NCLB law (Fritzberg, 2004), regular testing will provide parents with "objective data on where their child stands academically" (USDoE, 2003, p. 1). The NCLB of 2002, another reauthorization of the ESEA of 1965, "put teeth" into the 1994 Improving America's Schools Act (IASA) requiring identification of *adequate yearly progress* (AYP) as the target for student achievement (Fritzberg, 2004, p. 10). State-driven high-stake testing was the result of the accountability requirement of NCLB legislation (Cavendish, 2009). Deborah Meier, a national innovator in education, stated that "external standards and assessments rob local schools and families of their professional and parental prerogatives, no matter their quality" (Meire as cited in Fritzberg, 2004, p. 8).

The NCLB 2002 law was intended to close the achievement gap between high-achieving and low-achieving students with all students meeting the standards for improved student performance outcomes (Pepper, 2010)—a difficult challenge with a disparate student body (Fritzberg, 2004). Unlike the IASA, the NCLB required specificity regarding the data that the testing must produce coupled with severe consequences for underperformance (Fritzberg, 2004). With NCLB in place, states were required to establish standards of proficiency with all students

meeting the standards by 2014 (Peterson, 2016). The tests were given in the third and eighth grades and one time in high school in the areas of reading and math and later science, and the results of the tests were published by students' ethnicity and other categories (Peterson, 2016). With access to federally mandated and available data, parents could select a new school within a district if their student were not progressing or they could choose an after-school tutoring program (Peterson, 2016). If the school received a failing grade, then the leadership of the school could be replaced (Peterson, 2016).

No Child Left Behind (NCLB)—High-Stakes Testing

The NCLB extended the reach of the federal government into the local districts and classrooms (DeBray, 2005). Pepper (2010) concluded that the increased attention from the public and school performance based upon individual student test scores created a high-stake testing atmosphere (Pepper, 2010). Academic performance for school and student performance under NCLB was determined by student test scores (Pepper, 2010). The complexity of the NCLB mandates and measurements, as voiced by educators and administrators, presented a dilemma. For many, the federal measures required too much time testing, not enough time learning, and too little autonomy for districts to meet local needs creating a classroom conundrum—a challenging teaching and learning environment (The White House, 2015).

No Child Left Behind (NCLB)—The Consequences

Some viewed the NCLB law as a necessary step to improve educational quality while others viewed it an unnecessary federal formula that should have been state-driven education (Russo, 2016). The NCLB bill had lofty and commendable goals—to close the achievement gap through ambitious standards and accountability—but the prescriptive measures within the bill circumvented the achievement of the goals (Haller et al, 2016). The consequences of NCLB

created a “perverse incentive for states to lower academic expectations in order to avoid federal sanctions (Bush et al., 2017). The challenges of NCLB led to education policy changes and a new law with the election of a new United States President.

K-12: President Obama’s Regulations

The Federal Footprint

The Bush era regulatory reform of the NCLB was perpetuated by the Obama Administration (Russo, 2016). With different opinions about public policies on most issues, President Bush and President Obama shared a common educational goal of measuring progress through regulating the education of students (Peterson, 2016). President Obama agreed, in part, with some aspects of President Bush’s NCLB with respect to “overcoming the powerful forces of the status quo in public education” and that “schools and teachers would be held accountable for the academic performance of all students even (and especially) those whose educational prospect are hampered by poverty” (McGuinn, 2016, p. 393).

Race to the Top (RTT)—The Executive Order

President Obama dealt with the nation’s educational issues and international standing through increased regulation of education (Peterson, 2016). However, due to congressional gridlock, President Obama used his executive power to require states to establish charter school policies, common core standards and assessments, and teacher evaluations (McGuinn, 2016). In essence, President Obama circumvented the problems created by NCLB by establishing competition in his executive order called Race to the Top (RTT) (Peterson, 2016).

Race to the Top (RTT)—Creating Competition

The NCLB requirements were viewed by many as impossible to achieve which led forty-three states and the District of Columbia to receive waivers from many of the NCLB

accountability mandates—but only if the states adopted President Obama's RTT policies (Russo, 2016). This rendered NCLB impotent (Peterson, 2016). Of the RTT executive order, President Obama said that its purpose was to "incentivize excellence and spur reform and launch a race to the top of America's public schools" by developing common core standards, student performance teacher evaluation plans, and ensure "successful conditions for high-performing charter schools" (Peterson, 2016, p. Race to the Top section). It was not until the end of President Obama's tenure that the 2015 *Every Student Succeeds Act* (ESSA) was signed and enacted—a combination of the NCLB and another reauthorization of the ESEA (Peterson, 2016).

Every Student Succeeds Act (ESSA)—Flexibility and Control

President Obama's amalgam of administratively driven mandates set the stage for the ESSA which maintained the testing component of NCLB but allowed flexibility for making the results known to the public along with removing many other regulations and shifting the authority for education decisions back to the states for local implementation (Peterson, 2016). Seven years after the NCLB was set to expire, and with bipartisan support (McGuinn, 2016), the updated NCLB act newly titled the ESSA was another reauthorization of the original 1965 ESEA (Dynarski, 2015; Klein, 2016; Russo, 2016). The intent of ESSA was to narrow the USDoE's influence by consolidating fifty programs into block grants (Klein, 2016).

Every Student Succeeds Act (ESSA)—Best Practices

The hallmark of the ESSA was to ensure academic success with a change in education policy that established the use of proven practices for student success—addressing the yoked questions, "what works best and for whom" (Milner & Holston, 2015, p. 1)? The design of ESSA was to enlarge the investment in student academic outcomes that were evidence-based, to evaluate all programs under a microscope, and to terminate those programs that were inadequate

and ineffective (Milner & Holston, 2015)**.** According to Peterson (2016), a termination policy was needed as more than 50 years after ESEA, Black students were one standard deviation lower than White students. It was said of the new transition—education decisions based upon research could curtail the challenging Black and White student performance outcome divide (Peterson, 2016) while maintaining the civil rights legacy of the ESEA (Klein, 2016).

No Child Left Behind (NCLB) and Every Student Succeeds Act (ESSA)—A Comparison

Both Presidents Bush and Obama used regulations over their accumulated tenures to closely scrutinized student performance outcomes state-by-state (Peterson, 2016). Like the NCLB, the ESSA was approved with bipartisan support and moved to reverse the perverse environment by giving states the ability to design and implement accountability systems in addition to policies of intervention when needed (Bush et al., 2017). One challenge with NCLB was that nearly every school had some students who did not meet the proficiency standards as set forth by NCLB with the threat of "corrective actions on school districts for poor test results" (Peterson, 2016, p. 42). The new ESSA law maintained some of the aspects of the NCLB like testing but many of the regulations were eliminated (Peterson, 2016). Of the ESSA, President Obama said, "When we take the handcuffs off, we'll unleash a whole flood of innovation and ingenuity classroom by classroom, state by state, which will benefit children," and will eliminate the "cookie-cutter" model and allow for intrastate partnerships (Klein, 2016, p. 1).

The ESSA was the antidote for some educators and administrators who voiced strong opposition to NCLB known for the "inflexible, over prescriptive federal role in public education" (Klein, 2016, p. 1). According to Klein (2016), the ESSA reversed the intrusive nature of the federal footprint—a first since the 1970s. Although testing was still a mandate, the testing process was under the auspice of the states and local schools (Peterson, 2016). Pertaining to

teachers, there was an agreement by some that the passage of the ESSA ended the federal involvement in the licensing and evaluations of teachers (Sawchuk, 2016). This was a contentious issue with NCLB and one that led to states requesting waivers from the USDoE (Sawchuk, 2016). With the new ESSA, the authority of the U.S. Secretary of Education was severed in areas of assessment, standards, and teacher evaluations (Klein, 2016).

Another change from NCLB to ESSA is the emphasis and funding for development and support of principals, a major factor in the school's culture of teaching and learning (Haller et al., 2016). For example, under the NCLB, 97.5% of the federal funds were distributed through sub-grants local agencies and partnerships with insufficient attention paid to the development and retention of a school's keystone—the principal (Haller et al., 2016). Lastly, as NCLB law was replaced by the ESSA, states' rights won a battle in the war over control of their students' education. States were given authority for student outcome accountability, the measurement of student and school effectiveness, and the condition for communicating student performance outcomes to the public (Bush et al., 2017). In effect, the ESSA reduced the level of bureaucracy while giving more local control (McGuinn 2016; Peterson, 2016).

Higher Education: Arizona's Educational Environment

Arizona's educational environment mirrors national headlines and includes increasing tuition, decreasing state appropriations, changing financial aid, shifting demographics, advancing technologies, and demanding accountability requirements (Heller & Marin, 2002). Traditionally, state funding for public education was about equity, valuing education, and allocating resources. With many colliding complexities and increased competition, the nature of some of Arizona's higher education issues center on:

1. The System—governance and goals for the state's three universities.

2. The Students—changing demographics and student performance outcomes.
3. The Support—legislative appropriations and shifting priorities.
4. The Suits—litigation over education funding.

The System – Three Universities

In 1945, Arizona's Governor Osborn signed HB 136 to unite the public institutions under the auspice of ABOR and included the UA, and two state colleges in Tempe and Flagstaff (ABOR, n.d.a). By 1958 and 1966, ASU and NAU, respectively, became universities with ABOR maintaining the authority to manage a system connecting all three Arizona public universities (ABOR, n.d.a). The cohesive nature of the universities' collective goals for improved retention and college graduation included:

> ABOR is committed to ensuring access for qualified residents of Arizona to undergraduate and graduate institutions; promoting the discovery, application, and dissemination of new knowledge; extending the benefits of university activities to Arizona's citizens outside the university; and maximizing the benefits derived from the state's investment in education. (ABOR, n.d.a, p. 1)

When lagging undergraduate enrollment for traditionally underrepresented students, and persistence toward completion were reported, ABOR—in a spring 2009 meeting—addressed the problem by establishing an attainment plan called a 2020 Vision which stated:

> Goal one of the 2020 Vision long-term strategic plan is focused on increasing the educational attainment rate of Arizonans by 2020 to the national average or above. The 2020 Vision calls for the system to double the number of bachelor's degrees produced by 2020, which would require more than 80,000 new students in the system over the next 12

years. Providing the universities with adequate funding for the colleges, programs and classes is a key component of this goal. (ABOR, 2009c, p. 35, Item 4 section)

The Students – Demographics and Student Performance Outcomes

K-12—The Undergraduate Pipeline. Accelerating changes in student demographics with disappointing K-12 student performance outcomes are concerning for Arizona. In 2004, Arizona K-12 students became a majority-minority student population including American Indian, Asian Pacific, Black, and Hispanic students (Milem et al., 2016). By 2012, K-8 Hispanic students were 43% of the population with White students at 42% and declining (Hunting, 2014, p. 1). In the K-12 arena, 80% of high school students failed to meet college preparedness benchmarks in English, Reading, Mathematics, and Science with just 9% of Hispanics, 7% of Blacks, and 4% of American Indian students meeting all four benchmarks (Milem et al., 2016, p. 7). Many minority and first-generation students fail to pass standard tests, graduate from high school, access college, and persist to completion (Milem et al., 2016). Behind this statistical story of low student achievement are higher poverty and dropout rates for Black, Hispanic, and American Indian students, and the additional challenge for many Hispanics who speak English as their second language (Milem et al., 2016).

According to Hart & Hager (2012), the Latino youth student population "has grown by over half in just one decade" (p. 21); yet this fastest growing population is under-represented at college cap and gown ceremonies (Vagi et al., 2018). For Arizona's increasing majority of Hispanic students who access college, the percentage for degree completion is 17%—a concern for the student, institutions, businesses, and Arizona's economy (Milem et al., 2016, p. 8). Vagi et al., (2018) stated that for all Arizona's high school graduates in 2010, only 21% had earned a degree by 2016 (p. 6). According to Hunting (2014) and Hart and Hager (2012), these trends will

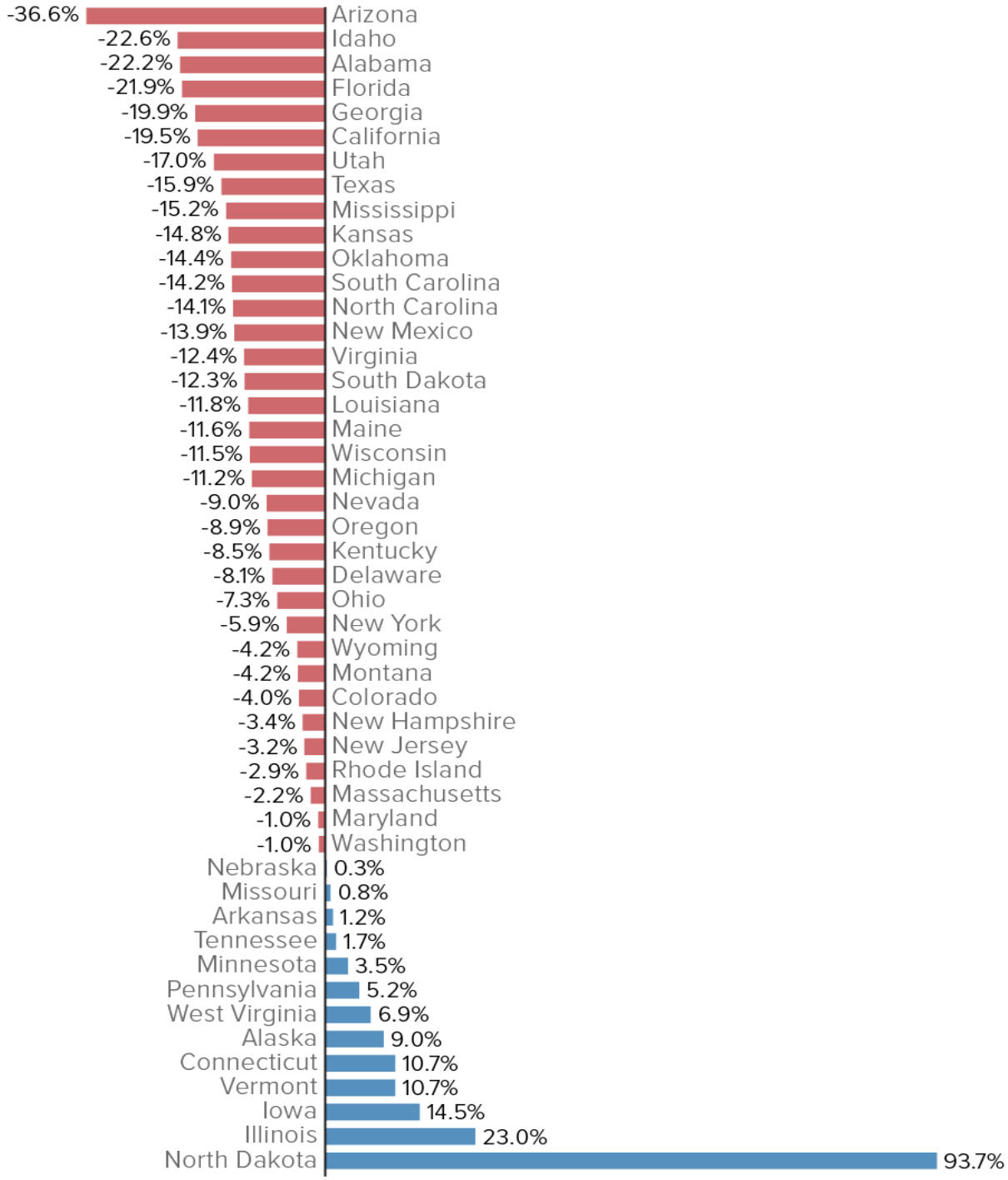
continue and impact all aspects of Arizona's education outlook and economy, if the educational disadvantages for underrepresented students in higher education are not effectively addressed.

The Support—Legislative Funding and Shifting Priorities

The makeup of Arizona's Legislature has been a Republican majority. It is imbued with a fiscally conservative mind set, coupled with a voter-approved agenda, and an economic downturn negatively impacting higher education funding. For K-12, Hager (2012), stated that Arizona spent less than almost every state (per pupil) questioning educational improvements without monetary support. In fact, comparing forty-eight states, Arizona topped the list (see Figure 1) in K-12 funding cuts for the Fiscal Year (FY) 2008-2014 (inflation adjusted) according to the 2016 report by the Center on Budget and Policy Priorities (CBPP). The -36.6% reduction over this six-year period falls below the 2008 funding-levels for Arizona's K-12 per student population—negatively impacting education throughout the state. Though Arizona voters approved Proposition 123 to restore 18% of the lost funding since 2008, the school children continued to ride in run down buses and remain in overcrowded classrooms (AZ Schools Now, 2018, p. 1).

Figure 1

Total State K-12 Funding Below 2008 Levels in Most States



(CBPP, 2016)

In response to funding cuts in 2007 to Arizona's community colleges and public universities, a declaration in support of higher education was made in a 2009 ABOR meeting:

> Launched in November 2007, *Solutions Through Higher Education* is a comprehensive, statewide public awareness campaign. As part of the campaign, a coalition of university system supporters was being formed to help convey the messages about the value of higher education through Arizona and to advocate on behalf of the university system. (ABOR, 2009c, p. 166, Item 27 section)

By the 2009 (FY), the university system's initial state budget appropriations included a $50 million cut. As the state's budget situation was worsened, mid-year budget cuts were needed to address the growing deficit (ABOR, 2009b, p. 18, Item 3 section).

