School Climate and the Relationship to Student Learning of Hispanic 10th Grade Students in Arizona Schools

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ABSTRACT

This study provided an analysis of Hispanic 10th grade student academic achievement in the areas of mathematics, reading and writing as measured by the Arizona's Instrument to Measure Standards. The study is based on data of 163 school districts and 25,103 (95%) students in the state of Arizona as published by the Arizona Department of Education. In the study, the quantitative correlations of three independent school climate-related variables with student learning (dependent variable) were analyzed. The independent variables were the following: teachers' academic preparation, Limited English Proficiency (LEP) student population and economically disadvantaged student population (ED). The study sought to inform principals and the discipline of Education Administration about the complex school climate issues that relate to student learning in Arizona high schools among the Hispanic student population. In so doing, the study offered informed arguments regarding the complex issue of narrowing the achievement gap of Hispanic students.

INTRODUCTION

Purpose of the Study

The objective of this study is to investigate the relationship between three school climate variables and student learning in Arizona high schools among the Hispanic student population in 10th grade. The three independent variables are: teachers' academic preparation, Limited English Proficiency (LEP) student population and economically disadvantaged student population (ED). The fourth variable, student learning, is the dependent one. The study seeks to inform principals and the discipline of Education Administration and other scholars of the complex school climate issues that relate to student learning in Arizona high schools among the Hispanic student population. The study was conducted at Bethel University in Saint Paul, Minnesota as part of the author's doctoral dissertation. Dr. Jay Rasmussen, from Bethel University, contributed with valuable suggestions and direction. Both Dr. Rasmussen and Faith Marie Nava offered enormous editorial suggestions and input as well, for which the author is very grateful to both.

Why School Climate?

School climate is a topic that has caught the attention of educators in recent years. Various studies link school climate to the academic achievement of students (Adams, 2005; Fiore 2001; Snowden & Gorton, 2002), as discussed in the literature review in the present study.

The present study is based on data analysis from hundreds of high schools in the state of Arizona, from the Arizona Department of Education. Furthermore, the present study zooms in on selected school climate variables that, according to the literature review, have been linked to affect academic achievement of Hispanic students, particularly, of Hispanic students in the 10th grade (Adams, 2005; Fiore 2001; PISA, 2006; Pashiardis, 2000; Snowden & Gorton, 2002). The Arizona Instrument to Measure Standards, whose data is analyzed in the present study, offers a rich opportunity to the researcher to deepen data examination analysis. Furthermore, the present study adds to the body of knowledge to help understand the issue of school climate and its effects on academic achievement. It complements international studies that have also zeroed on the same topic.

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Other important studies have analyzed school climate. The Programme for International Student Assessment (PISA) has conducted one such study (2003). PISA included the study of school climate in its research of 41 participating countries (Haahr, 2005). Although this study focuses on 10th grade Hispanic students attending high school in Arizona, it is worth mentioning that many Hispanic students in the U.S. are mobile and travel between the U.S. and Latin America, especially between the U.S. and Mexico. Serious research cannot simplify the issue of school climate and take for granted that the Hispanic student population in the U.S. is bound to the U.S., and that it has nothing to do with that in Mexico. Although the educational systems of both countries are very different, some students often spend part of 9th and 10th grade in U.S. schools and part in Mexican schools. Due to the undocumented status of many Hispanic students, it is extremely difficult to assess the percentage of mobile Hispanic students in 9th and 10th grade, and this is also beyond the scope of this research. This is not a study that relies heavily on cultural variables, either.

In addition, in recent years, Hispanic students have been exposed to a new phenomenon that causes fear and raises a red flag for parents, teachers, and students alike. In Spanish it is called *narco menudeo*, and it consists of petit drug dealers infiltrating schools to sell their harmful products; often students themselves act as these drug dealers. Along with this problem, public schools have the growing issue of staff members who work outside jobs to maintain financial viability. This has been aggravated by the current economic recession. This results in low morale among teachers and lack of effort, not to mention exhaustion. Some parents now perceive the school climate unsuitable for young students due to the introduction to stronger illegal drugs in middle and high schools. The present study discusses these issues as well.

In light of the above, today's administrators cannot consider school climate as an *interesting* topic and file it under the same category of school folklore. Administrators nowadays need to see the value of the connection between school climate and student achievement. The link between school climate and student learning is a topic school principals need to study and intentionally work to improve in their schools. School climate is definitely linked to student learning and a host of behavioral issues students experience in 9th and 10th grade. Additionally, school climate contributes to the success or failure of these students.

Operational Definitions

School Climate

The present study uses an original definition that is inclusive of the observations made by several other researchers whose contributions are analyzed here. Throughout the review of literature conducted for this study it was found that different researchers alluded to different aspects of school climate. During the literature review, as the study later shows, important aspects of school climate emerged. In the literature review of this study there are several definitions of school climate and its aspects. These aspects can be summarized in terms of school safety (levels of aggression in school, gang presence and school violence), the emotional well-being of school members, particularly of students, such as dropout and teen-pregnancy rates, and socioeconomic well-being, which are often associated to the degree of student learning, low income families, lack of school resources and LEP student population in schools. Even the PISA (2003) variables of school climate, such as student use of alcohol and illegal drugs, student intimidation or bullying and student absenteeism fit within these categories. Nevertheless, no single definition found in the literature review of this study adequately speaks of the main variables of school climate present in the instrument of this study. Therefore, it became clear that a new, more accurate definition to this study was important to be defined. For the present study, *school climate is the school community members' perception of how safety, emotional and socioeconomic well-being variables affect student learning* (Nava D., 2011).

Educators

For the present study, educators are considered to be high school teachers, principals and other administrators from different Arizona high schools where there is a Hispanic student population in grade 10.

'Hispanic' or 'Latino'

For the present study, the words *Hispanic* or *Latino* are synonymous and are simply mentioned as ethnic backgrounds in the AIMS Technical Report of the Arizona Department of Education (2007). This is how they are used in this study. They are not described as races, national origins or cultural denominations.

In education the word 'Hispanic' is a relative term that can mean different things in different places. For instance, in an urban Minneapolis school with 9th and 10th graders, a Hispanic student population may be about 17%, but the same percentage will likely be considered more insignificant in an urban school in Los Angeles. For instance, in Canoga Park Senior High School, part of the Los Angeles Unified School District in California, the average Hispanic/ Latino rate in high school is 30%. In Des Moines, Iowa it is 16.85%. Nevertheless, the present study followed the data offered per the Arizona Instrument to Measure Standards where student participants self identified on the test as *Hispanic*.

It is important to mention here that it is beyond the scope of this study to enter into a debate about who is a *Hispanic* and who is not. The present study will consider schools where students have self-identified as Hispanic or Latinos by declaring it so to the school. Therefore, the term *Latino* is considered here as synonym of Hispanic. The study assumes that native students from Mexico or other parts of the Spanish-speaking world are de facto Hispanic/ Latinos.

Student Learning or Academic Achievement

The literature review presented in this study shows that some researchers use the term *academic achievement* and others *student learning*. It is beyond the scope of this study to enter into a debate of the differences or similarities of both terms. For this study student learning is the preferred term because it is the term that it has been used in international research such as PISA. However, when in the literature review researchers have mentioned *academic achievement* it has been left as such.

Limited English Proficiency

The study kept the term *Limited English Proficiency*; despite of being more accurate or positive terms because it is the term used by the AIMS instrument for students whose English language proficiency is limited or poor.

Research Questions

Regarding schools in Arizona the research questions are:

1. What relationship is found, if any, between teachers' academic preparation and Hispanic student learning?
2. What relationship is found, if any, between the existence of a Limited English Proficiency student population and Hispanic student learning?
3. What relationship is found, if any, between the existence of an economically disadvantaged student population and Hispanic student learning?

The Null and the Alternative Hypotheses

H1o: There is no relationship between teachers' academic preparation and Hispanic student learning as measured by the Arizona's Instrument to Measure Standards.

H1: There is a relationship between teachers' academic preparation and Hispanic student learning as measured by the Arizona's Instrument to Measure Standards.

H2o: There is no relationship between a Limited English Language student population and Hispanic student learning as measured by the Arizona's Instrument to Measure Standards.

H2: There is a relationship between a Limited English Language student population and Hispanic student learning as measured by the Arizona's Instrument to Measure Standards.

H3o: There is no relationship between an economically disadvantaged student population and Hispanic student learning as measured by the Arizona's Instrument to Measure Standards.

H3: There is a relationship between an economically disadvantaged student population and Hispanic student learning as measured by the Arizona's Instrument to Measure Standards.

Concerns of the Present Study

The main concern for this study is that the Arizona Department of Education has used AIMS in its schools to measure student achievement every other school grade. Yet, until 2006, the Arizona Department of Education disclosed the terms if its validity and reliability. The later release delayed the analysis of data as well.

REVIEW OF THE LITERATURE

School climate affects what takes place in the classroom (Kratochwill & Roach, 2004). What happens in the classroom must certainly affect student achievement. School practitioners need to understand how perceptions of school climate affect student learning. As the literature review shows, this is especially true among Hispanic students struggling academically and behaviorally in schools.

School Climate

Although definitions of school climate are actually few, it is encouraging that the definitions do not seem to contradict each other. They consistently point to different faces of the same prism. Some define school climate as the quality and frequency of interpersonal interactions (Kuperminc, Leadbeater & Blatt, 2001). On the other hand, Stolp and Smith (1995) defined school climate as the shared perceptions of people within a work unit or organization. In the PISA studies referred to before, by looking at the variables to measure student-related and teacher-related factors affecting school climate, one can infer school climate is understood as a sense of belonging among students, safety in school, enthusiastic participation of teachers, and how teachers feel regarding their school principals (OECD, 2001). Yet other researchers, as we will see in the discussion of school climate versus school culture, define it as the observable or perceived personality of the school (Adams, 2005).

School Climate and School Culture

Some authors use the terms school climate and school culture interchangeably (Adams, 2005). However, school culture is generally seen in broader terms that encompasses school climate (Fiore, 2001; Stolp & Smith, 1995). While school culture is the set of values, beliefs, and assumptions of the group (Fiore, 2001), school climate is the personality and façade of the school, which is perceived or observed, and it depends on the health of the school culture (Adams 2005). School culture is to the root system of a tree what school climate is to the tree above ground itself. According to Adams (2005), school climate is therefore easier to change because external factors like leadership styles, infrastructure and staff, influence the latter. Also, school climate exists in a shorter length of time. While school culture embraces the history of relations in the school, school climate involves the perceptions about relations among people in a school (Adams, 2005).

In a study of 24 schools and 900 teachers, one salient area that affects the school climate is teachers' quality of life. In turn, the development of professional communities, opportunities for collaboration, enhancement of individual professionalism and teacher empowerment impact the quality of life (Louis, 1991; Louis, Marks, & Kruse, 1996).

Leadership styles have a marked influence on the climate of an organization (Barker, 2001). For instance, there is a positive relationship between transformational leadership and school climate (Blatt, 2002). Such relationship is maintained regardless if the school director is male or female. However, a positive relation between transactional leadership and school climate was found for male directors (2002). This is perhaps due more to the views of male leadership in Western culture.

School Climate and the Achievement Gap

As research shows, school climate is a factor that helps explain the achievement gap between Hispanic students and non-Hispanic students. The study of school climate is important to school leaders. When leaders promote a healthy school climate, teachers and staff in turn are able to concentrate on their duties, thus facilitating student learning in their schools (Adams, 2005). Fiore (2001) stressed the importance of school climate and its connection to student achievement: "a climate in which all feel comfortable leads to a productive learning environment that has a positive impact on the achievement of students" (p. 23).

