2017

Online High School Achievement versus Traditional High School Achievement

Katherine Elizabeth Blohm
Walden University

Walden University

College of Social and Behavioral Sciences

This is to certify that the doctoral dissertation by

Katherine Blohm

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Timothy Lionetti, Committee Chairperson, Psychology Faculty
Dr. Saydee Jonathan Mends-Cole, Committee Member, Psychology Faculty
Dr. Michael Plasay, University Reviewer, Psychology Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2017

Abstract

Online High School Achievement versus Traditional High School Achievement

by

Katherine E. Blohm

MA, Barry University, 2005

BS, Colorado State University, 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Psychology Program

Walden University

2017

Abstract

The following study examined the question of student achievement in online charter schools and how the achievement scores of students at online charter schools compare to achievement scores of students at traditional schools. Arizona has seen explosive growth in charter schools and online charter schools. A study comparing how these two types of schools are educating students will benefit parents who are considering the viability of online charter schools for their children's education. This study investigated the difference between educational achievements at online charter schools versus traditional schools. The study compared 16 online high schools to 16 similar traditional high schools. This study used the state standardized assessment, Arizona Instrument to Measure Standards (AIMS), scores to compare the two different types of schools. This study used ANOVA to compare the online charter school scores and students have in Arizona, this study identified which of these two schools is achieving greater academic success. By a significant margin the traditional brick and mortar schools achieved higher scores on the AIMS test in both reading and math. The traditional schools also achieved higher scores across the three years examined. In 2012 traditional school students earned an average of 51 points higher in reading and 41 points higher in math. In 2013 traditional school students earned an average of 84 points higher in reading and 28 points higher in math. In 2014 traditional school students earned an average of 52 points higher in reading and 35 points higher in math. This research hopes to direct positive social change by calling into question the validity of online high schools and how they are currently managed and accredited in AZ.

Online High School Achievement versus Traditional High School Achievement

by

Katherine E. Blohm

MA, Barry University, 2005

BS, Colorado State University, 2001

Proposal Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Psychology Program

Walden University

June 2017

Dedication

To the Arizona teachers struggling to always improve our high school student's achievement.

Acknowledgments

Thank you to all of the faculty members and family members who have patiently supported me through this process.

Table of Contents

Chapter 1: Introduction to the Study

Introduction

The provision of public education in America dates back to colonial days.
Thomas Jefferson believed that America would be strengthened with an educated
citizenry. He believed public education should be free from religious bias and be
available to all irrespective of status in society or wealth (Jefferson, 1899). Today, there
are so many options of how a student is to be "prepared" that it is easy to become
overwhelmed. Parents and policy makers are bombarded with choices and there is little
research which definitively identifies which schools are actually succeeding at educating
children.

A federal report revealing low student achievement in 1983 sparked a great deal
of debate and led to No Child Left Behind Legislation. The US government, noting that
academic achievement is positively correlated with earning potential (Mincer, 1974;
Card, 1999; Crissey, 2009) enacted this legislation hoping to ensure America's secure
place in the global market. A growing concern over falling American high school
achievement scores has made alternative educational settings or "school choice"
attractive (Abowitz, 2002; Shaw, Tomcala, Middleton, Rudee, Jones, & Smith, 1975).

Advocates of "school choice" cite Milton Friedman's work in 1955 which argues
that given greater school choice a society can reduce the monopolization of public
schools and improve the efficiency and effectiveness by forcing schools to compete for
students (Zimmer & Buddin, 2009). Charter schools are a form of school choice and may

open the door to the efficiency and effectiveness that school choice advocates are looking for.

Charter schools began in Minnesota in 1991 but as recently as 2009 have expanded into 40 states, Puerto Rico and the District of Colombia (Scott & Villavicencio, 2009). The International Association for K-12 Online Learning (iNACOL) estimates that 1.5 million students are taking one or more online courses (Vanourek, 2011). Charter and online charter schools are a relatively new option in school choice that has caught the attention of politicians, parents, educators, and students (Atkins, Hohnstein, & Roche, 2008; Hawkins, Barbour, & Graham, 2012) and have gained momentum since their inception in the 1990's (Gleason, Clark, Tuttle, Dwoyer, 2010). Parents and politicians in Arizona have embraced the idea of alternative or "out of the box" schooling with some of the most progressive charter school laws in the nation (Timmons-Brown &Hess, 2001). Politicians and educators alike have disputed whether charter schools should be a choice in the American Education system because of the mixed results of research on achievement (Scott & Villavicencio, 2009; Solmon, Goldschmidt, 2004). The reality is that very little research has been done which recognizes online charter schools as actually doing what they purport to be doing. Rather than having research follow reform, research should direct reform (Good & Braden, 2000). So while the debate continues still more versions of charter schools are opening.

In 1996 Arizona Virtual high school opened as the first online high school in Arizona (Communications with AZ Dept. of Education, 2014). Charter schools have drawn a lot of attention and controversy, despite this attention, little objective research

has been conducted to investigate the reasons for achievement or lack thereof in different school settings (Lin, 2001; Scott & Villavicencio, 2009). Educators must look beyond the novelty of online high schools and other charter schools and delve into how and whether charter and online charter schools benefit students (Chaney, 2001). Support through public funding should occur with an accurate picture of what educational growth those schools are providing their students, and what contribution those charter schools are making to the educational landscape (Good & Braden, 2000). Studies investigating different qualities between high schools will allow for the choice between schools to be based on objective evidence. The following study offers research which allows parents to choose the best option for their children and for leaders to direct funding towards schools that have produced high achievement in their students. To date, research is inconclusive and there remains to be any objective studies in states with large amounts of charter schools (Miron & Nelson, 2001).

Public funds should be allocated towards schools that have a financial plan and only as many schools should be granted charters as can be regulated effectively by the state (Good & Braden, 2000). Arizona and many other states have seen the rapid growth of charter school presence since they began in the 1970's (Bulkley & Fisler, 2002). In 2002 Arizona had approximately 400 charter schools (Bulkley & Fisler, 2002) currently in 2014 there are almost 700 charter schools educating high school students in Arizona (http://www.ade.az.gov/charterschools, 2014). Charter schools have exploded in popularity over the last 20 years and receive ongoing support from the current political administration (Frankenberg, Siegel-Hawley, Wang, 2011).

The following chapter discusses the background of charter schools as well as how online high schools have developed from charter schools and swiftly grown in the state of Arizona. Online schools, for the purpose of this paper, are schools that deliver their curriculum over the internet exclusively, there is no in person interaction between student and teacher. This chapter also discusses the problem statement that is driving the study, a discussion of the nature of the study, the rational for the design of the study, the research questions being addressed, the different hypotheses being proposed, terms that are being used, the assumptions and limitations of the following study, ethical considerations that were taken, as well as the social significance of this study.

Background

Arizona in particular has been searching for different educational solutions due to trailing behind other state's high school achievement scores (Miller, 1997; Timmons-Brown & Hess, 2001). Miller found that Arizona consistently had the lowest achievement scores when compared to other states. Since Miller's 1997's study pointing out Arizona's failing achievement scores and up until 2011, (the most recent data), Arizona has trailed behind the national average every year in reading, writing, math, and science on the National Assessment of Educational Progress according to the National Center for Education Statistics (http://nces.ed.gov/nationsreportcard/states/, 2014). This need for school reform because of poor performance was prompted educational reform in Arizona (Timmons-Brown & Hess, 2001). In 1994 the Arizona education system passed the most reformative charter legislation in the country (Timmons-Brown & Hess, 2001). Arizona's desire for change and the progressive charter laws in the state have made it particularly

conducive to online charter and charter schools opening (Timmons-Brown & Hess, 2001). The swift charter application process and relatively limited capital needed to open charter schools allowed businesses and educators of different interests and backgrounds to participate in this new educational forum (Fuller, Gawlik, Gonzales, 2003). The opening of nontraditional schools has changed the dynamics of the traditional schools; from the amount of funds that they receive (Lin, 2001) to the amount of students in each class (Scott & Villavicencio, 2009). Supporters of charter schools argue that charter schools provide positive competitive effects on traditional schools thereby raising the achievement of students that attended traditional schools; this has not necessarily proven to be the case (Zimmer & Buddin, 2009). Arizona's growing and diverse population is in need of dynamic changes (Timmons-Brown, & Hess, 1999), yet these changes should be monitored and regulated for the good of the consumer; the students. These changes have been prompted by the years that Arizona has lagged other states in achievement (Miller, 1997). At the time of the charter school laws passing in Arizona, the number of employees at the Department of Education was decreasing (Garn & Stout, 2001.) Therefore, Arizona did not have the required staff to regulate charter schools (Garn & Stout, 2001). Due to the lack of regulation it is unknown if the curriculum is meeting state standards or if funds are being properly utilized (Good & Braden, 2000).

Despite the many unknowns regarding charters schools, there are many attributes and innovations that proponents of charter schools anticipate will offer education (Bulkley & Fisler, 2002). Charter schools have the ability to approach learning in unique or unorthodox ways and utilize unique curriculum such as curriculum directed at the arts,

to meet their different student's needs (Bulkley & Fisler, 2002). Online charter schools in particular offer unique possibilities for students (Chaney, 2001). Online charter schools offer students who are school phobic, students in hospitals or medically fragile, students who have dropped out of their traditional schools, as well as single or young parents the opportunity to receive their high school diplomas (Chaney, 2001). However, online charter schools should be approached with caution due to the research showing that not all types of students are successful in the online environment (Studebaker, 2014). Charter schools experience less bureaucracy than traditional schools (Atkins, Hohnstein, Roche, 2008). For this reason, charter schools are more flexible in their hiring practices. In Arizona, teachers in charter schools are not required to be certified (Public Charters Organization, 2013). This allows administrators to hire teachers with different or diverse educational backgrounds. While traditional schools in Arizona are allowed several years of not meeting Annual Yearly Progress before they are put on improvement plans and eventually closed (Stuit, Thomas, Fordham, 2010), ineffective charter schools in Arizona on the other hand, are much more likely to close quickly. Being responsive to schools that are not providing students with an education is an important part of regulating public education as a whole. However, most charter schools are closing due to fiscal concerns rather than as a result of regulation or a lack of achievement (Buckley & Fisler, 2002). Charter schools are able to set different hours to meet the student's needs, have more or easier access to teachers, and are able to utilize their funds as they see fit which has allowed charter school administrators more freedom in where they spend the charter school's funding (Bulkley & Fisler, 2000). Charter schools typically have smaller class

sizes and give another option to students that were not served well in traditional public schools (Good & Braden, 2000). Online charter schools often allow accessibility for students and teachers twenty four hours a day, seven days a week as well as other advantages, El Mansour and Mupinga (2007) sited flexibility, convenience, online interactions, and instructor availability as being positive experiences for online courses.

Problem Statement

Researchers have known for decades that school achievement is positively correlated to future earnings (Mincer, 1974). In spite of this, little research exists that compares traditional high schools to online charter schools (Chung, Shin, Lee, 2009). When doing a search on Google Scholar, very few studies have been conducted doing a comparison. Many articles exist that speak to how charter schools and online charter schools have shaped the learning landscape but little has been written looking directly at the outcome of student's attending online high schools. In today's competitive economic environment a well rounded high school education is imperative as a foundational step toward an independent future for every young individual (Card, 1999; Crissey, 2009). In the era of "school choice" in Arizona, the public should be given objective data regarding the achievement outcomes or the progress of students enrolled in all public schools, and research thus far has not been conclusive (Solmon & Goldschmidt, 2004). The data should account for the many different confounding factors that may affect a student's or school's scores such as how schools differ in basic resources, socio-economic status of families, teacher qualifications, or disabled students being served under Individual Education Plans, or ethnic makeup (Fuller, Gawlick, Gonzales & Park, 2003). Currently

it is difficult for the consumer (parents and students) or state leaders to gather information and make comparisons about the achievement of schools because of the different school populations, and the many other confounding factors that do not allow for comparison (Fuller, Gawlick, Gonzales & Park, 2003). The letter grades that schools receive from the state do not account for some of the stark differences in schools including basic curriculum. Students have been able to earn their diploma without passing the Arizona Instrument to Measure Standards or AIMS (the state standard) by supplementing their AIMS scores with high grades attained in core courses. This alternative avenue towards graduation is called AIMS Augmentation. Students must take the AIMS assessment every time it is offered and their test scores can be "augmented" by grades they received on core classes (Arizona Department of Education, 2012). Core classes are those classes such as English, History, Science and Math however, those core classes did not have standards across schools until very recently. They do not include elective classes that the students can choose to take. The purpose of this study was to compare academic achievement between two different types of schools, online charter school, and traditional brick and mortar schools at the high school level. The study did not include brick and mortar charter schools. This was accomplished by comparing the AIMS scores of students at both types of schools. For the purposes of this study, the confounding factor of AIMS augmentation will not be factored into the scores. The study gathered data on the achievement of different students, attributing the achievement differences to the different schools that students attend while attempting to control for confounding factors. As noted above, this research gathered more informative data about student achievement

and the effectiveness of different types of schools to assist in the educational decision making of politicians, parents and students and discern whether an advantage exists. This information is urgent due to the importance of effective high schools on our young people and that if ineffective schools exist, politicians and parents should take appropriate action to either increase their effectiveness in educating students or ineffective schools should be defunded.