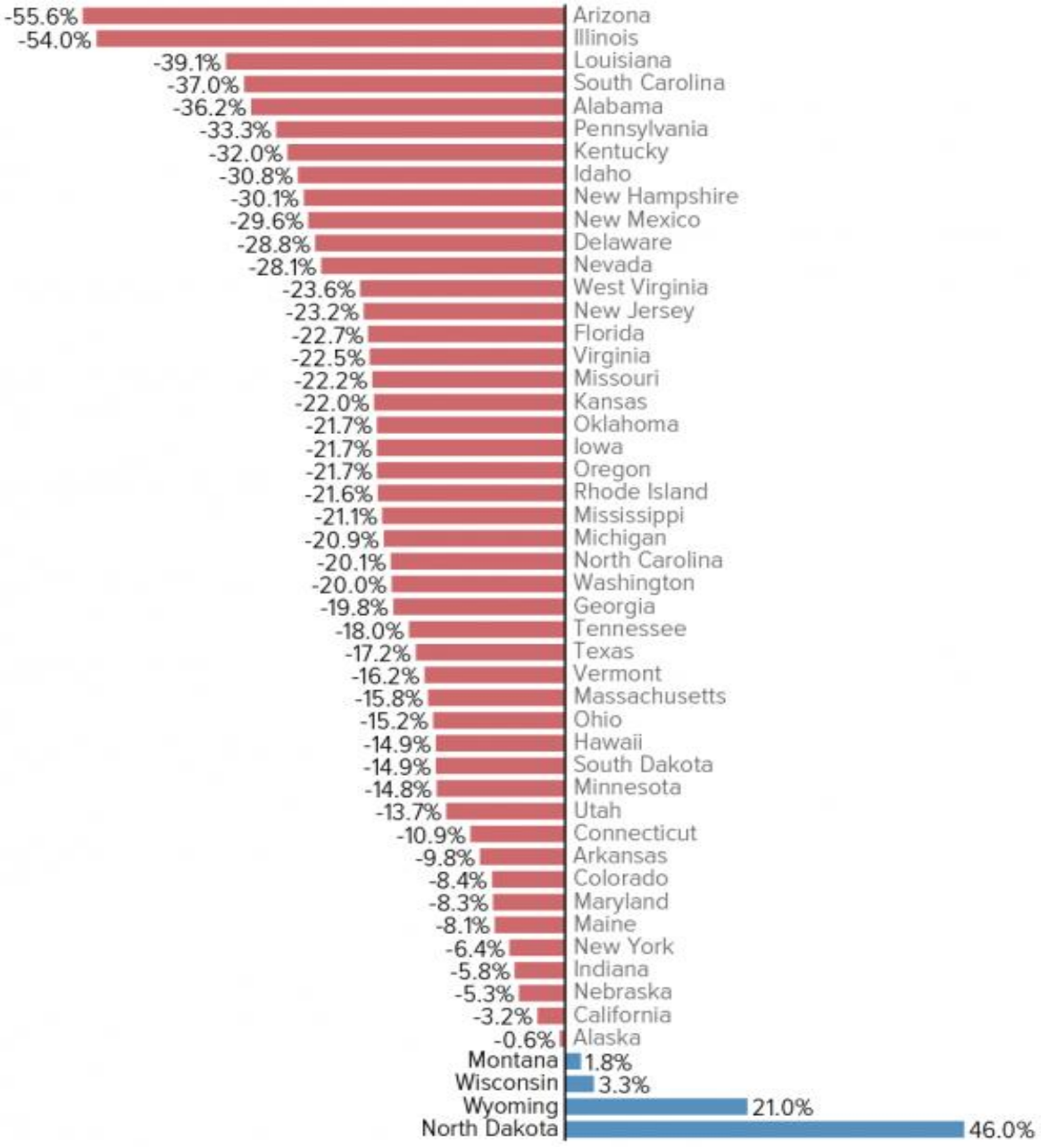
In the same ABOR meeting, notes read that "when mid-year state budget cuts were approved, the university system's budget was reduced by $141.5 million—40% more than the maximum amount the universities felt could be absorbed without impacting programs and services tremendously" (ABOR, 2009b, p. 18, Item 3 section). "Moreover, the cuts to the university system were disproportionate, representing 24% of the total General Fund cuts to state agencies, while the universities made up only 10.8% of the state budget prior to the cuts." (ABOR, 2009b, p. 18, Item 3 section)

By 2015, to balance a budget shortfall of 1.5 billion post-recession dollars, in lieu of raising taxes, the Arizona Legislature cut funding to the universities by 14% or nearly one hundred million (Jaschick, 2015, p. 2). Arizona's budget appropriations for institutions declined by half since 2008, and by 2015, state and local appropriations were 19% lower than the national average with a ranking of forty-one out of 50 (Hoffman & Rex, 2016, p. 1)—leaving institutions searching for sources of revenue. Nationally, as state funding for higher education dropped 16%

to $1,448 per-student, Arizona topped the list in percentage spending reduction per college student to below 2008 pre-recession levels (Mitchell et al. (2017, p. 4). Over the FYs 2008-2016, Arizona's legislators cut per-student funding by more than half to 55.6% (see Figure 2).

Figure 2

State Funding for Higher Education Remains Far Below Pre-Recession Levels



*Note. E*nrollment for the 2015-16 school year was estimated. (Mitchell et al., 2017, p. 4)

Statutory and Policy Requirements. Although a correlation between the public support for education and student performance outcomes had yet to be established, Hoffman and Rex (2016) stated that "the educational attainment of Arizonans, historically, was above the national average but had been falling versus the national norm since the 1970s and is now considerably below average" (p. 1). Pertaining to education funding, Arizona's Constitution mandates the public support of education as stated by Hoffman and Rex (2016) and discussed in an earlier ABOR meeting that "the legislature shall make such appropriations, to be met by taxation, as shall insure the proper maintenance of all state educational institutions and shall make such special appropriations as shall provide for their development and improvement" (p. 1). Additional 2009 ABOR meeting notes on constitutional education funding stipulations read:

1. The Arizona Constitution requires that the instruction furnished by universities 'shall be as nearly free as possible.' Arizona Constitution Article 11 Section 6. It also requires the Legislature to 'make such appropriations, to be met by taxation, as shall insure the proper maintenance of all state educational institutions and shall make such special appropriations as shall provide for their development and improvement.' Arizona Constitution Article 11 Section 10.
2. The Constitutional provision mandates that instruction is provided as nearly free as possible, not that tuition is set as low as possible. Any assessment of the cost of instruction will include many elements beyond the dollar amount of tuition and fees, such as the level and quality of instruction and the differentiated missions of the universities. The cost of education for an individual student is also dependent on the extent to which revenue is provided through legislative funding and the extent to which student financial aid is available.

3. Additional revenue through tuition and fees, beyond what is currently provided in Board policy, is necessary for the universities to fulfill their missions and provide a high-quality education to students. (ABOR, 2009c p. 13, Item 1)

Persistent Underfunding. With decreases in federal grant aid percentages, coupled with tuition increases at institutions (Mitchell et al., 2017), and persistent underfunding of education, underrepresented students suffer which negatively impacts students' educational quality (Carlson, 2016). Juxtaposed to the increasing tuition, is the Legislature's pattern of parsimony (Rau, 2017b) and their racial makeup—mostly White. While Arizona's Hispanic population is the fastest growing in Arizona at 31% of 6.7 million in 2014 (Helios Education Foundation, 2016, p. 1), the Legislative representatives do not reflect this growing Hispanic population. Dr. Gary Rhoades, a UA professor, condemned the disinvesting in education at the same time the minority student population increased noting that Arizona's state budget education allocations were among the lowest nationally (Carlson, 2016). In a recent Morrison Public Policy report, Garcia (2016) warned that if the educational disadvantages for underrepresented students were not addressed, Arizona may become a second-tier state across in education and the economy.

The Suits – K-12 and Higher Education

Government directs education through policies such as acts, bills, funding, laws, mandates, measurements, reforms, and regulations. The fight over education funding is decades old. The litany of litigation is front-page fodder for a cast of government defendants, including the State of Arizona, various Governors, and the Arizona Legislature—the captains of the coffers (Rau & Pitzl, 2014). The plaintiffs included individuals, cities, and educational organizations suing over voter-approved funding (Rau & Pitzl, 2014) and Arizona's Constitution—the meaning over the constitutional funding mandates (Schwartz, 2017).

An adequate, equitable, and predictable education funding eludes education advocates. An equitable and effective education for Arizona's students is the subject of heated debate, controversial public policy, citizen and constituent protests, voter-based referendums, numerous lawsuits, and judges' rulings. In the K-12 arena, as voters approved Proposition 123 that ended a $1.6 billion lawsuit over underfunding of Arizona's primary and secondary schools, the Arizona School Boards Association announced another school capital funding lawsuit—a legislative shortfall of $2 billion (Rau, 2017a). Pertaining to higher education, the Legislature cut funding by seventy-five million (Ryman, 2010), eventually reducing the appropriations to just 13% of the state's budget according to John Arnold, ABOR's Executive Director (personal communication, March 26, 2019). In response to the draconian budget cuts, the universities' officials requested, in an ABOR meeting, to raise tuition to cover the cost of the budget cuts (Christie, 2015).

In a 2017 lawsuit, Arizona's Attorney General (AG), Mark Brnovich, sued ABOR for dramatically raising tuition contrary to the State's constitutional mandate to provide university instruction to be "nearly free as possible" as detailed in the Arizona Constitution Article 11 Section 6 (Ryman, 2017). Later, a Maricopa County Superior Court Judge dismissed the suit claiming that the AG had no authority to sue either the Governor or the Legislature (Leingang, 2018). Again in 2019, the AG filed another lawsuit against ABOR, because ASU was leasing real estate to private, commercial businesses through its tax-exempt status—another law violation according to AG Brnovich (Leingang, 2019).

K-12: Arizona's Education Environment and Federal and State Laws

High-Stakes Testing in Arizona

In the late 1990s, Arizona's education policymakers influenced the creation of a state-driven, high-stakes test—defined as evaluating student performance on a test based on state-

specific standards (Smith et al., 1999). By 2001, the genesis of high stakes testing in Arizona began with external educational accountability legislation known as Education 2000 and Proposition 301 which authorized the Arizona Department of Education (ADE) to develop a system of statewide accountability testing (Melnick, 2002). This new testing resulted in a performance measurement for high school students known as the AIMS Test (Arizona's School Accountability System, 2010).

Arizona LEARNS and Federal Law

During the federal push for student performance outcomes, Arizona voters approved Proposition 301 in 2000 which provided funds to the ADE to develop a system to measure school performance based on student testing achievement (Horne, 2007). The legislative requirements for the accountability system were stated in Section 15-241 (ARS § 15-241) of the Arizona Revised Statutes (Horne, 2007). It was called Arizona LEARNS (AZ LEARNS)—the state's accountability program as measured through high-stakes testing (Wright & Choi, 2006). This accountability system was created to satisfy the statute (Horne, 2007). The AZ LEARNS manual described the method and process used to generate the 2009 AZ LEARNS achievement profiles for succeeding and failing schools (Horne, 2007).

Within the AZ LEARNS manual, the formulas, parameters, and business rules that made up the profile calculation were provided to each public school. The intent of the manual was to document and explain the methods used and to justify the education policies adopted. The accountability system was created annually to identify public districts and charter schools that were underperforming or failing as measured by student performance on the AIMS Test (Horne, 2007). AZ LEARNS was a precursor to the federal legislation—*No Child Left Behind* (NCLB)—enacted just one year later (Wright & Choi, 2006).

No Child Left Behind (NCLB) and Arizona Law

While college completion became the mantra for external stakeholders across the nation, federal legislation requiring accountability demands for K-12 student performance outcomes was taking shape. With the passage of the 2002 NCLB law, Congress legislatively set a goal that by the 2013-2014 school year all children in the United States would attain academic proficiency (Davenport, 2006). High-stakes tests were the result of the requirement of NCLB legislation (Cavendish, 2009). The new accountability demands of NCLB resulted in an environment of high-stakes testing (Pepper, 2010) with the assumption that "praise or shame is the most effective motivator for large bureaucratic institutions such as our state-run schools" (Fritzberg, 2004, p. 14). NCLB law mandated that states be accountable for improved student learning through scores on a test that was state created (Fritzberg, 2004, p. 17). This resulted in higher student scores for states that designed easier tests—essentially "assessing achievement by their own tests" (Fritzberg, 2004, p. 17).

The AIMS Test

The AIMS Test was a summative assessment and aligned with state-mandated public schools' core curriculum to measure student learning (ADE, 2009). This was the beginning of state-wide assessments in Arizona (Arizona State Senate, 2015). The initial AIMS pilot test occurred in the spring of 1999 and was the result of cooperation between the ADE, district test coordinators and teachers, and a test development contractor (Barra, 2004). The AIMS Test was created to meet the demands of the AZ LEARNS accountability program (Wright & Choi, 2006), but also satisfied President Bush's NCLB Legislation (Lawton, 2011). NCLB strongly influenced the state stipulations that schools must assess 95% of the student population using the AIMS Test. Furthermore, each school had to meet the state's proficiency targets which NCLB

required 100% of students achieving proficiency by the 2013-2014 school year (Barra, 2004). Arizona was one of many states that created a high-stakes assessment that doubled as a high school graduation exam (Heywood, 2009).

The AIMS Test was first administered to students in grades three, five, and eight in the spring of 2000 (Barra, 2004), but to comply with NCLB mandates, students in grades four, six, and seven were also given the AIMS Test (Wright & Choi, 2006). Arizona's high school student population began taking the AIMS Test in the fall of 2004 (Arizona State Senate, 2015). The four performance levels included the following standards (reading, writing, math):

1. Exceeds standards,
2. Meets standards,
3. Approaches standards, and
4. Falls far below standards (Barra, 2004).

Within the environment of testing, punishment through NCLB sanctions was part of the provisions of Arizona LEARNS program which labeled schools based on the AIMS Test scores of students (Wright & Choi, 2006). Public district and charter school achievement profiles were based on the AIMS Test scores for the individual students and led to school classifications of *excelling, improving, maintaining, underperforming,* and *failing* to meet academic standards (Wright & Choi, 2006). Schools that were *underperforming* two consecutive years were considered *failing* and threatened by an administrative takeover (Wright & Choi, 2006).

K-12 and Higher Education: The AIMS Scholarship and Federal Funding

The AIMS Scholarship—The History

The AIMS Scholarship, the centerpiece for this study, was known by two names. In the political arena, the scholarship was more often referred to as the AIMS Scholarship (Pallack,

2010b). Within the academic arena—at the university-level—the scholarship was legally identified as the Regents High Honors Endorsement (RHHE) (ABOR, 2010c). For this study, the scholarship will be referred to as the AIMS Scholarship. In 2003, Tom Horne, Arizona's Superintendent of Public Instruction recommended that ABOR create and implement a merit-based scholarship (ABOR, 2004b, p. 54, Item 7 section).

Subsequently, ABOR voted to establish the AIMS Scholarship for "the purpose of recognizing high school students for outstanding academic achievement, as demonstrated through test scores (ABOR, 2004b, p. 54, Item 7 section). The AIMS Scholarship details and the qualifications for earning the scholarship were established by ABOR while the tracking of Arizona's high school students' AIMS-qualifying achievements was under the auspice of the ADE (Pallack, 2010b). ABOR, in concert with Arizona's three public universities, disseminated the merit-based scholarship (Pallack, 2010a) which was paid for by undergraduate students' tuition dollars (Pallack, 2010b).

The AIMS Scholarship—The AIMS Test

The AIMS Scholarship was created as a generous financial incentive for Arizona's high school students to encourage them to pass the AIMS Test (Stephenson, 2007) by exceeding the standards on all three portions of the AIMS Test (Polletta, 2010). The benefits of giving academically deserving students a merit-based award included the flow of federal dollars and the potential for increased retention of Arizona's brightest students at the three public universities (Stephenson, 2007). From the beginning of the AIMS Scholarship dissemination, and until the fall of 2011, students were given three chances—separate attempts over several years—to pass the AIMS Test (Pallack, 2010a). The student demand to take the test, a second and a third time, was a surprise to ABOR, educators, and policymakers as were the burgeoning numbers of

students who exceeded the AIMS standards and met all of the other qualifiers to earn the reward of the AIMS Scholarship (ABOR, 2010c; Pallack, 2010a). By 2012, 25,357 students had utilized the AIMS Scholarship at a cost of $153.6 million dollars—a six-year period (P. Gates, personal communication, March 25, 2019), in part, because of the multiple testing opportunities for all students (Pallack, 2010a). This unexpected financial burden on Arizona's already enervated economy, led to a policy change in 2010 that permitted just one testing attempt during a student's sophomore year (ABOR, 2010c).

The AIMS Scholarship—The Original Criteria

The AIMS Scholarship was merit-based aid for Arizona high school graduates who met the AIMS Scholarship criteria as determined by ABOR and included three parts:

Part 1: Students must complete all 16 Core Competency courses by graduation with a B or better in each course (16 Core Competency Courses: four units English; four units Math; 3 units Lab Science: 2 units Foreign Language; and 1unit Fine Arts).

Part 2: Students must meet at least one of the following academic requirements:

Option 1: GPA: Cumulative GPA of 3.5 on a 4.0 scale.

Option 2**:** Class Rank: Student is in the top 5% of high school graduating class upon graduation**.**

Part 3: Student must meet a least one of the options:

Option 1: Exceed the Standards on 3 out of the 3 AIMS Tests.

Option 2: Exceed the Standards on 2 out of the AIMS Tests (third must meet the Standard). And get at least 3s on 2 of the AP or IB Tests. (ABOR, 2004b, p. 56, Item 7 section)

The AIMS Scholarship—The Public Policy Timeline

Awarding Arizona's high school students for their achievement began in 1998 with a merit-based scholarship known as the Regents High Honors Endorsement (RHHE). The RHHE transformed a few years later and became known as the AIMS Scholarship. Originally, for Arizona's high school students to receive the AIMS Scholarship, the student must exceed all standards on the three-part AIMS Test (Barra, 2004). Through many revisions and transformations to the AIMS Test and the AIMS Scholarship, two decades later, ABOR voted to revise Policy 4-323C (2) removing "the reference to the AIMS Scholarship" (ABOR, 2018, p. 9).

The following is the 20-year AIMS education policy timeline from conception to conclusion (P. Gates, personal communication, March 25, 2019).

In 1998. The Regents Honors Endorsement (RHHE) Scholarship - A.R.S. 15-1626.13 was developed and implemented as a high honors endorsement—the endorsement seal was affixed to each high school diploma of a qualifying student as demonstrated through testing instruments (P. Gates, personal communication, March 25, 2019).

In 2002 – 2003. For two years, the RHHE program had nine participating schools with 75% of the students qualifying for this recognition and receiving a seal on their diploma and a notation on their transcript. This program was voluntary for students (ABOR, 2004b, p. 56, Item 7 section).

In 2003. At the August 2003 ABOR meeting, Arizona's Superintendent, Tom Horne, proposed changes in the criteria for the RHHE program that emphasized high academic achievement as demonstrated by performance on curricular requirements and exceeding the standards on the AIMS Tests. He also suggested that a tuition scholarship be offered to students

who receive a ‘High Honors’ endorsement as an incentive for the brightest high school students to do their best on the AIMS Test (ABOR, 2004b p. 54, Item 7 section).