It has also been documented that a trait of effective schools always includes a positive school climate with an emphasis on academic achievement and effort, the belief that students can achieve, and a safe and orderly learning environment for students (Snowden & Gorton, 2002). Even in older studies the same results emerged. For example, research carried out in the decades of the 1970s and 1980s indicated that effective schools had a positive school climate that led to student learning (Deal & Peterson, 1999).

Shein (1992) described three levels in schools: the artifacts, values, and the underlying assumptions levels. The first level, the artifacts level, is the one that most closely resembles school climate because it is most visible. Unlike school culture, which could be seen as the sum of the group (school's) learning, and the array of the emotional and cognitive elements, school climate is dependent upon the school community's perceptions and is observable. As analyzed in the earlier section about school climate and school culture, school climate is the observable "above the ground" part of a tree. It can give educational leaders a measure of how healthy the underlying school culture is. School culture, according to Deal and Kennedy (1982), affects everything, including hiring and firing processes, choice of curricular activities and even sports practiced at the school.

The educational benefits of a positive school climate are numerous. Such benefits can be maximized if the school meets the needs of its students. For instance, a bilingual environment is more beneficial to bilingual students than one that is not (PISA, 2006, p. 46). In another study, carried out on secondary and elementary schools in Cyprus, school climate was directly linked not only to learning but to the sheer joy of it as well (Pashiardis, 2000). Furthermore, a positive school climate has profound effects on the future of students. School climate has been found in connection with students' aspirations as well (Plucker, 1998).

Educators, however, should be careful and not become overenthusiastic about the many benefits of a positive school climate and forget other important areas that a school needs in order to increase student achievement. Efforts to better the educational climate of a school should not replace good and sound pedagogical training of teachers, appropriate and sufficient teaching materials and resources, an adequate school infrastructure, a well thought-out and appropriate curriculum, and many other factors that contribute to learning in a school. Teachers are critical for student achievement, as they can affect student achievement in a school, yet they also play a role in school climate. The single basic unit of change in the school environment is the teacher (McGee, 2006). In addition, for learning to occur school administrators need to factor in aspects of teaching and learning at the school and classroom level. School climate is more important to student learning than many believe to be true: actual time spent on teaching and learning in the classroom and outside of the school, the extent of behavioral problems among students, the availability of appropriate resources such as books, computer equipment and relevant materials, an adequate, agreeable and safe school buildings and qualified teachers (Haahr, 2005).

Furthermore, in regards to computer availability and achievement, the Fuchs and Woessmann 2004 study correctly asserted that the simple conclusion derived from the PISA 2000 study regarding reading and mathematics in which mere computer access is positively related to student achievement, does not stand (Bielefeldt, 2005). In contrast, the simple access of technology by students, namely computers, is not related to student achievement. That technology access may either help or hinder academic achievement depending on how technology is put to use by students, not only in school but at home as well. A study that analyzed the results of the PISA 2003 study for many countries regarding school climate and student achievement concluded that, while a positive school climate may be a precondition for good outcomes, it is not a sufficient condition in and of itself for strong academics.

> A positive school climate may be necessary, but is not a sufficient condition for strong academic performance among students. If this hypothesis holds true, policy makers should consider whether specific initiatives can be initiated to strengthen the overall climate of each country's schools. It should be borne in mind in this connection, that there are probably benefits in respecting overall school autonomy. One option that may be relevant in several countries could be to focus on schools with a particularly poor school climate and consider possibilities for the restructuring of schools and/or the relocation of parts of the student body to other schools. (Haahr, 2005, p. 15)

Resources and Student Learning

Today's educators, whether in their professional role of administrators or teaching staff, need to understand and maintain an equilibrium between sound pedagogy, resources (human and non human) and actions that improve the climate in their schools. Furthermore, these areas of education affect one another. Educators cannot solely put their energies on one area and disregard the others. For instance, resources can affect student achievement, thereby affecting the school climate as well.

Students living in impoverished environments face uphill challenges to succeed in school (Alexander, Entwisle, & Kabbani, 2001). Various studies have established a link between poverty-related factors, such as student's inability to access middle-class schools, regardless if such factors affect the family unit or the school community where the student attends (Battin-Pearson et al., 2000; Cairns, Cairns, & Neckerman, 1989; Lehr, et al., 2004; Rumberger, 2001; Schargel, 2004; Wehlage & Rutter, 1986).

In addition, there are three factors in relation to scarcity of resources that affect a learning environment: teacher shortages, architectural infrastructure housing the learning, and educational resources (Haahr, 2005).

Infrastructure plays a vital role in the health of school climate and its connection to academic achievement. The location of a school can influence academic climate of a school (Marks, 2006). More specifically, the academic achievement gap increases when low-income children attend school in academically challenging environments (Williams, 2005). When a school lacks resources and is located in neighborhoods prone to gangs and known for domestic violence, it is more difficult for students to thrive and learn; thereby, contrary to their mission, schools can act as fermenting centers of the achievement gap rather than helping to close it. Many Hispanic students can attest to this on a personal basis. For instance, the high school a Hispanic student attended was in a ghetto in Mexico City. Due to school shortages, in Mexico many public school buildings are used twice a day. In the morning a school staff and student body occupies the building. In the evening, a totally different school staff and student body moves in. Often the morning shift (*turno matutino*) is reserved for younger and better achieving students; while the *turno vespertino* is for older students or students with lower grades. In this case the student attended the evening shift. Some evenings, gang members ran around the school with lit torches and hit the metal fence with them to intimidate students. This obviously caused not just distraction from academic learning but fear among students as well. Once out of school, students were often menaced to give money, join the gang (Los Batos Locos) or receive a beating (J. J. Piña Sanabria, personal communication, June 17, 2008).

Thus, the proper design of an optimal learning environment incorporates proper mechanisms to deliver enhanced learning and treatment (Wang & Zhang, 2007). Williams stated that there are two national categories of national environments, one that supports mutual influence of affect and achievement, and the other promotes motivational influence of affect and achievement (Williams, 2005).

Hispanic Students and the Achievement Gap

In the last decades there were some gains in narrowing the achievement gap between students of Hispanic origin and Caucasian students. According to the National Assessment of Education Progress, from 1975 to 2004 the reading gap closed from 34 to 21 points in 9 year-old students, and from 41 to 29 points for 17 year-old students (KewalRamani, 2007). Seventy percent of Hispanic students who come from homes with limited English language and who were assessed via the English reading assessment at the outset of kindergarten improved 0.5 of a standard deviation in kindergarten, and 0.125 by the end of 5th grade. Most of the gain occurred in 1st grade (National Task Force, 2007). Similarly, in mathematics the gap was narrowing. In a study that compared achievement between Hispanic students whose parents recently immigrated to the U.S., and Caucasian whose grandparents had immigrated to the U.S., the gap in mathematics was reduced to ¾ of a standard deviation at the start of Kindergarten and ½ of a standard deviation at the end of 5th grade (Reardon & Galindo, 2006). From 1973 to 2004 the gap in math scores decreased from 35 to 23 points for 13 year-olds, and from 33 to 24 points for 17 year-olds (KewalRamani, 2007).

Unlike math and reading scores, high school graduation rates among Hispanic students have not significantly improved compared to those of Caucasian students, and they are still behind those of African American students. In 2003 the overall high school graduation rate was 70%, with the Hispanic completion rate at 56% and the Caucasian rate at 76% (Education Trust, 2006). In 1990 the gap between Hispanic and Caucasian students was 31 percentage points and in 2005 the gap increased one percentage point to 32% (KewalRamani, 2007). However, the percentage of Hispanics with high school or higher education grew from 51% in 1990 to 58% in 2005. Optimistically speaking, this could be due to higher achievement rates. It could be due higher immigration with more Hispanics coming to the U.S. with their education completed, or close to completion, the lack of participation of the Hispanic population in educational surveys and studies, or the growth of the Hispanic population as a whole.

The reasons for the achievement gap between Hispanic and Caucasian students are extremely complex and numerous. Since this is a study regarding some school climate factors and student learning of 10th grade Hispanic students in order to inform school administrators, a detailed analysis of such reasons is beyond the scope of this study. However, the most commonly discussed cases of the achievement gap are discussed.

It is important to understand that the majority of Hispanic students attend schools with the scarcest financial and educational resources in the nation. According to Carey (2004), in 31 of 49 states, the school districts with the highest minority enrollment receive fewer resources than do school districts with the lowest minority enrollment. If most Hispanic students attend schools with the fewest resources in the nation, this probably means that Hispanic families are not able to afford housing within the boundaries of wealthier school districts. This is a reflection of the socioeconomic status (SES) of the family. A form of SES, economically-challenged students, is variable in this study. Poverty exerts a negative effect on the academic achievement of the student, and elevates the risk of low academic performance (Verdugo, 2010).

Scholars agree that the number one reason for the student learning gap is the discrepancy in socioeconomic status between Hispanic and non-Hispanic families. SES is a composite measurement that includes family income, parent education levels and parent occupation (National Task Force, 2007). When analyzing 1998 – 1999 federal government data about reading readiness in kindergarten students from the Early Childhood Longitudinal Study (ECLS-K), a strong correlation between student learning and the family SES was established. For instance, 36% of Hispanic children and 8% of Caucasian students were in the lowest SES quintile. In contrast, only 9% of Hispanic children came from families in the highest SES quintile, compared to 30% of Caucasian children (National Task Force, 2007). Similarly, the educational level of the parent was also found to be closely related to student learning. In the SES lowest quintile 64% of Hispanic parents had not graduated from high school and less than 1% of parents had a college degree. On the other side of the coin, in the highest SES quintile, 87% of Hispanic parents had a college degree, and only 3% of Hispanic parents had not graduated from high school (2007).

A component of the SES, family income, is more influential in determining how well a child does academically. This factor is even more important than the language spoken in the home. In a study that comprised Hispanic students at the end of 5th grade, it was found that among 30% of Hispanic students coming from recently immigrated families, two thirds to three fourths of the differences in reading scores between Hispanic and Caucasian students were strongly associated to the SES of the family. Again, this factor was more significant than the language spoken at home (National Task Force, 2007). Likewise, the SES of the student family is strongly associated with the learning of reading and math. In the highest SES quintile 78% of Caucasian students compared to 65% of Hispanic students grasped the mathematical concept of relative size (level 2 of the ECLS-K database); in the lowest SES quintile 37% of Caucasian students compared to 25% of Hispanic students did so.

Others factors have a detrimental effect on academic achievement of students. Limited English Proficiency is one of them (Ekstrom et. al., 1986; Rosenthal, 1998; Rumberger, 2001). Limited English proficiency, or LEP, is a variable in this study. Indeed, students raised in families with LEP tend to do poorly in schools where English is the main teaching language (Kaufman, et. al., 1992; Lehr et. al., 2004; Rumberger, 1986). Some studies wrap LEP into a term called Family Climate (Verdugo, 2010); nonetheless there is still strong evidence that LEP is a factor that hinders academic achievement. In addition, as Hispanic students become linguistically proficiency, they perceive or become aware of discrimination (Becerra, 2010).

