

A Study of the Impact Educational Setting has on Academic Proficiency
of American Indian Students as Measured by
the Minnesota Comprehensive Assessment

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Dedication

This dissertation is dedicated in the loving memory of my father Mike Crowley and Jim Isaac as well as all my relatives who have walked on. Peace to you as you continue on your journeys...

Abstract

The Minnesota Department of Education has collected Minnesota Comprehensive Assessments (MCA) results on every American Indian student who has taken the tests. This information has been made available so communities and parents can assess how their districts, schools, and students are performing based upon MCA proficiency criteria. Prior to this study, there had been no known studies on the impact of educational setting (Urban-Minneapolis/St. Paul, Metro-seven-county Metro area, Out State-greater Minnesota, and Bureau of Indian Education [BIE] schools) on mathematic and/or reading proficiency as measured by the MCAs for American Indian students in the state of Minnesota. The research population for this study included all American Indian students in the state of Minnesota, grades 3-11, who participated in MCAs between 2007-2010. This study incorporated multiple variables, which used empirical data from four educational settings (Urban, Metro, Out State, and BIE) and two academic subjects (mathematics and reading). The analysis used three regression models (linear, non-linear, and logistic), which provided statistical information regarding the relationship between educational setting and proficiency as measured by the MCAs. The results of this research supported the theory that educational setting does have an impact on MCA proficiency for the American Indian student in the state of Minnesota between 2007-2010.

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Chapter 1. Introduction

The Minnesota Department of Education (MDE) provided limited information regarding American Indian students in the state's education system. According to information provided by MDE for the 2010-2011 school year, there were 17,858 American Indian students in the state. According to MDE, special education services were provided to 22.6% of American Indian students, which represented the largest racial group per capita receiving special education services in the state. Over 70% of Minnesota's American Indian students received either free or reduced lunch.

In addition to special education and free or reduced lunch data, MDE collected results for every American Indian student who has taken the Minnesota Comprehensive Assessment (MCA). Historically, MCA information has been made available, which attempted to inform the public on how schools and districts performed based upon MCA proficiency criteria. Parents and guardians have been informed on how their child performed on the MCA. However, there had not been research investigating the possible impact that educational setting (i.e., Urban-Minneapolis/St. Paul, Metro-seven-county Metro area, Out State-greater Minnesota, or Bureau of Indian Education [BIE] schools) had on MCA proficiency scores for American Indian students.

Statement of the Problem

Although international regulations, federal policies, and state laws all provided clear support for American Indian people to be educated, many American Indian students were not proficient in reading and mathematics as measured by the MCAs.

Purpose of the Study

The purpose of this research project was to establish an understanding of available data surrounding MCA proficiency for American Indian students in the state of Minnesota. The research examined the relationship between educational setting and proficiency in mathematics and reading for Minnesota's American Indian students.

Giroux's (1992) research introduced the theory that there is a relationship between educational setting and academic success. Through his examination of politics, education, and educational setting he identified a connection between academic progress and postcolonial hegemonic systems that dictated the forms and processes of teaching and learning in specific educational settings (Giroux, 1992). Giroux (1992) suggested the level of self-advocacy or agency established amongst a people/setting played a powerful role in the educational system and process by which education occurred, concluding educational setting had a direct impact on education.

The results of this study affirmed the extent of a relationship between an educational setting and academic proficiency of American Indian students based upon MCA criteria in the state of Minnesota.

Rationale for the Study

The MDE has collected MCA results on every American Indian student who has taken the MCAs. This information has been made publicly available so that communities and parents can assess how their districts, schools, and students are performing based upon MCA proficiency criteria.

This, however, is where the dissemination of the primary information ended. There had been no known effort to study the impact of educational setting on mathematics and or reading proficiency as measured by the MCAs for American Indian students in the state of Minnesota. This research provided an understanding regarding the impact of educational setting as it pertains to academic proficiency for American Indian students. Traditional research variables such as academic subject and grade level provide additional information that may help guide future research and educational efforts regarding American Indian education in Minnesota.

The research population for this study included all American Indian students in the state of Minnesota in grades 3-11 who participated in the MCAs between 2007-2010. This time period was chosen because extensive trend data were not available prior to 2007. The state of Minnesota is required to review and revise state standards every six years. These reviews produced revisions that led to changes in curriculum, testing procedures, and outcome measures. The 2010-2011 academic year was the first year all Minnesota schools were required to implement the 2007 Minnesota Academic Standards for mathematics, which require all 8th grade students to take algebra. The MCA – Series III (MCA-III) was implemented for grades 3-8 and new performance standards based on new mathematics constructs were implemented. Based upon this information this study will focus only on data collected between 2007-2010.

Rationale for Quantitative Methods

This study engaged the research process from a quantitative approach through data collection of secondary sources. Quantitative strategies have been chosen for

several reasons. Generally speaking, quantitative research relies on empirical or numeric data and close-ended questions that may include information regarding performance, attitude, and statistical analysis. Quantitative research has been selected because of its commitment to identifying variables and their impact on participants.