In 2004. In an Executive Summary of the ABOR meeting on August 20, 2004, Agenda Item 7 reads, “The Regents High Honors Endorsement (RHHE) Program was suspended this most recent year due to a lack of resources to manage and administer the program.” ABOR, mandated by A.R.S. 15-1626.13, General Administrative Power of the Board, began to develop and implement an RHHE program for the purpose of recognizing high school students for outstanding academic achievement, as demonstrated through test scores. Student participation in the program was voluntary and required an application (ABOR, 2004b p. 54, Item 7 section).

During this same year, ABOR created a scholarship program called the RHHE—a program—to accompany the legislatively approved honors endorsement. The criteria for the endorsement were modified by replacing the student’s ACT and SAT scores with the AIMS Test score—the ‘exceeding standards’ standard level. The RHHE Scholarship was referred to as AIMS Scholarship with the first scholarships awarded in the fall of 2006 (P. Gates, personal communication, March 25, 2019).

In 2006. In 2006, to graduate from one of Arizona’s high schools, all students must have met or exceeded the standards in reading, writing, and mathematics (Arizona State Senate, 2015). High school students were given multiple opportunities to pass the AIMS Test (Barra, 2004). As shown in Table 1, in the spring of 2006, of the 2,649 Arizona high school students who qualified for the AIMS Scholarship, 1,561 were awarded the scholarship at a cost of $7.1 million (P. Gates, personal communication, March 25, 2019).

Statewide, the number of students who earned the AIMS Scholarship increased from 1,561 students in 2006 to 6,404 students by 2012—the last year before it was reduced to 25%.

The popularity of the AIMS Scholarship was evident in the 310% increase in student participation; however, with the popularity of the scholarship came at an increased cost of 591% over the six-year period. The cost in 2006 was $7.1 million and by 2012, the cost catapulted to $49.6 million—an unsustainable price tag for Arizona's three public universities.

Table 1

Regents High Honors Endorsement (RHHE) Scholarships

Year	# of Students	Cost (in millions)
	AIMS	
2006	1561	$7.1
2007	2173	$10.4
2008	2518	$13.4
2009	2914	$14.1
2010	3815	$20.3
2011	5972	$38.7
2012	6404	$49.6
	AIMS Discontinued – RHHE continues at 25% tuition	
2013	10313	$71.6
2014	8755	$60.3
2015	6784	$45.6
2016	3783	$25.1

(P. Gates, personal communication, March 25, 2019)

In 2008. During this year, 6,252 new or continuing students received the AIMS Scholarship at a cost of $30.4 million (P. Gates, personal communication, March 25, 2019).

In 2009. During a March 12 – 13, 2009 ABOR meeting, the discontinuance of the AIMS Scholarship was discussed and summarized:

> Regent DeConcini stated that during the Academic Affairs Committee meeting the universities presented a proposal to eliminate the Regent's High Honors Endorsement

scholarship [AIMS Scholarship]. Each of the universities described the increasing costs of the program in these challenging economic times. The universities also indicated that a number of students who received Regents High Honors Endorsement were students who would be eligible for other forms of merit aid from the institutions.

Superintendent Horne spoke to the Board in favor of the AIMS Scholarship. He stated that 5/6s of the scholarships would still be awarded through other scholarships, but if you remove the specific scholarship, you would lose the value that is obtained from it. There is criteria attached and students work to reach that criteria. The universities and the community get a benefit from the additional studying the students are doing to qualify for this scholarship.

Regent Calderón stated that he does not believe this is the area where cuts should be made. He encouraged the universities to go back and try to make the cuts elsewhere. Regent Calderón stated that he would like to see preservation of this scholarship at least through the class of students that have taken this test, which would be students who are high school sophomores this year. Regent Bulla stated that he agreed that if the scholarship is discontinued that the Board should hold harmless students who have already qualified. Regent Martinez stated that this is a very difficult choice that the Board needs to make because of budget cuts.

President Crow stated that he agreed that there should be some kind of compromise. He stated that all merit-based scholarships are based upon objective measures. The AIMS Scholarship recipients are not the highest performers based on objective measures. Everyone needs to remember that the universities have no state based financial aid. The universities self-finance the financial aid. The largest single non-

personnel discretionary item in the budget is financial aid. President Crow stated that reductions will be made in merit-based aid. If you keep this scholarship, then another form of merit aid will have to end.

President Haeger asked lots of questions regarding the AIMS Scholarships. AIMS Scholarship students that came to NAU in the fall of 07 were retained at the rate of 86.6%. The general retention of students is somewhere in the high 60%. If this Scholarship is maintained, this needs to be watched. If, in fact, a group of students has been created that have developed the appropriate study skills to succeed in college, this is a good thing. Remember, these are Arizona students that receive the AIMS Scholarship.

Regent DeConcini then restated his motion that the Board retain the Regent's High Honors Endorsement Scholarship and directed the presidents to develop options for the scholarship, to be presented to the Academic Affairs Committee at its April 2009 meeting. The motion passed unanimously with Superintendent Horne and Regents Martinez, Leonard, Bulla, DuVal, Calderón, McLendon, Mariucci, DeConcini and Regent Boice voting in favor of the motion. (ABOR, 2009a, p. 22 - 24)

On Monday, May 13 of 2009 and pursuant to A.R.S. 38.431.02—ABOR met to discuss the graduation requirements and college entrance exam attached to the AIMS Scholarship:

Senate Bill 1388 allows a minimum score on one or more nationally recognized college entrance exams, as determined by the State Board of Education, to be substituted for passing scores on the AIMS Test in order to satisfy high school graduation requirements. (ABOR, 2009c, p. 178, Appendix 29)

In 2010. Members of ABOR's Academic Affairs Committee met on Friday, June 4, 2010, to discuss agenda Item 1:

> The committee is asked to review and recommend for Board approval the suggested modifications for the procedures to qualify tuition scholarships awarded to recipients of the Regent High Honors Endorsement Program [AIMS Scholarship] and to adhere to implementing awards based on conditions F of ABOR policy 4-317 (see Appendix A), beginning in fall 2011. The three universities propose that the Regents High Honors Endorsement Program [AIMS Scholarship] and its alignment to university scholarship program be structured in the following manner:
>
> 1. For the fall 2011 university entry term (for those high school students who have recently completed the junior year), AIMS eligible students would receive merit-based aid at the same level that each university awards to equally meritorious students in their current scholarship programs.
>
>   The universities would adhere to Arizona Board of Regents Policy (ABOR) policy 4-317 condition F that states:
>
>   The Board-approved criteria for high honors endorsement shall be designed to minimize the likelihood that qualifying students will not also qualify for tuition scholarship for academic merit as determined by the universities.
>
>   Regents High Honors Endorsement qualifies for merit-based award at Arizona's three universities. Award would range from $1,000 to tuition-plus in value, with individual award to be determined by each university.
> 2. For the fall 2012 university entry term (for those high school students who have recently completed the sophomore year), the AIMS program would follow the same

awarding policies as noted for fall 2011. However, students graduating from Arizona high schools in spring 2012, would only be able to use the AIMS Test from the sophomore year (administered in spring 2010 in order to be eligible for the AIMS award consideration. However, any of the universities may choose to use additional tests taken by the end of the junior year, if desired for the fall 2012 entrants. RHHE qualifies for merit-based award at Arizona's three universities. Awards would range from $1,000 to tuition-plus in value, with individual awards to be determined by each university.

3. For the fall 2013 university entry term (for those high school students who have recently completed the freshmen year), the RHHE and its alignment to the university scholarship award would no longer be in effect for first-time freshmen entering Arizona universities. (ABOR, 2010a, pp. 2-3, Item 1 section)

Later in 2010, ABOR's Academic Affairs Committee changed one part of the AIMS qualifying standard to allow for only one AIMS testing attempt during the student's sophomore year (ABOR, 2010a). Also discussed during ABOR's Academic Affairs Committee meeting in 2010, was the cost of the burgeoning program at all three universities. ASU's leadership shared specific concerns about the AIMS Scholarship:

> For first-time freshmen entering ASU for the fall 2008 and 2009 terms, the university spent $2.5 million and $2 million respectively, in scholarship funds for students who would not have qualified for a university academic scholarship. The projected costs for the fall 2008 and fall 2009 students in these lower-level groups will approach $15 to $16 million during their eight semesters of attendance. For the fall 2009, nearly 31 percent of the AIMS scholars would not have received an ASU Scholarship or were upgraded from

> a lower value scholarship to the AIMS Scholarship value at base tuition. The AIMS Scholarship value for first-time freshman entering ASU for fall 2010 will be $7,793. That dollar value now places the AIMS Scholarship at the third highest-level for all general scholarships offered for Arizona residents. ASU forecasts that 487 AIMS students will join the fall 2010 first-time freshmen class either not on another ASU Scholarship or in a lower value ASU Scholarship program. Costs to upgrade or fully fund just these students to the full-tuition dollar value will reach $3 million for the 2010-2011 academic year. Projected costs for this group will approach $10 to $11 million during their eight semesters of attendance. ASU lowered its scholarships commitment to various programs—with our National Scholars program and in shifting more students into the Deans' Scholar program – as part of a cost-savings measure. (ABOR, 2010b, pp. 2-3, Item 1 section)

From 2006 to 2010, 12,981 students benefited from the AIMS Scholarship at a cost of 65.3 million dollars (Table 1). The financial reward for earning the AIMS Scholarship was generous and paid for by students' tuition dollars at the three public universities; however, with rising tuition and no permanent and sustainable funding mechanism to pay for the scholarship, the AIMS Scholarship parameters changed (Pallack, 2010b). According to Pallack (2010b), the cost of the program ballooned for two specific reasons:

1. The law's provisions allowed three test attempts during the student's high school career.
2. Many more students than expected passed the AIMS Test and were awarded the AIMS Scholarship.

Concurrently, as the AIMS Scholarship costs increased, in-state tuition soared as state appropriation declined (Pallack, 2010b). By the time, the *Great Recession* of 2007 – 2009 had significantly diminished the state's budget (Ryman, 2010; Schwarz, 2010), the cost of the AIMS Scholarship for the three universities was unsustainable as documented in the following ABOR executive meeting notes:

> If AIMS continues as is, the projected value of the AIMS Scholarship for first time freshmen entering university of Arizona in the fall 2011 term would be approximately $8,375. If 1,130 first-time freshmen were to enroll with RHHE at UA, the one-year cost would be approximately $9.5 million—with a four-year projected cost of approximately $34 million. (ABOR, 2010b, p. 6, Item 1 section)

In response to the unexpected cost of the scholarship, ABOR altered the AIMS Scholarship by reducing it from 100% to 25%—effective in the fall semester of 2013 (Pallack, 2010b, p. 1).

In 2011. In the fall of 2011**,** the value of the AIMS Scholarship was reduced to the same level as other merit-based scholarship programs from $1,000 to tuition-plus in value (P. Gates, personal communication, March 25, 2019).

In 2012. By fall semester 2012, the criteria to receive awards was altered. Instead of allowing up to three AIMS testing opportunities, the scores from only the student's sophomore year were considered for the AIMS Scholarship (Pallack, 2016a). Between 2006-2012, the years that the one-year (renewal), full tuition (waiver), AIMS Scholarship program was disseminated, the cost of the scholarship totaled $153.6 million with 25,357 students receiving the AIMS Scholarship (Table 1) (P. Gates, personal communication, March 25, 2019).

In 2013. By the fall of 2013, the AIMS Scholarship and its alignment to university scholarship awards was discontinued for first-time freshmen entering Arizona's three public universities (P. Gates, personal communication, March 25, 2019).

In 2014. In the fall of 2014, ABOR members approved a revision to the criteria for the RHHE Scholarship [AIMS Scholarship] removing the AIMS Test requirement since it was no longer offered. Students who are now awarded the RHHE Scholarship receive a tuition waiver of 25% of tuition based on criteria which include high school competency course completion, GPA, and ACT and SAT test scores (P. Gates, personal communication, March 25, 2019).

In 2018. At an ABOR meeting in April of 2018, it was proposed that a revision be made to remove "all references to the AIMS Scholarship" (ABOR, 2018, p. 9).

The AIMS Scholarship—The Current Research

Upton (2016) researched two state merit-based scholarship programs, and to date, it is the only AIMS-specific research study on the $153.6 million Arizona merit-based award program. Upton (2016) focused his study on undergraduate student enrollment outcomes in Arizona as compared to Georgia's HOPE Scholarship. Upton (2016) examined the effects of the AIMS Scholarship on increasing numbers of student applicants, student admissions report, underrepresented student enrollment, freshman ACT scores of AIMS Scholarship recipients, the retention of students, and tuition-levels at Arizona's three public universities. Upton (2016) concluded that the AIMS Scholarship increased enrollment and had the strongest effect on Black and Hispanic students. There was no evidence that the AIMS Scholarship affected either the quality of the incoming students as determined by the ACT score or the retention of the undergraduate student (Upton, 2016). Pertaining to increased costs of the three universities,

Upton (2016) conceded that the evidence of the AIMS Scholarship on tuition and fees was not sufficiently robust.

Upton (2016) posited that through his research, the differences between the HOPE and the AIMS Scholarships provided an analysis into merit-based scholarship aid, in general. Upton (2016) stated that the HOPE and the AIMS Scholarships, implemented at various times—1993 and 2006 respectively—may have impacted the results. In analyzing the HOPE program for public policies initiatives, Upton (2016) conceded that it may not be relevant to the AIMS Scholarship discussion. Each state's requirements to receive the scholarships along with the distinct difference in geography of the two states may explain the outcome differences as well (Upton, 2016). Finally, Upton's (2016) research did not address retention and dealt with the important student completion question as an aggregate and was not independently analyzed.

The AIMS Scholarship—The Case for Research

The challenges that education institutions face are real and complex with internal organizational and external societal fields impacting education policies (Crow & Debars, 2015; Kezar, 2014). In the early 2000s, a decision was made to create an Arizona public university merit-based scholarship for qualifying Arizona's high school graduates at a cost of millions of dollars (Lawton, 2011; Pallack, 2010a). What was known prior to the study was that 25,357 thousand students participated at a cost of millions of dollars (Pallack, 2010a). What was not known prior to this study were the undergraduate student performance outcomes—important findings related to college cohort retention, college cohort completion, and college cohort time to completion. In the age of transparency and increased accountability demands, with a microscope on undergraduate student performance outcomes, a legitimate case to research and report on the AIMS Scholarship was established.

Through an examination of the literature, there was just one research study (Upton, 2016) that analyzed the AIMS Scholarship and the effect on undergraduate student performance outcomes. Specifically, Upton's (2016) research dealt with enrollment with the completion question as an aggregate; thus, this needed study examined the effect of the AIMS Scholarship on college cohort retention, an important aspect for underrepresented students (Jobe et al., 2016; Rendon et al., 2000), completion, and time to completion—all important to stakeholders. The results of this research may more effectively inform institutional leaders, educators, and policymakers about the benefits and unintended consequences of public policies, add to the body of knowledge pertaining to merit-based scholarships, and improve student educational experiences and outcomes.

CHAPTER THREE: METHODOLOGY

Restatement of the Problem

Public policy influences state aid for higher education. While some scholars, education advocates, and policymakers focused their research on the trend away from need-based aid (Chen & DesJardins, 2010; Douglass, 2010; Umbricht, 2016), other researchers examined the negative social consequences of reduced state budget allocations on higher education (Ikpa, 2016; Johnson et al., 2011; Kallison & Cohen, 2010; McLendon et al., 2009). In this climate of financial aid changes (Chen & DesJardins, 2010; Douglass, 2010; Martinez & Turner, 2015; Umbricht, 2016)**,** increased higher education tuition, reduced state budget allocations (Ikpa, 2016; Johnson et al., 2011; Kallison & Cohen, 2010; McLendon et al., 2009), and stakeholder accountability (Crow & Debars, 2015; Kezar, 2014), ABOR, educators and policymakers conceived of a merit-based scholarship—an incentive-driven, public policy that rewarded qualified Arizona high school graduates (Upton, 2016).

Shifts in financial aid public policy in Arizona began a movement toward rewarding high school students' academic achievements with the financial incentive of a generous undergraduate scholarship (Ness, 2007). Many merit-based scholarships were earned through a set of state-created qualifying standards. For Arizona high school students, exceeding the standards on the AIM test was one qualifier. During the early 2000s in Arizona, the AIMS Test—a K-12 high-stakes exam for high school students—was developed as higher education state appropriations were fluctuating for ASU, UA, and NAU. It was at this critical public policy juncture that the AIMS Scholarship was established (Lawton, 2011).

Across the nation as key stakeholders increased demands for improved higher education completion rates (Coley et al., 2016; Conner & Rabovsky, 2011; Kuh et al.; 2008; Page & Scott-

Clayton, 2016; Spradlin et al., 2010; Tinto, 2011), merit-based aid became one way for the state to retain in-state high school graduates with academic acumen (Stephenson, 2007) while simultaneously recruiting high achieving out-of-state students to improve graduation rates (Burd, 2017). At this important education policy juncture, ABOR established the AIMS Scholarship for "the purpose of recognizing high school students for outstanding academic achievement, as demonstrated through test scores"—specifically, "exceeding standards on the AIMS Test" (ABOR, 2004b, p. 54, Item 7).

Arizona's high school graduates who exceeded the standards on the AIMS Test and met all the other qualifications and earned the full tuition AIMS Scholarship had the choice to apply to an Arizona public university including Arizona State University (ASU), the University of Arizona (UA), and Northern Arizona University (NAU) (Upton, 2016). The AIMS Scholarship provided a financial incentive to encourage Arizona's high school students to pass the AIMS Test—a high-stakes graduation exam (Stephenson, 2007). The benefits included the flow of federal dollars and the potential for increased retention of Arizona's brightest students at the three public universities (Stephenson, 2007).

Education policy influences aid for higher education. Across the nation, with increased demands by key stakeholders to improve college completion rates (Coley et al., 2016; Conner & Rabovsky, 2011; Kuh et al., 2008; Page & Scott-Clayton, 2016; Spradlin et al., 2010; Tinto, 2011), merit-based scholarships became one way to retain in-state high school graduates with academic acumen (Stephenson, 2007) while simultaneously recruiting high achieving out-of-state students to improve graduation rates (Burd, 2017). According to Doyle (2006), Sjoquist and Winters (2012b), and Upton (2016), Arizona was among a group of states to establish a scholarship based upon academic merit. Arizona's AIMS Scholarship was given to Arizona's

high school graduates who met the requirements—one requirement included exceeding the standards on the AIMS Test. While Doyle's (2006) research did not include Arizona's AIMS Scholarship, the 15-state, 1.2-billion-dollar investment represented the shift in education policy.