On the other side of the spectrum, school programs that culturally translate into Spanish academic subjects have resulted in improved test scores in mathematics and reading (León et. al., 2011). Other college preparedness programs such as Upward Bound and Talent Search, part of the Higher Education Act, do help Hispanic and other minority students prepare for college entrance (Walsh, 2011). Yet other Hispanic Serving Institutions (HIS) programs target more at-risk Hispanic students and first-generation students successfully. Students in HIS community colleges enjoy a higher GPA and educational expectations than those who attend non-HIS colleges (Núnez et al., 2011). Social networks that connect Hispanic students to the vision of college education have a positive effect on students (Márquez Kiyama, 2010).

Other family-related factors affect academic achievement such as health problems in the family and substance abuse (Rosenthal, 1998). When these factors become unbearable for the student, they end in school dropout, which is an on-going process rather than an event (Verdugo, 2010). School dropouts are especially high among minorities. Over a four-year period dropouts among blacks and Hispanics increased (2010). In 2007 the high school dropout rate for U.S. born Hispanic students was 21.4%, and the rate for Hispanic students born outside of the U.S. was 37.5%; as compared to first generation Hispanics (9.8%), and second generation Hispanics (13.1%) in the U.S. (León et. al., 2011). Jean Claude Brizard, former CEO of Chicago Public Schools, indicated that 9th grade is a crucial year when Hispanic students need extra support through school programs to prevent school dropout (WBEZ, 2011). A study in the city of Chicago related school dropouts to the cost of welfare programs since, it argued, school dropouts consume more of these resources (WBEZ, 2011, December).

Few other family-related factors may help explain why more Hispanic students drop out of school. The Pew Hispanic Research Center (2004) indicates that Hispanic students, more so than other ethnicities, view responsibility to support the family a priority over funding their college education. In 2004 less than 10% of Hispanic students were in college (Chapa & De La Rosa, 2004). This is why it is important, when examining the complex problematic of achievement gap, not arrive to wrong conclusions, such as that the interest of Hispanics is the same as that of non-Hispanics (Alemán & Alemán, 2010).

It is easy to imagine some of the reasons for the academic gap already presented here. According to minister Daniel Ramírez Toxtli (personal communication, February 12, 2009), many factors affect Hispanic children, such as deportation of parents, lack of financial resources, discrimination, family with low English proficiency, gang violence, traumatic experiences due to immigration from country of family origin to the U.S. If a family is persecuted by immigration or if the parents cannot understand the language in which their children's homework is written, it is difficult for them to support the educational endeavors of their children. If the parent(s) earn minimum wage, or if there is a lack of resources at home, or unsuitable study area, lack of food or chronic poverty in the family; or if there exists domestic abuse or drug/ alcohol abuse in the family, it is extremely difficult for parents to craft a vision for the future and inspire, much less support, the educational activities of their children. Likewise, if they had to leave their country of origin due to lack of opportunities and acquired debt to pay large sums of money to a "coyote" and cross the border, a family is impeded from helping their children at school. Or if the family had a parent or a child dying in the desert while crossing the U.S. border, or if members of the family were assaulted, raped, robbed or murdered while immigrating to the U.S., it is more understandable why the SES of a family affects the student learning of a student. Furthermore, if Hispanic students attend schools with little financial resources, where the average student family belongs to the lowest SES quintile, or if the child encounters discrimination in the school, where will these students find hope for the future and how will they be motivated to learn? These are just some of the challenges many families have to endure. For volunteers, pastors or workers, it is easy to experience and see first hand these challenges while working closely with Hispanic families in the U.S.

In general, Hispanic students are more likely to enter kindergarten unprepared, have to repeat a grade, are suspended more often, and experience a high school dropout rate twice as high as that of Caucasian students. They are less likely to enroll in college and, when they do, they are more likely to enroll in a community college instead of enrolling in a four-year program (Principals' Partnership, 2005). Once Hispanics are in school they face other challenges. They end up in classrooms with less experienced and unprepared teachers, often face discrimination, have teachers with low expectations of them, attend schools that offer little institutional support for their success and they are likely to enroll in less rigorous academic programs. Higher student learning in adolescents is linked to participation in after-school programs that protect adolescents from engaging in risky behavior such as drinking alcohol, drug abuse and violence (KewalRamani, 2007). Unfortunately, Hispanic students are less likely to participate in such activities. Only 44% of them participate in school sports versus 52% of Caucasian students. In addition, parents in dysfunctional families are more reluctant or are simply unable to participate in school life and to become involved in the education of their children.

Behavioral problems also affect student learning. Teenage pregnancy has been linked to the high school dropout rate (Hofferth, Reid & Mott, 2001). Since 1995 the birthrate of Hispanic teens has hovered around 83%, which has been higher than all other ethnic groups (KewalRamani, 2007). The same study reported that alcohol, cigarettes and drug use is low among academic achievers. In 2004, 18% of Hispanic students reported drinking alcohol; they are less probable, however, to smoke tobacco or marihuana than other ethnic groups.

The use of resources plays a role in student learning by facilitating skills and training in technology so that graduates are able to participate in an increasingly competitive and technologically sophisticated workforce. In this area, Hispanics, like other minorities, are at a disadvantage, thereby increasing the probability of repeating the SES of their families. In 2006 85% of Hispanic students used a computer at school and only 50% of them at home. In contrast, 91% of Caucasian students used it at school and 81% at home (KewalRamani, 2007). Like in computer literacy, Hispanic students lag behind in the use of Internet as well. In 2003 29% of Hispanic students reported accessing the Internet at home, compared to 60% of Caucasian students. Poor educational resources affect the achievement of students. The National Assessment of Educational Progress (NAEP) shows that 86% of eighth grade Hispanic students read below grade level (A plan for success, 2009).

In 2011 an ACT organization report was published. It indicates that the achievement gap for minorities, including Hispanic students, is widening:

> Asian Americans performed the best by that measure, with 41 percent meeting the college benchmarks for all four-subject areas. White students had similarly high scores in English and reading, but weaknesses in science and math dropped the number of white students who met requirements for all four topics to 31 percent.
> Only 4 percent of black students met the college readiness standards for English, math, reading and science, compared to 11 percent of Hispanics who did so.
> "None of the Benchmarks were met by at least 50 percent of African American, American Indian, or Hispanic students" (2011).

In the 2011 ACT scores only 47% of Hispanics passed the English section, compared to 76% of Asian students, 35% of Hispanic students passed the reading section compared to 62% of Asian students and, in Mathematics, only 30% of Hispanic students passed in contrast to 71% of Asian students; in science 15% of Hispanic students passed and 46% of Asian student passed (ACT, 2011).

Bullying and School Violence in the 8th to 10th grades

School violence and aggression, such as bullying, is a grave problem that has even claimed the lives of students. In the United States school violence is reaching almost epidemic proportions. It is of importance to take a look at the problem of bullying and aggression in schools since it is a variable that affects school climate and student learning. Schools may contribute to aggressive behavior due to the way they are organized, the way they treat youth, and even the methods they use (Reis, 2007). School violence is also related to academic achievement as a manifestation of poor academics and school dropout, peer rejection, substance abuse, depression, delinquency, gang activity, criminality, teen parenthood, and peer rejection (Giancola, 2003).

According to the PISA 2006 study, particularly:

> …in the United States in 2007, intimidation or verbal abuse of other students was cited most frequently as a serious problem (26%), followed by classroom disturbance (17%). The percentage of U.S. eighth-graders whose principals reported intimidation or verbal abuse of other students as a serious problem was about 10 percentage points higher in 2007 than in 1999. (OECD, 2007, p. 56)

Aggression and violence in U.S. high schools is a serious problem, often ending in death of students. In major cities like Los Angeles, New York and others, there have been beatings with tragic ends in school. Recently the nation was moved by such an episode. In Chicago, schoolmates viciously killed a high school student and the scene was caught on video (NPR, October 1, 2009).

As a reaction to the death of Derrion Albert, an honor student from Fenger High School on September 24, 2009 caught on cell phone video, the Obama administration sent two of his cabinet officials, U.S. Attorney General Eric Holder and Education Secretary Ernie Duncan (NPR, October 7, 2009). An article mentioned that:

> Last year, 34 students from Chicago Public Schools, the system Duncan used to lead, were murdered. This year, already five have died violently. And Attorney General Holder says this is not just a Chicago problem. Holder's Justice Department released a study today measuring the impact of youth violence. It shows that more than 60 percent of the children surveyed say they were exposed to violence, either directly or indirectly, within the past year. Half of children and adolescents report being assaulted at least once. And more than one in 10 suffered injuries as a result. (NPR, 2009)

Experienced teachers in urban areas, like the Chicago area, often encounter and expose their wellbeing to breakup school fights:

> As a teacher, you can't let students fight, much less in the classroom. If a fight isn't broken up in the classroom quickly, what may be a fight of two may end up a fight of four, six or more students. On one occasion, I heard a panic-stricken colleague calling out loud for school security. Two freshmen were fighting in her classroom. A good teacher must know how to stop a fight. So, as I ran to intervene, I docked to avoid a chair coming at me. Then I went in between the to fighting students, head first, open arms to embrace them; one in each arm, to pull them apart, seize them and take them outside the classroom. As a Christian teacher I learned to love these students and I am of a mission to save their lives and influence them for good; to give them hope and show them that respect is far better than violence (Javier Brathwaite, personal communication, January 19, 2014).

METHODOLOGY

Sampling Procedures

The study analyzed which variables published in the 2007 AIMS data relate to student learning of Hispanic 10th grade students. For purposes of answering the research questions, the researcher collected data already published by downloading it from the Arizona Department of Education, and numerous Arizona school districts websites. The study includes data from over 400 schools in 163 school districts and 25103 which represented 95% of Hispanic students in the 10th grade in the school year 2005-2006. In these schools there is a wide range of Hispanic student population. Such data offers the researcher clues as to which school climate variables may be at play in the schools and whether there is a relationship to student achievement for Hispanic students.

This study measured school climate-related factors and whether they relate to student learning of 10th grade Hispanic students in Arizona. The study also analyzed which variables most affect school climate as they relate to student learning. The study also yielded a picture of what kind of schools 10th grade Hispanic students attend in regards to the variables of this study. Although it is not the main objective of this study, the results may give important information about factors that negatively impact student learning, such as teen pregnancy, dropout rate and low level of socioeconomic family level among others. These issues, as the research shows, particularly affect minority students like Hispanics.

Instrumentation

The instrument in the study is the Arizona Instrument to Measure Standards (AIMS), which is a reputable instrument in use by over 900 schools K-12 in the state of Arizona. The Arizona Department of Education has AIMS under contract with Pearson Education (2010). Evidence of the validity and reliability of the AIMS is found in Appendix A.

The variables in the survey were carefully selected as various studies have shown them to affect student learning and school climate. The scores were analyzed to determine which variables of school climate most relate to student learning. The conclusion was written keeping in mind that the readership is intended for school administrators. The present study used quantitative methods.

Participants and Ethical Considerations

There is little or no risk involved for participants since it is data already made public. All data has been compiled and stored confidentially by the researcher. The participants were high school 10th grade Hispanic students. Teachers, school principals, assistant principals and other school administrators in schools where students have taken the Arizona's Instrument to Measure Standards also play a role but these parties are not the participants in this study. Thanks to the design and nature of the study, there is no reasonable expectation that any type of harm, whether, physical psychological, psychological or financial come upon any of the participants. No personal information such as social security numbers or specific names of people will be collected nor associated in the study.

The sample comes from schools with a Hispanic student population offering 10th grade in the state of Arizona. The schools are mostly urban, but some suburban and even rural schools participated.

Variables

The study is a quantitative correlation study. It measures if there is a relationship between four school climate variables.