This study was designed as a case study where the researcher examined the relationships between educational setting, grade level, academic subject, and academic proficiency for a specific group of people. This approach was appropriate because a case study is generally bound by time and activity according to Stake (1995). The research “seeks to discover the direction and magnitude of the relationship among variables” (Gall, Gall, & Borg, 2007, p. 636).

Postpositive worldview has had a direct impact on quantitative research. This impact can be seen through an emphasis on experimentation and correlation (Campbell & Stanley, 1963). This study analyzed multiple variables and empirical data that included information regarding performance and statistics.

This research relied on numeric data to test or identify the impact of educational settings on variables of education as they pertain to American Indian students. A primary contributor in choosing quantitative research methodology is the use of standards to help ensure validity and reliability. This study used unbiased research practices in statistical procedures manipulating numerical information. Due to the fact that all the data had already been collected and archived by the MDE, quantitative methods were used to measure the data throughout the research project.

Research Questions

This study focused on one central research question. The central research question was, “What impact does educational setting have on MCA proficiency scores for American Indian students in the state of Minnesota grades 3-11?” This study analyzed proficiency standards measured by the MCAs collected between 2007 and 2010.

The following subordinate questions further explored perspectives related to the central research question:

- Is there a relationship between the educational setting of schools and MCA proficiency for American Indian students?
- Does educational setting (i.e., Urban, Metro, Out State, and BIE) have an impact on MCA proficiency for American Indian students?

Definition of Terms

Various terms used in the study may have multiple meanings depending upon who is using the word and the context in which it is placed. The purpose in providing a definition for specific terms used in this research was to create a common language that will allow all readers, regardless of cultural background, education, and experience, to establish understandings of terms as they relate to the design and results of the study. Additional information regarding major concepts will be provided in Chapter 2. For the purpose of the study, the following definitions were used:

- American Indian, Native American, Native, or Indigenous: Due to the complexity of the issues surrounding indigenous identity, there is no generally agreed upon single definition for declaring someone to be an American

Indian, Native American, Native, or Indigenous. Various organizations such as the Census Bureau, individual tribes, and the BIE all have differing criteria. These definitions range from “people who identify themselves as American Indians, to tribal members, to those having one-fourth or more American Indian ancestry” (“American Indian Communities,” 2012). However, MDE racial classifications are all based upon self-identification. Therefore all MDE data referencing American Indian, Native American, Native, or Indigenous students are based upon individual students’ self-identification.

- **Drum:** The animate position and spirit the Drum holds within American Indian cosmology requires the Drum to hold a place of significance comparable to a proper noun in Western ideology and therefore will always be capitalized.
- **Culture:** “What a group of people have, think, and do” (Buffalohead E., 2006).
- **Gender/sex:** Used to encompass societal expectations connected with femininity/masculinity and male/female. The rules for femininity/masculinity and male/female are grounded in the biological and anatomical distinctions as well as social constructs (Lips, 2003).
- **Race:** A socially constructed classification system based upon a variety of physical attributes; most commonly connected to skin color but may also include eye color, hair texture, and bone structures of people (Singleton & Linton, 2006).

- Theory: “A heuristic device for organizing what we know, or think we know, about a particular time about some more or less explicitly posed question or issues” (Blaikie, 2010, p. 124; Inkeles, 1964, p. 28).
- Sociological Theory: “Refers to the logical interconnected set of proposition from which empirical uniformities can be derived” (Blaikie, 2010, p. 124; Merton, 1967, p. 39).
- Educational Setting: Incorporates attributes of the five primary themes of geography (i.e., location, place, human-environment interaction, movement, and region) (Rosenberg, 2012), historical moments, climate, and social context, which when combined transcend the limits of absolute location by including relative conditions, human attitudes, and affairs that are particular to specific places. It is the amalgamation of these elements that creates and engenders its own personality, mood, theme, and essence that define educational settings.
- Urban Educational Setting: Incorporates the definition of educational setting for schools located in the Minneapolis and St. Paul school districts.
- Metro Educational Setting: Incorporates the definition of educational setting for schools located in all school districts located in the seven-county Metro area (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties), except for the Minneapolis and St. Paul school districts.

- Out State Educational Setting: Incorporates the definition of educational setting for schools located in greater Minnesota except for the four BIE schools.
- BIE Educational Setting: Incorporates the definition of educational setting for the four BIE schools listed in Minnesota (Bug-O-Nay-Ge-Shig School, Circle of Life School, Fond du Lac Ojibwe School, Nay-Ah-Shing School).

Outline of the Study

This study is divided into five chapters and an appendix. The first chapter provides a brief introduction regarding American Indian education and the struggles for survival that American Indian people and culture have confronted. In addition to this topical introduction, this chapter also included the rationale for the study, the rationale for using quantitative research methods, the statement of the problem, and the central research question.