Conceptual Framework

Online high school education is a relatively new phenomenon which limits the theories that are based on the concept (Maddox, 2013). Online education has sprouted from the idea of individualized learning which is a strength of the online format (Cavanaugh, Gillian, Kromery, and Blomeyer, 2004). The theory behind charter schools and online charter schools is that in an effort to increase or maintain enrollment, competition among schools will increase the efforts of all educators and therefore all students will benefit from this competition (Zimmer, Gill, Booker, Lavertu, Sass, Witte, 2009). Arizona is one of the states with the most charter and online charter schools. It would be beneficial to have a better understanding of how and if these online schools are able to educate students as seen through the achievement on the AIMS assessment. This study attempted to add to the academic literature by investigating if there is a difference in mean AIMS scores when comparing the two different types of schools across three academic years.

Nature of the Study

The intent of this study was to obtain a picture about the achievement of students in different school settings (e.g., traditional and online charter). Currently, Arizona utilizes one test to monitor the progress of schools and students and assigns letter grades to each school depending on achievement on the state standardized test as well as other factors. However, these letter grades are not objective and can give a skewed picture of achievement due to other factors that cannot be accounted for when considering how a school is progressing with their achievement scores. Such issues include allowing students to supplement their standardized scores with grades that they received in core classes. An example: a student scores poorly on the AIMS test but because they received an A in a core class (English, Math, Science) they are then able to supplement their AIMS score because of the A received in a core class (www.az.gov, 2013). This matter is further complicated when one considers the fact that some high schools use different curriculum or may have lower expectations for class completion.

The following study gathered objective data in regards to achievement for high school students in different types of high schools. The two different levels of the first independent variable are online charter high schools and traditional high schools. The second independent variable is the three different years being examined. The dependent variable is the mean AIMS scores obtained from each of the schools.

Rational for Study and Design

How individuals learn in different formats is an important area of study due to the local and global impact of education (Van der Sluis, van Praag, & Vijverberg, 2005). A

student's achievement in high school has great bearing on their future income potential which influences many aspects of their life (Mincer, 1974; Card, 1999; Crissey, 2009). The characteristics of students who learn most effectively in different educational settings are important because of the variety of different schools that are currently available to students (Ho, 2009). Students learn in both traditional and nontraditional settings, however more defined research needs to be investigated in an effort to better understand which settings are more advantageous for the majority of young students and if some settings are detrimental. Chartering agencies are having difficulty holding charter schools accountable based on their performance (Buckley & Fisler, 2002). State and Federal governments need to invest the public's money in educational venues that are proven through objective data to be effective for students and until chartering agencies are able to regulate more effectively, this has proven to be extremely challenging (Buckley & Fisler, 2002). Once a systematic type of accountability is enforced, different schools may prove to be more or less successful for the many different students that Arizona is currently educating.

Despite rigorous efforts, there is no consensus in the literature on how best to compare or evaluate charter schools to traditional schools (Scott & Villavicencio, 2009). This study is unique in that it is investigating and comparing a group of online only achievement scores and comparing those achievement scores to those of traditional public school student scores. During the years examined, the state had a standardized test (Arizona Instrument to Measure Standards or AIMS) that was utilized to analyze achievement. Currently, Arizona utilizes a grading system (A to F) to evaluate schools

(Arizona Department of Education, 2013). AIMS scores is just one of many factors that go into what letter grade a school receives. These grades cannot be directly compared to each other due to the skewing of data with AIMS augmentation as well as all the confounding factors previously discussed. Comparing charter schools to traditional schools has been difficult since the inception of charter schools. Frankenberg, Siegel-Hawley, and Wang (2011) found difficulty comparing the two different types of schools due to self-selection into charter schools and attrition. This study adds to the literature by looking at three school years and determining if online charter schools are a viable alternative to traditional brick and mortar schools. The study identifies which type of school is able to produce higher average AIMS scores on a consistent basis which means that one learning environment is more beneficial than the other for the majority of young learners. The study utilized a between-within mixed ANOVA so that a comparison of means between the two groups across three years is made. The one dependent variable is the AIMS. Data was collected from the Arizona Department of Education's website and analyzed using the SPSS program.

Research Questions

Is there a difference in mean AIMS scores between online high schools and traditional brick and mortar high schools in the area of reading?

Is there a difference in mean AIMS scores between online high schools and traditional brick and mortar high schools in the area of math?

When comparing the two schools over a period of three years, which type of school has higher scores on state standardized reading and math assessments?

Hypothesis

H_{01}: There will be no difference between Arizona Instrument to Measure

Standards test scores in the area of reading in the two types of schools.

H_1: There will be a difference in Arizona Instrument to Measure Standards scores

in the area of reading between the two different types of schools.

H_{02}: There will be no difference between Arizona Instrument to Measure

Standards scores in the area of math in the two types of schools.

H_2: There will be a difference between Arizona Instrument to Measure Standards

scores in the area of math in the two types of schools.

H_{03}: There will be no pattern of differences in means across the three years

between the two types of schools showing no pattern of superior achievement scores.

H_3: There will be a pattern of difference in means across the three years between

the two types of schools showing one school repeatedly having superior achievement

scores.

Key Terms

AIMS: Arizona's Instrument to Measure Standards. Arizona's state standardized

achievement assessment as mandated by the No Child Left Behind legislation. "Arizona's

criterion-referenced content assessment that tracks student proficiency for adequate

yearly progress determinations" (Crane, Huang, Barrat, 2011, p. 2). Students are required

to pass the assessment unless it is written in an individual education plan or 504 plan

stating otherwise (Arizona Department of Education, 2013). Achievement: Achievement

will be viewed through student's scores on the AIMS (Arizona's Instrument to Measure

Standards). Student's progress will be seen through the statistical method of a between within mixed ANOVA.

Adequate Yearly Progress (AYP): The minimum state defined targets of proficiency that schools and districts must achieve. AYP is the measure of success or failure for high schools under the legislation No Child Left Behind (Balfanz, Legters, West, & Weber, 2007). Balfanz et al. (2007) goes on to explain that meeting AYP means that a high school is being successful whereas those that do not make AYP are struggling and needing additional help or reform.

Charter Schools: An organization or person who has a charter contract with the state department of education. Charter schools receive public funding and may also receive donations. Charter schools are schools of choice that are publically supported and autonomously operated (Buddin & Zimmer, 2005; Zimmer & Buddin, 2009). Charter schools have more autonomy and flexibility given their independence from school districts and waivers from state laws and regulations (Bulkley & Fisler, 2002; Chung, Shin, & Lee, 2009). Some states allow for charter school freedom in their collective bargaining practices and their requirements of teacher certification. However, waivers are rare for fiscal requirements and student assessment policies (Bulkley & Fisler, 2002). Arizona Department of Education website (2014) describes charter schools as "Created by the Arizona State Legislature in 1994, charter schools are state funded public schools. Charter schools are established to give parents academic choices for their children and provide a learning environment to improve student achievement. Charter schools contract with the state or district to provide tuition free educational services."

Online Charter Schools: Like standard charter schools, online charter schools receive public funding and do not have to follow the same rules as traditional schools. Online charter schools differentiate themselves by not having a physical building where students and teachers meet, according to El Mansour and Mupinga (2007)

Traditional Schools: In this paper traditional high schools will be in reference to public high schools that do not hold a charter, and do not have classes on the internet. Traditional high schools receive public funding, and are not able to cap their enrollment. Traditional schools also require their teachers to be certified by the state in order to teach.

Assumptions and Limitations

This study assumed certain facts so that the results could be analyzed, interpreted and generalized. This study assumed that the AIMS scores are a valid estimate of measurement for educational attainment. This study assumed that the AIMS scores gathered from the Arizona Department of Education are a true representation of their student's academic achievement and that teachers or administrators are not manipulating scores. This is an important assumption due to the fact that the AIMS scores were used as the dependent variable for the study.

The studies limitations include the inability to account for students who change schools or who come from another state and may have had different curriculum in the state they transferred from. This study was not able to control for the many students in Arizona who change schools multiple times throughout their high school career. This study drew from schools that have similar socio-economic factors; however variation in socio-economic status between individual students and between schools is inevitable and

is therefore a limitation of the study. This study may be limited in generalization to different states because of the differences in the state's standardized assessments. Also, different states have different requirements regarding their standardized assessments and each state has a different assessment that they utilize. While the results are informative regarding charter education and online charter education, each state has different requirements of its charters regarding standards, attendance and requirements to open so generalizations cannot be made to different states. Through this literature review it was found that Arizona has some of the most progressive or least restrictive laws regarding charter schools, how they operate, and their requirements for opening (Timmons-Brown & Hess, 1999). The National Alliance for Public Charter Schools (NAPCS) ranked Arizona 10th in the United States in regards to its charter school laws (Ziebarth, 2010) meaning that Arizona may not be a state that is easily compared with other states or that the ability to apply these results may be limited to Arizona.

Ethical Considerations

All the students within the study are anonymous as the state does not publish individual student's scores. The scores that were used for this study are part of public domain and were gathered from the Arizona Department of Education's website and were not linked back to specific individuals. Achievement scores are currently published on the Arizona Department of Education's website and include all public high schools. The traditional schools were picked in an effort to compare similar socio-economic status of students to the students in the online high schools. Due to the anonymity, permission was never asked of the students. As stated previously, schools were selected based on similar

socio-economic status, race, and disability status of the students so that these possible confounding factors will be controlled for and the achievement of the overall students can be compared.

Social Significance

As graduating from high school is an important achievement; students should have different options that suit their educational needs while maintaining state standards for credits. A high school diploma should carry with it an understanding that a student has received and passed a standard set of classes. A diploma should indicate that the student has the requisite skills to be successful in the first year of state college or be successful in their alternate career goals. With the quickly changing educational landscape in Arizona, students have a plethora of options to choose from but very little information about those options. With the ongoing budget cuts in K-12 education in Arizona, policy makers should consider the effectiveness of the schools that they are funding. The study supplies accurate and objective data to policy makers, parents, educators and students about how students are achieving academic growth in different educational settings.

Conclusion

It is my hope that this study will lead to greater clarity regarding the achievement of students in Arizona's public high school schools. Through an objective analysis comparing online charter high schools and traditional high schools this study presents data illustrating how students are faring in the public high schools available in Arizona. With the decreasing funds for education across all the different types of educational

institutions in Arizona, it is imperative that parents and legislators direct funding towards those schools that are proven to be succeeding in educating students.

In the following literature review, benefits and disadvantages of charter schools, academic achievement in Arizona, educational theory, traditional high schools in Arizona and their achievement, online education, and educational reform through No Child Left Behind (NCLB) will be discussed. This paper hopes to illustrate high school options for students in Arizona and how those options may affect their achievement.

Chapter 2: Literature Review

Introduction

The No Child Left Behind (NCLB) legislation brought with it expectations to close the "achievement gap between high and low-achieving students and especially the achievement gaps between minority and non-minority students along with advantaged and disadvantaged students" (Gawlik, 2012, p. 210). Because NCLB has mandated proficiency and graduation goals, which is tracked through Annual Yearly Progress (AYP), if those goals are not met, districts are required to take action to improve failing schools and provide students with access to alternative educational options (Balfanz, Legters, West & Weber, 2007). With the No Child Left Behind legislation in place, the states began to find alternative ways to educate students; charter schools offer one such solution.