The independent variables are:

1) Arizona high school teachers' academic preparation measured by number of teachers having a: B.A., M.A. or Doctorate per school.
2) Arizona high school Limited English Proficiency student population measured by number of students per school.
3) Arizona high school economically disadvantaged student population measured by number of students per school.

The continuous dependent variable is student learning measured by number of mean scaled score in AIMS test, namely in Math, Reading and Writing. The dependent variable will be measured by the Arizona's Instrument to Measure Standards (AIMS). Results published in 2007 for the school year 2005-2006, recently published scores for 10th grade students (Arizona Department of Education, 2010), are used in this study. There are various reasons why AIMS was selected. The AIMS instrument was selected because Arizona high schools publish AIMS scores for Hispanic students at even grade levels (2nd, 4th, 6th, 8th, etc).

The Arizona Department of Education presents validity and reliability of AIMS in its technical reports. However, in February of 2005, the William E. Morris Institute for Justice published a challenge to the use of AIMS as a tool to grant high school diplomas and questioned its validity. The institute mentioned that:

> Two bills, HB 2294 and SB 1069, have been introduced that would prohibit the requirement of a passing score on the Arizona Instrument to Measure Standards ("AIMS") test or any other competency test in order to graduate from an Arizona public school. Currently, no matter what grades a student receives in school, including subjects not covered by the AIMS test, their attendance, and their participation in athletic or other extra-curricular activities, if a student does not pass all three parts of the AIMS test, they will be denied a high school diploma. Denial of a high school diploma will severely curtail the student's employment and further educational opportunities. Thousands of Arizona students have failed the AIMS test. Over 26,500 students in the class of 2006, who must pass AIMS to graduate, did not pass the mathematics test in 2004. As demonstrated below, the AIMS test is not required by federal law; serious questions about its validity have been raised; it has a; and as of this date over 57% of Arizona students have not passed all three parts of the test after two attempts. (2005)

In addition, the William E. Morris Institute for Justice (2005) stated that AIMS discriminates against minorities:

> AIMS test results show that African-American, Hispanic, and Native American students have pass rates well below the pass rates for comparable white students.
> For Spring 2004, for 10th grade school students: [1]
>
> For white students
> * 47% did not pass mathematics
> * 24% did not pass reading
> * 27% did not pass writing
>
> For African-American students
> * 77% did not pass mathematics
> * 52% did not pass reading
> * 43% did not pass writing
> Their pass rates are 43%, 63% and 78% of the pass rates for white students.

For Hispanic students
* 80% did not pass mathematics
* 63% did not pass reading
* 53% did not pass writing
Their pass rates are 38%, 48% and 64% of those of white students.

For Native American students
* 84% did not pass mathematics
* 69% did not pass reading
* 56% did not pass writing
Their pass rates are 30%, 41% and 60% of those of white students.

For Fall 2004 for 11th graders, the percentage of students taking the AIMS test who did not pass, increased for each ethnic group in each subject category.

In addition, up to the school year 2005 - 2006 there was no published data about the validity of AIMS:

> The William E. Morris Institute for Justice (2005) submitted a public records request to the Arizona Department of Education ("ADE") in December 2004, and requested documentation concerning validity data for the 2004 AIMS test. ADE responded: "The 2004 Technical Report from Harcourt Assessment has not had final approval and is not available for public dissemination." Thus, there is no published validity data for a test that ADE has used two times for the class of 2006. ADE also has not published its final data on how the passing scores for the 2004 AIMS test were determined for each subject.
> Dr. Darrell Sabers, Ph.D., Professor and Head of the Department of Educational Psychology, University of Arizona, and a nationally recognized expert on testing, has stated that the AIMS test is not a valid measure for whether a student has qualified for a high school diploma. He notes the subjectivity in setting performance levels and the inability to determine what levels of performance should be demonstrated in order to make a valid judgment about graduation. Dr. Sabers' letter is Attachment 1.
> The other major issue is whether each student is receiving an adequate educational opportunity to learn the required standards. As an example, with over 26,500 students failing the mathematics section, either the test is not testing what the students are learning, or the students are not being given the educational opportunity to learn the standards.

The doctrine of *fair use* allows the use of copyrighted material for research and educational purposes. Most university style manuals limit this to 150 words provided that they do not constitute a major portion of the original work. The citing and analysis of this small portion of the AIMS instrument fits well within these guidelines (Roberts, 2004).

Evaluation of the Hypothesis and Statistical Choices
For the quantitative analysis, the researcher analyzed the *Pearson r* coefficient to determine the correlation of scores between the variables in the study. To calculate the *r* coefficient, this study used the Correlation Coefficient Computation Formula because it is a more direct and simple way to obtain the coefficient than the z Score Formula (Witte & Witte, 2007, p. 142). Such formula is:

$$r = \frac{SP_{xy}}{\sqrt{SS_x SS_y}}$$

$$\text{where } SS_x = \Sigma(X - \bar{X})^2 = \Sigma X^2 - \frac{(\Sigma X)^2}{n}$$

$$\text{where } SS_y = \Sigma(Y - \bar{Y})^2 = \Sigma Y^2 - \frac{(\Sigma Y)^2}{n}$$

The stronger the correlation, the stronger the potential relationship between the independent variables and dependent variable is. Therefore, a coefficient of 1.00 signifies that there is a direct, strong relationship between the sets of scores. An inverse, strong relationship leans towards -1.00. A score of 0.00 indicates that there is no relation between the sets of scores (Patten, 2005). The quantitative analysis data calculation using the tool SPSS yields the standard deviation, the mean, standard deviation, range and frequency. The researcher looked at *p* values of less than 0.05 as statistically insignificant ($p<0.05$). The researcher focused attention on the Pearson *r* results that are either the smallest or the largest. A large *r-value* in a given variable indicated that the participants in this study had a similar perception. The opposite is of interest as well. The researcher also followed the statistician's recommendations for further investigation.

A *multiple regressions* analysis was performed to see how an independent variable changes as does the dependent variable if there is a minimum of 230 participants.

In addition, the researcher ran an *analysis of variance* (*Anova*) to compare mean scores for all five variables to determine if the overall set of differences is significant, therefore testing the null hypotheses. To determine which pairs of means are significant, a *multiple comparison* test has been carried out. In addition, a *sampling distribution* to understand the significance and an *effect size* has been calculated to ascertain the magnitude of the difference.

Angel Vázquez, a Food Science engineer and a statistician, assisted the researcher by running the statistical analysis of the data and met with the researcher to adjust the analysis to pursue objectives and purpose of the study at various times. The statistician also helped the researcher discern what the results mean and provided recommendations for further investigation. The author filed permission to conduct the study with the IRB at Bethel University, Saint Paul, Minnesota.

Limitations

The Arizona's Instrument to Measure Standards (AIMS) provides valuable data at various levels. Nevertheless, some of the data limits the findings of the present study. The following are the main limitations of the study:

- The most recently published AIMS test results for 10th grade published up to 2011 dates back to the year 2007 and it is for the school year 2005-2006.
- The study does not have data as to what percentage of the ED student population is Hispanic.
- The study does not have data as to what percentage of the LEP student population is Hispanic.
- The study does not have data as to what percentage of teachers with three years or less of experience actually taught the Hispanic students.
- The study does not have data as to what percentage of teachers with 4-6 years of experience actually taught the Hispanic students.
- The study does not have data as to what percentage of teachers with 7-9 years of experience actually taught the Hispanic students.
- The study does not have data as to what percentage of teachers with 10 + years of experience actually taught the Hispanic students.
- The study does not have data as to what percentage of teachers with an M.A. actually taught the Hispanic students.

DATA ANALYSIS

AIMS Data Analysis

Purpose: To investigate the relationships between school climate variables and 10th grade Hispanic student's ability to pass Arizona's Instrument to Measure Standards test (AIMS).

Questions to test:

Q1: Is there a relationship between teacher education level regarding the students' ability to pass the AIMS test?

Variables to test:

I. Teacher education levels vs. Hispanic students' ability to pass the AIMS test (Math, Reading, and Writing).
II. Educator experience and education levels vs. Hispanic students' ability to pass the AIMS (Math, Reading, and Writing)

Q2: Is there a relationship between the existences of Limited English Proficiency (LEP) student population vs. Hispanic students' ability to pass the AIMS test (Math, Reading, and Writing)?
Variables to test:

I. LED vs. Hispanic's students' ability to pass the AIMS test (Math, Reading, and Writing).

Q3: Is there a relationship between ED (Economically Disadvantaged) students vs. Hispanic students' ability to pass the AIMS test (Math, Reading, and Writing)?
Variables to test:

I. Economically Disadvantaged (ED) Hispanic students vs. Hispanic's students' ability to pass the AIMS test (Math, Reading, and Writing).

Test parameters
Factors to test

- Teacher education
  - % Bachelor = # Bachelor / (# Bachelor + # Masters)
  - % Masters = # Masters / (# Bachelor + # Masters). Converted the # of teachers with bachelors and masters to a percentage.
- Teachers experience
  - % 3 yrs or less experience = (#Bach 3 or less + #Masters 3 or less) / (#Bachelor + #Masters)
  - % 4-6 yrs experience = (#Bach 4-6 yrs + #Masters 4-6 yrs) / (#Bachelor + #Masters)
  - % 7-9 yrs experience = (#Bach 7-9 + #Masters 7-9) / (#Bachelor + #Masters)
  - % 10 yrs or more experience = (#Bach 10 yrs or more + #Masters 10 yrs or more) / (#Bachelor + #Masters)
- % LEP (05-06) = # LEP (05-06) / # Tested (district)
- % ED (05-06) = # ED (05-06) / # Tested (district)

Respondent

- Percentage (%) passed = Summed the data for percentage (%) Met + percentage (%) Exceeded of Hispanic (05-06) students.
- Success criteria $p \leq 0.05$ to be statistically significant

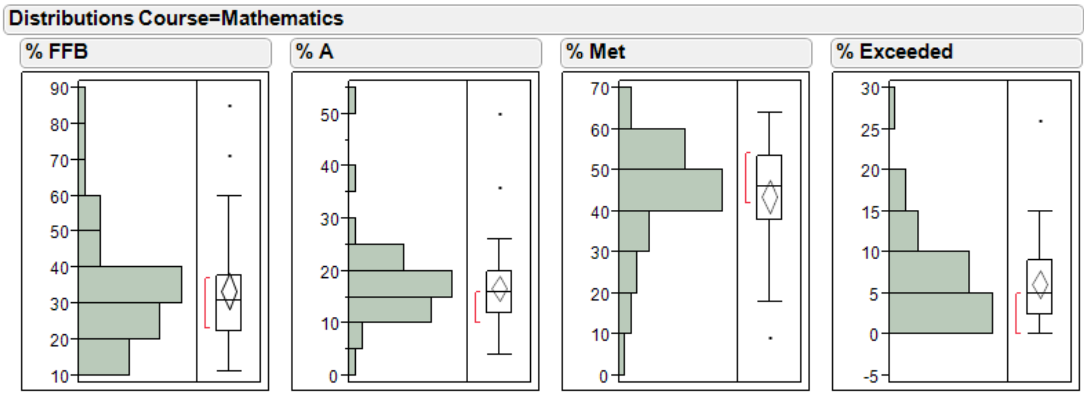
Proficiency levels:

A	=	Approached the standard
E	=	Exceeded the standard
FFB	=	Falls far below the standard
M	=	Met the standard

In this data analysis, all numbers were converted to percentages so as to compare like quantities. These numbers include: teachers' years of experience, LEP of students, ED students at various levels.