Chapter 2 presents a review of the literature providing insight into previous studies surrounding American Indian education and history that are relevant to this project. The third chapter documents the proposed research methods for this study including the timeline of research, how locations were developed, definition of research variables, various forms of statistical test, data analysis efforts, validation strategies, potential ethical issues, and the role and background of the researcher.

Chapter 4 presents the research findings, and the fifth chapter discusses the findings and results of the study, possible future research, the strengths and limitations of

the study, and a conclusion. An appendix includes copies of various tables and charts that had been developed during the research process.

Chapter 2. Review of Literature

When considering American Indian education, there has been a significant body of literature amassed. However, there appears to be no study specifically on the significance of location as it relates to American Indian education in the state of Minnesota. Creswell (2009) suggested many possible purposes for a literature review. This literature review includes results of previous works related to the research that is being undertaken in this study. This review of literature intends “to provide a framework for establishing the importance” (Creswell, 2009, p. 25) of this research project. It is not designed to be a comprehensive document on the history or trends in American Indian education as much as it is designed to specifically focus on the forces that shape the educational opportunities and systems, which currently impact Minnesota’s American Indian learners.

Foundations for Indian Education

Demmert’s (2001) review of literature considered traditional education systems of American Indians. These systems originally taught skills and knowledge from one generation to the next. These systems had been developed throughout the people’s existence. According to Demmert (2001), indigenous systems were committed to the student’s success and failure was not an option because the very life of the community was directly connected with the student’s development. Demmert (2001) indicated a strong relationship existed between the family, clan, tribe, and instructor who worked with the youth until the learner indicated a firm grasp of the information or skill being

taught. Traditional indigenous education systems were just a part of daily life and ceremonies and not an isolated, limited part of a youth's day. In his foreword for his 2001 work, Demmert established some key points in time that marked radical changes in American Indian education including the Treaty of August 14, 1722 and the Act of March 3, 1819, where the federal government formally assumed Indian education responsibility.

Deloria (1975) presented information in a similar fashion to Demmert (2001) with a timeline theme, which established Indian education foundations as he explored the role of the federal government in American Indian education. Deloria (1975) provided detailed information regarding the Act of March 1, 1873, where the Secretary of the Interior officially assumed responsibility (from the War Department) for American Indian education, which led to the development of Bureau of Indian Affairs (BIA).

In the late sixties the U.S. Senate published a report entitled "Indian Education: A National Tragedy: A National Challenge" (Senate Report No. 91-501, 1969). This report, which was brought forward by a special subcommittee on American Indian education, clearly presented the vast education disparities that were present between American Indian learners and dominant culture. This report inspired change resulting in the Indian Education Act of 1972, followed by the Self-Determination Act of 1975. These legislative efforts helped establish the importance of culturally relevant indigenous pedagogical practices for American Indian students.

Contemporary policy literature suggests that the federal government has continued to place a value on American Indian education by including language in the

education policy of No Child Left Behind (2002) through Title VII. SEC. 7101. This language indicated the intent of the U.S. was to fulfill its responsibility to educate American Indian children. According to this policy, the federal government committed itself to work with Indian tribes, local educational agencies, and postsecondary institutions, as well as other organizations to provide the highest quality programs that serve American Indian children. The intent was not only for basic elementary and secondary educational needs, but also to address the unique culturally related needs of these children.

The international community has also contributed to the literature supporting the foundation and importance of American Indian education. On September 13, 2007, the General Assembly of the United Nations adopted resolution 61/295 (United Nations, 2007). The resolution affirmed several rights of American Indian people through 46 various articles. Article 14 addressed the importance of American Indian education establishing it as a human right. Article 14 reads as follows:

1. Indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning.
2. Indigenous individuals, particularly children, have the right to all levels and forms of education of the State without discrimination.
3. States shall, in conjunction with indigenous peoples, take effective measures, in order for indigenous individuals, particularly children, including those living outside their communities, to have access, when possible, to an

education in their own culture and provided in their own language. (United Nations, 2007, n.p.)

The literature suggests that the state of Minnesota followed suit with the international community and federal government in identifying American Indian education is of foremost importance. This has been exemplified through various legislative efforts. One of the most prolific efforts produced Minnesota Law Chapter 146—H.F. No. 2245, Section 41 (Minn. Gen. Laws, 2007).

Through this law the Advisory Task Force on Minnesota American Indian Tribes and Communities and K-12 Standards-Based Reform was formed. As part of their executive summary, key recommendations were made. The task force addressed the need to understand best practices by suggesting a comprehensive study involving American Indian students and their families needed to be conducted. They proposed a study should be commissioned that focused on best practices in curriculum content, effective instructional strategies, culturally relevant pedagogy and assessment, and further legislative recommendations should be developed from the results of the study (Fraedrich & Brown, 2009).

Possible Impact of Location/Setting

Giroux (1992) introduced his postcolonial theory that suggested a connection between academic success and educational setting. He suggested educational settings varied in the degree that politics and pedagogy have been developed around hegemonic mandates versus the contradictory perspective of complex multiplicities, which may

include language, culture, and identity. Giroux(1992) suggested the level of hegemonic antagonism present at a educational setting might have an impact on academic success.