It this study, the effect of the AIMS Scholarship on Arizona's undergraduate student performance outcomes are researched, analyzed, and reported. It is expected that the results of this research will add to the body of knowledge regarding improved undergraduate student performance outcomes, inform education policymakers pertaining to state merit-based aid for undergraduate students, and ultimately benefit Arizona's university administrators, educators, and the student population in understanding the nexus between education policy, the alignment of university goals, and student performance outcomes.

Restatement of the Purpose of the Study

Through education policy and the pivotal National Defense Education Act of 1965, governments played a key role in creating policies for funding opportunities—the goal was to spur the college access especially for underrepresented student populations (St. John et al., 2005; Tinto, 2004). However, as the number of students attending college more than doubled (Cataldi et al., 2018; Kuh et al., 2011; Tinto, 2011), from nine million students in 1980 to 20 million in 2011 (Tinto, 2011, p. 2), and the completion rate remained at about 50% (Kuh et al., 2008; Bound et al., 2010; Radford et al., 2010; Supiano, 2011).

Tinto (2004), among a host of other researchers (Conner & Rabovsky, 2011; Kuh et al., 2008; Page & Scott-Clayton, 2016; Spradlin et al., 2010; Tinto, 2011), emphasized the vital importance of college retention towards college completion for the student personally as well as the important and positive societal and economic impact that an educated population has on communities, states, and the nation. Tinto (1998) posited that increasing access without

continued student participation toward completion is senseless. Combining access, with stagnated completion rates (Conner & Rabovsky, 2011; Kuh et al., 2008; Page & Scott-Clayton, 2016; Spradlin et al., 2010; Tinto, 2011)**,** decreased federal funding (Umbricht, 2016), decreased state appropriation (Alexander et al., 2010; Ikpa, 2016; Johnson et al., 2011; Kallison & Cohen, 2010; McLendon et al., 2009; Mortenson, 2012), and increased accountability demands (Alexander, 2000; Crow & Dabars, 2015; Conner & Rabovsky, 2011; Kezar, 2014), colleges and universities sought ways to retain students with their four-year degree completion as the goal (Coley et al., 2016 ; Page & Scott-Clayton, 2016; Tinto & Pusser, 2006). It is within this demanding environment that merit-based scholarships were conceived.

Education policy is at the center of student financial aid programs. The focus of this study details a specific Arizona education policy—the design, dissemination, and effect of the AIMS Scholarship—on undergraduate student performance outcomes of MPS high school graduates who enrolled in at least one semester at ASU. The key purpose of this dissertation is to examine the effect of the AIMS Scholarship on Arizona's undergraduate student performance outcomes including college cohort retention, college cohort completion, and college cohort time to completion.

Restatement of the Research Questions and Hypotheses

The three main research questions effectively framed this study and include:

1. Does receiving the AIMS Scholarship impact college cohort retention?

   H_o1. There is no statistically significant difference in college cohort retention between AIMS Scholarship recipients and non-recipients.

   H1. There is a statistically significant difference in college cohort retention between AIMS Scholarship recipients and non-recipients.

a. Does college cohort retention differ by gender among AIMS Scholarship recipients?

   H_o1a. There is no statistically significant difference in college cohort retention by gender between AIMS Scholarship recipients and non-recipients.

   H1a. There is a statistically significant difference in college cohort retention by gender between AIMS Scholarship recipients and non-recipients.

b. Does college cohort retention differ by minority status among AIMS Scholarship recipients?

   H_o1b. There is no statistically significant difference in college cohort retention by minority status between AIMS Scholarship recipients and non-recipients.

   H1b. There is a statistically significant difference in college cohort retention by minority status between AIMS Scholarship recipients and non-recipients.

c. Does college cohort retention differ by socioeconomic status (SES) among AIMS Scholarship recipients?

   H_o1c. There is no statistically significant difference in college cohort retention by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

H1c. There is a statistically significant difference in college cohort retention by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

2. Does receiving the AIMS Scholarship impact college cohort completion?

H_o2. There is no statistically significant difference in college cohort completion between AIMS Scholarship recipients and non-recipients.

H2. There is a statistically significant difference in college cohort completion between AIMS Scholarship recipients and non-recipients.

a. Does college cohort completion differ by gender among AIMS Scholarship recipients?

H_o2a. There is no statistically significant difference in college cohort completion by gender between AIMS Scholarship recipients and non-recipients.

H2a. There is a statistically significant difference in college cohort completion by gender between AIMS Scholarship recipients and non-recipients.

b. Does college cohort completion differ by minority status among AIMS Scholarship recipients?

H_o2b. There is no statistically significant difference in college cohort completion by minority status between AIMS Scholarship recipients and non-recipients.

H2b. There is a statistically significant difference in college cohort completion by minority status between AIMS Scholarship recipients and non-recipients.

c. Does college cohort completion differ by socioeconomic status (SES) among AIMS Scholarship recipients?

H_o2c. There is no statistically significant difference in college cohort completion by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

H2c. There is a statistically significant difference in college cohort completion by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

3. Does receiving the AIMS Scholarship impact college cohort time to completion?

H_o3. There is no statistically significant difference in college cohort time to completion between AIMS Scholarship recipients and non-recipients.

H3. There is a statistically significant difference in college cohort time to completion between AIMS Scholarship recipients and non-recipients.

a. Does college cohort time to completion differ by gender among AIMS Scholarship recipients?

H_o3a. There is no statistically significant difference in college cohort time to completion by gender between AIMS Scholarship recipients and non-recipients.

H3a. There is a statistically significant difference in college cohort time to completion by gender between AIMS Scholarship recipients and non-recipients.

b. Does college cohort time to completion differ by minority status among AIMS Scholarship recipients?

H_o3b. There is no statistically significant difference in college cohort time to completion by minority status between AIMS Scholarship recipients and non-recipients.

H3b. There is a statistically significant difference in college cohort time to completion by minority status between AIMS Scholarship recipients and non-recipients.

c. Does college cohort time to completion differ by socioeconomic status (SES) among AIMS Scholarship recipients?

H_o3c. There is no statistically significant difference in college cohort time to completion by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

H3c. There is a statistically significant difference in college cohort time to completion by socioeconomic status (SES) between AIMS Scholarship recipients and non-recipients.

Variables

The variables for this study included the AIMS Scholarship—the categorical, independent variable (IV); college cohort retention (second-year retention rate), college cohort completion (graduation with a degree), and college cohort time to completion (a four-year degree

earned in four years) are the continuous, dependent variables (DV); and the following are control variables (CV) that rule-out any alternative explanations:

1. Gender
2. Minority Status
3. SES
4. High school GPA
5. SAT/ACT score
6. AIMS scores
7. AIMS testing attempts

Research Design

To obtain the desired objectives of statistically discerning student performance outcomes for college cohort retention, college cohort completion, and college cohort time to completion, the most appropriate research methodology for this study was quantitative (Check & Schutt, 2012). It is a low-cost approach for dealing with a large sample of students (Check & Schutt, 2012). For this quantitative research study, a post-hoc, nonequivalent control group design within the family of quasi-experiments was selected (Check & Schutt, 2012). This design best explained the causal effect of the AIMS Scholarship on undergraduate student performance outcomes including college cohort retention (second-year enrollment), college cohort completion (graduating with a four-year degree), and college cohort time to completion (graduating with a four-year degree in four years). As for other design options, a true experiment was not considered because randomization of the student population was not possible. Using this methodology and design facilitated the analysis of the effect of the AIMS Scholarship on retention, completion, and time to completion, as defined in this study.

The MANCOVA statistic was selected because it is the most appropriate application to determine if differences exist between two or more groups after controlling for CVs on multiple DVs. MANCOVA elicited a causal effect of the intervention with an established threshold above and below a cut-off point—the cut-off point being 'exceeds the standards' on the three, separate portions of the AIMS Test (Pagano, 2012). Students were matched on all characteristics except one student will have received the scholarship (treatment) and the matching student will not have received the scholarship (control). This quasi-experiment controlled for selection bias. The intervention was the AIMS Test, and the cut-off was the predetermined scores required to receive the AIMS Scholarship. This methodology and design facilitated the analysis of the effect of the AIMS Scholarship on retention, completion, and time to completion, as defined in this paper, for MPS graduates who enrolled in at least one semester at ASU during the study period.

Population and Sample

For the purposes of this research, the population was all Arizona high school students who met the study parameter items 1-5. The sample included high school students who attended one of MPS's high schools during the academic years of 2005-2006 to 2011-2012. The student-level data from MPS was requested, received, and used to measure the treatment group and control group variables. The data for students who attended MPS during the study period were obtained through Dr. Robert Carlisle, the Office of Research and Evaluation director at MPS. More specifically, MPS students (parameter item numbers 1-4) and the correlated student-level data from ASU and the NSCH (parameter item number 5) defined the sample during study period and included students who:

1. Were enrolled in MPS grades 10-12.
2. Attended an MPS high school.

3. Took the AIMS Test sometime during their high school career.
4. Graduated from one of the MPS high schools (May 2006 – May 2012).
5. Were accepted and enrolled at ASU beginning in August of 2006 to August of 2012.

Instrumentation

The source for the study's instrumentation included MPS's student-level data with correlating undergraduate student-level data from ASU and the NSCH. MPS was selected for this study because it is the largest district in Arizona serving 64,000 students in grades P-12 (MPS, n.d.a). The data request covered only the students, grades 10-12, who were enrolled in one of the MPS high schools during the 2005-06 to 2011-12 academic years—the period that the full-tuition (waiver) AIMS Scholarship was available to students. Both the MPS and the correlating NSCH data sets were requested through the Director of MPS's Office of Research and Evaluation. ASU's data was collected through ASU's office of General Counsel and transferred to MPS where the data sets were correlated and anonymized.

Informed Consent

When a researcher uses anonymous data from an institution's archive, it is not necessary to obtain the consent of the data owner (Texas Woman's University, n.d.). Specific to this dissertation, a cursory introduction was made via telephone and follow-up emails with the MPS's Director of the Research and Evaluation. For ASU's student-level data, several contacts were made before the Office of General Counsel agreed to collect and transfer the data to MPS. MPS facilitated the correlation of data with ASU student-level data and NSCH's data files. An estimate of four weeks was given as a timeline at a fee of $50 per hour for collection procedures; however, to process to obtain the correlated, anonymized student-level data from MPS, ASU, and NSCH took three years—a complex process.

Data Collection Preparation and Procedures

Prior to beginning the study, IRB approval, through NAU, was applied for and received (see Appendix B). As well, requests for data were made to MPS and ASU (see Appendix C and Appendix D). Once approval was granted by each, requested data were sent to the researcher. For students attending MPS high schools during the study period, vital information was requested and included the student's gender, minority status, SES, GPA, SAT, and ACT scores. In addition, each student's AIMS testing achievement levels along with the scaled scores were also requested. MPS's data reliability was assessed, and it was determined that MPS researchers accurately collected the requested data and appropriately anonymized each student.

As for the ASU student-level data, vital information was also requested and included the student's gender, birthdate, zip code, MPS high school attended, and year graduated. ASU's enrollment history, major, degrees earned and year award, and the year the AIMS Scholarship was received and whether the student retained it from year-to-year. ASU's data reliability was assessed and, it was determined that ASU researchers accurately collected the requested data and appropriately de-identified the students.

The ASU student-level data was transferred to Dr. Robert Carlisle with MPS. He was charged with obtaining the NSCH data, the center which works with institutions of higher learning, states, school districts, high schools, and organizations involved in education policies (NSCH, n.d.). Dr. Carlisle then correlated the ASU student-level data with MPS's student-level data by matching the vital information. The correlated data from three sources was then anonymized with the complete data file transferred to the researcher. Requesting and receiving data from the three entities allowed for a more complete picture of the effect of the AIMS

Scholarship on college cohort retention, college cohort completion, and college cohort time to completion across gender, minority status, SES lines, and academic acumen.

Data Analysis Procedures

Multivariate analysis of variance (MANOVA) is a statistical analysis used when a researcher wants to examine the effects of one or more independent variables (IVs) on multiple dependent variables (DVs). Using the MANCOVA statistic, the differences in students' outcomes (from the population at MPS who attended ASU—a four-year university in Arizona was analyzed. Specifically, the outcomes of college cohort retention, college cohort completion, and college cohort time to completion. Differences on a variety of variables between students who scored just above the qualifying threshold and received the AIMS Scholarship compared to students who scored just below the qualifying threshold and did not receive the AIMS Scholarship were conducted. The treatment group (students) who earned the AIMS Scholarship and were accepted and enrolled at ASU—one of Arizona's public universities. These students were equally matched on all variables to the control group. The control group consisted of students who did not qualify for the AIMS Scholarship but were accepted and enrolled at ASU.

Chapter Summary

Chapter Three of this dissertation presented the research and design methodology for this quantitative post-hoc, nonequivalent control group design study. The sections included: (a) restatement of the problem; (b) restatement of the purpose; (c) restatement of the research questions and hypotheses; (d) research and design methodology; (e) population and sample; (f) data source; (g) data collection procedures; (h) data analysis procedures; and (i) informed consent. The summary presents the details of the study's methodology. The focus of the study centered on the effect of the AIMS Scholarship on undergraduate student performance outcomes.

The research and design section detailed the methodology that was used to complete the study's objectives. The sources for the sample were delineated while the data collection procedures and analysis were discussed. The research questions, null, and alternative hypotheses were established.

Summary

Chapter One of this dissertation addressed the impetus and the importance for researching, analyzing, and reporting undergraduate student performance outcomes based on an Arizona merit-based scholarship. Chapter One also described the background and rationale of the study, methodological framework, and the purpose and significance of the study. In addition, research questions were listed, sample and data sources were described, delimitations, limitations, and assumptions were discussed, acronyms were detailed, and operational definitions were delineated followed by a summary. Chapter Two provided the literature review as it pertained to the subject of this study. Chapter Three outlined the research and design methodology. Chapter Four describes the study results and Chapter Five presents a summary of the study and results, implications, recommendations for practice and future results, and conclusions.

CHAPTER FOUR: DATA ANALYSIS AND RESULTS

The focus of this research was to examine the effect of the AIMS Scholarship on undergraduate student performance outcomes. This one-year, (renewal) full-tuition (waiver), merit-based scholarship was earned by 25,357 Arizona undergraduate students at a cost of 153.6 million (P. Gates, personal communication, March 25, 2019). The students in this study graduated from one of the high schools in MPS and were enrolled at ASU during the study period. Specifically, the study analyzed the effect of the AIMS Scholarship on undergraduate student performance outcomes of college cohort retention, college cohort completion, and college cohort time to completion—important student performance markers in increasing access and fiscal accountability.

Within Chapter 4 are three main sections detailing the findings and the results followed by an ending summary. The sections include:

1. A discussion of the data collection procedures and analysis.
2. A review of the descriptive statistics which is organized according to each research question.
3. The results of statistical testing and analyses address each of the study's research questions.

Data Collection Procedures and Analysis

With the assistance of the MPS Director of Research and Evaluation, Dr. Robert Carlisle, a file with 2,749 anonymized student-level data records were obtained. The sample of students that were analyzed included those who graduated from an MPS high school between 2009-2011 and were matched to records from the ASU data files. The sample included 1,877 MPS graduates during the study period and who had enrolled in at least one semester at ASU. Matches were

verified using the variables: birthdate, gender, high school, high school graduation year, and zip code. When confronted with ambiguous matches, cross-checking ASU student-data information with data from the NSCH provided information on degrees, degree conferral dates, and majors which increased the matches.

Of the reported 1,877 MPS graduates who enrolled at or completed a degree at ASU, matching for 1,762 records had a 94% (1,762/1,877) match rate. Through careful analysis, it was determined that the remaining records that did not have matches were largely students who started college at another institution (e.g., UA, NAU, Mesa Community College, etc.) before enrolling at ASU or had insufficient data to resolve ambiguous matches (e.g., two or more students of the same gender, same graduating year and high school, same birthday, and same degree, etc.). For this research analysis, the 1,762 students served as the base sample.

Descriptive Statistics

Provided in Table 2 are the initial descriptive statistics for this base sample. Nearly 80% of the students were retained after their first year of enrollment. More than 65% of students from this sample graduated with a bachelor's degree from ASU. The average time to completion was 7.7 semesters. Approximately 15% of students in the sample were recipients of the AIMS Scholarship upon enrollment at ASU with 18% meeting the AIMS requirements. The average weighted high school GPA and ACT Composite scores were 3.6 and 24.5, respectively.

In terms of demographics, 53% of the students were female, 27.6% were minority students, and 12.9% were considered to have low SES. To be expected, a positive association was observed amongst the various university academic variables (ASU Graduate, Retention, Number of Semesters, AIMS Recipient) and high school academic variables (AIMS

Requirements, GPA, ACT). Demographics such as minority status and low SES were also negatively correlated with academic achievement, a pattern documented by prior research.

Table 2

Descriptive Statistics and Correlations

	M	*SD*	Max	Min	1	2	3
Retention	0.780	0.414	0	1			
ASU Graduate	0.653	0.476	0	1	0.408		
# Semesters	7.679	3.632	1	21	0.518	0.628	
AIMS Recipient	0.148	0.355	0	1	0.078	0.166	0.103
HS GPA	3.628	0.487	1.610	4.640	0.183	0.362	0.262
ACT Composite	24.489	4.245	13	35	0.006	0.081	0.055
Met AIMS Requirement	0.175	0.380	0	1	0.046	0.132	0.062
Gender	0.531	0.499	0	1	0.009	0.084	-0.031
Minority	0.276	0.447	0	1	-0.016	-0.057	0.029
Low SES	0.129	0.335	0	1	-0.029	-0.030	-0.016

	4	5	6	7	8	9	10
AIMS Recipient							
HS GPA	0.292						
ACT Composite	0.212	0.1563					
Met AIMS Requirement	0.514	0.335	0.143				
Gender	0.066	0.080	-0.021	0.027			
Minority	-0.132	-0.204	-0.079	-0.108	0.036		
Low SES	-0.122	-0.106	-0.221	-0.084	0.056	0.259	

Note. n=1,762 students.