Mathematics
Figure 1 shows the percentage distribution of passing rates for the four proficiency groups in the area of mathematics. The four proficiency levels are: percentage of Hispanic students in tenth grade that fell far below the standard (%FFB), the percentage of Hispanic students who approached the standard, the percentage of Hispanic students who met the standard, and the percentage of Hispanic students who exceeded the standard. Forty to fifty percent (median) of Hispanic students met the standard in the area of mathematics, while less than 5% exceeded the standard.

Figure 1:



Quantiles

Quantile		% FFB	% A	% Met	% Exceeded
100.0%	maximum	85	50	64	26
99.5%		85	50	64	26
97.5%		84.3	49.3	63.85	25.45
90.0%		55.8	24	57.8	14.4
75.0%	quartile	38	20	53.5	9
50.0%	median	31	16	46	5
25.0%	quartile	22.5	12	38	2.5
10.0%		12.6	10	21.6	0
2.5%		11	4.1	9.45	0
0.5%		11	4	9	0
0.0%	minimum	11	4	9	0

Moments

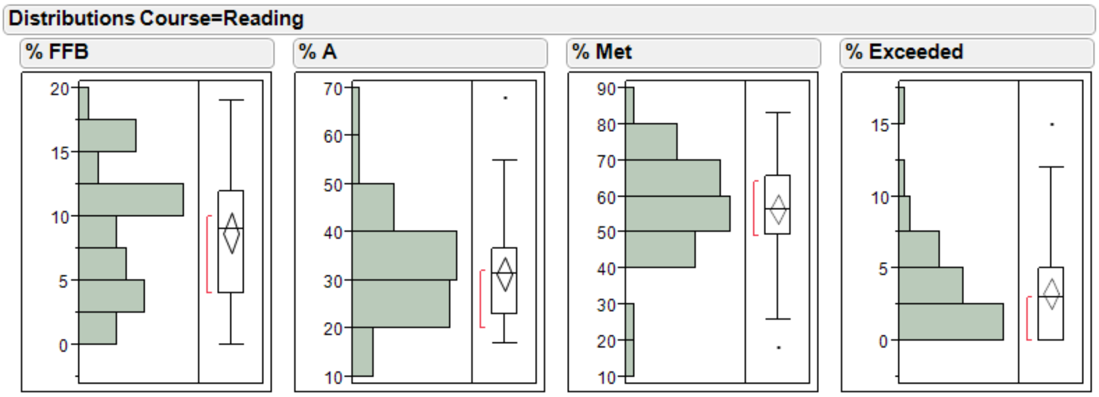
	% FFB	% A	% Met	% Exceeded
Mean	33.390244	16.780488	43.682927	6.097561
Std Dev	15.913639	7.8629263	12.76213	5.3842589
Std Err Mean	2.4852928	1.2279828	1.9931098	0.84088
Upper 95% Mean	38.413208	19.262334	47.711152	7.7970428
Lower 95% Mean	28.36728	14.298642	39.654702	4.3980792
N	41	41	41	41

Figure 1 Mathematics
Percentage distributions of passing percentages for the four groups:
%FFB, %A, %Met, and %Exceeded

Reading

Figure 2 shows the percentage distribution of passing percentages for the four proficiency level groups in the area of reading. The three proficiency levels are: percentage of Hispanic students in tenth grade who fell far below the standard (%FFB), the percentage of Hispanic students who approached the standard, the percentage of Hispanic students who met the standard, and the percentage of Hispanic students who exceeded the standard. Fifty to sixty percent of Hispanic students (median) met the standard in the area of reading, while less than 2.5% exceeded the standard.

Figure 2:



Quantiles

	% FFB	% A	% Met	% Exceeded
100.0% maximum	19	68	83	15
99.5%	19	68	83	15
97.5%	18.95	67.675	82.75	14.925
90.0%	15.9	42.9	70.9	7.9
75.0% quartile	12	36.75	65.5	5
50.0% median	9	31.5	56.5	3
25.0% quartile	4	23	49.25	0
10.0%	2.1	20	40.1	0
2.5%	0	17	18.2	0
0.5%	0	17	18	0
0.0% minimum	0	17	18	0

Moments

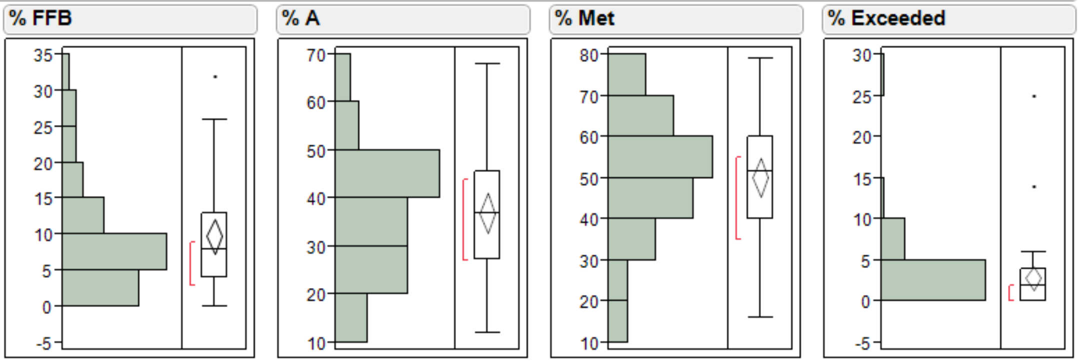
	% FFB	% A	% Met	% Exceeded
Mean	8.725	31.45	56.475	3.3
Std Dev	5.0178527	10.473287	12.86017	3.3527639
Std Err Mean	0.7933922	1.6559721	2.0333714	0.5301185
Upper 95% Mean	10.329787	34.79952	60.587882	4.3722659
Lower 95% Mean	7.1202128	28.10048	52.362118	2.2277341
N	40	40	40	40

Figure 2 Reading
Percentage distributions of the four groups:
%FFB, %A, %Met, and %Exceeded

Writing
Figure 3 shows the percentage distribution of passing rates for the four proficiency level groups in the area of reading. The three proficiency levels are: percentage of Hispanic students in tenth grade that fell far below the standard (%FFB), the percentage of Hispanic students who approached the standard, the percentage of Hispanic students who met the standard, and the percentage of Hispanic students who exceeded the standard. Fifty to forty percent (median) of Hispanic students met the standard in the area of writing, while less than 5% exceeded the standard.

Figure 3:

Distributions Course=Writing



Quantiles

		% FFB	% A	% Met	% Exceeded
100.0%	maximum	32	68	79	25
99.5%		32	68	79	25
97.5%		31.85	67.925	78.85	24.725
90.0%		22.7	56.5	71.7	6
75.0%	quartile	13	45.75	60	4
50.0%	median	8	37	51.5	2
25.0%	quartile	4	27.25	40	0
10.0%		2	19.2	29.1	0
2.5%		0	12.125	16.05	0
0.5%		0	12	16	0
0.0%	minimum	0	12	16	0

Moments

	% FFB	% A	% Met	% Exceeded
Mean	9.85	36.975	50.175	2.925
Std Dev	7.4749153	13.147072	15.033104	4.5199699
Std Err Mean	1.1818879	2.0787347	2.3769425	0.71467
Upper 95% Mean	12.240594	41.179638	54.98282	4.3705565
Lower 95% Mean	7.4594061	32.770362	45.36718	1.4794435
N	40	40	40	40

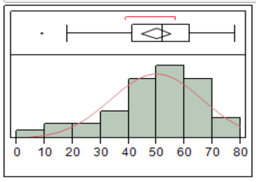
Figure 3 Writing
Percentage distributions of the four groups:
%FFB, %A, %Met, and %Exceeded

Data distribution
Figure four shows that all responses the percentage of *p* values (% *p*) are normally distributed. Small *p* values reject the null hypothesis (H0).

Figure 4:

Distributions Course=Mathematics

% Passed



Quantiles

100.0%	maximum	78
99.5%		78
97.5%		77.9
90.0%		69
75.0%	quartile	62
50.0%	median	52
25.0%	quartile	41.5
10.0%		22.6
2.5%		9.45
0.5%		9
0.0%	minimum	9

Moments

Mean	49.780488
Std Dev	16.334798
Std Err Mean	2.5510668
Upper 95% Mean	54.936386
Lower 95% Mean	44.62459
N	41

Fitted Normal

Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	49.780488	44.62459	54.936386
Dispersion	σ	16.334798	13.411079	20.90042

-2log(Likelihood) = 344.403366941846

Goodness-of-Fit Test

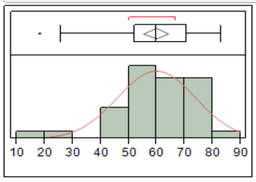
Shapiro-Wilk W Test

W	Prob<W
0.966932	0.2727

Note: Ho = The data is from the Normal distribution. Small p-values reject Ho.

Distributions Course=Reading

% Passed



Quantiles

100.0%	maximum	83
99.5%		83
97.5%		82.875
90.0%		76.9
75.0%	quartile	70.75
50.0%	median	60
25.0%	quartile	52
10.0%		43.2
2.5%		18.2
0.5%		18
0.0%	minimum	18

Moments

Mean	59.775
Std Dev	13.942165
Std Err Mean	2.2044499
Upper 95% Mean	64.233921
Lower 95% Mean	55.316079
N	40

Fitted Normal

Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	59.775	55.316079	64.233921
Dispersion	σ	13.942165	11.420878	17.902235

-2log(Likelihood) = 323.308500744503

Goodness-of-Fit Test

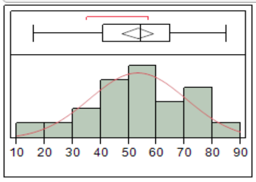
Shapiro-Wilk W Test

W	Prob<W
0.950255	0.0774

Note: Ho = The data is from the Normal distribution. Small p-values reject Ho.

Distributions Course=Writing

% Passed



Quantiles

100.0%	maximum	85
99.5%		85
97.5%		84.95
90.0%		76.8
75.0%	quartile	64.75
50.0%	median	54.5
25.0%	quartile	40.75
10.0%		29.1
2.5%		16.05
0.5%		16
0.0%	minimum	16

Moments

Mean	53.1
Std Dev	17.226694
Std Err Mean	2.7237794
Upper 95% Mean	58.609364
Lower 95% Mean	47.590636
N	40

Fitted Normal

Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	53.1	47.590636	58.609364
Dispersion	σ	17.226694	14.111436	22.119686

-2log(Likelihood) = 340.231893663803

Goodness-of-Fit Test

Shapiro-Wilk W Test

W	Prob<W
0.981730	0.7533

Note: Ho = The data is from the Normal distribution. Small p-values reject Ho.