Wilson (1998) called for more research that examined the association of environmental factors and academic achievement. Wilson (1998) suggested geographic location be further explored to help better understand its impact on academic performance. Wilson (1998) believed there were several variables connected to a geographic location or setting that may have the ability to impact student learning. These variables included social economic, community skills, and values.

Sampson (2012) contributed to William F. Tate IV's (2012) work by providing an article, which explored what he referred to as a "complex system of friendship, kinship, and acquaintanceship networks, and formal and informal associational ties rooted in family life and ongoing socialization processes" (Sampson, 2012, p. 11). Sampson (2012) indicated social organization was directly connected to systemic networks that enable or prohibit social control. He postulated the level of social control available in a location had a direct impact on variables such as poverty, residential mobility, and criminal behavior, all of which may have an impact on academic success. He identified the understanding of location needs to surpass a geographical phenomenon and it should focus on social networks. Sampson's (2012) systemic theory is founded in the belief that location-based social networks provide the "core social fabric of human ecological communities" (p. 11).

Reininger's (2011) article for the American Educational Research Association focused on patterns of geographic mobility for teachers. Using data from the National

Education Longitudinal Study, Reininger (2011) identified geographic preferences for teachers, which suggested teachers commonly preferred to work close to where they were raised and educated. This appeared as a distinct characteristic in her research. According to Reininger (2011), there are direct implications of teacher preference that perpetuate many shortages for schools having historically low success rates. Based upon Reininger's (2011) study, there appeared to be a relationship between "hard-to-staff schools" and educational setting (p. 131).

Chung and Mason (2012) studied the impact of location in the rural regions of China. Their research concluded a disconnect appeared between the government of China and its citizens located in poor and rural locations. This disconnect is based upon a clash between the government's transitional society represented in the current education system being implemented by the Chinese government and the values of many rural and poor Chinese citizens who have been "marginalized and cannot easily adjust, perhaps because of their disadvantaged socio-economic, cultural and geographic location" (Chung & Mason, 2012, p. 1).

This disconnect seemed to be possibly heightened by the Chinese government's concept of education, seen through a reductionism lens that had been perceived by many rural citizens as insensitive. A disconnect between administrators' interests and local relevance and intrinsic values of the rural participants in the pedagogical process may have impacted academic success. Though this research took place in China, it is important to consider for this project based upon a similar political and educational history of American Indian people and the U.S. government.

Educational setting and location has notoriously impacted American Indian education and existence throughout history. Churchill (2004) documented the boarding school era. This era clearly marked a period of time where geography and location were identified as key contributors in accomplishing the educational policy of the U.S. government at that time: to kill the Indian save the man.

Best Practice

With the focus of this study concentrating on students located in the state of Minnesota and the previous mention of Minnesota Law Chapter 146—H.F. No. 2245, Section 41, one would be remiss not to acknowledge the foundational work of the Advisory Task Force on American Indian Tribes and Communities and K-12 Standards-Based Reform (Fraedrich & Brown, 2009). This organization and ultimately their research project were based upon a legislative act from the state of Minnesota. The Minnesota state government had become keenly aware of the need to provide culturally appropriate education for American Indian students. This task force conducted a quantitative study to identify what best practices might look like for American Indian students and presented its findings in May 2009.

One of the key recommendations from Fraedrich and Brown's (2009) study was to establish a State Indian Education Office which would be led by an American Indian educator at the director level to support curriculum development and teacher training. The task force indicated a strong need to provide adequate funding for K-12 education throughout the state. The report suggested that the state needed to support high quality, literacy-based preschool programming and all-day kindergarten. Adequate funding for

the Success for the Future grant was also recommended. Teacher preparation programs became a point of concern in this report and the task force advocated for passing legislation addressing effective preparation and in-service programs. In addition, the task force identified a need for a professional development program to help insure that local American Indian education directors were highly knowledgeable and skilled. Additional information suggested that the task force should continue as a resource to MDE. The task force also recommended further research into best practices in curriculum content, effective instructional strategies, culturally relevant pedagogy and assessment, and the findings be used for additional legislative recommendations.

In 1994, McLaughlin introduced a challenging notion suggesting that academic success for indigenous students may be connected to surrounding power relationships that minority groups may have within the educational system including the classroom and curriculum. McLaughlin (1994) argued that academic success for Navajo and other American Indian students was directly connected to the extent that educational systems reverse the traditional power roles that have characterized relationships between dominant and minority groups historically. He believed that the success of indigenous students was directly connected to how empowered indigenous students felt in relationship to their own education. According to McLaughlin (1994), the students' or institutions' place of power, privilege, and identity had more to do with students' academic growth and learning than other common views such as students' deficiencies, ineffective schools, or home-school cultural differences.