In a time of pressure to improve academic achievement, states are willing to support different strategies for educating students. While charter schools provide an alternative to traditional schools, research investigating charter school achievement has been limited in scope. Previous research comparing achievement between traditional schools and charter schools has been inconclusive (Jae-Young et al., 2009) and very little research exists comparing achievement in online high schools with that of traditional schools (McNally, 2012; Studebaker, 2011). The purpose of this study is to help fill that gap in research. The study objectively shows which of these two school choices, have the best academic achievement. The following literature review shows the discrepancy in

research conclusions and thus the necessity for the type of comparison presented in this paper.

This literature review will include an introduction to charter schools in the United States and in Arizona as well as online high schools. The review discusses the inception of charter schools as well as how they have expanded and contracted in terms of scope and quality, as well as positive and negative changes that charter schools have fueled within today's high school American educational system. The literature review will introduce online charter schools and the unique qualities that online schools offer their students. This literature review also discusses the current research regarding achievement in charter schools, online charter schools, and traditional brick-and-mortar high schools. Discussion of traditional high school achievement and the political motivation that has helped to fuel the charter school movement are also reviewed.

The articles reviewed were found through the Walden library using the EBSCO databases including Psych Info, Psych Articles, Academic Search Complete, Google Scholar, and Education Resource Information Center, Education Full Text, and Teacher Reference Center. Search words/phrases included were "educational reform", "charter schools", "traditional high school achievement", "web-based schools", "online high schools", "Common Core", "charter reform", "No Child Left Behind", "alternative high schools", "charter school achievement", "high school achievement", "financial mismanagement in public high schools", "online high school achievement" and "distant education".

Variables

In an effort to narrow the scope of research focus and define the terminology within this domain, this study uses the term *"charter schools"* as schools that accept public funding, have a charter contract with the state department of education, and have a physical location where the students and teachers meet. The term *"online charter schools"* in this study refers to public schools that accept state and federal funding, have a charter contract with the department of education, but do not have a physical location where the students and teachers meet. *"Traditional brick-and-mortar"* schools will be defined as schools that accept public funding, do not have a "charter" contract with the state department of education, and have a physical location where the students and teachers meet.

Charter Schools and Online Charter Schools

Charter School/Online Charter definition: *Charter schools* are defined as "...public schools that are established on the basis of a contract or charter that a private board holds with a charter authorizer over some pre-determined number of years" (Gleason, Clark, Tuttle, Dwoyer, & National Center for Education Evaluation, 2010, p. 1). Charter schools differ from one another in theory, calendar, staff credentials, basic resources, support for low-achieving or disabled students as well as the services including clubs, lunches, sports, counselors offered to students (Fuller, Gawlik, Gonzales, & Park, 2003; Lin, 2001). Charter schools can vary greatly in the number of students they serve, the socio-economic make up of students, mission, educational theory, policy and

management. Due to the great diversity among charter schools, researching them as a group ignores the many differences between them (Fuller, Gawlik, Gonzales, Park, & Gibbings, 2003). Arizona in particular has seen a substantial growth in charter schools; currently Arizona has one of the highest percentages of students attending public charter schools (AZ Department of Education.gov, 2014). According to the Arizona State Board for Charter Schools, Arizona currently has 565 charter schools in operation (www.asbcs.az.gov, 2015). In 1994, Arizona signed into law the provision for charter schools. Currently, 30 percent of the state's schools are charter and approximately 17 percent (190,000 students) attend charter schools (AZ Department of Education, 2014).

The term *online learning* may be defined, for the purpose of this study, as the learning that typically occurs when a student is exclusively enrolled in internet classes. In this environment, the student never enters into a physical classroom and may never meet the teacher in person. Many schools offer "hybrid" classes, classes that combine the use of online classes with traditional classrooms (Mupinga, 2005). This study will only be addressing the online classes that take place exclusively online, where the teachers never come into physical contact with their students. Currently AZ has 19 online schools accepting Arizona students. Two of the nineteen schools serve elementary and/or middle school students.

Background

Charter schools began in the early 1990's and have been increasing in number throughout the last decade (Schneider & Buckley, 2003). Despite the rapid growth of charter schools in the last 30 years, they remain a disputed topic for many (Lin, 2001;

Miller, 1997; Buddin& Zimmer, 2005; Abowitz, 2002). Charter schools were created

through legislation that specified that the primary reason to exist is their purported ability

to increase student achievement (Lin, 2001). Arizona in particular has seen a rapid

growth (Gresham, Hess, Maranto, &Milliman, 2000); in 2002 Arizona had more than 400

charter schools while California, Texas and Florida had approximately 150 each

(Bulkley, Fisler, 2002). Currently, Arizona supports 565 charter schools (Arizona State

Board for Charter Schools, 2015). Online charter high schools have also seen rapid

growth in the United States. In 2005, Mupinga reported that twenty-five percent of public

schools are currently offering distance education courses and nineteen states have

officially recognized virtual high schools (Mupinga, 2005). In 2011, the National

Association of Charter School Authorizers stated that in the 2009-2010 school year there

were 219 virtual charter schools (exclusively online or considered "distance" education)

across the nation or about 4.5 percent of all charter schools serving more than 168,000

students (Lin, 2008). Unfortunately objective research on online charter schools has not

kept pace with their growth (Cavanaugh, 2009). There is no research that addresses

online academic achievement in the high school setting in the state of Arizona, a state

that leads the country in the number of online high schools. Not only is their lack of

research addressing charter schools, there is a lack of basic understanding. Charter

schools have been defined in a multitude of ways and they still remain a confusing topic

for public and professional educators alike (Lane, 1998).

     Much of the public has the misconception that charter schools are private schools

or schools that do not receive state, district and federal funding. Often professional

educators in charter schools are unaware of the special education obligations that charter schools are required to adhere to according to state and federal law. American Charter Development states that other misconceptions by the public of charter schools include: the idea that students aren't required to take state standardized testing, that charter schools can choose who they let in or have a screening process for admittance, that the funds they use come from school districts or that charter schools will not or do not have to provide services for special education students (amercd.com, 2013). Charter schools have had to fight the misconception that they are able to selectively enroll students, that they encourage segregation since they tend to serve a higher proportion of black and Latino students, or that they support the privatization of schooling (Lazarin, 2011). These and other misconceptions are driven by misinformation, a lack of transparency, political opposition and even legitimate concern (Lazarin, 2011).

All of this misinformation by the public of what a charter school is and how they serve students only furthers to cloud the issue. It is difficult to know which students are benefiting from which type of educational setting when those involved to not understand the options available. Understanding those differences will allow the public to make better choices for students and also allow charter schools to be held accountable.

Charter schools differ from traditional brick and mortar schools in many ways. Understanding these differences is the only way to make accurate conclusions on whether students are learning and how the varied schools are achieving success. When we know who is achieving success and how, we can begin to replicate best practice and reach more students. Many charter schools have a lottery and a limited enrollment, while others take

an unlimited number of students and have an open enrollment. Charter schools tend to be smaller in class size; and charter schools that are operated by educational management organizations (EMOs) tend to be larger than other charter schools (Scott & Villavicencio, 2009). EMOs, with the help of being well-funded and obtaining political support, have been able to produce high-achieving students (Scott & Villavicencio, 2009). There is a large variance between those charter schools that opened recently versus those that have been established for several years and have been able to work out the growing pains of being a newly established school (Fuller et al., 2003). These organizational differences again emphasize the many differences among charter schools making objective research challenging.

Online charter schools have seen a rapid growth spurt in the last several decades. The exponential advances in technology have dramatically influenced the way that we live and the way that we learn (Ho, 2005) as computers are used in almost every aspect of our daily lives, their use in the classrooms has also seen exponential growth. With each advancement in technology, the applications in the classroom grow. As charter schools have evolved, the advancement of technology within charter schools has also had an explosive growth (Hawkins, Graham, & Barbour, 2012). Since its inception in 1994 at Utah's Electronic High School, online learning programs have spread to all but two states (Hawkins, Graham, & Barbour, 2012). Over the years a shift in education has occurred, the focus now being instruction from a distance rather than face to face or in a traditional classroom (Mupinga, 2005). Online charter schools in Arizona have incorporated technology into their curriculum in unique ways. Many of these schools supply the

curriculum through the internet via videos, activities and projects as well as assessments such as tests and quizzes, through the internet (Kachel, Henry & Keller, 2005; Mupinga, 2005). Curriculum developed through websites has allowed for new and creative interactions between students and teachers. While exciting and innovative, these interactions that have not been without unique challenges (Mupinga, 2005).

Wang and Newlin (2001) found that inconsistent communication between teacher and student tended to remove feelings of connection between the two parties. Other challenges include the lack of socialization opportunities for students, the increased work load of teachers, and the bias held against online education (Mupinga, 2005). Many factors go into a student being successful in an online class including their personal learning style (Mupinga, Nora, & Carole-Yaw, 2006) which may not be suited to online classes. Learning styles or preferences are diverse in nature ranging from the environment of the class to the student's own learning motivation (Ho, 2005).

Despite some of the obstacles that online classes present, many students are attracted to the online learning environment due to the convenience and flexibility of the classes (Ryan, 2001). Online learning has provided positive outcomes for some students in more difficult classes. Carnevale (2002) found that online Advanced Placement (AP) courses produce better exam grades when compared to students who took traditional in class AP courses. Online classes can often offer specialized classes that are not normally available to students in rural or small towns (Chaney, 2001) such as rare language classes or other subjects with specialization. Students that have been hospitalized, mentally ill, traveling families or students who have children of their own often benefit from the

availability of virtual classes (Mupinga, 2005). With the benefit of convenience and flexibility, the added responsibility of accountability and perseverance is also present (Ryan, 2001). Online education has offered a completely different dynamic and format for learning that offers many advantages to different types of students. Despite the many advantages, some students may not have the perseverance and responsibility that online education requires. The schools themselves also hold an immense amount of responsibility to abide by state and federal laws.

Accountability and responsibility not only lies in the hands of the students, but also the institutions themselves (Buckley & Fisler, 2002). In Buckley and Fisler 2002 article, they point to the responsibility that charter schools have to their chartering agencies such as curriculum, finances, assessment, compliance with federal and state regulation, and student achievement. Online charter schools must fulfill some of the same requirements that traditional brick and mortar schools require such as: curriculum that is aligned with Arizona Academic Standards, clear performance objectives that align with state standards, attendance rates, administering norm-referenced assessments, achievement in those assessments, as well as business plans that include detailed business plan and budgets (Arizona Department of Education.edu, 2013). Charter schools utilizing online classes for their schools have responsibilities unique to the online environment. Online Charter Schools are required to meet certain standards for their charter school contracts to be renewed (Arizona Department of Education.edu, 2013). Online charter schools have to employ creative means to fulfill these standards, such as counting how many hours a student is online or having students log hours that they studied off-line

(Pinnacleeducation.com, 2013). Traditional schools do not have to fulfill these different obligations, the students are in attendance within the buildings and their attendance is reported to the state. Schools are required to submit to the state how many hours and days students are in attendance in order to get proper funding from the state. The unique forum of online high school raises questions regarding the honesty of hours and whether course work is being completed by the students themselves or by friends or parents. It is impossible for schools to monitor whether a student is logging into a class themselves Mupinga (2005).

Arizona Virtual Schools

Currently there are 20 online schools in Arizona that are accepting students, 19 of those serve high school students (https://azcharters.org, 2015). The schools are located throughout the state but most have their offices in the Phoenix valley including Phoenix, Gilbert, Scottsdale, Glendale, Tempe, Mesa and Chandler. One school is outside of the Phoenix area; that school is located in Yuma Arizona. One high school has not provided its location to the Arizona Charter School Association. The school that has been established the longest was founded in 1995 the most recent two schools opened in August of 2014 (https://azcharters.org, 2015). The schools vary in which grades they offer classes to, some only serve high school students and other schools serve Jr. High and high school students. Five schools serve K through 12th grade (https://azcharters.org, 2015).

Previous Research

Research focusing on charter schools is limited and often conflicting. Hill, Angel, and Christensen (2006) state that definitive research across states lines is difficult due to differing state laws, funding, size, grade-level coverage, and independence from regulation from states. Due to online high schools being a relatively new phenomenon, very little comprehensive research exits (McNally, 2012; Studebaker, 2011). The following study by Young, Soo and Heesook explores research that supports charter and online charter school growth as well as the research that does not.