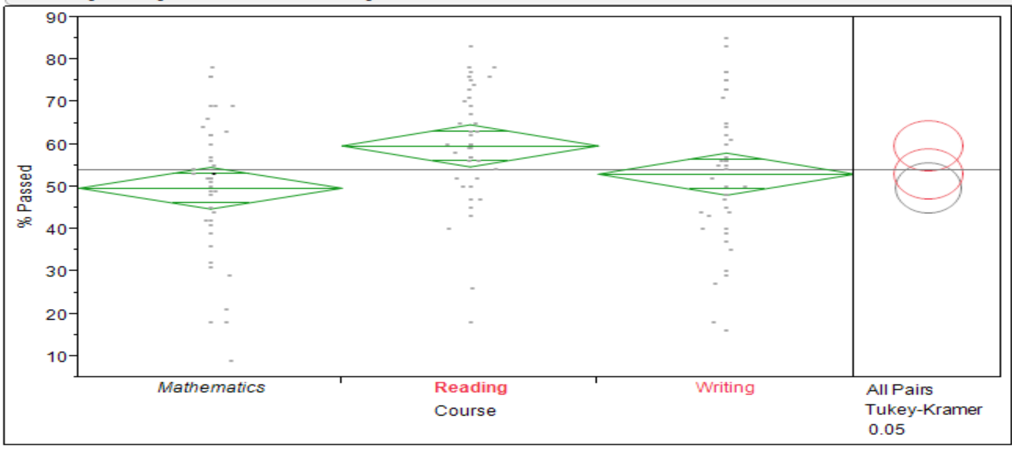
Figure 4 Data distribution
Shows that all responses (% *p*) are normally distributed.

Test Success Based on Subject

Figure five shows a statistical difference between Hispanic tenth grade students passing the reading and mathematics test sections of the AIMS. The figure also shows the data distribution that aligns well in the three areas (math, reading and writing), despite that there is data across the percentage spectrum. The figure also shows that Hispanic students did better in the area of reading, followed by writing, and then followed by mathematics.

Figure 5:

Oneway Analysis of % Passed By Course



Missing Rows 53

Oneway Anova

Summary of Fit

Rsquare	0.065551
Adj Rsquare	0.049713
Root Mean Square Error	15.89894
Mean of Response	54.18182
Observations (or Sum Wgts)	121

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Course	2	2092.401	1046.20	4.1388	0.0183*
Error	118	29827.599	252.78		
C. Total	120	31920.000			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Mathematics	41	49.7805	2.4830	44.863	54.697
Reading	40	59.7750	2.5138	54.797	64.753
Writing	40	53.1000	2.5138	48.122	58.078

Std Error uses a pooled estimate of error variance

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

q*	Alpha
2.37368	0.05

Abs(Dif)-HSD

	Reading	Writing	Mathematics
Reading	-8.4387	-1.7637	1.6074
Writing	-1.7637	-8.4387	-5.0676
Mathematics	1.6074	-5.0676	-8.3352

Positive values show pairs of means that are significantly different.

Level			Mean
Reading	A		59.775000
Writing	A	B	53.100000
Mathematics		B	49.780488

Levels not connected by same letter are significantly different.

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
Reading	Mathematics	9.994512	3.533367	1.60743	18.38160	0.0151*
Reading	Writing	6.675000	3.555111	-1.76370	15.11370	0.1497
Writing	Mathematics	3.319512	3.533367	-5.06757	11.70660	0.6165

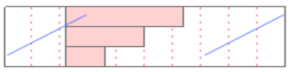


Figure 5 Test success based on course

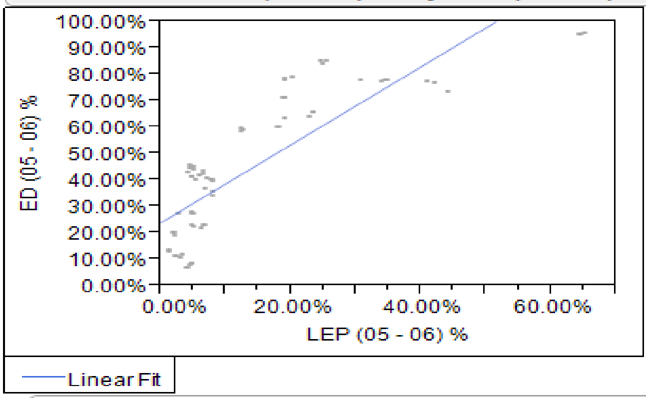
Shows a statistical difference between Hispanics passing Reading and Mathematics tests.

Economically Disadvantage vs. Limited English Proficiency Student Population in 10th Grade (school year 2005-2006)

This graph (Figure 6) shows a relationship between ED (economically disadvantaged) and Limited English Proficient students. In the graph the *RSquare*, which tells us how good the mode is, is 0.698678. This accounts for a variation of approximately 70%. In Arizona school districts as the LEP student population increases, the ED student population doubles. For instance, at the 20% LEP student population mark, the ED student population doubles. Roughly put, in Arizona high schools, for every LEP student there are two ED students.

Figure 6:

Bivariate Fit of ED (05 - 06) % By LEP (05 - 06) %



Linear Fit

ED (05 - 06) % = 0.2401149 + 1.4766475*LEP (05 - 06) %

Summary of Fit

RSquare	0.698678
RSquare Adj	0.694606
Root Mean Square Error	0.146519
Mean of Response	0.437961
Observations (or Sum Wgts)	76

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	3.6835121	3.68351	171.5841
Error	74	1.5886079	0.02147	**Prob > F**
C. Total	75	5.2721200		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	0.2401149	0.022596	10.63	<.0001*
LEP (05 - 06) %	1.4766475	0.11273	13.10	<.0001*

Figure 6 ED vs. LEP (05-06)

This graph shows a relationship between ED (economically disadvantaged) and limited English proficient students.

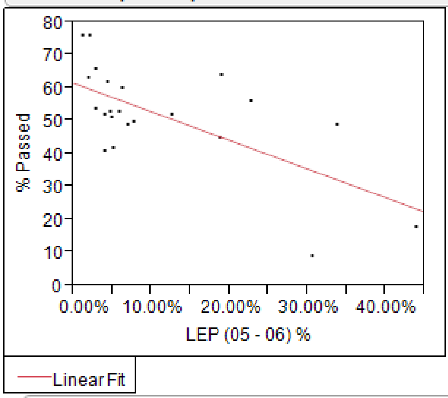
X and Y Regression of LEP Percentage vs. Passed Percentage by Subject
The relation between the variables LEP vs. the percentage of Hispanic students that passed the mathematics section of the AIMS test in the year 2005-2006 was found to be significant (see Figure 7). The *p* value was less than 0.05 (actually 0.0008). In other words, the data shows that as the LEP student population increases, Hispanic students perform worse according to AIMS. For instance, at the 10% LEP student population mark, approximately 55% of Hispanic students passed the mathematics section of AIMS. At the 40% LEP student population mark about 30% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and the hypothesis is proven correct.

The relation between the variables LEP vs. the percentage of Hispanic students that passed the reading section of the AIMS test in the year 2005-2006 was also found to be significant (see Figure 7). The *p* value was less than 0.05 (actually 0.0030). In other words the data shows that, as the LEP student population increases, Hispanic students perform worse according to AIMS. For instance, at the 5% LEP student population mark, over 64% of Hispanic students passed the reading section of AIMS. At the 30% LEP student population mark approximately 50% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and this hypothesis is proven correct as well.

However, for the variables LEP vs. percentage of Hispanic students in tenth grade in the area of writing was not found significant and, therefore, the null hypothesis was proven. The *p* value here was 0.1790 (see Figure 7).

Figure 7:

Fit of LEP (05 - 06) vs % Passed = Mathematics



Linear Fit

% Passed = 61.560094 - 86.84772*LEP (05 - 06) %

Summary of Fit

RSquare	0.439932
RSquare Adj	0.411929
Root Mean Square Error	11.94662
Mean of Response	51.86364
Observations (or Sum Wgts)	22

Analysis of Variance

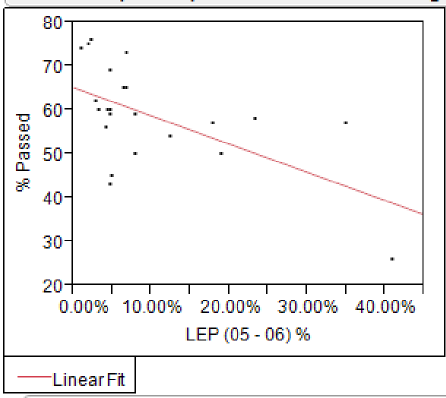
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	2242.1560	2242.16	15.7100
Error	20	2854.4349	142.72	Prob > F
C. Total	21	5096.5909		0.0008*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	61.560094	3.531595	17.43	<.0001*
LEP (05 - 06) %	-86.84772	21.91142	-3.96	0.0008*

Significant

Fit of LEP (05 - 06) vs % Passed = Reading



Linear Fit

% Passed = 65.154365 - 64.245167*LEP (05 - 06) %

Summary of Fit

RSquare	0.349295
RSquare Adj	0.318309
Root Mean Square Error	9.471736
Mean of Response	58.82609
Observations (or Sum Wgts)	23

Analysis of Variance

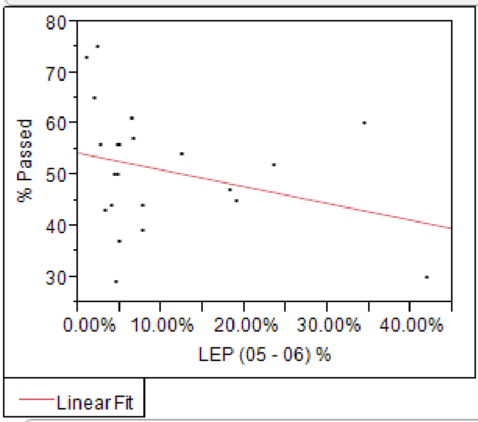
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1011.3149	1011.31	11.2727
Error	21	1883.9894	89.71	Prob > F
C. Total	22	2895.3043		0.0030*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	65.154365	2.730051	23.87	<.0001*
LEP (05 - 06) %	-64.24517	19.13493	-3.36	0.0030*

Significant

Fit of LEP (05 - 06) vs % Passed=Writing



Linear Fit

% Passed = 54.332965 - 32.868642*LEP (05 - 06) %

Summary of Fit

RSquare	0.088388
RSquare Adj	0.042807
Root Mean Square Error	11.76934
Mean of Response	51.04545
Observations (or Sum Wgts)	22

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	268.6073	268.607	1.9392
Error	20	2770.3473	138.517	Prob > F
C. Total	21	3038.9545		0.1790

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	54.332965	3.445236	15.77	<.0001*
LEP (05 - 06) %	-32.86864	23.60342	-1.39	0.1790

Figure 7. X and Y regression of % LEP vs. % Passed by Subject

X and Y Regression of Percentage of Economically Disadvantaged Student Population vs. Percentage of Hispanic Students in 10th grade that Passed by Subject

Mathematics: ED & Hispanic Achievement

The relation between the variables ED vs. the percentage of Hispanic students that passed the mathematics section of the AIMS test in the year 2005-2006 was found to be significant (see Figure 8). The *p* value was less than 0.05 (actually 0.0002). In other words, the data shows that as the ED student population increases, Hispanic students perform worse according to AIMS. For instance, at the 10% ED student population mark, roughly about 63% of Hispanic students passed the mathematics section of AIMS. At the 80% ED student population mark approximately under 40% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and the hypothesis is proven correct.

Reading: ED & Hispanic Achievement

The relation between the variables ED vs. the percentage of Hispanic students that passed the reading section of the AIMS test in the year 2005-2006 was also found to be significant (see Figure 8). The *p* value was less than 0.05 (actually 0.0001). In other words, the data shows that as the ED student population increases, Hispanic students' performance AIMS declines. For instance, at the 10% ED student population mark, about 70% of Hispanic students passed the reading section of AIMS. But at the 40% ED student population mark only slightly over of 60% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and this hypothesis is proven correct as well.