Barnhardt's (1994) doctoral dissertation focused on 50 Alaska Native teacher education students who attended the University of Alaska Fairbanks (UAF) between 1989 and 1993. Barnhardt (1994) identified that the numbers of Native students enrolled at UAF had increased while the actual percentage of Native students graduating was still significantly lower when compared with Caucasian students. Barnhardt (1994) addressed several factors believed to contribute to the academic success of the Native students who participated in the study. This study provided a description of the programs designed with the Native students in mind such as student services and academic coursework at UAF.

Barnhardt (1994) identified multiple factors, including various intelligence styles, which contributed to the academic success of the students in her study. Some of the factors listed included (a) culturally responsive teaching and learning environments, (b) culturally diverse and respectful student support services, (c) strong family and community support, (d) positive educational and life experiences, and (e) exceptional individual efforts. Barnhardt (1994) concluded her work with solid recommendations and directions designed to produce a respectful inclusive educational environment, which in turn produced successful academic results for various stakeholders in the educational system including students, staff, and the institution.

In a study commissioned by the U.S. Department of Education, Brown (1991) indicated American Indian students performed significantly lower than the norm in language arts related subjects. This study provided an overall review of the language arts educational process for American Indian students. In addition to considering literature,

strategic plans, and educational theories, the study also focused on the influence of the learning environment. Brown's (1991) work established a premise, which supported culture-based education and instruction and provided frameworks in current theories including comprehension, communication (holistic or integrated), and natural approaches. Brown (1991) explored culture education through content-based instruction and academic competency, which considered the importance of cultural inclusive Native materials. In addition, Brown (1991) presented instructional strategies he suggested were proven to be effective in educating American Indian students. Some of the instructional strategies he referenced included providing contextual cues, peer interaction, and cooperative learning experiences.

McEachern's (1990) work on emergent literacy and its impact on young American Indian students not only considered curriculum but also addressed social and economic issues. The results of his work aligned with well-documented information surrounding high American Indian dropout rates and disproportionately high special education designations for American Indian students. McEachern (1990) provided some practical pedagogical principles for teachers who teach literacy. McEachern (1990) suggested teachers should incorporate what he called whole language learning. He also suggested curriculum must contain culturally relevant materials. One unique aspect of McEachern's (1990) work suggested effective curriculum must incorporate the linguistic background of students as well as respectfully using locally produced materials to enhance young students' emergent literacy skills. He suggested this approach might make some link between prior traditional indigenous knowledge and reading

comprehension. According to McEachern (1990), culturally relevant instructional materials increased listening comprehension among American Indian primary students.

A study by Coburn and Nelson (1987) identified characteristics of American Indian students completing high school, thus aligning high school graduation with academic success for Native students. The research population for this study included high school graduates from various locations such as public, tribal, urban, and rural schools in Oregon, Washington, Idaho, and Montana. The study highlighted various student activities including tribal, sports, civic, and church activities. This study provided information regarding what high school graduates identified as being influential in their personal academic success. The results indicated teachers were the most influential people in the graduates' academic journey. According to Coburn and Nelson (1987), teachers were credited with making school interesting through providing experiences that inspired and challenged students while they maintained high expectations. Other contributing factors to Native students' academic success were also identified. These included the students' aspirations for postsecondary education, self-confidence, awareness of the possible consequences connected with dropping out, as well as other extrinsic motivations such as family, friends, and community. Coburn and Nelson (1987) observed students believed education was the pathway off the reservation.

Swisher (1991) examined various forms of learning and their impact on indigenous learners. Her study of various learning styles led her to conclude cultural values played a significant role in preparing students to learn and early socialization experiences also impacted how indigenous children saw the world. She believed the

early development of a person's worldview had a direct influence on how indigenous students related to various environments. Swisher (1991) suggested possible methods for teachers to consider when dealing with different learning styles. Swisher (1991) believed Cherokee children preferred to participate in learning environments that encourage cooperation versus competition, and these children hid academic competence to avoid being identified as possibly superior to their peers. Swisher's (1991) observations on this issue are especially important as the Cherokee people represent the third largest group of indigenous people in the state of Minnesota behind Ojibwe and Dakota (U.S. Census Bureau, 2010).

Novick's (1996) work explored culturally responsive education. She reviewed a synthesis of available literature on culturally relevant educational practices, including themes such as critical literacy and pedagogy. She determined multiple intelligences played a significant role in developing an understanding of the individual student as well as possible various forms of intelligences may be culturally connected. Her study also considered multi-age groupings. Novick (1996) strongly advocated academic success for students is developed through a process that allowed children to create their own understanding through a holistic interpretation and interaction with the greater world around them.

Novick's (1996) premise relied on intrinsically motivated and self-directed learning. Novick's (1996) report was divided into the following ten main topics, which reinforced her holistic approach to teaching and learning: (1) an overview of appropriate developmentally practices; (2) early literacy; (3) integrated curriculum; (4) mathematics;

(5) coverage, multiple-intelligences, and standardized tests; (6) multiage grouping; (7) family/school/community partnerships; (8) continuity for children and families; (9) culturally responsive teaching; and (10) children with disabilities.