Utilizing a meta-analysis Jae-Young, et. al., (2009) found 40 "changes over time" studies; 21 of those showed overall gains in charter schools were larger than public schools, 5 found comparable gains between charter and traditional schools and 4 studies found that charter schools lagged behind in achievement. Jae Young, et at., (2009) utilized the growth model of mean changes within meta-analysis statistics to gain a clear picture rather than the snapshot analysis that many studies have utilized to analyze the achievement accomplished by charter school students. Through this analysis they found a small but positive effect (.06 standard deviations) for students attending charter schools when compared to students attending traditional schools. Their review of literature revealed various studies with contradictory results. Such studies conducted by Bifulco and Ladd (2006), Hanushek, Kain, Rivkin, and Branch (2007) Sass (2006), and, Simmer and Buddin (2003), showed charter schools as having insignificant or negative impact on student's achievement scores. Contradictory studies completed by Booker, Gilpatric, Gronberg, and Jansen (2007), Chung and Shin (2009), Hoxby and Rockoff (2004),

Solmon and Goldschmidt (2004) and Solmon, Paark, and Garcia (2001) showed charters having a positive impact on student's achievement scores. Still other studies showed mixed results such as Miron and Nelson (2001).

Another concern regarding charter schools is the lack of valid research. After reviewing different studies of charter school achievement Miron and Nelson (2001) found that very few studies existed, and still fewer that they considered to be empirical and systematic. Having completed a study that examined the existing body of research and accounting for their methodological quality, they found that the impact of student achievement by the charter schools appeared to be mixed or very slightly positive. Scott and Villavicencio (2009) found that research is further complicated by demographic trends such as race, social class and student selection which can complicate research which measures performance in charter schools.

A search for studies that look specifically at achievement in online high schools yielded limited results. There exists a deficiency of research which addresses achievement in the online environment for high school students (McNally, 2012; Studebaker, 2011). Daniels (2009) found that high levels of self-motivation are needed for high school students to complete online classes. McNally (2012) found her research to be inconclusive when comparing traditional schools to online schools in Florida, stating that the findings were inconclusive and did not support online classes over traditional classes. Studebaker (2011) found that students performed significantly better in their traditional classes when compared to classes taken online as did Maddox (2013) when controlling for socio-economic-status.

In an effort to clarify the competing and contradictory results, further studies are needed to explore the differences between the different types of high schools and the effects they have on high school student achievement. This study adds to the literature providing objective data regarding online classes versus traditional classes, specifically in the state of Arizona. Further research investigating charter school efficacy and why some charter schools excel while others provide minimal achievement for their students would allow decision makers (politicians as well as parents) to make educated decisions that will allow for effective policy and higher student achievement.

Differences in Charter Schools and Traditional School

Charters differ by state; they are hybrids of public and private institutions that allow independent development and decision making with public funds within the confines of state accountability (Hanushek et al., 2006). El Mansour and Mupinga (2007) discuss many of the advantages that charter and online charter schools have over traditional brick and mortar schools. They cite studies that look at how some students learn differently and may benefit from a different learning approach from the traditional face to face environment. However, traditional schools are typically more established, have more teachers who are certified (Fuller et al., 2003), and they frequently provide group activities or individual activities that require more participation rather than passive listening or learning (El Mansour & Mupinga, 2007).

One of the qualities highlighted in Shoaf's (2007) work is the extreme differences in what charter schools and in particular, what online charter schools can offer. The Calvert School program, the school that was studied by Shoaf, is touted as being a "home

school" option. However, many online programs do not require the intensive oversight of parents that the Calvert School required. In order to ensure that students are doing their own work, parents are needed to monitor the work of their children.

Students also need to come into the e-leaning environment possessing a specific set of technological skills that all students may not possess (El Mansour and Mupinga, 2007). Another characteristic of online learning that students and professors must overcome is the physical distance between them. Much of the interaction between professor and student is lost when using an online or internet format. The internet format can leave students and professors feeling disconnected. As cited by El Mansour and Mupinga (2007), Wang and Newlin found that the delay in communication between professor and student removed feelings of connection between the instructor and the student. The connection between professors and students is vital not only in student retention to school, but also plays an important role in a student's ability to learn (Grash & Yaangarber-Hicks, 2000). Students who are high school age and are using an online environment for education may be less autonomous or independent than post-secondary students. This age of student may lack intrinsic motivation and be less likely to monitor their own work, or be self-directed (Murphy & Rodriguez-Manzanares, 2009), attributes that high school teachers often help to instill in their students in a traditional setting. The fact that young students may lack intrinsic motivation to complete their work may mean that online teachers need to have different skills to captivate and motivate their students. This set of skills may be completely different from the skills that a traditional classroom

teacher has, and may be needed in addition to the many skills that teachers are already required to have to be an effective online teacher (Kachel, Henry & Keller, 2005).

Online charter schools have dramatically changed the landscape of high school education in Arizona and the United States as a whole (Mupinga, 2005) this is seen in curriculum, accountability, and how online schools have forced traditional schools to keep up technologically and in their flexibility to teach different types of students. Online high schools differ widely in what they offer in regards to curriculum, teacher experience or credentials, as well as opportunities to meet outside the classrooms. Pinnacle Education is one online high school in Arizona that in its tenure has not offered enough credits through its curriculum to meet the state's minimum standards to graduate (the school lacks higher math classes as well as language and science courses), nor does Pinnacle offer the curriculum required by state universities for admittance (Pinnacleeducation.edu, 2010). Other schools such as the Calvert School offer a wide spectrum of personalization.

The Calvert School in Ohio, by contrast individualizes the curriculum, assigns a "learning coach" in the student's home who is then supported by an assigned teacher at the school. The site teacher, with the learning coach at home monitor the student's progress and a file is kept at the school that contains samples of student work and communication from the student and the learning coach (Shoaf's, 2007). This personalized experience greatly influences the experience of the students and the teachers.

The employment standards for teachers at online charter schools differ greatly from traditional schools. Most online charter school teachers have fewer years of experience in comparison to teachers at traditional brick-and-motor schools (Center for Applied Research and Educational Improvement, 2008). Charter school teachers are less likely to hold the same credentials as their professional peers at traditional public schools (Bulkley & Fisler, 2002). Charter school teachers have shorter longevity in their positions than public school teachers. (Miron & Applegate, 2007).

Charter schools are able to define their student body in ways that a traditional public school cannot. Some charter schools limit their admissions through lotteries (Pedersen & Pfleiderer, 2010). Other charter schools use techniques such as requiring applications, contracts, applicant's prior records, and parental involvement policies when admitting students (Bulkley & Fisler, 2002). Charter schools can also shape the school with their students by recruiting (Rapp & Eckes, 2007). Traditional public high schools only have the use of discipline policies and are required to admit all students living within a geographical area by comparison (Scott & Villavicencio, 2009).

Motivation for opening charter and online charter schools

Some of the motivating factors behind the creation of charter schools are the belief that traditional public schools are too entrenched with bureaucracy, that public school teachers are not sensitive to the needs of students or parents and that the competition from charter schools will lead to increased innovation and energy in all public schools (Zimmer, Gill, Booker, Lavertu, Sass, Witte, 2009). Online schools are able to offer a variety of classes to potentially thousands of students across the state. This

expands the school's reach and thereby their ability to provide educational opportunities to students that might normally have access to education options (Lin, 2011). Early advocates argued that charter schools would help close the achievement gap due to their freedom from bureaucracy and many of the state rules (Good & Braden, 2000; Lin, 2001). While autonomy from the bureaucracy and red tape of school districts is not the goal of charter schools, it is a key component to allowing the charter schools freedom to be innovative (Jae, Young, In-Soo, & Heesook, 2009). Charter schools are given more freedom due to the fact that they are not run by a school district, but by the charter's organization (Jae, Young, In-Soo, &Heesook, 2009). This lack of red tape, allows charter schools to "craft crisp educational missions, respond to diverse parents, and create tighter communities to strengthen motivation among students and teachers alike" (Fuller, Gawlik, Gonzales & Park, 2003, p. 5), charter school organizations were theoretically given the opportunity to respond to the unique needs of their population of students.

Proponents of charter schools not only purport that they will be able to raise the achievement of the students who attend them, but also provide beneficial competition to traditional schools (Zimmer &Buddin, 2009). This healthy pressure from charter schools should therefore provide a systemic positive effect on the educational system as a whole (Zimmer &Buddin, 2009). However, Zimmer and Buddin (2009) discovered that charter schools had little effect on the achievement of students in the California traditional public schools. Their research shows only modest competitive effects of charter schools within the public education sector and that staff at traditional schools did not change their behavior based on the opening or proximity of a charter school.

Charter schools are generally given freedom in two important ways, school size and school curriculum/mission (Scott & Villavicencio, 2009). In theory, if a charter school is successful it will attract more students, but to date there has been little evidence that charter schools are more accountable to the public or responsive to public demand than traditional public schools (Lin, 2001). However, instead of public endorsement through enrollment or achievement being the main factors keeping a charter school open or closing it, Buckley and Fisler (2002) found that most charter school closed due to managerial or fiscal problems rather than a lack of achievement. If the consumer is responsible for the success or failure of a charter school, not the state department of education, then many charter schools will go without regulation (Abowitz, 2002).

Charter schools were developed with entrepreneurship in mind (Garn & Stout, 2001). Specifically, the Arizona charter school policy was formed on economic theory rather than empirical findings (Garn & Stout, 2001). Virtual schools were not developed for the benefit of students alone; many for-profit companies have increased their efforts to sell their distance courses internationally (Chaney, 2001). This profit minded focus has encouraged leaders of charter schools to focus on the profit margin rather than the educational achievement of the students within the school. Public schools are competing for the limited monies that Arizona has allocated towards public education, therefore a student choosing to attend a charter school will have a direct financial impact on the neighborhood school; depriving them of the state funding that the school would have received had they attended the neighborhood school (Abowitz, 2002). Dee and Fu (2003) found that Arizona charter schools had a detrimental effect on traditional school's

stability. Their study found that charter schools increased the pupil to teacher ratio by 6% (Dee & Fu, 2003).

Finances

Charter schools must successfully manage the operation and finances as well as the agreed upon goals of the charter (Jae, Young, In-Soo, & Heesook, 2009). States differ dramatically with regard to the funding that is allocated to charter schools (Nelson, 1997). Nelson (1997) found that, despite charter school advocates' claims that charter schools are "free" experiments, they are generally overfunded. They are overfunded because they do not generally offer the same services (transportation, cafeteria services, bi-lingual education) as their public school counter parts, but receive similar funding. Despite Arizona being one of the states' least financially supportive of education, Nelson (1997) found that each charter school is over funded by $1,000 per student. They are overfunded in that they do not have to supply students with the same services as traditional high schools. Similar findings were discovered in other states; in Michigan charter schools are overfunded by $600, in Massachusetts by $1,307, and in California by $500 (Nelson, 1997). Currently, Arizona funds charter schools $1,335 per student less than their traditional public school counterparts (AZ Department of Education, 2014). Arizona allocates $7,848 to traditional public schools for every student that they have enrolled. This is less than the national average of $10,615, and only above what Utah and Idaho allocate for their students (cencus.gov, 2011). Despite receiving less money than traditional schools, they provide significantly less services. Charter schools in Arizona receive between $5,000 and $5,500 per student. This amount changes, as it does for

traditional schools based on special needs status, whether the school receives funding due to free and reduced eligibility of its students, as well as many other factors (azcharter.org, 2012).

Additionally, many states do not have clear laws regulating what happens to the assets of a charter school if it closes. This lack of regulation is true in the three states with the most charter schools, Arizona, California, and Michigan (Nelson, 1997). Across the board, charter schools are spending less on teachers and students and are spending more on administration (Good & Braden, 2000; Lin, 2001). Some of the public funding that charter schools have allocated for administration is wasted, "because the creation of any new school virtually guarantees that some public money will be spent on redundant administrative costs" (Good & Braden, 2000 p. 747). If a charter school opens up within an area of an established school district, money will be spent on positions that serve the same purpose (human resources, special education directors, principals, etc) therefore public money is wasted on those redundancies. The financing of charter schools also has direct impact on the schools that surround a charter school.

With more schools to choose from, many parents are electing to enroll their children in charter schools, which decreases the amount of funds that their neighborhood school would have received "… the more (money) charter schools get, the less traditional public schools get" (Abowitz 2002 p.37). Abowitz (2002) concluded that if traditional schools continue to lose financial support to charter or private schools, the traditional public school may not survive. Financing charter schools still needs to be further

researched to better understand how the funding is being used as well as how to ensure that it is being used appropriately.