Base Sample Results

Next, a naïve simple linear regression was used to observe how the receipt of the AIMS Scholarship influenced the likelihood of college cohort retention, college cohort completion, and college cohort time to completion. Included were the remaining covariates as control variables. As shown in Table 3, MPS students who enrolled at ASU and received the AIMS Scholarship were 6.7% more likely to be retained after their first year and 9.9% likely to graduate with a degree. They did, of note, take 0.7 more semesters to graduate.

Table 3

Base Sample OLS Regression

	(1)	(2)	(3)
	Retention	ASU Graduate	# of Semesters
AIMS Recipient	0.067*	0.099**	0.672**
	(0.030)	(0.031)	(0.246)
High School GPA	0.149***	0.336***	2.047***
	(0.023)	(0.024)	(0.185)
ACT Composite	0.000	0.001	0.012
	(0.001)	(0.001)	(0.010)
Met AIMS Requirements	-0.019	-0.028	-0.443+
	(0.031)	(0.032)	(0.258)
Gender	-0.004	0.050*	-0.413*
	(0.019)	(0.022)	(0.169)
Minority	0.033	0.019	0.787***
	(0.024)	(0.026)	(0.207)
Low SES	-0.036	0.014	-0.075
	(0.033)	(0.035)	(0.270)
Observations	1,762	1,762	1,762
R-Squared	0.037	0.139	0.082

Note. p-values: +p<0.20, *p<0.05, **p<0.01, ***p<0.001. The OLS regression coefficients with robust standards errors are reported in parentheses. Indicator variable are also included (not displayed) for each high school graduation year to control for differences in macro-economic activity that may affect all students.

At first glance, these results may appear to broadly support the main effect predictions in H1-H3; however, it is likely the students who received the AIMS Scholarship differed in many ways from those who did not qualify. For example, individual motivation and familial support are factors that may influence the likelihood of college cohort retention and college cohort completion rates but are nevertheless unobserved in this sample. Their omission indeed suggests that the estimates could very well be biased.

This suspicion is further corroborated after comparing those who received the AIMS Scholarship from those who did not on observable pre-scholarship characteristics. As displayed in Table 4, when analyzing the differences in pre-treatment characteristics in the base sample, it was found that MPS students who received the AIMS Scholarship had higher high school GPAs, higher ACT Composite scores, and were more likely to have exceeded the standards and all the AIMS Test sections (i.e., Reading, Writing, Math, and Science). To the extent that these characteristics were positively correlated with intrinsic motivation, which is unobserved, it could be said that those who received the scholarship and were retained as students, were more likely to graduate, and graduate more quickly simply because of their motivation, not necessarily because they received a merit-based scholarship.

In a similar manner, it was observed that students who received the AIMS Scholarship were less likely to be minority students and more likely to come from privileged backgrounds (i.e., high SES). Such factors are likely to be correlated with familial support and access to financing, again a factor that is not directly observed but could nevertheless influence the likelihood of being retained for a second year (college cohort retention), graduation (college cohort completion, graduation in four-years (college cohort time to graduation).

Table 4

Two-Sample t-Tests: Comparison of Pre-Treatment Characteristics in Base Sample

	Treatment		Control		Difference	
	M	*SD*	*M*	*SD*	*M*	*SD*
HS GPA	3.970	0.015	3.569	0.013	0.401	0.020***
ACT Composite	26.762	0.254	23.858	0.176	2.904	0.309***
Met AIMS Requirements	0.644	0.030	0.094	0.008	0.550	0.031***
Gender	0.609	0.030	0.517	0.013	0.092	0.033**
Minority	0.134	0.021	0.300	0.012	-0.166	0.024***
Low SES	0.031	0.011	0.146	0.009	-0.115	0.014***

Note. p-values: +p<0.20, *p<0.05, **p<0.01, ***p<0.001. A two-sample t-test to compare differences among the treatment (AIMS Recipient = 1; n=261) and control group (AIMS Recipient =0; n=1,501) was used.

Matching Procedure

To estimate the causal effect of the AIMS Scholarship, a researcher would ideally run an experiment where students would be randomly assigned a scholarship. For obvious reasons, such an ideal experiment would be both unethical and infeasible. Nevertheless, using a quasi-experimental matching methods can approximate an experiment. Specifically, matching students who received the AIMS Scholarship with those who did not on all the pre-treatment characteristics such that the only difference between the two groups would be that one received the AIMS Scholarship, and one did not. Like an actual experiment, this quasi-experimental design should reduce the potential for omitted variable bias (i.e., individual motivation, familial support, etc.) and allow for estimating the true causal effect of the AIMS Scholarship.

First, students were matched on all measures of high school academic achievement including high school GPA, ACT Composite scores, an indicator for whether the students actually exceeded standards on all AIMS subjects (reading, writing, math, science) and high school graduation year. Also matched were these students on observed demographic characteristics including gender, minority status, and low SES. Specifically, a matching routine known as coarsened exact matching was utilized (Blackwell et al., 2009). Dichotomous variables like gender and minority status were matched exactly while continuous variables such as GPA and ACT scores were coarsened into bins.

The coarsening into bins process created separate strata or groups that contained both the treatment and control variables. Given that there are many more control units (students) than treatment units (students), Mahala Nobis was used to compute the distance between each treated unit and its potential matched control unit. Within each stratum, the treated unit with the closest matching control unit (i.e., the observation with the lowest Mahala Nobis distance) were matched. The result included 122 treated units and 122 control units for a total matched sample of 244 students or units.

While this matching process significantly reduced the sample size, a quasi-experimental context that approximates a true randomized experiment was established, namely a sample with balance between the treatment and control groups on all relevant pre-treatment characteristics.

As shown in Table 5, are the mean and 25th, 50th, and 75th percentiles for all pre-treatment characteristics. Using a two-sample difference in means *t*-test and a Kolmogorov-Smirnov (*KS*) equality of distribution tests, no evidence was found to reject the null of equal means and equal distributions. Overall, the statistics in Table 5 confirm that the control students were nearly identical to the treatment students in all observable aspects with the exception of

their treatment status and were, thus, likely to provide a valid counterfactual of how treated students might behave if they did not receive the AIMS Scholarship.

Table 5

Comparison of Pre-Treatment Characteristics in Matched Sample

		Observa-tions	*M*	25th %ile	50th %ile	75th %ile	*p*-value (t-test)	*p*-value (KS-test)
HS GPA	T	122	3.936	3.756	3.947	4.089	0.988	0.999
	C	122	3.937	3.761	3.947	4.075		
ACT Composite	T	122	26.143	24	26	29	0.822	1.000
	C	122	26.286	23	26	29		
Met AIMS Requirements	T	122	0.377	0	0	1	1.000	1.000
	C	122	0.377	0	0	1		
Gender	T	122	0.566	0	1	1	1.000	1.000
	C	122	0.566	0	1	1		
Minority	T	122	0.115	0	0	0	1.000	1.000
	C	122	0.115	0	0	0		
Low SES	T	122	0.049	0	0	0	1.000	1.000
	C	122	0.049	0	0	0		

Note. T=Treatment, C=Control.

For valid inference, it is also important to compare this matched sample to students that were unmatched from the original base sample. Specifically, a two-sample differences-in-means *t*-test was used to compare students in the matched sample with students that were unmatched.

As shown in Table 6, students in the matched sample were much more academically qualified given their higher GPA, ACT, and AIMS scores. This result is not surprising given that the AIMS Scholarship was a merit-based scholarship tethered to academic achievement of an individual student. Those in the matched sample, however, were much less likely to be minority students and come from under-privileged households. Taking these results into account, any inferences one might make about the causal effect of the AIMS Scholarship should be applied to

the characteristics of this matched sample, namely high-achieving academic students who were not in the minority and did not come from under under-privileged homes.

Table 6

Two-Sample t-Tests: Comparison of Pre-Treatment Characteristics Between Matched and Unmatched Students

	Matched		Unmatched		Difference	
	M	*SD*	*M*	*SD*	*M*	*SD*
HS GPA	3.936	0.017	3.579	0.013	0.358	0.021***
ACT Composite	26.214	0.316	24.188	0.170	2.904	0.309***
Met AIMS Requirements	0.377	0.031	0.143	0.009	0.234	0.032***
Gender	0.566	0.032	0.525	0.013	0.041	0.033
Minority	0.115	0.020	0.302	0.012	-0.187	0.024***
Low SES	0.049	0.014	0.142	0.009	-0.092	0.014***

Note. p-values: +p<0.20, *p<0.05, **p<0.01, ***p<0.001. A two-sample t-test to compare differences among the treatment (Matched Sample = 1; n=244) and control group (Unmatched Sample =0; n=1,518) was used.

Statistical Testing and Analyses

Matched Sample Results

With this context in mind, the effects of the AIM Scholarship on the likelihood of college cohort retention, college cohort completion, and college cohort time to completion using the matched sample of 244 students were analyzed. Given the treatment and control groups were nearly identical, any statistically significant differences in outcomes were interpreted as the causal effect of the AIMS Scholarship.

Research Question 1 (RQ1) Results

Does the AIMS Scholarship have a casual effect on college cohort retention? The first main effect research question (RQ1) investigated the difference in college cohort retention among AIMS Scholarship recipients and non-recipients. To answer RQ1, a MANCOVA was conducted and as shown in Table 7, the results indicated that the main effect of the AIMS Scholarship on college cohort retention was supported. Based on the results, the null hypothesis was rejected.

In column 1 of Table 7, the effect of receiving the AIMS Scholarship was examined for the likelihood of college cohort retention. It was found that receiving the AIMS Scholarship increased the probability of enrollment after the first year at ASU by 9.8%. Setting all other variables at their means, it was also found that students who received the AIMS Scholarship in their first year had an 88.5% probability of enrolling after their first two semesters compared to 78.8% for those who did not receive the AIMS Scholarship. As predicted, this result strongly supports H1, namely that there is a statistically significant difference in college cohort retention between AIMS Scholarship recipients and non-recipients.

RQ1a Sub-Question Results

Does college cohort retention differ by gender among AIMS Scholarship recipients? To answer RQ1a, a MANCOVA was conducted and, as shown in column 2 of Table 7, the results indicated that the effect of the AIMS Scholarship on college cohort retention by gender was supported. Based on the results, the null hypothesis was rejected.

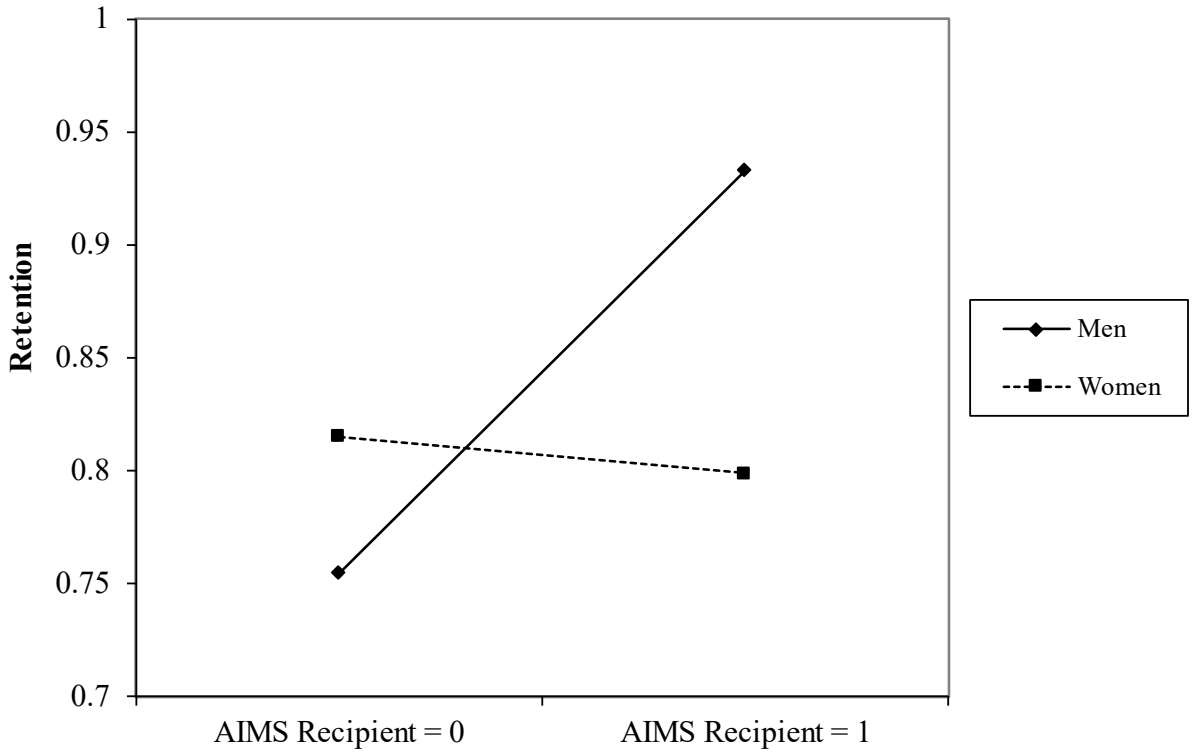
In Table 7 and pertaining to RQ1a, examined were the moderating effect of gender in column 2, the moderating effect of minority status in column 3, the moderating effect of low SES in column 4, and fully saturated interaction model in column 5. The results of the moderating

effect of gender on college cohort retention were statistically significant (coef. = -0.194, $p = 0.041$) (see column 2).

As shown in Figure 3, receiving the AIMS Scholarship appeared to have no effect on the likelihood of retention for women but had strong positive effect on the likelihood of retention for men. This result strongly supports H1a which predicted that the relationship between receiving the AIMS Scholarship and the likelihood of retention to be moderated by gender.

Figure 3

Retention x Gender



RQ1b Sub-Question Results

Does college cohort retention differ by minority status among AIMS Scholarship recipients? In order to answer RQ1b, a MANCOVA was conducted and, as shown in column 3 of Table 7, the results indicated that the effect of the AIMS Scholarship on college cohort

retention by minority status was not supported. Based on the results, the null hypnosis was retained.

RQ1c Sub-Question Results

Does college cohort retention differ by SES among AIMS Scholarship recipients? In order to answer RQ1c, a MANCOVA was conducted and, as shown in column 4 of Table 7, the results indicated that the effect of the AIMS Scholarship on college cohort retention by SES was supported. Based on the results, the null hypothesis was rejected.

Table 7

Matched Sample OLS Regression: Research Question 1: Retention

	(1)	(2)	(3)	(4)	(5)
	RQ1	RQ1a	RQ1b	RQ1c	RQ1a-1c
AIMS Recipient	0.098*	0.188**	0.093+	0.069	0.178*
	(0.048)	(0.068)	(0.051)	(0.049)	(0.069)
High School GPA	0.110	0.109	0.110	0.114	0.113
	(0.095)	(0.095)	(0.095)	(0.095)	(0.095)
ACT Composite	0.001	0.001	0.001	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Met AIMS Requirements	0.014	0.014	0.014	0.013	0.013
	(0.061)	(0.061)	(0.061)	(0.060)	(0.059)
Gender	-0.037	0.043	-0.037	-0.037	0.060
	(0.049)	(0.077)	(0.049)	(0.049)	(0.076)
Minority	-0.035	-0.035	-0.060	-0.035	-0.025
	(0.086)	(0.087)	(0.128)	(0.085)	(0.130)
Low SES	-0.106	-0.106	-0.106	-0.406+	-0.436*
	(0.144)	(0.147)	(0.144)	(0.209)	(0.206)
AIMS Recipient x Gender		-0.159+			-0.194*
		(0.095)			(0.095)

Table 7 (continued)

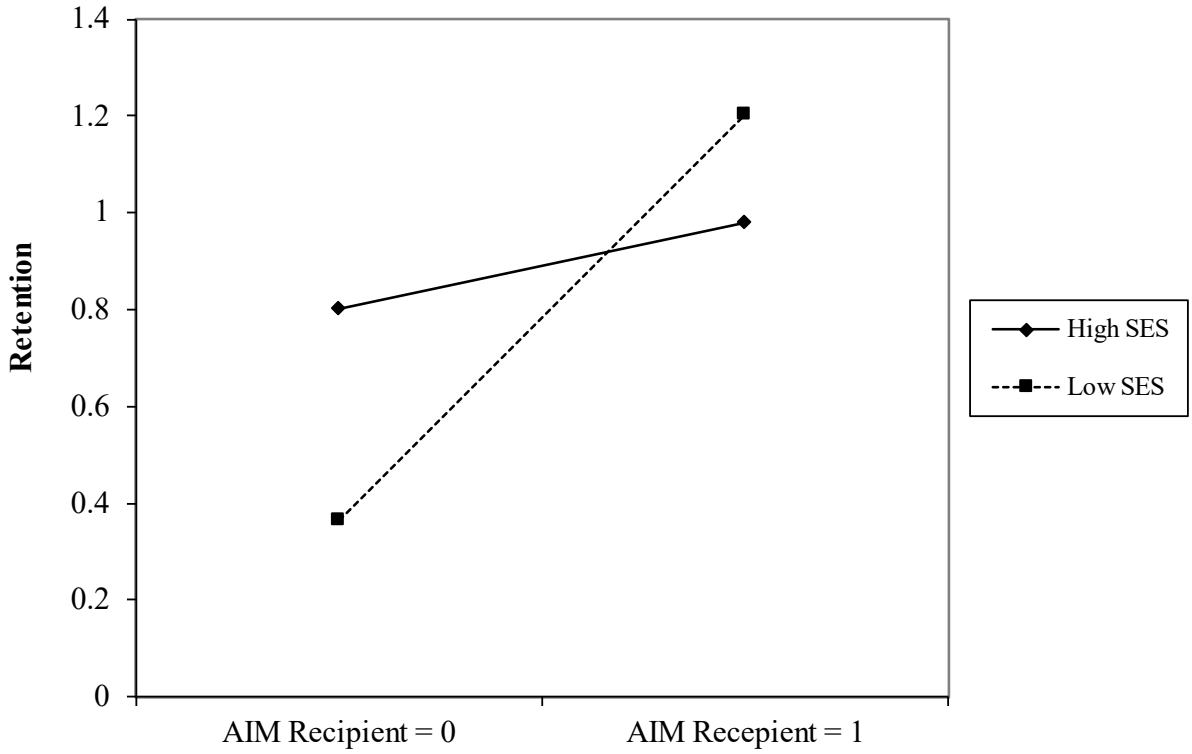
	(1)	(2)	(3)	(4)	(5)
	RQ1	RQ1a	RQ1b	RQ1c	RQ1a-1c
AIMS Recipient x Minority			0.049		-0.019
			(0.161)		(0.162)
AIMS Recipient x SES				0.601**	0.660**
				(0.209)	(0.208)
Observations	244	244	244	244	244
R-Squared	0.044	0.055	0.044	0.073	0.0894

Note. *p*-values: +*p*<0.20, **p*<0.05, ***p*<0.01, ****p*<0.001. The OLS regression coefficients with robust standards errors are reported in parentheses. Indicator variables are also included (not displayed) for each high school graduation year to control for differences in macro-economic activity that may affect all students.