Estrin and Nelson-Barber (1995) examined the issues of assessing academic progress for indigenous students in their 1995 research. This study focused on whether or not traditional assessments like the MCA test, which is used in Minnesota, was an appropriate tool that should be used to measure Native academic progress. They focused on assessment issues as well as pedagogical issues related to indigenous teaching and learning.

Estrin and Nelson-Barber (1995) provided insight into the differences between traditional American Indian educational strategies, which focused on community, hands-on learning, and reflection, versus the classrooms of today which rely primarily on linguistic-based instruction. They attributed these differences to the disadvantages indigenous students have learning in today's educational system. Their work also aligned with several previously cited scholars, drawing parallels between historical relationships, ongoing educational practices, and American Indian and Alaska Native teachers. They advocated effective education and assessment of indigenous students required both an understanding of socio-cultural perspectives and recognition of differences between community and school in their social and cultural context.

Estrin and Nelson-Barber (1995) indicated that regardless of the support for American Indian education from the international community, federal and state governments had no culturally specific instruments to assess American Indian student

academic performance, thus bringing into question the very nature of using standardized norm-referenced tests are potentially cultural irrelevant. They established the argument that such tests may be a better measure of the student's acculturation into Western dominant cultural practices rather than true academic progress.

Culture-Based Education

In 1994, Demmert produced a personal narrative of pragmatic ideology, which created the *Blueprints for Indian Education: Languages and Cultures*. He compiled various reports from the Indian Nations At Risk Task Force and the White House Conference on Indian Education. The results suggested the need to commit to saving and revitalizing American Indian and Alaska Native languages and to recognizing indigenous cultures as national resources. He accused the education system of doing away with indigenous languages through a comprehensive assimilation plan targeted and designed to eliminate indigenous culture through education. He provided the following eight recommendations or steps in his 'blueprint' for indigenous educational reform:

- 1) Amend the Bilingual Education Act of 1965 to include provisions that would:
 - a) Fund programs to strengthen Native American languages
 - b) Permit students to learn their tribal languages as a first or second language in school
 - c) Encourage partnerships among schools, parents, universities, and tribes
 - d) Provide long-term assessment and evaluation of language programs
 - e) Ensure that Native language teachers meet competency standards
 - f) Develop innovative models for language programs

- 2) Add provisions to other education-related legislation that would:
 - a) Develop curricula for restoring lost languages
 - b) Establish course credit for Native languages in institutions of higher education
 - c) Provide funds that would put reservation, rural, and urban Native groups on an equal footing
 - d) Allow Native Americans to assume primary responsibility for their education programs
- 3) Exempt language and culture monies from Gramm-Rudman-Hollings Act restrictions
- 4) Design protections for parent involvement in Native education programming through various accountability, sign-off, and grievance procedure provisions
- 5) Assign highest national priority to funding for Native languages, literacy, and cultural programs
- 6) Implement related Indian Nations At Risk recommendations
- 7) Put Native Americans in control of and hold them accountable for all federal education funds for Native peoples
- 8) Recognize the significance of language and culture programs in efforts to improve schooling for Native Americans. (Demmert, 1994, pp. 5-6)

Peshkin (1992) explored the dynamics of the relationships between various individuals (i.e., parents, students, and community members), which he referred to as agents and the school. He introduced a unique perspective regarding culture-based

education, suggesting the agent's relationship with the system operated on both a formal and informal platform with the agent serving as the primary force of change and reform for schools. Peshkin (1992) suggested the agent is the person or force that can bring about a change in values and culture to curriculum and overall pedagogy. According to Peshkin (1992), there is a complex relationship between schools and their constituencies that has an identifiable cultural context. He believed effective culture-based education must reflect the cultural values of the community or agents. In addition, Peshkin (1992) explored the dynamic and complex relationships surrounding competing orientations by introducing what he referred to as macro- and micro-level theories. Peshkin (1992) examined how these theories impacted assimilation, ethnic or community maintenance, economic competitiveness, status maintenance or reversal, and citizenship.

From the boarding school era until today there have been mixed opinions on how culture has shaped education. Gilliard and Moore (2007) investigated how culture shaped instruction by examining three early childcare education programs on the Flathead Indian reservation. While elements of traditional values, mythology, and worldview are introduced in a variety of subject matter, special attention was given to the Drum as the heartbeat of their American Indian community. Gilliard and Moore (2007) expressed a similar point of view that there was a need to consciously make room for American Indian ideologies to become foundational in the education process. The authors believed there is a direct connection between traditional American Indian values being introduced to students in their early childhood years and the readiness of American Indian youth to learn what dominant culture has defined as the knowledge of most worth.

Gilliard and Moore (2007) observed that the Drum drew people into a place where they solidify their identity, which had a significant impact on their preparation for learning.