Advantages of online charter and charter schools

El Mansour and Mupinga (2007) noted many different advantages that online learning offers their students; flexibility in time and environment, differentiated progression through the curriculum, and curriculum that is consistent across the board to better ensure meeting the standards of a given state board of education. Also, interactivity or the diverse modes of communication is one of the most provocative attributes that online education has to offer (Kachel, Henry, & Keller, 2005). Students are no longer allowed to sit in the back of a large classroom observing quietly; students are required to participate through discussion threads that are clearly laid out within the expectations of the class (Kachel, Henry, & Keller, 2005). These threads of communication can be reviewed for attributes of critical thinking rather than a regurgitation of information. Professors and teachers alike are able to monitor the scholarship of the student's work (Kachel, Henry, & Keller, 2005). In Shoaf (2007) many advantages of online charter schools were discussed from the vantage point of the students, the parents and the teachers of the online school. The charter school that was the focal point of the discussion was a school that serviced students in grades pre-K through 8th grade, but many of the advantages that were discussed are applicable for a high school setting as well. The school offers tailored curriculum for the individual students based on an assessment before the student starts their classes. Each student has goals that are adjusted to their needs and the goals are reviewed and modified on a regular basis. The parents are

partners in their child's education, giving them tests, sending in work samples and speaking with the teachers whenever necessary. Another added benefit that online classes add to the educational environment is the opportunity to take classes that are more obscure in nature or are difficult to staff with qualified teachers (Kirby & Sharpe, 2010). Students in rural areas of the country are able to take classes that their local high schools are not able to offer (Chaney, 2001).

Brick and mortar charter schools can also offer specialized programs that local high schools may not be equipped to offer such as performing arts schools (http://www.goasa.org, 2014). Despite the political controversy and the inconclusive research (Kelly & Loveless, 2012) surrounding charter schools, many different contributions have been made from the introduction of charter schools. One positive attribute that Good and Braden (2000) identified is that charter schools typically have the ability to offer a smaller class size which then leads to more individualized assistance in the classroom. Charter schools have also provided more choices for parents as well as offer an alternative to students that haven't been well served in public schools (Good & Braden, 2000). Advocates of charter schools cite the fact that charter schools allow parents to choose a school that best matches their child's interests and one that advances their community's identity (Fuller, Gawlik, Gonzales, Park, & Gibbings, 2003). Some charter schools that serve as second or third chances for students are able to individualize opportunities that are not available at the neighborhood public school (Good & Braden, 2000). Schneider and Buckley (2003) found through survey data that parents of charter students rate their charter schools higher than their traditional counterparts in the areas of

teachers, principals, facilities, and schools. They found these conclusions despite controlling for self-selection into charter schools. The power of that choice also shifts the role of students making them central to the design of the school and curriculum (Schneider & Buckley, 2003). This has allowed many art, technical or high schools with specific special education populations in mind to offer unique opportunities specific to their student's needs and educational goals (Woodall, 2011).

Researchers have found that many charter schools are serving populations that traditional public high schools have been unable to educate. Gresham, Hess, Maranto, and Milliman (2000) found that in Arizona specifically two-thirds of charter secondary schools are for at-risk students, most of these students had failed in the traditional school setting. Atkins, Hohnstein, Roche (2008) found that many charter schools are serving more "at risk" populations of students. Findings concluded that in 2006, 12 percent of students attending both alternative and charter schools are on an Individual Education Program (IEP), which is slightly greater than the students being served in traditional high schools. These percentages can change however, in 2000 Gresham, et al. (2000) found that in Arizona specifically, that only three percent of charter school students had IEP's compared to nine percent of student in district schools. Snyder and Dillow (2012) found that the percentage of students receiving special education services in 2008-2009 school year was 13.2% which rose from 8.3% in the 1976-1977 school year. Gresham et al. (2000) also noted that opponents of charter schools believe that charter schools illegally discourage the parents of special education students from enrolling in charter schools. Greene, Forster, and Winters (2006) likened making comparisons between traditional

schools and charter schools to comparing apples and zebras due to the stark differences between the different school's populations. Atkins, Hohnstein, and Roche (2008) found that students with disabilities that had individualized education plans (IEP's) had positive perceptions of their schools and found that the school that they attended (charter or alternative schools) were helping them make positive changes. These students, who had previously attended public school without success, reported that academically they were better students, behaviorally they were less likely to skip school, and socially they had more friends and felt better about themselves. In regard to these school's populations, advocates of charter schools support the design of different ways to evaluate charter schools in an effort to take into consideration the more difficult students they serve (Scott & Villavicencio, 2009).

Disadvantages of charter and online schools

Opponents of charter schools describe the charter school movement much like other educational reform; opponents of charter schools see them as a simple solution to a very complex problem (Good & Braden, 2000). Proponents see the charter movement as a way to increase competition, school choice, and innovation across the educational field (Lubienski, 2009), however, no data has emerged that has been able to link school choice with increased student achievement (Abernathy, 2005; Garcia & Garcia, 1996). Lin's 2001 study, investigating charter schools in Arizona, California and Michigan, found that charter schools are not as successful as politicians have claimed. Still, educational policies are being written with the limited data currently available. Charter schools are thought to create "healthy" competition for established public schools (Abowitz, 2002;

Zimmer &Buddin, 2009). This argument has been difficult to validate because student achievement has been viewed primarily through state standardized tests, which may not include other important achievement components. Despite the assessment's limitations in investigating achievement, allowing charter schools exemption from state mandated assessments is irrational because there is as of yet, no other monitoring mechanism in place. Standardized assessments are used as one reason to justify the creation of charter schools (Lin, 2001). The healthy pressure from charter schools should have provided a systemic positive effect on the educational system in its entirety. However, Zimmer and Buddin's (2009) showed that charter schools had little effect on the achievement of students in the California traditional public schools. The study also was unable to reveal any evidence of positive competition for traditional public schools; it has been difficult to prove that charter schools increase the motivation of traditional school districts, principals, or teachers (Good & Braden, 2000; Lubienski, 2009).

Proponents of charter schools not only purport these schools will be a source of healthy competition, but also raise the achievement of the students who attend them through the charter school's innovation (Bulkley & Fisler, 2002; Good & Braden, 2000; Hanushek, Kain, Rivkin, & Branch, 2006). The most consistent findings of charter schools are that there is no controlled experimentation in charter schools and little innovation (Good & Braden, 2000; Hanushek et al., 2006). If one of the reasons that advocates support charter schools is because they will be focal points of innovation, the public should insist that innovation be an outcome to a charter school being approved for funding. Abowitz (2002) concluded, based on fact the that most charter schools are not

well regulated and are not serving students well, the innovation and flexibility that many

charter schools strive for, could be achieved in the public school system without the

many risks that coincide with charter schools. Many charter schools are currently under

investigation for financial mismanagement, fraud, or illegal practices. In Philadelphia 19

of the 74 charter schools are under federal investigation. Board members have been found

taking money from the schools, putting unqualified family members on the payroll, and

depriving special education students of the services for which they qualify. (Woodall,

2011).

Online charter high schools have brought forth new controversy. Learning online

may not fit every student's preferred learning style (El Mansour & Mupinga, 2007, Lin

2011). Many students learn actively and interactively while others focus on facts (El

Mansour & Mupinga, 2007). Some students may prefer visual forms of information and

others learn from written and spoken explanations. Students at the secondary level are

less likely to be autonomous and independent than post-secondary students, they may

lack intrinsic motivation and be less able to manage their own learning or be self-directed

(Murphy, Rodriguez-Manzanares, 2009). Lin (2011) states that online charter schools

often attract a diverse group of students, not all of whom are a good fit for an online

education. Lin (2011) listed a high capacity for and a commitment to independent, self-

directed learning without the need for consistent face-to face guidance from teachers.

These students also will not need or will be able to do without the social interaction that

traditional schools offer their students. Accommodating the diversity of the backgrounds

and learning styles of the students, online classes have challenges that traditional high

schools have already overcome. These traditional strategies may not necessarily translate to the online learning environment (Mupinga, Nora, & Yaw, 2006).

Conflicting Research

One of the complications to understanding achievement in charter schools is that charter schools vary greatly from school to school (Buckley & Fisler, 2002; Good & Braden, 2001; Kelly & Loveless, 2012) and there are conflicting results (Loveless & Field, 2009). Charter schools differ immensely in the student demographics that they serve, the qualifications of the teachers that they employ, whether they are a "start up" charter school or a "conversion" charter school, staffing ratios, and if they are managed by local educators or by private companies (Fuller et al., 2003). Compounding the issue is that different states have very different laws, expectations, and standards for Annual Yearly Progress (AYP) that guide charter schools from their inception to regulating charter schools in their operations (Gawlik, 2012). Charter schools utilize different curriculum and a different set of standards and focus; making conclusions difficult to generalize to other charter schools. While some charter schools focus on international baccalaureate academics, others are the last option for juvenile offenders, the goals of charter schools may be very different due to the very different students they serve (Good & Braden, 2000). Buddin and Zimmer's (2005) analysis of California charter schools compared conventional public schools that have been transformed into charter schools. Their analysis concluded that:

- Charter schools that have been transformed from conventional schools are performing at the same level as traditional public schools,

- Charter schools starting from scratch require time to develop but show the most promise and

- "Charter schools that are not classroom based are performing poorly and policy makers should approach these schools with reservations" (p.369).

Researchers must show caution in grouping all charter schools together due to their diversity in nature. Research regarding charter school achievement is often conflicting, and there exists a scarcity of research focusing on online charter school achievement. This study hopes to add to the charter school achievement literature by focusing on online charter schools and comparing their achievement to those of a traditional high school.

The charter school achievement research that has taken place thus far has been contradictory and extremely limited in regards to online high schools. Charter schools vary significantly in their mission, the population of students that they serve, their staff, their resources, and the state laws that guide them. Despite preliminary research being conducted about what is needed to be successful in the online environment there still exists very little research that examines the success of online high schools and their ability to educate high school students. Even less research exists that compares traditional high schools to online high schools. This study supplies objective research regarding whether or not an advantage exists in online high school achievement and traditional high school achievement. The study provides more data about the success of online achievement by comparing the mean achievement scores of all the online high schools in Arizona to the mean achievement scores of similar traditional high schools. This study is

informative because of its investigation into one of the most progressive chartering states,

Arizona.

Chapter 3: Research Method

Introduction

Despite rigorous effort and intention, consensus still does not exists on how to best measure achievement in charter schools or how to compare that achievement to traditional public schools (Scott & Villavicencio, 2009). This study is an investigation into how two different types of schools compare in achievement. The study compares traditional high schools to online charter schools using the state standardized AIMS assessment as the measure to determine achievement differences in the two types of schools. This study is also looking to see if there are differences in the two types of schools across three different school years in an attempt to determine if one type of school consistently out performs the other. This chapter examines the test being used (the Arizona Instrument to Measure Standards), methods of the proposed study including the population sample, measures, procedures, research design, and limitations. The purpose of this study is to determine if students attending different types of high schools achieve statistically significant higher scores on the AIMS assessment.

Research Questions

Is there a difference in mean AIMS scores between online high schools and traditional brick and mortar high schools in the area of reading?

Is there a difference in mean AIMS scores between online high schools and traditional brick and mortar high schools in the area of math?

When comparing the two schools over a period of three years, which type of school has consistently higher scores on state standardized reading and math assessments?

Hypothesis

H_{01}: There will be no difference between AIMS scores in the area of reading in the two types of schools.

H_1: There will be a difference in AIMS scores in the area of reading between the two different types of schools.

H_{02}: There will be no difference between AIMS scores in the area of math in the two types of schools.

H_2: There will be a difference between AIMS scores in the area of math in the two types of schools.

H_{03}: There will be no pattern of differences in means across the three years between the two types of schools showing no pattern of superior achievement scores.

H_3: There will be a pattern of difference in means across the three years between the two types of schools showing one school repeatedly having superior achievement scores.

Background

Arizona state law, state statute (ARS §15-701.01) and State Board of Education Rules (R7-2-302, R7-2-302.01, and R7-2-302.02) established AIMS HS Writing, Reading, and Mathematics as the competency tests students must pass for graduation from an Arizona public high school. This requirement was first effective for the

graduating class of 2006 (Arizona Department of Education, 2014). All students residing in Arizona and attending public schools were mandated to take and pass the AIMS test in order to fulfill graduation requirements for high school unless otherwise stated in their Individual Education Plan. Students began taking the test in 3rd grade, in high school they started taking the high school assessment as sophomores. The 10th grade year was selected for the proposed study because it was required that all public school students complete AIMS in 10th grade (Arizona Department of Education, 2013) regardless of what type of school they attended making every Arizona public school student a potential participant to the study. Students are required to take the exam until they receive a "Meets" score or have it written in their IEP that it is not a requirement.