The results for moderating effect of SES, on cohort retention to be statistically significant (coef. = 0.660, $p = 0.002$). As shown in Figure 4, the AIMS Scholarship had a strong positive effect on the likelihood of retention for high and low SES students, but a much stronger effect for those with low SES than those with high SES. This result strongly supports H1c which predicted that the relationship between receiving the AIMS Scholarship and the likelihood of retention to be moderated by SES. All other interaction effects were found to be statistically insignificant.

Figure 4

Retention x SES



Summary of RQ1 and RQ1a-1c Results

In summary, the results support the findings for the main effect of the AIMS Scholarship on college cohort retention (RQ1) and the sub-questions for retention and gender (RQ1a) and retention and SES (RQ1c). The fact that having the AIMS Scholarship on college cohort retention was not supported for minority status (RQ1b) means that there was no interaction effect, and the main effect did not differ by minority status.

Research Question 2 (RQ2) Results

Does the AIMS Scholarship have a casual effect on college cohort completion? The first main effect research question (RQ2) investigated the difference in college cohort completion among AIMS Scholarship recipients and non-recipients. To answer RQ2a, a MANCOVA was

conducted and, as shown in column 1 of Table 8, the results indicated that the effect of the AIMS Scholarship on college cohort completion was supported. Based on the results, the null hypothesis was rejected.

In column 1 of Table 8, the effect of receiving the AIMS Scholarship on the likelihood of college cohort completion was examined. It was found that receiving the AIMS Scholarship increased the probability of graduation from ASU by 14.8%. Setting all other variables at their means, the students who received the AIMS Scholarship in their first year had an 86.2% probability of graduating with an undergraduate degree versus 71.6% for those that did not receive a scholarship. As predicted, this result strongly supports H2 in which a statistically significant difference in college cohort completion between AIMS Scholarship recipients and non-recipients.

RQ2a Sub-Question Results

Does college cohort completion differ by gender among AIMS Scholarship recipients? To answer RQ2a, a MANCOVA was conducted and, as shown in column 2 of Table 8, the results indicated that the effect of the AIMS Scholarship on college cohort completion by gender was not supported. Based on the results, the null hypothesis was retained.

RQ2b Sub-Question Results

Does college cohort completion differ by minority status among AIMS Scholarship recipients? To answer RQ2b, a MANCOVA was conducted and, as shown in column 3 of Table 8, the results indicated that the effect of the AIM Scholarship on college cohort completion by minority status was not supported. Based on the results, the null hypothesis was retained.

RQ2c Sub-Question Results

Does college cohort completion by SES differ among AIMS Scholarship recipients? To answer RQ2c, a MANCOVA was conducted and, as shown in column 4 of Table 8, the results indicated that the effect of the AIMS Scholarship on college cohort completion by SES was not supported. Based on the results, the null hypothesis was retained.

Table 8

Matched Sample OLS Regression: Research Question 2 Graduation

	(1)	(2)	(3)	(4)	(5)
	RQ2	RQ2a	RQ2b	RQ2c	RQ2a-2c
AIMS Recipient	0.148**	0.255**	0.158**	0.146**	0.235**
	(0.052)	(0.081)	(0.055)	(0.053)	(0.083)
High School GPA	0.359***	0.358***	0.359***	0.359***	0.359***
	(0.098)	(0.099)	(0.098)	(0.098)	(0.099)
ACT Composite	0.000	0.000	0.000	0.000	0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Met AIMS Requirements	-0.041	-0.041	-0.042	-0.041	-0.041
	(0.063)	(0.062)	(0.063)	(0.063)	(0.062)
Gender	0.047	0.116	0.047	0.047	0.118
	(0.053)	(0.083)	(0.053)	(0.053)	(0.083)
Minority	-0.007	-0.007	-0.038	-0.007	0.042
	(0.095)	(0.097)	(0.133)	(0.096)	(0.139)
Low SES	0.014	0.014	0.014	-0.002	-0.033
	(0.149)	(0.150)	(0.149)	(0.233)	(0.235)
AIMS Recipient x Gender		-0.137			-0.142
		(0.106)			(0.107)
AIMS Recipient x Minority			-0.090		-0.099
			(0.176)		(0.186)
AIMS Recipient x SES				0.031	0.064
				(0.275)	(0.283)

Table 8 (continued)

	(1)	(2)	(3)	(4)	(5)
	RQ2	RQ2a	RQ2b	RQ2c	RQ2a-2c
Observations	244	244	244	244	244
R-Squared	0.089	0.096	0.090	0.089	0.097

Note. p-values: +p<0.20, *p<0.05, **p<0.01, ***p<0.001. The OLS regression coefficients with robust standards errors are reported in parentheses. Indicator variables are also included (not displayed) for each high school graduation year to control for differences in macro-economic activity that may affect all students.

Summary of RQ2 and RQ2a-2c Results

In summary, the result for the main effect of the AIMS Scholarship on college cohort completion (RQ2) was supported. The fact that having the AIMS Scholarship did not have an effect on college cohort completion by gender (RQ2a), minority status (RQ2b) and SES (RQ2c) means that there were no interaction effects and that the main effect did not differ by gender, minority status, or SES.

Research Question 3 (RQ3) Results

Does the AIMS Scholarship have a casual effect on college cohort time to completion? The first main effect for research question (RQ3) investigated the difference in college cohort time to completion among AIMS Scholarship recipients and non-recipients. To answer RQ3a, a MANCOVA was conducted and, as shown in column 1 of Table 9, indicated that the effect of the AIMS Scholarship on college cohort time to completion was supported. Based on the results, the null hypothesis was rejected.

In column 1 of Table 9, the effect of receiving the AIMS Scholarship on the college cohort time to completion was also examined. It was found that receiving the AIMS Scholarship increased the number of semesters required to graduate by 0.869 semesters. Setting all other

variables at their means, it was found that students who received the AIMS Scholarship in their first year took an average of 8.71 semesters to graduate while those who did not receive the AIMS Scholarship took 7.84 semesters to finish. As predicted, this result strongly supports H3 in which a statistically significant difference in college cohort time to completion between AIMS Scholarship recipients and non-recipients.

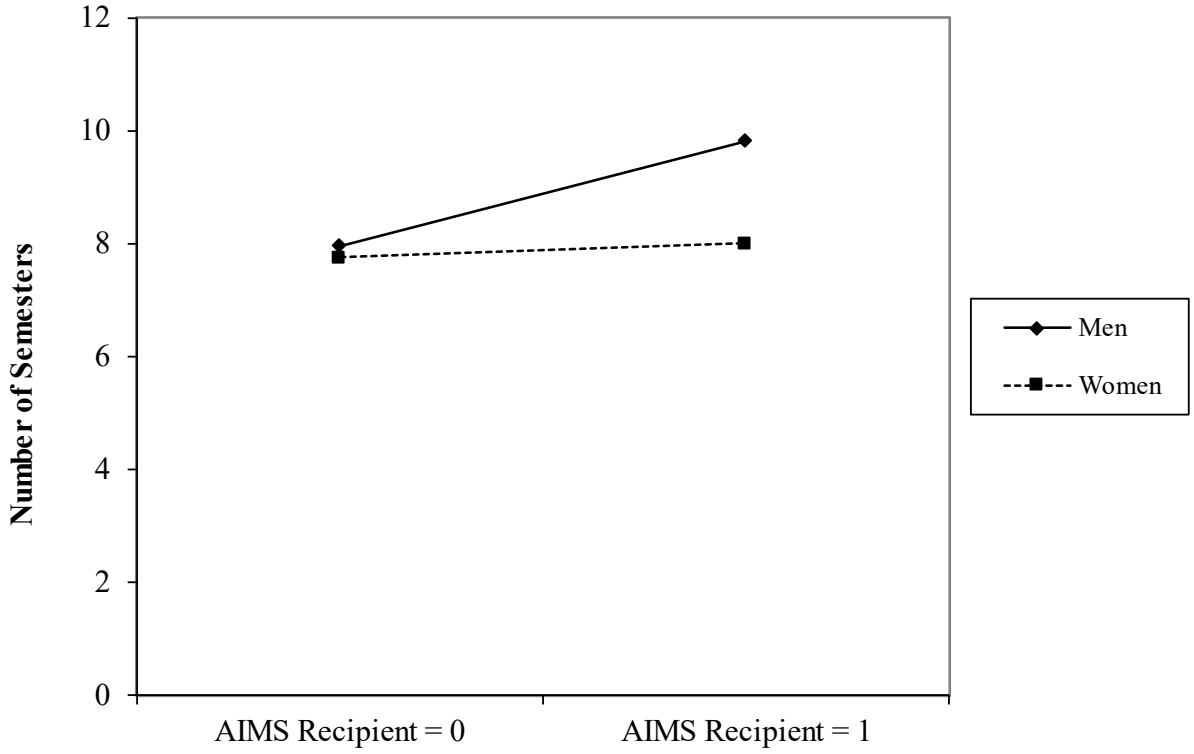
RQ3a Sub-Question Results

Does college cohort time to completion differ by gender among AIMS Scholarship recipients? To answer RQ3a, a MANCOVA was conducted and, as shown in column 2 of Table 9, the results indicated that the effect of the AIMS Scholarship on time to college cohort completion by gender was supported. Based on the results, the null hypothesis was rejected.

Also discovered were the moderating effect of gender on college cohort time to completion to be marginally significant (coef. = 1.622, $p = 0.052$) (column 2 of Table 9). As displayed in Figure 5, receiving the AIMS Scholarship appeared to have no effect on the number of semesters taken to graduate for women, but appeared to increase the time to graduation for men by approximately 1.6 semesters. This result strongly supports H3a which predicted that the relationship between receiving the AIMS Scholarship and college cohort time to completion to be moderated by gender.

Figure 5

Time to Completion x Gender



RQ3b Sub-Questions Results

Does college cohort time to completion differ by minority status among AIMS Scholarship recipients? In order to answer RQ3b, a MANCOVA was conducted and, as shown in column 3 of Table 9, the results indicated that the effect of the AIMS Scholarship on college cohort time to completion by minority status was not supported. Based on the results, the null hypothesis was retained.

RQ3c Sub-Questions Results

Does college cohort time to completion differ by SES among AIMS Scholarship recipients? In order to answer RQ3c, a MANCOVA was conducted and, as shown in column 4 of

Table 9, the results indicated that the effect of the AIMS Scholarship on college cohort time to completion by SES was not supported. Based on the results, the null hypothesis was retained.

Table 9

Matched Sample OLS Regression: Research Question 3 Time to Graduate

	(1)	(2)	(3)	(4)	(5)
	RQ3	RQ3a	RQ3b	RQ3c	RQ3a-3c
AIMS Recipient	0.869*	1.751*	0.993*	0.843*	1.863**
	(0.400)	(0.697)	(0.426)	(0.413)	(0.705)
High School GPA	1.231	1.221	1.237	1.235	1.235
	(0.904)	(0.887)	(0.902)	(0.904)	(0.882)
ACT Composite	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Met AIMS Requirements	-0.215	-0.214	-0.216	-0.215	-0.215
	(0.498)	(0.500)	(0.495)	(0.499)	(0.496)
Gender	-1.016*	-0.236	-1.016*	1.016*	-0.205
	(0.428)	(0.648)	(0.428)	(0.429)	(0.649)
Minority	0.431	0.430	0.969	0.431	1.030
	(0.690)	(0.696)	(0.973)	(0.692)	(1.010)
Low SES	-0.303	-0.303	-0.303	-0.567	-0.933
	(0.954)	(0.977)	(0.953)	(1.444)	(1.457)
AIMS Recipient x Gender		-0.1558+			-1.622+
		(0.833)			(0.830)
AIMS Recipient x Minority			-1.076		-1.199
			(1.255)		(1.316)
AIMS Recipient x SES				0.528	1.260
				(1.679)	(1.752)
Observations	244	244	244	244	244
R-Squared	0.082	0.096	0.085	0.082	0.101

Note. p-values: +p<0.20, *p<0.05, **p<0.01, ***p<0.001. The OLS regression coefficients with robust standards errors are reported in parentheses. Indicator variables are also included (not displayed) for each high school graduation year to control for differences in macro-economic activity that may affect all students.

Summary of RQ3 and RQ3a-3c Results

In summary, the result for the main effect of the AIMS Scholarship on college cohort time to completion (RQ3) was supported as was sub-question RC3a, college cohort time to completion by gender. The fact that having the AIMS Scholarship and college cohort time to completion by minority status (RQ3b) and by SES (RQ3c) were not supported means that there were no interaction effects and that the main effect did not differ by minority status or SES.

CHAPTER FIVE: DISCUSSION

This study examined the effect of the AIMS Scholarship on college cohort retention, college cohort completion, and college cohort time to completion—important student performance markers, especially in an era of fiscal accountability. Over the six-year span (2006 – 2012) of this one year, (renewable) full-tuition (waiver) merit-based award, a total of 25,357 Arizona high school graduates received the AIMS Scholarship to attend one of Arizona's three public universities—at a cost of $153.6 million (P. Gates, personal communication, March 25, 2019). In today's educational climate of increased access to higher education and with an important and necessary concentration on student retention to completion, studying and reporting on the results of the AIMS Scholarship is vital for framing Arizona education policies focused on access and affordability to degree completion.

Summary of the Study

This quantitative research study followed high school students who graduated from MPS during the 2009–2011 academic years. They were matched with corresponding ASU student-level data including gender, birthdate, high school attended, year graduated, and zip code. The NSCH data was used to identify ambiguities. The anonymized files then followed the MPS students through their ASU careers. Though preliminary statistical analyses were completed on the base sample of 1,762 students, finding the true effect of the AIMS Scholarship was the goal. Using a post-hoc, nonequivalent control group design within the family of quasi-experimental designs, students who received the AIMS Scholarship were matched with those who did not receive the AIMS Scholarship on all the pre-treatment characteristics including gender, minority status, SES, high school GPA, ACT Composite, and the AIMS requirements. The only difference between the two groups was that one received the AIMS Scholarship (Treatment), and one did

not (Control). This quasi-experimental design reduced the potential for omitted variable bias (i.e., individual motivation, familial support, etc.) and allowed for estimating the true causal effect of the AIMS Scholarship.

Summary of Findings and Conclusions

For the base sample (n=1,742) findings, nearly 80% of the students were retained after their first year of ASU enrollment. More than 65% of students from this sample graduated with a bachelor's degree from ASU. The average time to completion was 7.7 semesters. Approximately 15% of students in this sample were recipients of the AIMS Scholarship upon enrollment at ASU, with 18% meeting the AIMS requirements. The average weighted high school GPA and ACT Composite scores were 3.6 and 24.5, respectively.

In terms of the demographics for the base sample, 53% of the students were female, 27.6% were minority students, and 12.9% were considered to have low SES. To be expected, a positive association was observed amongst the various university academic variables (ASU Graduate, Retention, Number of Semesters, AIMS Recipient) and high school academic variables (AIMS Requirements, GPA, ACT). Demographics such as minority status and low SES were also negatively correlated with academic achievement, a pattern also documented by prior research.

The findings of a naïve simple linear regression showed how the receipt of the AIMS Scholarship influenced the likelihood of college cohort retention, college cohort completion, and college cohort time to completion. Included were the remaining covariates as control variables and included gender, minority status, SES, GPS, ACT, AIMS requirements. The results concluded that MPS students who enrolled at ASU and received the AIMS Scholarship were

6.7% more likely to be retained after their first year and 9.9% more likely to graduate with a degree. They did, however, take 0.7 more semesters to graduate.

These results appear to broadly support the main effect predictions in H1-H3. It nonetheless is likely that the students who received the AIMS Scholarship differed in many ways from those who did not qualify. For example, individual motivation and familial support are factors which could well influence the likelihood of college cohort retention and college cohort completion rates but are nevertheless unobserved in this sample. Their omission indeed suggests that the estimates could indicate bias.

To estimate the true causal effect of the AIMS Scholarship, and to avoid bias, a quasi-experimental design matched students to approximate an experiment. On all the pre-treatment characteristics of gender, minority status, SES, GPA, ACT Composite, and the AIMS requirements, the students were matched, nearly perfectly. Specifically, the treatment group included 122 units/students who received the AIMS Scholarship and were matched with the control group of 122 units/students who did not receive the Scholarship. This quasi-experimental design reduced the potential for omitted variable bias (i.e., individual motivation, familial support, etc.) and allowed for estimating the true causal effect of the AIMS Scholarship.

These findings indicated that receiving the AIMS Scholarship appeared to have no effect on the likelihood of retention for women but had a strong positive effect on the likelihood of retention for men—a predictor for graduation. In addition, the AIMS Scholarship had a strong positive effect on the likelihood of retention for high and low SES students, but a much stronger effect for those with low SES than those with high SES—again, a predictor for graduation. Lastly, receiving the AIMS Scholarship appeared to have no effect on the number of semesters taken to graduate for women, but appeared to increase the time to graduation for men by

approximately 1.6 semesters. All are important effects in an era not only of fiscal accountability but for the increased undergraduate performance outcomes—a primary goal of the AIMS Scholarship.

RQ1 – RQ1a-c Summary

To summarize, the finding for the main effect of the AIMS Scholarship on college cohort retention (RQ1) was supported. In addition, the effect of the AIMS Scholarship on college cohort retention by gender (RQ1a) and by SES (RQ1c), respectively, were also supported. Based on these results, the null hypotheses were rejected. This study also showed that college cohort retention did not differ by minority status with the reception of the AIMS Scholarship (RQ1b). In this case, the researcher failed to reject the null hypothesis.