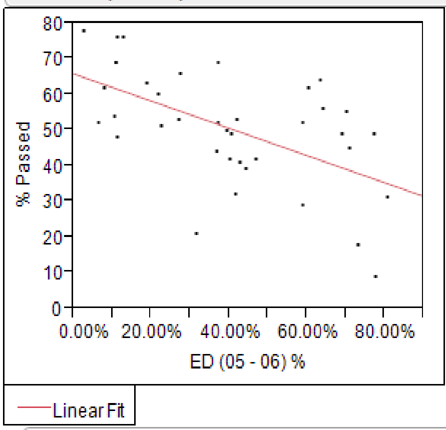
Writing: ED & Hispanic Achievement

The relation between the variables ED vs. the percentage of Hispanic students that passed the writing section of the AIMS test in the year 2005-2006 was found to be significant (see Figure 8). The *p* value was less than 0.05 (actually 0.0355). In other words, the data shows that as the ED student population increases, Hispanic students' academic achievement declines according to AIMS. For instance, at the 10% ED student population mark, roughly over 60% of Hispanic students passed the writing section of AIMS. At the 80% ED student population mark only about 50% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and the hypothesis is proven correct. It is interesting to note that the correlations between the ED and math and reading are stronger than between Ed and writing.

According this study, it is very clear that Hispanic students' academic achievement in Arizona 10th grade was directly impacted by economic variables as measured by the AIMS scores for the most recently published school year 2005-2006.

Figure 8:

Fit of ED (05 - 06) vs. % Passed = Mathematics



Linear Fit

% Passed = 65.921963 - 38.16858*ED (05 - 06) %

Summary of Fit

RSquare	0.320169
RSquare Adj	0.301285
Root Mean Square Error	13.3108
Mean of Response	50.78947
Observations (or Sum Wgts)	38

Analysis of Variance

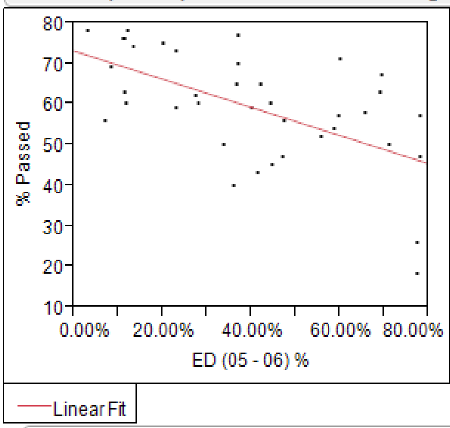
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	3003.9283	3003.93	16.9544
Error	36	6378.3875	177.18	Prob > F
C. Total	37	9382.3158		0.0002*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	65.921963	4.262507	15.47	<.0001*
ED (05 - 06) %	-38.16858	9.269695	-4.12	0.0002*

Significant

Fit of ED (05 - 06) vs. % Passed = Reading



Linear Fit

% Passed = 73.217672 - 34.675754*ED (05 - 06) %

Summary of Fit

RSquare	0.34747
RSquare Adj	0.329344
Root Mean Square Error	11.24388
Mean of Response	59.36842
Observations (or Sum Wgts)	38

Analysis of Variance

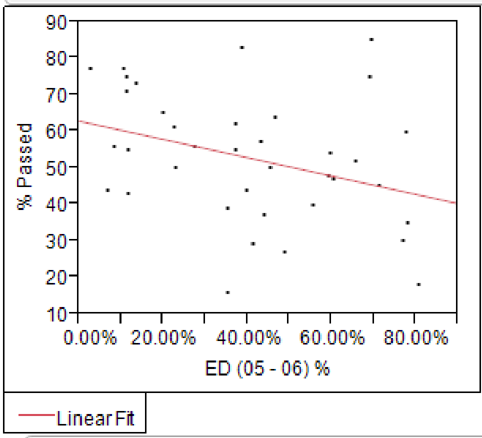
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	2423.5476	2423.55	19.1699
Error	36	4551.2945	126.42	Prob > F
C. Total	37	6974.8421		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	73.217672	3.651349	20.05	<.0001*
ED (05 - 06) %	-34.67575	7.919839	-4.38	<.0001*

Significant

Fit of ED (05 - 06) vs. % Passed = Writing



Linear Fit

% Passed = 62.972891 - 25.071495*ED (05 - 06) %

Summary of Fit

RSquare	0.117118
RSquare Adj	0.092593
Root Mean Square Error	16.42822
Mean of Response	52.92105
Observations (or Sum Wgts)	38

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1288.853	1288.85	4.7755
Error	36	9715.911	269.89	Prob > F
C. Total	37	11004.763		0.0355*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	62.972891	5.316012	11.85	<.0001*
ED (05 - 06) %	-25.07149	11.47279	-2.19	0.0355*

Significant

Figure 8. X and Y regression of % ED vs. % Passed by Subject

X and Y Regression of Percentage of Teachers with a Masters Degree vs. Percentage of Hispanic Students in 10th Grade That Passed by Subject

Figure 9 shows the relations between the variables: Percentage of Teachers with Master Degree and Percentage of Hispanic 10th grade students who passed each of the three subjects assessed by AIMS via an X and Y regression. The subjects are mathematics, reading and writing.

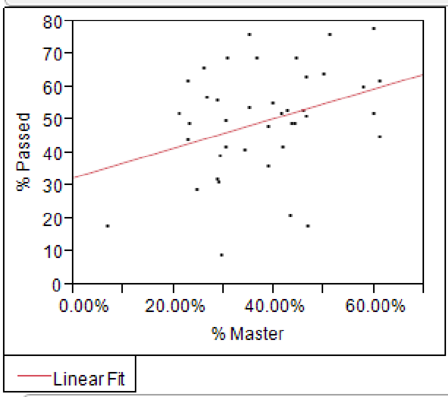
Mathematics and Hispanic students

The correlation between these two variables was found to be significant at a *p* value of 0.0277 as per the ANOVA analysis; much lower than the 0.05 value set in this research. In other words, according to the analysis, the more teachers there are with a Masters degree, the higher the mathematics achievement rates of Hispanic students in 10th grade. When 20% of teachers have a higher academic degree, fewer than 40% of students passed the math section of AIMS. Consequently, when 60% of teachers have higher academic degrees, the student passing rate goes up to approximately 60%.

However, for the subjects of reading and writing, the ANOVA analysis did not show a significant correlation (see fig. 9). *P* values for reading and writing are 0.3565 and 0.3617 respectively.

Figure 9:

Fit of % Master vs. % Passed = Mathematics



Linear Fit

% Passed = 32.723959 + 45.01934*% Master

Summary of Fit

RSquare	0.118214
RSquare Adj	0.095604
Root Mean Square Error	15.53435
Mean of Response	49.78049
Observations (or Sum Wgts)	41

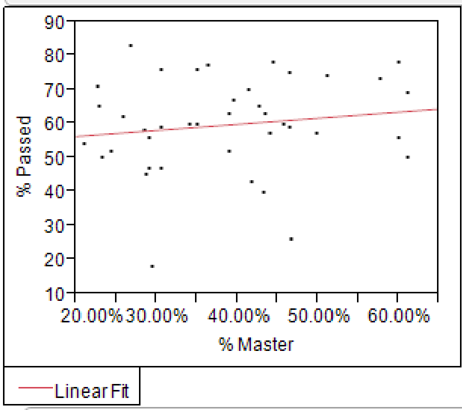
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1261.701	1261.70	5.2284
Error	39	9411.323	241.32	Prob > F
C. Total	40	10673.024		0.0277*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	32.723959	7.844029	4.17	0.0002*
% Master	45.01934	19.68856	2.29	0.0277*

Fit of % Master vs. % Passed = Reading



Linear Fit

% Passed = 52.802798 + 18.031109*% Master

Summary of Fit

RSquare	0.022413
RSquare Adj	-0.00331
Root Mean Square Error	13.96524
Mean of Response	59.775
Observations (or Sum Wgts)	40

Analysis of Variance

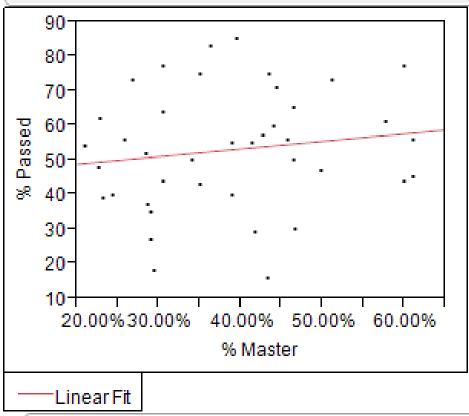
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	169.9143	169.914	0.8712
Error	38	7411.0607	195.028	Prob > F
C. Total	39	7580.9750		0.3565

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	52.802798	7.789235	6.78	<.0001*
% Master	18.031109	19.31772	0.93	0.3565

Significant

Fit of % Master vs. % Passed = Writing



Linear Fit

% Passed = 44.576328 + 22.043434*% Master

Summary of Fit

RSquare	0.021942
RSquare Adj	-0.0038
Root Mean Square Error	17.25936
Mean of Response	53.1
Observations (or Sum Wgts)	40

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	253.947	253.947	0.8525
Error	38	11319.653	297.886	**Prob > F**
C. Total	39	11573.600		0.3617

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	44.576328	9.626561	4.63	<.0001*
% Master	22.043434	23.87439	0.92	0.3617

Figure 9. X and Y Regression of % Masters vs. % Passed by Subject

CONCLUSION

The analysis of the data presents the following conclusions:

Mathematics
Figure 1 shows that 40 – 50% (median) of Hispanic students met the standard in the area of mathematics, while less than 5% exceeded the standard.

Reading
Fifty to sixty percent of Hispanic students (median) met the standard in the area of reading, while less than 2.5% exceeded the standard (Figure 2).

Writing
In the subject of writing, 40 – 50% (median) of Hispanic students met the standard in the area of writing, while less than 5% exceeded the standard (Figure 3).

Data Distribution
Figure 4 shows that all responses the percentage of *p* values (% *p*) are normally distributed. Small *p* values reject the null hypothesis (H0).

Test Success Based on Subject Area
Figure five shows a statistical difference between Hispanic tenth grade students passing the reading and mathematics test sections of the AIMS. The figure also shows the data distribution that aligns well in the three areas (math, reading and writing) despite that there is data across the percentage spectrum. The figure also shows that Hispanic students did better in the area of reading, followed by writing and worse in mathematics.

Economically Disadvantage (ED) vs. Limited English Proficiency (LEP) Student Population in 10th grade (school year 2005-2006)
The graph shown in Figure 6 shows a correlation between ED (economically disadvantaged) and Limited English Proficiency students. In the graph, the mode is shown as 0.698678. The *RSquare*, which tells us how good the mode is, shows a variation of approximately 70%. In Arizona school districts as the LEP student population increases, the ED student population doubles. For instance, at the 20% LEP student population level, the ED student population doubles. Roughly put, in Arizona high schools, for every LEP student there are two ED students.

LEP Student Population vs. Hispanic Student Achievement by Subject
Mathematics: LEP vs. Hispanic Student Achievement -Significant
The relation between the variables LEP vs. the percentage of Hispanic students that passed the mathematics section of the AIMS test in the year 2005-2006 was found to be significant (see Figure 7). In other words, the data shows that as the LEP student population increases, Hispanic students perform worse according to AIMS. For instance, at the 10% LEP student population level, roughly about 55% of Hispanic students passed the mathematics section of AIMS. At the 40% LEP student population level about 30% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and the hypothesis is proven correct.