Grant and Gillespie (1992) believed literature could be used as a tool, which has powerfully transmitted interpretations of culture. Grant and Gillespie (1992) established a direct link between academic successes of indigenous students and Native literature. They advocated indigenous students needed to see themselves present within academic curriculum and literature. They believed attempting to substitute Native authors for stories about Natives from non-Natives is simply shortsighted curriculum based upon the richness of literature available from indigenous authors. Grant and Gillespie (1992) indicated reading a variety of literature best helped students to understand cultural principles, values, and traditions. They also advocated for indigenous learners to study traditional myths, legends, and songs. They suggested traditional learning experiences helped contemporary Native learners understand the various differences between who they are as Native students and mainstream education. Grant and Gillespie (1992) suggested through quality Native literature, age-old stereotypical images of Native Americans, which may have had negative impacts on indigenous education, could be overcome.

In his May 26, 2011 testimony before the Senate Indian Affairs Committee titled, *In Our Way: Expanding the Success of Native Language and Culture-Based Education*, Dr. David Beaulieu (2011) provided insight on the subject of culture-based education as it relates to Native languages. According to Beaulieu (2011), there appeared to be a

correlation between language and culture-based education and academic achievement for American Indian students.

Beaulieu (2011) provided several examples where the data indicated a clear connection between academic achievement and American Indian students learning their indigenous language and culture. For the purpose of this review there is a brief summary of three of the examples he brought forth in his testimony.

The first example was a program named Tséhootsooí Diné Bi'ólta' ([TDB], The Navajo School at the Meadow Between the Rocks, or the Fort Defiance Navajo Immersion School). This program provided full immersion for American Indian students in grades K-8. In the primary grades initial literacy instruction is provided in their Native Navajo tongue. The introduction of the English language occurred in 2nd grade and was increased until the 6th grade where 50% of the instruction was in Navajo and English.

According to Beaulieu (2011), the longitudinal data from TDB indicated Native-language revitalization did not come at the cost of the children's acquisition of English or their academic achievement. The longitudinal data indicated in these cases the American Indian students who participated in the immersion experience outperformed their peers from English-only programs in English reading, writing, and mathematics based upon local and state assessments.

Rock Point provided another example of a program where both the Navajo language and English were taught to American Indian students. Students, similar to TDB, learned to read first in the Navajo language and then in English. The longitudinal data from Rock Point was similar to TDB in that students there not only outperformed

comparable students in English-only programs but they also surpassed their own previous annual growth rates.

Rough Rock was an English-Navajo Language Arts Program, which served American Indian students in grades K-6. Learning centers and small group instruction in Navajo and English provided the epicenter of the classroom. The curriculum was interdisciplinary based upon units with indigenous themes. Additional summer programming was provided through literature camps, which included a cross section of the community (i.e., students, teachers, parents, and elders). The longitudinal data showed after four years American Indian students in the Rough Rock program increased their English comprehension from 58% to 91%.

These were just three examples all located in reservation communities. Each of these three examples provided insight into options regarding culture-based education and clearly displayed the academic advantages available through language reacquisition and instruction for American Indian students.

Henze and Vanett (1993) introduced the idea of dislocation. They looked at the phenomena of being overrun in one's original community by outsiders and the significant cultural impact this experience had on indigenous youth as they individually decided whether or not to continue to pursue their original culture or assimilate into the new culture. Henze and Vanett (1993) argued the metaphor of walking in two worlds is merely a façade, which over simplifies the complexity of the issues faced by American Indian students today. For many of these students it is not about walking in two worlds but rather which world they have chosen.

Henze and Vanett (1993) identified key assumptions, which lie behind the ideology of walking in two worlds. The key assumptions were:

1. *Cultures exhibit internal uniformity*: Walking in two worlds assumes two distinct, readily identifiable worlds exist, and that the worlds are internally uniform. Henze and Vanett (1993) suggested this was far from true and “two equal worlds simply do not exist equally” (p. 119). *Everyone means the same thing when referencing the concept of walking in two worlds*. The stereotypical image of the ideal bicultural individual who is established in their original culture and who is also fully functional and accepted by another culture is not universally accepted as the definition for a person who walks in two worlds among American Indian people. Henze and Vanett’s (1993) research showed varied interpretations of the metaphor including the world a child was born in versus the world the person lives in today as well as the traditional response of Native culture versus Western culture.

2. *Children have available to them two cultural worlds, which, although different, they can merge together to form an individual who is bi-lingual and bi-cultural*: Henze and Vanett (1993) documented a tremendous internal conflict can ensue when an individual tries to live according to two value systems, which in some ways contradict each other.

3. *Children and young adults are able to pursue the “best” of both worlds*: Henze and Vanett (1993) discussed how unreasonable it is to expect children to have the maturity and understanding to negotiate such complex

cultural and internal issues when they have not had the time to be deeply immersed in either culture.

4. *The school can help students mediate between Native culture and Western culture:* Henze and Vanett (1993) argued that it is unreasonable to expect a school system that is strongly based in one culture to effectively help students mediate these issues of identity related to a person from another culture. (Henze & Vanett, 1993, pp. 123-127)

In many American Indian societies the education process began in the womb and continued throughout life's journey. In dominant culture, formal education at the postsecondary level rarely involved intentional traditional cultural training. However, a commitment to traditional cultural training has been often found at tribal universities and in tribal college curriculums.