RQ2 – RQ2a-c Summary

To summarize, the finding for the main effect of the AIMS Scholarship on college cohort completion (RQ2) was supported and the null hypothesis was rejected. The fact that having the AIMS Scholarship did not have an effect on college cohort completion by gender (RQ2a), minority status (RQ2b) and SES (RQ2c) means that there were no interaction effects and that the main effect did not differ by gender, minority status, or SES. Regarding the three sub-questions (RQ2a-c), the researcher failed to reject the null hypotheses.

RQ3 – RQ3a-c Summary

In summary, the finding for the main effect of the AIMS Scholarship on college cohort time to completion (RQ3) was supported as was the sub-question (RC3a) college cohort time to completion by gender. Based on the results, the null hypotheses were rejected. The fact that having the AIMS Scholarship on college cohort time to completion by minority status (RQ3b) and by SES (RQ3c) were not supported means that there were no interaction effects and that the

main effect did not differ by minority status or SES. In these cases, the researcher failed to reject the null hypotheses (RQ3b-c).

Implications and Recommendations for Practice

The results of researching and analyzing, and now reporting the effect of the $153.6 million AIMS Scholarship education policy adds knowledge regarding the strong and notable correlation between this Scholarship on retention for men and those students with low SES—who are a considerable proportion of underrepresented students on the campuses of Arizona's three public universities. The findings will inform education policymakers pertaining to the benefits of this specific Scholarship. Additionally, these results concerning the AIMS Scholarship on increased access and affordability align with ABOR's higher education goals—critical information for university administrators, educators, and all other stakeholders across the spectrum.

Education costs money and is a determining factor for retaining undergraduate students for their second-year enrollment—a measurement for increased graduation. This study demonstrated that money in the form of a merit-based scholarship very much mattered to 25,357 of Arizona's high school graduates who earned the AIMS Scholarship—a one-year (renewable) full-tuition, (waiver) award. The results of this research aligned with two of ABOR's *Strategic Direction Goals—Participation and Affordability:*

1. To Increase Student Participation in University Education (ABOR, 2004a, p. 82).

Addressing this important topic of student participation in university education, the popularity of the AIMS Scholarship was evident in the 310% increase in student enrollment across Arizona's public university system (P. Gates, personal communication, March 25, 2019). Among the students who received the AIMS Scholarship, the positive impact on retention for

men and for student in the low SES category were significant—an underrepresented student population in Arizona's higher education system was offered an opportunity for greater participation.

A current Arizona education report confirms that:

> Latino students are about 8 to 10 percentage points lower than white students going to college right now. If we increased Hispanic students, Black students, Native American students to the same level, if everyone was at the same level of college going, we would see an $8.69 billion increase in social gains. Arizona would also see an increase of $3.3 billion in fiscal gains per high school cohort (Helios Education Foundation, 2023).

2. To Increase Affordable Education for Students (ABOR, 2004a, p. 82).

The increased higher education enrollment for Arizona high school graduates, a positive effect of the AIMS Scholarship, came at a 591% increased cost to the universities over the six-year period (P. Gates, personal communication, March 25, 2019); yet because of this Arizona designed and disseminated scholarship, unprecedented numbers of Arizona students who may not have afforded college, otherwise, participated in higher education, which would be expected to yield future enormous personal and economic advantages for those students, their communities, and Arizona.

In a 2009 ABOR meeting (ABOR, 2009a, p. 22 - 24), a main discussion topic was the discontinuance of the AIMS Scholarship. While ABOR members and ASU, UA, and NAU presidents weighed the skyrocketing costs of the Scholarship against the backdrop of the dramatic increases of student participation (with concerns for students who were unprepared for

college), NAU's President Haeger made favorable and salient points regarding the AIMS Scholarship evidence:

> AIMS Scholarship students that came to NAU in the fall of 07 were retained at the rate of 86.6%. The general retention of students is somewhere in the high 60%. If this Scholarship is maintained, this needs to be watched. If, in fact, a group of students has been created that have developed the appropriate study skills to succeed in college, this is a good thing. Remember, these are Arizona students that receive the AIMS Scholarship. (ABOR, 2009a, p. 22 - 24)

Since an overarching purpose of this study is to inform stakeholders as to the consequences of merit-based aid policies, now Arizona education stakeholders are better able to consider the policy that created the AIMS Scholarship with a state-developed test in lieu of the ACT or SAT in addition to other state-determined academic parameters. This Scholarship, which propelled thousands of students into higher education, without a doubt, provided life-changing opportunities for 25,357 Arizona high school graduates. Stephenson (2007) posited that providing merit-based aid for in-state students increased the potential to retain those with academic acumen—from eager students to contributing and prosperous citizens.

To facilitate student access with participation to completion, "particularly for the fast-growing number of first-generation students" (ABOR, 2004a, p. 82), the continuation of merit-based awards for Arizonans seeking a post-secondary education is vital and working in partnership with Arizona's Legislators, and all other interested individuals, is the key to unlocking the future for many Arizonans for their betterment and that of Arizona as a whole. The Legislature has the funding responsibility dictated by Arizona's Constitution. Establishing a

working relationship of trust by showing improved undergraduate student performance outcomes, based on research results, is critical during budget negotiations.

As for the function of the Legislature, a common maxim is that state government's budgetary role is to "incarcerate, medicate, and educate." Tax dollars spent on education are not only a wise expenditure in and of itself but an expenditure which will result in fewer dollars spent on other costly programs, such as incarceration and health care. These facts are confirmed by a recent Arizona-specific report:

> The lifetime earnings of a high school graduate from the class of 2022 to be $679,000. By contrast, a resident who obtains a bachelor's degree would make $1,531,000, a 77% increase. All told, the billions in economic gains that come from expanding postsecondary enrollment and completion—not to mention the thousands of individuals empowered with greater economic opportunity and prosperity—more than justify the investments required of the state to ensure that more students graduate high school and go on to pursue a postsecondary education. (Helios Education Foundation, 2023)

This report by the Helios Education Foundation (2023) does not even address the cost of juvenile delinquency, crime, recidivism, and incarceration, or the strain on health care system. Thus, it is recommended that ABOR, Arizona's public university presidents, Arizona education non-profit organizations, advocates, and policymakers work closely and transparently with the Legislature to ensure effective education funding. All stakeholders working together is the key to student access and success.

An educated populace is a goal of ABOR as stated in their *Strategic Directions*:

> The quality of life and improvement in the social, economic, and environmental health of Arizona's citizens is directly related to the education, research and public service

> provided by Arizona's public universities. Access to a university education for Arizona citizens, particularly for the fast-growing number of first generation, time- and place-bound students, is critical to social stability, meeting workforce needs, and having citizens who are responsible stewards of the state's legacies and resources. (ABOR, 2004a, p. 82)

Recommendations for Future Related Research

All education stakeholders understand the importance of protecting student information. While navigating the challenges associated with records requests for student-level data, the researcher received the following information from Ellen Campbell with the Student Privacy Policy Office of the USDoE:

> With regard to whether receipt of a scholarship can be considered 'directory information,' we have advised that if the scholarship is not 'need-based' but is indeed an 'honor or award,' a school can disclose the information if the school designated something like "honor or award" as a directory information item and the student had not opted out of directory information. If the scholarship is need-based, then that cannot be disclosed as directory information and the eligible student would need to provide consent before that information is disclosed.
>
> Therefore, consistent with FERPA, a university could disclose information from a student's education records concerning scholarship or financial aid if the following conditions exist:
>
> 1) The financial aid or scholarship is considered an honor or award based on academic or athletic achievements;

2) The category of information has properly been designated as ‘directory information’ as set forth in § 99.37 of the FERPA regulations; and
3) The student whose records have been requested has not indicated that he or she does not wish directory information disclosed. (E. Campbell, personal communication, March 22, 2022)

This seminal statement regarding student privacy, “consistent with FERPA, a university could disclose information from a student’s education records concerning scholarship or financial aid” (E. Campbell, personal communication, March 2022) unlocked the data door and made possible this study’s student-level data information. Such a critical piece of official information would allow for continuing efficient and effective outside research investigation. For the benefit of student outcomes, stakeholders should jointly recommend that Arizona’s three public universities add to their student directory information state-determined merit-based aid (all honors and awards) alongside national honors and awards. This transparent kind of access to student-level data could alter the current Arizona student performance outcomes trajectory through a more complete understanding of the full context of education funding. As stated in the Helios Education Foundation (2023) report:

> Approximately 25 percent of high school graduates in Arizona who are eligible do not go to community college or a four-year university. Many fewer—just one in ten—earn advanced degrees. What is more, postsecondary attainment patterns are stratified along all too familiar racial and socioeconomic lines. Consequently, communities, municipalities, and regions, and Arizona as a whole, are all missing out on the extraordinary aggregate benefits that result from having a more educated populace. (Helios Education Foundation, 2023)

Although the AIMS Scholarship was discontinued, with 25,357 students who participated in this Scholarship program, a treasure trove of data has yet to be examined. This study could be replicated (expanding the academic years to obtain a larger sample) and compared to the Arizona RHHE—the merit-based scholarship of this decade.

Since the RHHE has different requirements than the AIMS Scholarship, a comparison between the two regarding student access, participation, and retention to completion is needed. Adding a mixed-method design would provide even more answers to complex college drop-out data. If past student performance outcomes are not scrutinized with transparent and ongoing research, policymakers will not be sufficiently informed, resulting in less effective education policies.

Studies on past and present merit-based aid should be continuous and education policies should reflect the current and transparent studies. Rigorous research on student undergraduate outcomes is critical in informing stakeholders with data-driven results. To understand the policies that give impetus to the desired outcomes is vital. Research will also reveal the array of impediments that block higher education students' persistence to degree completion. A continuous evaluation of, in this case, merit-based aid will facilitate the critical changes necessary to accomplish stakeholders' goals.

Closing Remarks

From 2000 to 2016, I was a witness to the rise and demise of the AIMS Test and subsequent AIMS Scholarship. I became interested in the topic of merit-based aid when my husband's and my eight children were taking the AIMS Test during their high school years. I quickly came to understand the importance of exceeding the standards on all parts of the Test and meeting the other AIMS Scholarship requirements. I have long wondered about the

outcomes of the AIMS Scholarship on student access, affordability, and retention to degree completion.

When I began my NAU doctoral program in 2016, I was eager to study and learn about the student performance outcomes of the AIMS Scholarship. My research design was unknown until Dr. Joe O'Reilly, former Director of MPS's Research and Evaluation, agreed that using MPS student-level data would make a great study. Given that MPS student population was bimodal (a nearly equal division of white and Hispanic students), I grew increasingly excited about all aspects of researching this topic because providing access with affordability for Arizona's underrepresented student populations and the betterment of Arizona's education are of great interest to me personally and as a citizen.

With the help and influence of a many supportive people, my doctoral program and dissertation have drawn to a close, but this AIMS Scholarship story is the beginning of more collaborative, data-driven and transparent merit-based aid research. I will continue to work in the field of education and for policies that will help to improve student access and affordability for improved student performance outcomes—the goal for all education stakeholders.

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APPENDIX A: 4-317 RESIDENT TUITION SCHOLARSHIPS FOR RECIPIENTS OF A REGENTS HIGH HONORS ENDORSEMENT

The universities are authorized to award full resident tuition scholarships to Arizona high school graduates who meet the board-approved qualifications for an endorsement of high honors. Awarding of these scholarships is subject to the following conditions:

A. The Arizona Board of Regents honors endorsement program is established by the board for the purpose of recognizing high school students for outstanding academic achievement, as demonstrated through performance in high school courses and test scores.

B. The board is responsible for implementing the program, approving program criteria and for determining how the program shall be administered.

C. The superintendent of public instruction is authorized to administer the program for the Board of Regents and to recommend to the universities students who qualify for the high honors endorsement. The recommendation shall be in the form of a list provided to the Arizona Board of Regents including student names, mailing addresses and phone numbers, high school attended, and other information shall be required by the universities.

D. The universities may choose not to award a scholarship to any student who receives other scholarship assistance intended to cover the cost of tuition.

E. The universities may choose not to award a scholarship to any student who does not apply for financial aid, or whose application is incomplete, incorrect, not submitted in a timely fashion, or for any other reason fails to meet university guidelines for applying for financial aid.

F. The board-approved criteria for a high honors endorsement shall be designed to minimize the likelihood that qualifying students will not also qualify for tuition scholarships for academic merit as determined by the universities.

G. Any change or anticipated change, in conditions affecting the number of students who might qualify for a high honors endorsement, conditions affecting number of resident students who might be awarded tuition scholarships for academic merit using university-determined criteria, and any instance where a student qualifies for high honors but not for a university-determined tuition scholarship shall be reported to the board along with a recommendation for appropriate modifications in the criteria for awarding high honors.

H. A systematic review of the Regents Honors Endorsement Program will be conducted every five years, with the results and any recommendations reported to the board.

I. Tuition scholarships must be claimed by the student enrolling at one of the universities within one year of graduation from an Arizona high school. Special consideration for unique situations may be exercised by each university.

APPENDIX B: NAU IRB APPROVAL

NAU NORTHERN ARIZONA UNIVERSITY
Office of Research Compliance

Institutional Review Board for the
Human Research Protection Program

525 S Beaver St
PO Box: 4062
Flagstaff AZ 86011
928-523-9551
https://www.nau.edu/IRB

To:	LaCinda Lewis, Ed Leadership/EdD
From:	NAU IRB Office
Date:	February 7, 2019
Project:	The Effect of the Arizona AIMS Scholarship On Undergraduate Student Outcomes
Project Number:	1372753-1
Submission:	New Project
Review Level:	Administrative Review
Action:	RESEARCH - NOT HSR
Project Status:	RESEARCH - NOT HSR

The project listed above does not require oversight by the Northern Arizona University Institutional Review Board because the project does not meet the definition of 'research' and/or 'human subject'.

- **Not Research as defined by 45 CFR 46.102(d):** As presented, the activities described above do not meet the definition of research as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "research means a systematic investigation, including research development, testing and evaluation, designed to contribute to generalizable knowledge".
- **Not Human Subjects Research as defined by 45 CFR 46.102(f):** As presented, the activities described above do not meet the definition of research involving human subjects as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention or interaction with the individual, or identifiable private information".

Note: Modifications to projects not requiring human subjects review that change the nature of the project should be submitted to the Human Research Protection Program (HRPP) for a new determination (e.g. addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the research question). Please contact the HRPP to consult on whether the proposed changes need further review.

Northern Arizona University maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #0000357).

NAU NORTHERN ARIZONA UNIVERSITY

Office of Research Compliance

Amendment of Approved Human Research

Request to amend previously approved research	
IRB Project No.:	1372753-1
Project Title:	The Effect of the Arizona AIMS Scholarship on Undergraduate Student Outcomes
Investigator:	Lewis
Investigator's Contact Information:	Lsl73@nau.edu:
Alternate Contact:	Dr. Walter Delecki
Alternate Contact's Information:	Walter.Delecki@nau.edu

SECTION 1: TYPE OF AMENDMENT *(check all that apply AND attach copies of all updated documents with track-changes)*	
☐ Change in Investigators-**Complete Personnel Amendment form**	☐ Change in location of research
☐ Change in study design	☐ Change in participant activity
☐ Change in participant cost or compensation	☐ Change in recruitment method
x☐ Change in participant population	☐ Change in consent form(s)
☐ Change in funding source	☐ Change in advertisement(s)
☐ Change in risks and/or benefits	☐ Other, please describe:

SECTION 2: Summarize all requested changes in lay language (limited to 2000 characters including spaces):

The collection of de-identified student data Mesa Public Schools (MPS) and the National Student Clearinghouse (over a three-year period) was received in July of 2019. To complete my research, and to fully understand the impact of the AIMS Scholarship on the MPS students in the data files, there is one more step and it involves two parts.

Within the MPS and NSC student data files, I will ask MPS to extract those students who enrolled at Arizona State University (ASU). The students in this new data set will be identified by name, high school, graduation year, and student ID for the benefit of ASU's data personnel **only**. I will never have access to this identifiable information.

Once this amendment is approved by IRB, I will make a formal data request for ASU student data. This will require that MPS data personnel work closely with ASU to match the MPS student data files with each student's ASU enrollment to graduation and AIMS Scholarship history. I will then receive only a student data file with no identifiable student information.

NORTHERN ARIZONA UNIVERSITY
Office of Research Compliance

Amendment of Approved Human Research

Provide the rationale for the requested changes:		
To fully understand the effect of the AIMS Scholarship (a 154.6-million-dollar public policy decision) on the MPS student population, I will need to track the students through their ASU enrollment to graduation and AIMS Scholarship details.		
Discuss how subjects will be notified of these amendments. If subjects will not be notified of the amendments, discuss why:		
This is not human subject research so the subjects will not be notified of this amendment.		
Does this amendment change the risk/benefit ratio? If yes, how?	x☐ No	☐ Yes
Has this amendment already been implemented? If yes, how?	x☐ No	☐ Yes
Has there been a change in funding? If yes, complete below: a. Funding PI: b. Proposal Title: c. Funder Name: d. Total funding amount **OR** per subject amount:	x☐ No	☐ Yes

- Submit this form and all applicable new and/or revised research materials affected by the changes (recruitment, consent, data collection, permissions/approvals, etc.). All revised materials must be submitted with proposed changes clearly outlined (e.g., using track changes in Word).

- For changes to research personnel at this time, please use Amendment of Key Personnel Form and include a (track changed) List of Project Personnel form.

APPENDIX C: MPS APPROVAL

Dear Researcher:

In order to cooperate with individuals or agencies outside the district intending to do meaningful research within the district, the Research Priority Board must have an opportunity to evaluate the research request. Completing the attached form will facilitate this effort.

Subsequent to your completion and submission of the PER (Permission to Engage in Research) form to the Department of Research and Evaluation, the Research Priority Board will review your application to determine if permission to conduct research will be granted.

The board will use the following criteria in evaluating the research request:

1. A minimum of student and teacher time should be involved in program implementation, surveys, testing, etc. Benefits will be weighed against time spent.

2. The research instrument and procedures must be of such a nature and wording so as not to be construed as "offensive" by participants and/or the community.

3. The results of the research must be of benefit to the students and district.

4. The proposal must be solid in terms of designs, measurement, and analysis.

Immediately after the Research Priority Board's review, the individual or agency requesting permission to engage in research will be notified of the board's decision.

Respectfully yours,

David McNeil

Dr. David McNeil

Attachment

While conducting research in the Mesa Public Schools, I agree to the following terms on the collection and use of data:

1. I agree that I will not disclose to any other party any personally identifiable information obtained by m in the course of my research unless I have obtained the prior written consent of the parent or eligible student. I will furnish a copy of any such consent to the Department of Research and Evaluation.