As of 2015, students no longer have to pass the AIMS in order to graduate from a public high school; the state is currently using the AZMerit assessment. All students had to pass the AIMS during the years being studied for this research therefore it is the most appropriate instrument to use to assess the two different types of schools.

Students had their first opportunity to take the AIMS High School test for high school graduation in the areas of Reading, Writing, and Mathematics during the spring semester of their second year or sophomore year of high school. (Arizona Department of Education, 2013 http://www.azed.gov/standards-development-assessment/files/2012/07/aims-hs-graduation-overview_revised-aug-2012.pdf).

The AIMS assessment used at the high school level is not a norm referenced assessment; it is a criterion referenced measure. A standard deviation was not published or readily available (AIMS Technical Report, 2013).

Variables

The variables being studied are 16 online high schools and 16 traditional high schools. The dependent variable is the mean AIMS score each school is able to achieve in a given year. The AIMS scores are measured for this study by taking the mean or average of each school's scores. The average was then attached to that school type (online or traditional) and then a comparison was made regarding whether there is a statistical difference in the two types of schools. Three different school years are also being studied in an effort to see if there is a pattern of achievement differences across three different years in between the two types of schools. The term *"online charter schools"* in this study refers to public schools that accept state and federal funding, have a charter contract with the department of education, but do not have a physical location where the students and teachers meet. *"Traditional brick-and-mortar"* schools will be defined as schools that accept public funding, do not have a "charter" contract with the state department of education, and have a physical location where the students and teachers meet.

Research Design and Approach

Sample Selection

The sampling method in this study is purposive as it is examining the scores of students who attend online high schools within the state of Arizona. A systematic sampling technique was used to match traditional schools with the online charter high schools. Traditional schools were picked based on having the name of the city in the high school's name such as Chandler High School, or Gilbert High School (Chandler and

Gilbert both being cities in Arizona) or the high school represented major suburban areas. Currently there are 19 online high schools open to Arizona students. During the years being studied, 16 of the 19 online high schools were open. Those 16 schools had students take the AIMS test during the 2011-2012, 2012-2013, and 2013-2014 academic school years and are part of the study. The traditional schools were picked to closely match the online school population; however, matching the schools will be one of the limitations due to the fact that online schools can enroll students from around the state whereas traditional schools typically enroll from their boundaries or neighborhood. Only sophomore spring scores were used in the study in an effort to exclude any retest validity threat. The data was screened for outliers such as missing or incomplete data. The data was analyzed for the assumptions of normality and equal variance through the SPSS software. All of the schools that were picked for the study are located in Arizona. Student anonymity was preserved through a separation of individual student names and scores, this researcher never knew individual scores as individual scores are not published on the state's website. Anonymity for individual schools is also preserved by not publishing test scores attached to the names of the matching school. This researcher had no contact with individual students. The findings from the analysis will be given to the principals of all the schools studied. Data was held on a password protected thumb drive and only the researcher, chair members, and two colleagues helping with the analysis will have access to it. Data will be destroyed after 5 years. The school's mean AIMS scores were gathered from the Arizona Department of Education's website and are public record.

An Analysis of Variance or ANOVA was used to analyze the data. ANOVA was first developed by Fisher in 1925 and has widespread applications (Cardinal, 2013). Its purpose it to predict a single dependent variable on the basis of one or more predictor variables (Cardinal, 2013). ANOVA was used to examine mean differences of AIMS scores which are the dependent variable and the two predictor or independent variables. The years being analyzed are (2011-2012, 2012-2013, and 2013-2014) and the two different types of school (traditional and online charter schools). Cohen's d is the widely used standardized true value of an effect in the underlying population (Cumming. 2013); this is what was used to determine the effect size. The analysis resulted in requiring 12 schools at a .05 Alpha with a large effect that will result in .80 power (The G Power Team, 2014). This study will be utilizing 16 online charter schools and 16 traditional schools which will meet the requirement to reject the null hypothesis.

Sampling Method

Due to the limited availability of online schools, the sample was not random. The schools were selected due to their location in Arizona. The schools were found on the Arizona Department of Education's website under currently open online charter high schools. Most of the schools have been open and accepting students for at least 5 years, this time period allows for an increase in stability within the school. Three of the online high schools opened up during the 2011-2012 school year. The traditional high schools were picked for similar qualities, 3 were picked because they had also opened up during the 2011-2012 school year. Schools were also chosen for their diversity in student population, and location in the Arizona valley. All of the students within the schools

selected that are sophomores had their AIMS scores counted. The only AIMS scores being used are those of sophomores, this will control for students that do not meet the standards the first time who then must retake it in their Junior and/or Senior years.

Sample Setting

The data gathered is archival, gleaned from the state's education department website. The data was taken across three academic years (2011-2012, 2012-2013, 2013-2014) in an effort to show if there is a trend in achievement between the two types of schools in reading and math achievement as assessed by a standardized assessment. The students all take the exam under similar conditions, as all administrators of the exam undergo training with protocol that has been established by the state department (Arizona Department of Education, 2014).

Instrumentation

The data used in the proposed study was obtained from the Arizona Department of Education website and staff. The Arizona Instrument to Measure Standards (AIMS) is used as the assessment in Arizona, created by the Arizona Department of Education in conjunction with Pearson, to measure student's achievement in Arizona and is in compliance with the requirements of No Child Left Behind (NCLB). The test was first used for high school students in the spring of 1999 (AZ Department of Education, 2011). In high school, students begin taking the AIMS in 10th grade and must retake the test until they pass it or they are not permitted to matriculate. The following study used the AIMS scores of students from two different types of high schools, online charter schools,

and traditional high schools. The year and schools were selected in an effort to compare similar student populations and schools.

The AIMS technical report addresses both the reliability and validity. The reliability of the AIMS was measured using the Cromback Alpha. The Cromback Alpha is used to determine internal consistency. For the high school sample, the reliability for Reading for both sexes was at least .9, for different ethnicities it ranged from .89 for American Indians to .94 for Asians. The ELL population had the reliability coefficient of, 76, for the SPED population it was .87, Low SES .91 and Migrant students had the internal consistency of .88. A statement from the AIMS technical report regarding the AIMS validity said that Spring 2013 AIMS tests were designed and developed to provide fair and accurate ability scores that support appropriate, meaningful, and useful educational decisions. In searching for validity the AIMS test involved Arizona educators. The committees were made up of teachers, curriculum specialists and administrators from across the state. The committees looked at among other criteria, the appropriateness of the content, and the accuracy of the information, that the test questions were not biased toward a particular gender or ethnic group. Validity was also considered in the test design, assessment questions were carefully designed to test the Arizona content standards. The report also stated that the "knowledge, expertise, and professional judgment offered by Arizona educators ultimately ensured that the content of AIMS formed an adequate and representative sample of appropriate content and that the content formed a legitimate basis upon which to validly derive conclusions about student

achievement." (Arizona Department of Education [ADE], 2013). There was not,

however, a validity coefficient statement.

Data collection Procedures and Analysis

Upon IRB approval from Walden University, data was collected from the Arizona

Department of Education's website, the data is archival and open to the public. Gathering

the data from the State Department of Education's website is the most reliable and

reputable place to gather the information as the Department of Education is the

organization that is responsible for instituting the test, training proctors, and compiling

the data to be used in grading individual schools. The Arizona Department of Education

has a process that the public can request data sets of AIMS scores. This process was used

to gain access to the data. No time or resource constraints were present due to the data

being available to the public. The scores were compiled in an Excel file and SPSS

software was used to conduct the statistical analysis. The data compiled was the mean

AIMS scores from each school being studied. The analysis used is using a mixed model

(between and within) ANOVA, with 3 repeated measures (year) and a between subjects

factor (online vs traditional school). Through the investigation of factors or independent

variables, the ANOVA procedure calculates the different variation within a sample mean

drawn from the population (Marascuilo & Serlin, 1988). This method was chosen due to

its usefulness in analyzing data that will compare mean scores across the different types

of schools and across the three academic school years. Scores are compared across three

years in an effort to determine if a statistically significant pattern can be seen in the

difference between the means. The program G Power was used in order to determine the

sample size and level of effect (The G Power Team, 2014). An 80% power and significance cutoff or alpha of .05 was used. Both of these measurements are commonly used in similar analysis. The correlation between repeated measurements (year over year) is .8. This will give a .827 power to detect an effect (The G Power Team, 2014). Precautions to uphold internal and external validity will also be taken.

Threats to internal validity include students retaking the test after not being able to pass the test initially. This threat will be addressed by only looking at the scores from the school's sophomores taking the test in the spring. The spring test for sophomores is the first opportunity to take the test, which will eliminate repeated testing or testing effects. One limitation to the study is a threat to external validity, it includes the fact that different types of students may be drawn to online education, researchers have found that originally only highly motivated students were in online classes but as the options have changed in Arizona that may no longer be true. This concern makes generalizing the findings across different states challenging. The data included for the study is only from students in Arizona and brick and mortar charter school students were not included. Both of these populations could be considered not to be an average sample of Arizona high school students. This same issue can also be considered a threat to internalizing validity.

The previous chapter addressed the methodological approach that this researcher took in an effort to answer if students are achieving statistically different scores on average in two different types of schools, online charter schools and traditional brick and mortar high schools. The following chapter will be a discussion of the results from the ANOVA analysis.

Chapter 4: Results

Introduction

The purpose of this study was to compare academic achievement between two different types of schools, online charter school, and traditional brick and mortar schools at the high school level. Specifically, the purpose of this study was to identify which type of school produced higher AIMS scores in reading and math and if those results were consistent over three years. The following chapter presents the outcome of the data analysis conducted. The chapter also depicts the procedures of the study. The study investigated the following research questions: if there was a difference between online charter schools and traditional schools in Reading AIMS scores, if there was a difference between online charter schools and traditional schools in Math AIMS scores, and if there was a pattern of difference in the scores across the three years being analyzed.

Data Collection Procedure

The timeframe for this study's data collection was extremely short once IRB approval was obtained. The data utilized for the study was archival. All the information is available to the public on the Arizona Department of Education's website. Downloading the different school's AIMS scores and organizing the data into an excel file to be processed by SPSS (the software used to analyze the data) took approximately an hour. There was no discrepancy between the plan for collecting the data and the actual collecting the data process.

The characteristics of the brick and mortar schools that were chosen were matched as closely to the available online high schools as possible. The traditional

schools were chosen as major and well established high schools, the majority of which have the name of the city that they are from in the name of the school. Because online high schools do not participate in free and reduced food programs, matching them to the traditional schools was one of the limitations of the study. The entire charter online high school population in AZ was used in the analysis; all of the online high schools that were open during the years being analyzed that reported scores to the department of education were used in the study. Because traditional schools far outnumber online schools, an attempt was made to match the traditional schools to the online schools. An effort was made to match the online school to traditional schools from the same cities. Traditional schools were picked because they were in the major cities that the online high schools were in. A systematic sampling technique was employed in which traditional schools were picked based on having the name of the city in the high school's name such as Chandler High School, or Gilbert High School (Chandler and Gilbert both being cities in Arizona) or the high school represented major suburban areas.

Analysis

The following show the results from the ANOVA analysis that was completed. The tables show a comparison of results from the years 2012, 2013, and 2014.

Table 1

Descriptive Statistics Results Online Charter Schools Reading

	N	Minimum	Maximum	Mean	Standard Deviation
2012	10	532	689	630.3	59.287
2013	10	396	685	611.8	91.417
2014	10	528	735	646	68.617
Overall		396	735	623.08	77.52

Table 2

Descriptive Results Traditional Schools Reading

	N	Minimum	Maximum	Mean	Standard Deviation
2012	15	465	729	681.60	63.15
2013	15	671	722	696.20	16.62
2014	15	676	738	699.40	19.08
Overall		465	738	692.40	29.58

The findings show that currently online high schools are not preforming as well as traditional high schools, either individually or over time in either math or reading. Despite the fact that traditional schools always received better scores than online schools, the results show that the online scores did improve over the three year period however not to a degree that is statistically significant.