Reading: LEP vs. Hispanic Student Achievement -Significant
The relation between the variables LEP vs. the percentage of Hispanic students that passed the reading section of the AIMS test in the year 2005-2006 was also found to be significant (see Figure 7). In other words, the data shows that as the LEP student population increases, Hispanic students perform worse according to AIMS. For instance, at the 5% LEP student population mark, over 64% of Hispanic students passed the reading section of AIMS. At the 30% LEP student population level roughly about 50% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and this hypothesis is proven correct as well.

Writing: LEP vs. Hispanic Student Achievement –Not Significant
However, for the variables LEP vs. percentage of Hispanic students in tenth grade in the area of writing was not found significant and, therefore, the null hypothesis was proven. The *p* value here was 0.1790 (see figure 7).

Economically Disadvantaged Student Population (ED) vs. Hispanic Student Achievement
ED & Mathematics -Significant
The relation between the variables ED vs. the percentage of Hispanic students that passed the mathematics section of the AIMS test in the year 2005-2006 was found to be significant (see Figure 8). In other words, the data shows that as the ED student population increases, Hispanic students perform worse according to AIMS. For instance, at the 10% ED student population level, roughly about 63% of Hispanic students passed the mathematics section of AIMS. At the 80% ED student population level approximately under 40% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and the hypothesis is proven correct.

ED & Reading -Significant
The relation between the variables ED vs. the percentage of Hispanic students that passed the reading section of the AIMS test in the year 2005-2006 was also found to be significant (see Figure 8). The *p* value was less than 0.05 (actually 0.0001). In other words, the data shows that as the ED student population increases, Hispanic students' performance on the AIMS declines. For instance, at the 10% ED student

population level, about 70% of Hispanic students passed the reading section of AIMS. But at the 40% ED student population level only slightly over of 60% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and this hypothesis is proven correct as well.

ED & Writing -Significant
The relation between the variables ED vs. the percentage of Hispanic students that passed the writing section of the AIMS test in the year 2005-2006 was found to be significant (see Figure 8). The *p* value was less than 0.05 (actually 0.0355). In other words, the data shows that as the ED student population increases, Hispanic students' academic achievement declines according to AIMS. For instance, at the 10% ED student population mark, roughly over 60% of Hispanic students passed the writing section of AIMS. At the 80% ED student population mark only about 50% of Hispanic students passed. Since the *p* value is extremely low, the data indicates that the relation between these two variables is very strong, linear, and the hypothesis is proven correct despite that the correlations between the ED and math and reading are stronger than between Ed and writing.

According to this study, it is very clear that as more economically disadvantaged student population attended Arizona 10th grade in schools, Hispanic students' academic achievement dropped almost in an indirect proportion based on the AIMS scores for the most recently published school year 2005-2006.

Percentage of Teachers With a Masters Degree vs. Hispanic Student Achievement
Figure 9 shows the relations between the variables: Percentage of teachers with Master degree and percentage of Hispanic 10th grade students who passed each of the three subjects assessed by AIMS via X and Y regression. The subjects are mathematics, reading and writing.

Mathematics: Teachers with Master's Degree and Hispanic Student Achievement – Significant
According to the analysis (Figure 9), the more teachers there are with a Masters degree, the higher the mathematics achievement rates of Hispanic students in 10th grade. When 20% of teachers have a higher academic degree, fewer than 40% of students passed the math section of AIMS. Consequently, when 60% of teachers have higher academic degrees, the students passing rate goes up to under 60%.

Reading: Teachers with Master's Degree and Hispanic Student Achievement – Not Significant
However, for the subject of reading, the ANOVA analysis did not show a significant correlation (see fig. 9).

Writing: Teachers with Master's Degree and Hispanic Student Achievement – Not Significant
For writing, the ANOVA analysis did not show a significant correlation (see Figure 9).
Regarding schools in Arizona the research conclusions are:

1. There is a relationship found between teachers' academic preparation at the level of Master's degree and Hispanic student learning in the subject of mathematics.
2. There is a relationship found between the existence of a Limited English Proficiency student population and Hispanic student learning in the subjects of mathematics and reading. As the LEP student population increases in schools the achievement scores of Hispanic students significantly drop.
3. There is a relationship found between the existence of an economically disadvantaged student population and Hispanic student learning. In all three subject areas, mathematics, reading and writing. As the economically disadvantaged student population increases, the scores of Hispanic students in these three subject areas drop.

Implications for School Improvement:
This research, with data from 25103 Hispanic students in 163 school districts, corroborates that school climate poverty-related factors correlate the most with low achievement of Hispanic students, followed by language proficiency. It is important to note that the academic areas most adversely affected are mathematics and writing, followed by reading. The first two academic areas demand output more than reading, and need closer guidance from educator. As per *p* values the following are the variables whose data indicates correlation, from the strongest to the weakest:

Variables negatively correlating to achievement of Hispanic students are:

- ED and reading
- ED and mathematics
- LEP and mathematics
- ED and writing
- LEP and writing

In addition, when there are higher numbers of teachers, with 4-6 years of experience, despite that LEP levels rise, math achievement scores increased. But with low numbers of these teachers, achievement scores drop. This alludes to the finding that younger teachers help students learn better when there is a language proficiency barrier at the school.

On the other hand, this research, with data from more than 400 schools or 163 school districts, also corroborates that school climate non poverty-related factors correlate the most with higher achievement of Hispanic students. As per p values the following are the variables whose data indicates correlation, from the strongest to the weakest:

- Teachers holding an M.A. degree and mathematics

Through this research it becomes clear that when Hispanic students encounter an economically disadvantaged population, an English Limited Proficiency student population in schools, and when there are either inexperienced teachers, or teachers with fewer academic degrees, trade marks of economically challenged schools, achievement scores of Hispanic students plummet.

These findings are in line with previous research discussed in the literature review. When Hispanic students go to a school where the main school language is different that the language they speak at home, when children see parents being deported or live in fear; or when they lack the basic needs, such as food, shelter, sense of belonging and safety are in jeopardy (many of these trademarks of economically challenged groups); or when there are drug addition or gang issues at schools, how can society expect these students to perform at par with their white-dominant counterpart?

The present study found a surprising result: veteran teachers with 10 or more years of experience made no difference in the academic achievement of Hispanic students. That is to say, no significant correlation in any of the three subject areas of mathematics, reading and writing was found (see graphs in Figure 13). What can be said next is speculative in nature. It could be that these kind of teachers are generally tenured and do not feel obligated to improve their teaching. It could also be because, having growing up in a time where the state was less diverse, they regard Hispanic students in a different way as they see other students. It could also be because these older teachers use older technology in the classroom or are more resistant to educational innovation through change.

Recommendations for Future Research

Some of the issues that remain to be researched for a further study are:

- Replicate the present study with new AIMS data of subsequent school years such as 2007-2008, 2008-2009, etc.
- Analyze female and male ratios to see how they correlate to Hispanic academic achievement
- Analyze the same variables in the present study and correlate them to Asian and African-American student populations to see how they compare to Hispanic student achievement. In other words, do these variables also affect these two other student populations in the same way as they affect Hispanic student achievement?

The Significance by Hypothesis:

The following are the hypotheses that have been proven in this research:

- H1: There is a relationship between teachers' academic preparation and Hispanic student learning as measured by the Arizona's Instrument to Measure Standards.
- H2: There is a relationship between a Limited English Language student population and Hispanic student learning as measured by the Arizona's Instrument to Measure Standards.

- H3: There is a relationship between an economically disadvantaged student population and Hispanic student learning as measured by the Arizona's Instrument to Measure Standards.

This research is an effort to explain and help school administrators and scholars realize of some of the factors that may help their schools reduce the so-called achievement gap between Hispanic students and non-Hispanic students. This is just a little grain of sand in the vast beach of factors that form this complex problem.

The present research began when the researcher moved to the U.S. and often heard about Hispanic student lagging behind in achievement scores. Then the process of studying former research on the subject began. As this researcher encountered more prior research suggesting that some factors alluded to school climate adversely affecting the achievement of Hispanic students (see Literature Review), the focus shifted to a close-up school climate study. As the literature was read, it became evident that many factors affect Hispanic student achievement. This includes poverty of students, lack of school resources (human and financial -school community poverty), and low rates of contextual factors that support students, such as not knowing the language of teachers well and the inability of parental support interacting and tapping support school systems that most students have. For instance, if parents of Hispanic students cannot understand the directions of home school assignments due to either language barriers (not speaking English well) or lack of education in the parent generation, this presents a tremendous challenge to Hispanic students, not to mention a disadvantage.

This research challenges school administrators and educators in general to think broader terms and exercise creativity. In other words, some of the issues presented in these findings indicate that the control of some variables is well beyond the scope of the traditional mind frame of schools. While it is evident that schools need to employ classrooms teachers with higher academic degrees and proven experience to boost Hispanic achievement rates, other variables such as ED and LEP fall father away from the school, and well into the realm of the school community, the local community and even the society in general. Thus, school administrators and educators need to go into the community and control the variables that correlate to negative Hispanic academic achievement. With ever-increasing costs, shrinking budgets and political constraints, these are not small tasks but true challenges for the educators of the XXI century.

The Greek philosopher Aristotle defined tragedy as the failure of people due to one single human character flaw. The biblical story of Samson and Delilah illustrate pride as the character flaw that brought Samson to his demise (see Judges 16). In the same manner, the Spanish conquistadors from the XVI century almost single handedly destroyed entire civilizations such as the Inca in the south and the Mexica (the so called Aztecs) in the north without considering the value of these great civilizations. These tragedies all have the common tread of pride. The present study is yet another exhortation to school administrators and educators to see beyond the walls of the classroom and beyond the principal's desk, and recognize forefront that improving the academic achievement of Hispanic students is a complex task well beyond the school's capabilities; and that cooperation with other organizations such as, but not limited to, churches, community programs, lawmakers and the institution of the family is necessary if not mandatory.

Pride among educational sometimes can be wrongly fueled by a misinterpretation, or manipulation of test scores. A study examined that the assumption of improved test scores was erroneous (Verdugo, 2010). The study proved that test score improvements over a four-year period was not due to improved academic achievement but quite to the contrary, to school dropouts that gradually left the school over the four-year period and whose test results did not make the statistics. Recently the educational system in the U.S. has been trying to play catch up with other developed nations whose students test higher. Thus, educators have focused on improving test scores. However, academicians, like Dr. Jim Yong Kim, President of Dartmouth College, states that the nation needs to focus on educating all students, re-focus schools to fostering creativity, intellectual thought and, learning about the world through national research institutions, schools and colleges, its environment and cultures, trademarks of a liberal arts education (PBS, 2011). Furthermore, those at the top and middle of the economic and cultural pyramid of the U.S. society, along with the government, need to invest in the education and employment opportunities of those at the bottom of the social pyramid, while at the same time investing in sound infrastructure, technological innovation and development, health care and education. The concept of globalism is elsewhere and has invaded the mind of the man of the XXI century. Nevertheless, we should go one step beyond and think of a new concept that will carry us well into the XXI century. In this study we introduce the concept of *global care*, which alludes to the necessity of global responsibility towards people in the lower quintiles of the SES scale for the welfare of the entire society and indeed of the planet. As a society, we need to view those at the bottom of the SES and academic achievement pyramid as partners in a national program to narrow the achievement gap, improve the educational system and the nation. Failure to do so will only result in a wider achievement gap and a nation crippled to compete before emerging world powers such as China, India, Brazil, Norway, and Sweden among others. We need to remember that people want to be educated and fully participate of the life of the nation; that the human spirit is a wonderful creation that endures.

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