2. I will advise every study participant of his/her right to refuse to answer any question either written or oral. This will be stated on any written instrument or prior to any interview for gathering data.

3. I will furnish the Mesa Public Schools Department of Research and Evaluation a copy of the results of the project. This report will be filed and made available to personnel at their request.
4. I will obtain clearance from the Department of Research and Evaluation and the schools involved if persons other than those specifically names in this application will work with students and/or district personnel in connection with this project.
5. If district staff have to create data files or provide more than incidental assistance, the researcher will be charged $50 per hour.

SIGNATURE

DATE

PERMISSION TO ENGAGE IN RESEARCH (PER FORM)

Name of institution sponsoring research: Doctoral student at Northern Arizona University
Agency funding project: N/A
Project funding level: N/A
Name of project leader: LaCinda Smoot Lewis (doctoral student); Dr. Walter Delecki, (Committee Chair)
Name of researcher: LaCinda Lewis **Address: 513 E. Campbell Avenue Gilbert, AZ 85234** **Phone Number Email Address:** 480-322-1717 email is preferred way to contact me lacinda.lewis@gmail.com or lsl73@nau.edu
Anticipated beginning date: February 2019
Anticipated completion date: May 2019

Name of Mesa District contact: Mesa Public Schools (all high schools)

1. **PURPOSE OF STUDY:** Public policy is at the center of financial student aid decisions. In Arizona, the specific problem that needs to be researched and the focus of this dissertation topic centers on an Arizona undergraduate student merit aid scholarship and student performance outcomes. The AIMS scholarship was a one-year, renewable, full-tuition (waiver), merit aid scholarship and was given to thousands of Arizona public university freshmen (Lawton, 2011). The details of the scholarship and the students' performance outcomes of retention, completion, and time to completion have yet to be examined. In addition, research is needed in the important aspect of fiscal accountability regarding millions of dollars. Specifically, researching undergraduate student outcomes pertaining to the public policy that created and disseminated the AIMS scholarships is vital and timely.

   MPS was selected for this proposed research study because it is the largest district in Arizona serving 64,000 students in grades P-12 (Human Resources, n.d.).

   Correlating the MPS data set with the data from the National Student Clearinghouse (NSC) will provide a unique picture into the effect of the AIMS scholarship for MPS student population who met the research parameters below.

2. **SAMPLE (Who, Number, When):** For this research study, students who attended Mesa Public Schools from 2006 to 2010 will be examined. The targeted sample includes students who attended MPS and who were enrolled in grades 10-12 during the 2006-2010 school years. The students, using the convenience sampling technique, must also have met the following study parameters which include students who 1) took the AIMS Test, 2) graduated from one of the MPS's high schools), and 3) attended one of the three public universities in Arizona. The population includes Arizona high school students.

   The student data sets for the NSC will cover years 2007-2014. This time period will allow an examination of the MPS students who earned the AIMS scholarship in 2010 for example but took four years to graduate.

3. CLASSROOM PROCEDURES (How long, How many times): N/A

4. TREATMENT VARIABLES: The independent variable is student receipt of the AIMS scholarship. The dependent variables are second-year retention rate, completion rate, and time to completion. The control variables (matching students) are race, ethnicity, gender, socioeconomic background, GPA and SAT/ACT scores. Students will be matched on all characteristics except that one student received the AIMS scholarship (treatment) and the matching student did not receive the AIMS scholarship (control); this quasi-experiment will control for selection bias.

5. RESEARCH DESIGN: For this quantitative research study, a post-hoc, nonequivalent control group design within the family of quasi-experiments has been selected. This design will best explain the causal effect of the AIMS scholarship on student outcomes including retention, completion, and time to completion. For descriptive statistics, the Measurements of Central Tendency will include mode, median, and mean; the Measurements of Variation will include range, interquartile range, variance, and standard deviation.

A difference in differences (DD) and MANCOVA statistics are applied with a pre-test-posttest that elicits a causal effect of an intervention and a threshold above and below a cut-off point (exceeds standard) of the AIMS Test. In this case, the intervention is the AIMS Test and the cut-off is the

predetermined scores required to receive the AIMS scholarship. Using this design and methodology will allow the researcher to analyze the effect of the AIMS scholarship on retention (second-year), completion, and time to completion for MPS students attending one of the three public universities.

6. EVALUATION INSTRUMENT (Data Source): For this research, the required de-identified archival data sets (2006-2010 school years) will be requested through the Mesa Public Schools Office of Research, Assessment, and Accountability. The request includes data on all MPS, students in grades 10-12, who were enrolled in the 2006-2010 school years and who met all study parameters. Additional vital information will include GPA, AIMS and SAT/ACT scores. Analyzing students' race, gender, and socioeconomic status are all important detail for this research. The data request will cover only the students, grades 10-12, who were enrolled in all of the Mesa Public School high schools during the 2006-2010 years—the period that the full-tuition (waiver) AIMS scholarship was available to students.

To obtain the MPS students' university enrollment, retention (second year), completion, and time to completion history (2007-2014) will require requesting information through NSC which works with institutions of higher learning, states, school districts, high schools, and organizations involved in public policy and education ("National Student Clearinghouse," n.d.). Obtaining data from both of these entities will allow a more complete picture of the effect of the AIMS scholarship on student retention, completion, and time to completion across race, gender, and socioeconomic lines.

7. What is the benefit to the school district, school and/or the student from participating in this study? By 2010, 8,400 students were utilizing the AIMS scholarship at a cost of 44.1 million dollars (Lawton, 2011). Through an examination of the literature, there is just one research study that analyzed the AIMS scholarship and the effect on student enrollment (Upton, 2016). The request for MPS data will provide the necessary information for the researcher (dissertation) to examine the effect of the AIMS scholarship on retention, completion, and time to completion—equally timely topics in the current atmosphere of accountability. The results of this research study could provide information for institutional leaders, educators, and policymakers of the benefits and unintended consequences of public policies, add to the body of knowledge pertaining to merit aid scholarships, and ultimately improve student educational experiences and performance outcomes in MPS and throughout Arizona.

APPENDIX D: ASU APPROVAL

HENZE COOK MURPHY PLLC
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722 E. OSBORN RD. SUITE 120
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April 21, 2022

VIA E-MAIL
Ms. Beth Avelar
Executive Administrative Support Specialist
University Registrar Services
Arizona State University
Beth.Avelar@asu.edu

Ms. Avelar:

This firm represents Ms. LaCinda Lewis, a Northern Arizona University ("NAU") doctoral candidate, and respectfully requests the public records identified below from Arizona State University ("ASU"), and any ASU department, division, agency, database, employee, agent, and/or consultant (collectively "ASU"). This request is made for a non-commercial purpose, pursuant to Arizona's Public Records Law, A.R.S. § 39-121, *et seq.*

This request includes, but is not limited to: (1) the items identified in the "Student Directory Information Purchase Request Form," attached as **Exhibit A**; and (2) AIMS Scholarship details **(also known as the Regents High Honors Endorsement)** within the category of: "Degrees, honors, and awards received (including Dean's List, National Merit, National Achievement, and National Hispanic Scholars)."

I understand that Ms. Lewis has discussed student data requests regarding the AIMS Scholarship with several ASU personnel, including Dr. Joseph O'Reilly, Dr. Sheila Ainley, and Mark McCain. She has also involved Michelle Udall, an Arizona Legislator from Mesa, along with Michael Haener, a Legislative Liaison for ASU. Ms. Lewis has been told that student data is available only in aggregate form, which is not suitable for her research study.

I am aware that Ms. Lewis has communicated with you directly about her public records requests, and that you informed her that all but one piece of the student data is available by requesting Student Directory Information. The missing data piece is each student's reception/non-reception of the AIMS Scholarship. In any event, in addition to the records requested in **Exhibit A**, we are seeking specifically to obtain the AIMS Scholarship details in a non-aggregated format within the category of:

"Degrees, honors, and awards received (including Dean's List, National Merit, National Achievement, and National Hispanic Scholars)"

Although it is not necessary under Arizona's Public Records Law for Ms. Lewis to establish the basis for the records request, it may provide important context demonstrating her critical need for the data in non-aggregated form. Namely, existing research about this State of Arizona funded $153.6 million merit aid program is limited, although it impacted 25,357 undergraduate students. Ms. Lewis' study will address:

1. The important student outcomes of college cohort retention, an important factor for underrepresented students (Jobe, Spencer, Hinkle, & Kaplan, 2016; Kuh *et al.*, 2008).
2. College cohort completion—an important and timely topic in the current atmosphere of academic accountability and fiscal responsibility for student performance outcomes (Alexander, 2000; Crow & Dabars, 2015; Kezar, 2014).
3. Cohort time to completion—equally important and timely, because the time-to-degree completion ratio is increasing (Bound, Lovenheim, & Turner, 2012).

See References, attached as Exhibit B.

In addition, it is expected that the findings of Ms. Lewis' research will:

1. Add to the body of knowledge regarding merit aid scholarships and undergraduate student performance outcomes.
2. Inform education policymakers as to the benefits and intended and unintended consequences of the AIMS Scholarship.
3. Benefit Arizona's university administrators, educators, legislators, parents, and students in understanding the nexus between merit aid policy, the alignment of university goals, and student performance outcomes.

If ASU withholds production of any records or takes the position that any responsive records are protected by the attorney-client privilege, please provide an index in accordance with A.R.S. § 39-121.01(D)(2). We further request that responsive documents be provided promptly, as required by Arizona law. *Id.* at § 39-121.01(E).

Please provide copies of the records electronically in native or PDF format on a rolling basis, rather than at the conclusion of your search. You can send any records by email to kiersten@hezecookmurphy.com or via other storage medium (thumb drive, disk, etc.) to my attention at the address above.

Ms. Lewis agrees to pay all charges authorized by law or applicable regulations in connection with this request up to $400.00. *See id.* at § 39-121.01(D)(1) (fees for records sought for a non-commercial purpose). If the charges will exceed that amount, please contact me immediately.

I look forward to hearing from you as soon as possible.

Very truly yours,

HENZE COOK MURPHY, PLLC

By: Kiersten Murphy
Kiersten Murphy

Student Directory Information Purchase Request Form
University Registrar Services
Arizona State University

Requestor information:

Company/Organization: *LaCinda Lewis*	Date: April 7, *2022*
Address: *513 E. Campbell Avenue*	City, State, Zip: *Gilbert, AZ 85234*
Name of individual contact: *LaCinda Lewis*	Title: *Northern Arizona University Doctoral Candidate*
Telephone Number: *480-406-4084*	E-mail Address: *lacinda.lewis@gmail.com*

Request purpose:

Describe purpose/planned use of requested student information: *I am a Northern Arizona University (NAU) doctoral candidate researching <u>The Effect of the AIMS Scholarship on Undergraduate Student Outcomes</u> for my dissertation. I am following high school graduates from Mesa Public Schools (MPS) who enrolled at Arizona State University (ASU) during the academic years beginning in the Fall of 2006 through the Spring of 2013. The AIMS Scholarship also known as the Regents High Honors Endorsement (RHHE) was given to 25,357 Arizona students at a cost $153.6 million.* *For this research purpose, I am requesting ASU Student Directory Information. Once received, I will work with my research team* to have the ASU Student Directory Information merged with MPS student data. Once the process is completed, I will receive only anonymized student data. Then, I will be examining MPS high school graduates, who enrolled at ASU during the years to be studied. The students will be matched on all characteristics except for one—the reception or non-reception of the AIMS Scholarship. The data will be analyzed to explain the causal effect of the AIMS Scholarship on undergraduate student outcomes including college retention, college cohort completion, and college cohort time to completion. The results will be explained.* **Research team includes my four dissertation committee members (Dr. Walter Delecki, Dr. Brad Barrett, Dr. Blue Brazelton, Dr. Ric Wiggall), and MPS's data director, Dr. Robert Carlisle, and data analyst, Dr. Ben Lewis.*
Planned use is (check one): ☐ Commercial x Non-commercial
Copy of material(s) to be sent to students attached: ☐ Yes x No
Is request pursuant to the Solomon Amendment governing military recruitment? ☐ Yes x No

Student population* for requested list:

Select term (**required**): Year? ***All Arizona residents who were enrolled from Fall 2006 - Spring 2013***_____ Semester? ***(All Semesters)*** x Spring x Summer x Fall Status (select one, **required**): x Registered for classes, or x Graduated Note: All students registered for classes or graduated in identified term(s) will be listed, unless the requester refines population further with the following **optional** selections.
Select campus location(s) -- based on campus of major (**optional**): x Tempe x West x Polytechnic x Downtown x Online □ Other locations _____
Select academic level(s) (**optional**): x Freshman x Sophomore x Junior x Senior □ Graduate student (including Law) □ Graduate student (excluding Law)
Select major(s) (**optional**): Review list of majors at http://www.asu.edu/degrees to identify specific major(s) requested (attach additional page, if needed). ***As per ASU's Student Directory Information, please include each student's academic major.***
Select college(s) (**optional**): Review list of colleges at http://www.asu.edu/colleges to identify specific college(s) requested (attach additional page, if needed). ***As per ASU's Student Directory Information, please include each student's college.***
Select enrollment status (**optional**): x Full-time x Part-time ***(semester to semester)***
Select specific addresses or zip codes (**optional**): x Remove students with non-USA and non-Arizona addresses: x All □ Home (permanent) □ Local □ Mailing □ Identified zip code(s) only (attach additional page, if needed). ***Please include all students with only Arizona zip codes (see attached list).***

Student data elements* to appear on requested list:

First and last names always included. ***As per ASU's Student Directory Information, please include the birthdates of each student.***
Select address types (provided, if available): x Home (permanent) x Local x Mailing x ASU email addresses
Select phone number types (provided, if available): x Home x Cell x Local
x College x Major x Campus of major x Academic Level ***In addition to the above and per ASU's Student Directory Information, please include the following:*** ***Degrees, honors, and awards received (including Dean's List, National Merit, National Achievement, National Hispanic Scholars, and also include the AIMS Scholarship also known as the Regents High Honors Endorsement)*** ***Participation in officially recognized activities and sports*** ***Most recently attended educational institution*** ***Weight/height of athletic team members***

*Note: Requested student population and data elements may only be based and sorted on ASU's "Directory

Information" categories. Also, requestors seeking specialized sub-categories, such as "STEM majors," certain degrees, or certain zip codes addresses, etc., are responsible for researching and providing the specific choices desired.

Target date requested (reminder, minimum of 10-14 days required): ***15 days from date received***

Resulting student lists will be provided to requestor in **Excel format** and copied onto a hard disk.

Select disk delivery preference: x Hold for pick up ▫ Mail via US Mail ▫ Send via FedEx account provided by requestor ▫ Other? _____

Internal Use Only

Request rec'd: ___/___/___ Sent for estimate: ___/___/___ Sent estimate to requestor: ___/___/___ Processed/Not processed: ___/___/___ Number of students: _____ Final list cost: _____

12/20/2019

Student Directory Information Purchase Request
University Registrar Services
Arizona State University

Policy/Agreement:

• All applicant/student information will be handled in accordance with the requirements of applicable rules, regulations, and legislation, e.g., the federal Family Educational Rights and Privacy Act (FERPA), the Solomon Amendment of 1997, Arizona public records laws, etc. "Directory information," as defined by ASU's FERPA policy, will be released, unless individual students have specifically requested non-disclosure of such directory information (see https://students.asu.edu/policies/ferpa).

- ASU will charge requestors either a commercial or non-commercial fee, based on the purpose identified for requesting the information. The fee for commercial requests is $4000, plus $165 per thousand names, payable upon receipt of the information. (A preliminary estimate will be provided after receipt of the completed request form.) The fee for non-commercial requests is a flat rate of $400, payable upon receipt of the information.
- Requestor agrees that this purchase is for a one-time use.
- Requestor agrees not to sell, distribute, transfer, give or provide in any manner whatsoever the list or any portion of the list to any other party or secondary market.
- Requestor agrees that all solicitation materials and information forwarded or provided to prospective, current or former ASU students will be truthful and accurate.
- Requestor agrees that its sole purpose in requesting the information is as stated in the written request to the University Registrar.
- Requestor will attach a sample of materials that will be sent to students to assist with determination of the necessary student population sought and/or appropriate fee charged.
- Requestor agrees not to represent to any ASU students that the requestor is owned, operated, controlled by, related to, or affiliated with Arizona State University and/or the Arizona Board of Regents, in any manner.
- ASU will provide the information to the requestor within 10-14 days, after receipt of the completed written request and attachments from the requestor.
- Requestor will be responsible for pick-up or delivery of the information from University Registrar Services and will acknowledge receipt by signing/returning the cover letter provided at delivery.

I have read and agree to all of the above policy/agreement statements.

Requestor's Authorized Signature Date

Requestor's Printed Name: ***LaCinda Lewis***

Use provided request form and submit to:
University Registrar Services
Arizona State University
PO Box 870312
Tempe, AZ 85287-0312

Questions may be directed to University Registrar Services at (480) 965-7302. 12/20/2019

BIOGRAPHICAL INFORMATION

LaCinda Smoot Lewis was born in Seattle, Washington. Her primary grades were spent with her parents and sisters in Redlands, Californian. The Smoot family moved to Provo, Utah where she completed her secondary education and earned her B.S. degree from Brigham Young University in 1981. LaCinda graduated from Arizona State University in 1987 with her M.S. degree. She began her doctoral studies in Educational Leadership for Community Colleges and Universities at Northern Arizona University in 2016 and will be graduating in May of 2023.

A lifelong learner, LaCinda has been interested in education policy and regulations, and their impact on students, teachers, and educational institutions within her community and beyond. As an adoptive and foster mom, she is devoted to children's issues. She participates in nonprofit work locally and globally and has served on nonprofit boards. She taught tailoring, pattern design, and alterations at Mesa Community College.

LaCinda married John Wootton Lewis in 1980 and their growing family includes their eight children (six spouses), a foster son, and two Chinese exchange students—all beloved family members. She is known as the Magic Grandma, Grandma Hunee, and Fairy Grandmother to their twenty-five grandchildren—their wishes are her command! She can attest that family life is the best research laboratory.

LaCinda will continue learning, serving, teaching, traveling, writing, and cherishing her children, grandchildren, and family and friends' relationships. Her philosophy in life is to leave people and places better than she found them.