Reading Results

The analysis showed that the traditional schools had higher scores in reading in all three years analyzed. This information is presented in Table 1 and 2. The online high schools showed a maximum AIMS score in reading in year 2012 of 698 with a mean of 630.30. The traditional high schools in year 2012 had a maximum score of 729 with a mean score of 681.60, traditional schools being on average 51.3 points higher than online schools. In year 2013 the online high schools had a maximum score of 685 with a mean score of 611.80. The traditional high schools had a maximum score of 722 with a mean score of 696.20. The traditional schools scored on average 84.4 points higher than the online high schools. In year 2014 the online high schools had a maximum score of 735

with a mean score of 646.50. The traditional high schools had a maximum score of 738

with a mean score of 699.40. The traditional high schools received on average 52.9 more

points than the online high schools.

The hypothesis questions looked at whether or not there was a difference between

online charter schools and traditional high school's scores across three different years.

The analysis supports rejecting all three null. Traditional high schools had higher scores

in all three years in both reading and math by a large margin.

Table 1 and 2 shows the results of the first hypothesis: There will be no difference

between AIMS scores in the area of reading in the two types of schools.

<div align="center">

Math Results

</div>

The following tables depict the results of the descriptive analysis for Math.

Table 3

Descriptive Results Online Charter Schools Math

	N	Minimum	Maximum	Mean	Standard Deviation
2012	11	405	461	445.18	21.07
2013	12	410	522	458.00	28.55
2014	11	401	468	450.36	22.72
Overall		401	522	446.83	19.08

Table 4

Descriptive Results Traditional Schools Math

	N	Minimum	Maximum	Mean	Standard Deviation
2012	15	462	518	487.13	18.38
2013	15	466	511	486.47	13.94
2014	15	466	513	486.20	14.40
Overall		462	518	486.60	15.29

The analysis showed that the traditional schools had higher scores in math in all three years analyzed. Those results are seen in Table 3 and 4. In math for year 2012 the online high schools received a maximum AIMS score of 461 with a mean of 445.18. The traditional high schools in 2012 received a maximum score of 518 with a mean score of 487.13. The traditional high schools received 41.95 more points on average. In year 2013 in math the online high schools received a maximum score of 522 with a mean score of 458.00. The traditional schools received a maximum score of 511 with a mean score of 486.47, the traditional schools received on average, 28.47 more points. In year 2014 the online high schools received a maximum score of 468 with a means score of 450.36. The traditional school received a maximum score of 513 with a mean score of 486.20. The traditional schools received on average 35.84 more points than the online high schools.

Analysis of Descriptive Statistics

The analysis did reveal that each year despite consistently having lower scores, the charter schools were improving each year with the exception of year 2013 to 2014 in Math and from 2012 to 2013 in Reading.

ANOVA Analysis

Table 5

ANOVA Results Between Subject Effects Math

Source	SS	DF	F	Sig
School Type	24200.00	1	29.83	<.001
Error	18655.33	23		

Table 6

ANOVA Results Between Subject Effects Reading

Source	SS	DF	F	Sig
School Type	75205.57	1	9.69	.005
Error				

Table 7

ANOVA Results Within Subject Effects Math

Source	MS	DF	F	Sig
School Year	341.18	1.08	.86	.37
Error	393.80	25.04		

Table 8

ANOVA Results Within Subject Effects Reading

Source	MS	DF	F	Sig
School Type	2266.79	1.39	1.73	.19
Error	1306.60	42		

Repeated measures ANOVA tests were run to investigate the potential differences in AIMS scores across years for online and traditional high schools. Mauchly's test indicates the assumption of sphericity was violated for both math [Chi Square=39.91, df=2, p<.001] and reading [Chi Square=11.40, kf=2, p<.001] analysis. Therefore, the Greenhouse-Geisser correction was used. The results show that there is a significant difference in both math and reading between online charter high schools and traditional high schools.

Table 5 addresses research question one and two: Is there a difference in mean AIMS scores between online high schools and traditional brick and mortar high schools in the area of reading? Is there a difference in mean AIMS scores between online high schools and traditional brick and mortar high schools in the area of math? The table shows that traditional schools perform better than online charter schools. There is sufficient evidence to reject the null hypothesis in both reading and math. A reading analysis showed that there is a large effect of school type on AIMS performance. $F(1, 21)= 9.69$, $p=.005$, partial eta square$=.316$. A math analysis showed that there is also a large effect of school type on AIMS performance. $F(1, 23)= 29.83$, $p>.001$, partial eta square$=.565$.

Tables six and seven show that there is no difference across time for either subject or school type. The descriptive statistics show small improvements however as stated before they do not reach statistical significance. The Math analysis revealed no significant within subject difference across time for either school type [$F(1.089, 25.041)=.866$, $p=.37$]. The Reading analysis revealed no significant within subject difference across time for either school type [$F(1.394, 29.278)=1.73$, $p=.19$].

The finding indicate that brick and mortar schools perform significantly better in both math and reading, further the magnitude of these differences are large as indicated by the effect size. Based on the above analysis the schools did not improve or decline significantly in their performance across the three years studied in either subject regardless of school type.

Summary

Online high school attendance continues to grow however there is a lack of research that examines how well these students are being educated compared to traditional high school students. This study looks to fill in some of those research gaps by looking specifically at the outcome of AIMS scores at the two different types of schools. This research found that the traditional schools examined consistently (in all three years studied) perform better in both reading and in math in comparison to the online charter schools examined. The analysis also showed that the effects as measured by Cohen's d are large in both reading and math. It should be noted that the effect for math is larger than in reading.

Chapter 5 presents an interpretation of the results found in Chapter 4. It also discusses the social implications and possible political ramifications of the findings. Recommendations for action as well as further study are presented. The chapter will conclude by discussing the limitations and an overall summary.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to compare academic achievement between two different types of schools, online charter school, and traditional brick and mortar schools at the high school level. This study used the Arizona Instrument Measure Standards (AIMS) test to evaluate the different types of schools and their academic achievement. The study compared all of the online high schools that administered the test during the years examined as well as compared the scores across a three-year time period. The scores were looked at over a three-year time period in an effort to determine if there was a pattern of difference between the two types of schools.

Interpretation of the Findings

The findings show that currently online high schools are not preforming as well as traditional high schools, either individually or over time in both reading and math shown through the AIMS scores. The results show that traditional schools analyzed consistently (in all three years) outperformed the online charter schools analyzed in both reading and in math.

The study contributed to the current literature about online high schools by giving concrete objective data looking at specific schools in the same state that must adhere to the same testing conditions. Previous studies often had mixed results, were inconclusive due to confounding factors or the study was completed in other states with different regulatory standards. This study showed similar results as McNally (2012) who didn't recommend online schools over traditional high schools. The results are also similar to

Maddox (2013) and Studebaker (2011) who found that students performed better in traditional classrooms over online classes. This study contributes to the growing literature questioning the validity of online high schools as a valid alternative to traditional schools.

The findings can be analyzed in the context of Arizona's education system, the findings show that online high schools may not be educating high schools as they purport and Arizona regulators should move forward with online high schools with caution. Regulators may need to reconsider the requirements for online high schools to open or maintain their charter. Often online charter schools are generalized into the same category as charter schools however they should be viewed as a completely separate type of school. Often previous research comparing traditional schools and charter schools did not include online charter schools. This study hoped to continue the dialogue about the efficacy of online charter schools. This study showed like others before it including Buddin and Zimmer (2005) which concluded that charter schools that weren't classroom based were performing poorly, that online education at the high school level requires more research before it gains the financial and legal backing of our state governments. This study, like those before it, recommends caution when using an online exclusively for high school students. This study has extended the knowledge of the educational discipline in Arizona by looking specifically and objectively at how these two types of schools are performing based on a standardized assessment.

The theory behind charter schools and online charter schools is that in an effort to increase or maintain enrollment, competition among charter schools and traditional schools will increase the efforts of all educators and therefore all students will benefit

from this competition (Zimmer, Gill, Booker, Lavertu, Sass, Witte, 2009). This theory does not appear to bear out in application due to the relatively limited knowledge of how online high schools scores compare to traditional schools.

Limitations of the Study

The results of this study have limitations that have to be considered when generalizing to other states and populations. This study cannot be generalized to other states as the curriculum standards set by the state are different in each state for the years being analyzed. Due to the fact that the AIMS assessment is not a norm-referenced test but a criterion based assessment and standard deviation was not published; limited comparisons could be made which also limited the potential for generalization of the findings. Another limitation of the study is the requirements for opening a charter school are drastically different in different states. The results of the study are also limited in that a relatively small pool of online high schools were available for the study. The study was also not able to account for student movement. The study was not able to account for students that took the AIMS test while enrolled at an online school but had previously been enrolled at a traditional school as well as students that were previously enrolled at online institutions and then transferred to a traditional school. Another limitation to this study is the socio-economic status of the students that attended the different types of schools is unknown. It is known that socio-economic status greatly influences the achievement of students and it may have had unintended consequences on the results.

Another limitation is that because a random sample was not possible the results of the study can not be generalized to the rest of the traditional high schools. This limitation

is mitigated by analyzing the state ratings (the grades given to schools be the state) for the schools. The traditional schools included in the analysis obtained state grades from A to C which may be interpreted to mean that a wide variety of traditional schools were included in the study with respect to performance on the Arizona state report card. Having schools that ranged from A to C on the state report card implies that all of the traditional schools included in the study were not top performers.

Recommendations

As this study was able to conclude that currently online high schools are not performing as well on the Arizona state standardized test as traditional high schools, it is suggested that further research take place in a variety of states, with a larger number of online high schools and across a longer time span would allow future researchers to draw random samples of appropriate size and compare them to randomly selected brick and mortar schools. Future research should investigate whether certain online high schools that are catered toward specific types of students, such as teen parents, students with concerns inhibiting their attendance perform differently than other online high school students. Research into other states that utilize online high schools may have drastically different results due to different standards required for online charter schools to open, if those results show positive outcomes when compared to traditional schools, the differences could contribute to the positive outcomes that online schools are having and be utilized in Arizona to help standardize online high schools.

Implications

This study hoped to inform a variety of different people and effect social change on a variety of levels. The results hope to steer legislators, parents and students toward requesting more information about the validity of the current online high schools open in Arizona. Further studies need to be conducted in an effort to determine if any online high schools should be singularly responsible for the education of high school students or if online classes should only be used to supplement current traditional classes in Arizona. Families and individual students may find the current study informative and may decide to make different educational decisions. Educators may discover the findings of this research informative and investigate how they are using technology in their classes and make decisions based on how independent their learners are.

The greatest hope of this research is to inspire Arizona education policy makers at the state level to demand better results from online high schools. Until better results from online charter schools are achieved, the state should limit the proliferation of online charter high schools.

Conclusions

This study encourages parents, students and heads of state education departments to look carefully into current and future educational legislation that would include or encourage the use of online high schools under the current requirements for charter schools in Arizona.

References

Abernathy, S. F. (2005). School choice and the future of American democracy. Ann
    Arbor, Mich: The Universityof Michigan Press.

Abowitz, K. A. (2002). From public education to educational publics. *The Clearing
    House*, 76(1), 34-38.

Arizona Charter School Association (2015). List of open charter schools. Retrieved from
    https://azcharters.org

Arizona Department of Education (2011). *AIMS technical manual.* Phoenix: Pearson.
    www.azed.gov/standards-development.../aims_tech_report_2011_final.pdf

Arizona State Board of Charter Schools (2015). Retrieved from https://asbcs.az.gov

Balfanz, R., Legters, N., West, T.C., & Weber, L. M. (2007). Are NCLB's measures,
    incentives, and improvement strategies the right ones for the nation's low-
    performing high schools? *American Educational Research Journal,* 44(3), 559-
    593.

Bulkley, K. & Fisler, J. (2002). A decade of charter schools: From theory to practice.
    CPRE, Policy Brief, 1-11.

Buddin, R., & Zimmer, R. (2005). Student Achievement in Charter Schools: A Complex
    Picture. *Journal of Policy Analysis & Management*, 24(2), 351-371.
    doi:10.1002/pam.20093

The Earning Potential of Career and Technical Education. (2001). *Techniques:
    Connecting Education & Careers*, 76(6), 24.

Brinson, D. & Rosch, J. (2010). Charter School Autonomy: A Half-Broken Promise. Thomas B. Fordham Institute. 1-47.

Cardinal, R. N., & Aitken, M. R. (2013). *ANOVA for the behavioral sciences researcher*. Psychology Press.

Cavanaugh, C., Gillan, K., Kromrey, J., Hess, M., & Blomeyer, R. (2004). The effects of distance education on K–12 student outcomes: A meta-analysis. Naperville, IL: Learning Point Associates. Retrieved from http://www.ncrel.org/tech/distance/k12distance.pdf

Chaney, E. (2001). Web-based instruction in a rural high school: A collaborative inquiry into its effectiveness and desirability. *NASSP Bulletin*, 85(628).

Cumming, G. (2013). *Understanding the new statistics: Effect sizes, confidence intervals, and meta-analysis*. Routledge.

Daniels, B. M. (2009). *Motivation, academic success, and learning environments: Comparing high school face-to-face and online courses* (Order No. 3340542). Available from ProQuest Dissertations & Theses Global. (288084686). Retrieved from http://search.proquest.com/docview/288084686?accountid=14872

Dee, T. S. & Fu, H. (2003). Do charter schools skim students or drain resources? *Economics of Education Review*, 23, 259-271.

El Mansour, B., Mupinga, D.M. (2007) Students' positive and negative experiences in hybrid and online classes. *College Student Journal*, 41(1), 242-248. Retrieved from EBSCO*host*

Felder, R. M. (1996). Matters of style. *ASEE Prism*, 6(4), 18-23.

Fuller, B., Gawlik, M., Gonzales, E. K., Park, S., (with Gibbings, G). (2003). Charter schools and inequality: National disparities in funding, teacher quality, and student support. Policy analysis for California education, working paper series 03-2. April, 2003, from http://pace.berkeley.edu/Chartersummary.pdf.

Garn, G. A., & Stout, R. T. (2001). Chapter 9: Closing Charters: How a good theory failed in practice. In, *School Choice in the Real World: Lessons from Arizona Charter Schools* (pp. 159-172). Perseus Books, LLC. Retrieved from EBSCO*host*.

Garcia, G. F., & Garcia, M. (1996). Charter schools: Another top-down innovation. *Educational Researcher 25*, 8, 34-36.

Garn, G. A., & Stout, R. T. (2001). Chapter 9: Closing Charters: How a Good Theory Failed in Practice. *School Choice in the Real World: Lessons from Arizona Charter Schools* (pp. 142-158). Perseus Books, LLC.

Gawlik, M. A. (2012). Moving beyond the rhetoric: Charter school reform and accountability. *The Journal of Educational Research*, 105, 210-219.

Grasha, A. F., & Yangarber-Hicks, N. (2000). Integrating teaching styles and learning styles with instructional technology. *College Training*, 48(1), 2. Retrieved from EBSCO*host*.

Gleason, P., Clark, M., Tuttle, C. C., & Dwoyer, E. (2010). The Evaluation of Charter School Impacts: Final Report. NCEE 2010-4029. *National Center for Education Evaluation and Regional Assistance.*

Good, T. L., & Braden, J. S. (2000). Charter Schools: Another Reform Failure or a

Worthwhile Investment? *Phi Delta Kappan*, 81(10), 745-50. Retrieved from

EBSCO*host*.

Greene, J. P., Forster, G., & Winters, M. A. (2006) Apples to apples: An evaluation of

charter schools serving general student populations. *Education Working Paper

Archive*, 1-19.

Hasler-Waters, L., Barbour, M. K., & Menchaca, M. P. (2014). The Nature of Online

Charter Schools: Evolution and Emerging Concerns.

Hawkins, A., Graham, C. R., & Barbour, M. K. (2012). "Everybody Is Their Own

Island": Teacher Disconnection in a Virtual School. *International Review Of

Research In Open And Distance Learning*, 13(2), 123-144.

Hill, P. T., Angel, L., & Christensen, J. (2006). Charter school achievement studies.

Education,1(1), 139-150.

Ho, L. (2009). The antecedents of e-learning outcome: An examination of system quality,

technology readiness, and learning behavior. *Adolescence*, 44(175), 581-599.

Retrieved from EBSCO*host*.

Hubbard, B., & Mitchell, N. (2011a) Online K-12 schools failing students but keeping tax

dollars. -News Network. Retrieved from

http://inewsnetwork.org/2011/10/02/online-k-12-schools-failing-students-but-

keeping-tax-dollars/

Jae Young, C., In-Soo, S., & Heesook, L. (2009). The effectiveness of charter school: \ Synthesisynthesizingdized mean-changes. *KEDI Journal Of Educational Policy*, 6(1), 61-80.

Jefferson, T. (1899). *The Writings of Thomas Jefferson* (Vol. 10). Putnam's.

Kachel, D. D., Henry, N.L., & Keller, C.A. (2005). Making it real online. Distance learning for high school students. *Knowledge Quest*, 34(1), 14-17.

Kelly, A. P., & Loveless, T. (2012) Comparing new school effects in charter and traditional public schools. *American Journal of Education*, 118.

Lane, B. (1998). Choice matters: Policy alternatives and implications for charter schools. *Northwest Regional Educational Laboratory*, 1-40.

Lazarin, M. (2011). Federal Investment in Charter Schools: A Proposal for Reauthorizing the Elementary and Secondary Education Act. *Center for American Progress*.

Lin, Q. (2001). An evaluation of charter school effectiveness. *Education*, 122(1), 166. Retrieved from EBSCO*host*.

Loveless, T. & Field, K. (2009). Perspectives on charter schools. *Handbook of Research on School Choice*, New York: Routledge. Suggested Citation:

Lubienski, C. (2009). Do quasi-markets foster innovation in education? A comparative perspective. OECD *Education Working Papers*, No. 25 OECD Publishing.

Maddox, P. R. (2013). *A comparative study of english language arts content standards test scores in california for online and traditional public high school students* (Order No. 3606075). Available from ProQuest Dissertations & Theses Global. (1492128262). Retrieved from

http://search.proquest.com/docview/1492128262?accountid=14872

Marascuilo, L. A., & Serlin, R. C. (1988). Statistical methods for the social and behavioral sciences. New York: W. H. Freeman and Company.

Mathis, W. J. (2010). The "Common Core" Standards Initiative: An Effective Reform Tool? Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved from http://epicpolicy.org/publication/common-core-standards

McNally, S. R. (2012). *The effectiveness of Florida virtual school in terms of cost and student achievement in a selected Florida school district* (Order No. 3569631). Available from ProQuest Dissertations & Theses Global. (1369522103). Retrieved from

http://search.proquest.com/docview/1369522103?accountid=14872

Mertler, C. A., & Vannatta, R. A. (2002). Advanced and multivariate statistical methods. *Los Angeles, CA: Pyrczak.*

Miller, J. A. (1997). Doing more with less. *Education Week*, 16(17), 69.

Mincer, J. (1974). Schooling, Experience, and Earnings. Human Behavior & Social Institutions No. 2.

Miron, G., & Applegate, B. (2007). Teacher attrition in charter schools. *East Lansing, MI: Great Lakes Center for Education Research and Practice.*

Miron, G., & Nelson, C. (2001). *Student achievement in charter schools: What we know and why we know so little*. New York: National Center for the Study of Privatization in Education, Columbia University.

Mupinga, D. M., Nora, R. T., & Yaw, D. C. (2006). The learning styles, expectations and needs of online students. *College Teaching*, 54(1), 185-189.

Mupinga, D.M. (2005). Distance education in high schools: Benefits, challenges, and suggestions. *Clearing House*, Jan./Feb. 105-108.

Murphy, E., & Rodriguez-Manzanares, M. A. (2009). Teachers' perspectives on motivation in high school distance education. Journal of Distance Education, 23(3), 1-24.

National Center for Educational Statistics. (2014). http://nces.ed.gov/programs/stateprofiles/sresult.asp?mode=short&s1=04

Nelson, E. H. (1997). How much thirty thousand charter schools cost. Paper presented at the Annual Meeting of the American Education Finance Association, Jacksonville, FL.

Parsons, Ebbie, I.,II. (2011). A comprehensive study of the relationships between teacher characteristics and value-added to student achievement. (Order No. 3492295, University of Pennsylvania). ProQuest Dissertations and Theses, 124. Retrieved from http://search.proquest.com/docview/916792302?accountid=14872. (916792302).

Porter, A., McMaken, J., Hwang, J., & Yang, R. (2011). Common core standards: The new U. S. intended curriculum. Educational Researcher, Vol. 40, No. 3, pp. 103–116 DOI: 10.3102/0013189X11405038

http://www.publiccharters.org/law/ViewComponent .aspx?comp=16.

Ryan, S. (2001). Is online learning right for you? *American Agent and Broker*, 73(6), 54-58.

Rapp, K. E. & Eckes, S. E. (2007). Dispelling the myth of "White Flight": An examination of minority enrollment in charter schools. *Educational Policy*, September 2007 21:615-661, April 24, 2007.

Renzulli, L. A., Parrott, H. M., & Beattie, I. R. (2011). Racial mismatch and school type teacher satisfaction and retention in charter and traditional public schools. *Sociology of Education*, 84(1), 23-48.

Salkind, N. J. (Ed.). (2010). *Encyclopedia of research design* (Vol. 1). Sage.

Schneider, M. & Buckley, (2003). Making the grade: Comparing DC charter schools to other DC public schools. *Educational Evaluation and Policy Analysis*, 25(2), 203-215.

Scott, J., & Villavicencio, A. (2009). School context and charter school achievement: A framework for understanding the performance "black box". *Peabody Journal of Education*, 84, 227-243.

Shaw, C.N., Tomcala, M., Middleton, J., Rudee, B., Jones, E., & Smith, J. (2001). A comparative study of students in alternative and traditional high schools. *Education*, 85(2), 12-.

Snyder, T. D., & Dillow, S. A. (2012). *Digest of education statistics 2011*. National

    Center for Education Statistics.

Stout, R. T., & Gregg A., G. (2001). Chapter 10: Nothing New: Curricula in Arizona

    Charter Schools. In, *School Choice in the Real World: Lessons from Arizona*

    Charter Schools (pp. 159-172). Perseus Books, LLC. Retrieved from EBSCO*host*.

Snyder, T. D., & Dillow, S. A. (2012). *Digest of education statistics 2011*. National

    Center for Education Statistics.

Studebaker, J. A. (2011). Online education and high school students: A mixed methods

    investigation into performance, access, and perception. *Dissertation Abstracts*

    International Section A, 75.

Timmons-Brown, S., & Hess, F. (1999). Why Arizona embarked on school reform (and

    Nevada did not). *School choice in the real world*, 115-128.

The G*Power Team (2014). *G*power*, Version 3.1.9.2. [Computer software] Bonn,

    Germany: Universität Bonn.

Wang, A. Y. & Newlin, M.H. (2002). The Journal, Online lectures: Benefits for the

    virtual classroom, Aug 2001 (29)1. 17-22.

Woodall, M. (2011). Investigating charter school fraud in Philadelphia. *National Public*

    Radio. Retrieved from http://www.npr.org/2011/06/27/137444337/what-happens-

    when-charter-schools-fail

Van der Sluis, J., van Praag, M. & Vijverberg, W. (2005). Entrepreneurship Selection and

    Performance: A Meta-Analysis of the Impact of Education in Developing

    Economies. *World Bank of Economic View*, 19 (2), 225-261.

Zimmer, R., & Buddin, R. (2009). Is charter school competition in California improving

    the performance of traditional public schools? *Public Administration Review*,

    69(5), 831-845.

Zimmer, R., Gill, B., Booker, K., Lavertu, S., Sass, T.R., & Witte, J. (2009). Charter

    schools in eight states: Effects on achievement, attainment, integration, and

    competition. RAND Corporation. Document number: RB-9433-BMG/JOY/WPF

Appendix A: Title of Appendix

Insert appendix here. Appendices are ordered with letters rather than numbers. If there is but one appendix, label it Appendix, followed by the title, with no letter designation.

The appendices must adhere to the same margin specifications as the body of the dissertation. Photocopied or previously printed material may have to be shifted on the page or reduced in size to fit within the area bounded by the margins.

If the only thing in an appendix is a table, the table title serves as the title of the appendix; no label is needed for the table itself. If you have text in addition to a table or tables in an appendix, label the table with the letter of the appendix (e.g., Table A1, Table A2, Table B1, and so on). These tables would be listed in the List of Tables at the end of the Table of Contents.

If you include in an appendix any prepublished materials that are not in the public domain, you must also include permission to do so.

Template updated September 2016.