Tribal colleges and universities, in addition to providing American Indian people with higher education, have helped to bridge both the cultural and academic gap between American Indians and mainstream culture. Many American Indian colleges have contributed to sustaining American Indian art forms through classes and degrees offered. In her 2005 article, Robbins provided an in-depth look at one art student's experience at a tribal college. She documented how an individual was strengthened in his own identity as he exposed himself to indigenous art and developed his own art.

Robbins (2005) reinforced the need for continued education of traditional American Indian culture into adulthood. She validated the theory of self-contributing genocide by affirming the importance of arts and culture in education. Lastly, Robbins

(2005) offered insight into how issues of identity and self-worth for American Indian people have been connected to cultural training.

Relocation policies of the U.S. government have forced many American Indians to leave the reservation in search of employment and opportunities. For many American Indians this disconnection from their tribal reservations brought about a loss of culture and identity. Because of this, American Indian migration communities like Minneapolis and its surrounding suburbs developed a significant American Indian population by the mid-1960s. This concentration of American Indian people in Minneapolis and its surrounding suburbs resulted in a need for cultural training and education. Buffalohead (Buffalohead & Stenner, 2001) emerged as a leader and innovator in this work.

Buffalohead (Buffalohead & Stenner, 2001) shared truths and methodologies she had learned and developed in her 30-plus years of experience. She documented intergenerational approaches that reflected tribal traditions. She also provided examples of how generations learned together and how grandparents, parents, and students were involved in the academic decision making process. The program, which Buffalohead started in Osseo, Minnesota, placed significant emphasis on the Drum. Entire families were involved with Drum, dance, and language classes taught by elders and other community members with emic knowledge and understanding of their tribal culture and heritage.

Buffalohead's (Buffalohead & Stenner, 2001) work was specific to a suburb of the Minneapolis metropolitan area. Buffalohead (Buffalohead & Stenner, 2001) examined intergenerational learning, which is a unique element of American Indian

culture. Buffalohead (Buffalohead & Stenner, 2001) was able to call upon her lived experience (transitioning from adult to elder) as she provided personal firsthand information on the importance of intergenerational cultural learning. Through her work she established the importance of intergenerational teaching and learning as a key element that must be considered to understand cultural training from a traditional American Indian perspective.

Skinner (1991) extended beyond the common themes previously mentioned and identified ethnocentrism within the educational system as a leading cause for poor academic performance of American Indian students. Consistent with Peshkin (1992), Skinner (1991) observed community participation was critical in producing effective systems to educate American Indian students. Skinner (1991) believed effective and active community participation lead to community control, which ultimately would create culturally relevant curriculum and pedagogy. Community control could provide an education system responsive to American Indian students. Skinner (1991) called for a working relationship between dominant culture and indigenous culture to develop a comprehensive local linguistic and cultural context within the structure and curriculum found in the education system.

The Ojibwe people are the largest group of indigenous people in the state of Minnesota with seven reservations located throughout the state (U.S. Census Bureau, 2010). Peacock and Wisuri (2006) provided foundational background information on the Ojibwe nation in their book, *The Four Hills of Life: Ojibwe Wisdom*. Peacock and

Wisuri (2006) offered cultural context for the Ojibwe people as they explored the four hills of life.

Intertribal Education

Rohrl (1972) examined intertribal sharing of teaching and learning of Drum traditions between the Ojibwe and Dakota people. He found strong bilateral kinship ties and provided insights into traditions such as the fact the Drum once was considered a central icon, readily shared between different tribal groups like the Dakota and Ojibwe (Rohrl, 1972). These two tribal groups are part of main tribal groups that are located in Minnesota. Many of the indigenous teachings in Minnesota today have a direct connection to the pan-Indian foundation that these two tribes fostered.

Rosa (1994) created a manual to help develop an appreciation and respect for indigenous philosophy. Rosa's (1994) manual was divided into four sections. The four sections were designed to ensure seasonal recognition and environmental awareness. Each chapter began with one or more oral histories from various American Indian nations, which were relevant to the concepts and ideas covered in that chapter. Rosa (1994) introduced American Indian ideology through the concept of the circle, which has no beginning or end, encompasses all directions, and includes all creatures and elements of nature. This was contrasted with the non-Indian perception that time and its relation to nature is linear, with a beginning and an end. Rosa (1994) paralleled these fundamentally different worldviews throughout the book.

In section 1-Fall, Rosa (1994) covered the circle, education, wildlife, astronomy, games, sports, food, lodges, tipis, and the hunt. In Section 2-Winter, Rosa (1994)

explored communication and memory involving individual nations from Alaska to South America including Haudehoshonee, Anishinabe, Métis, Inuit, Kwakiutl, Plains Cree, Maya, and Taino. Rosa (1994) provided context for each nation, such as its creation story, social and governing organization, lifestyle, and history before and after European contact. In section 3-Spring, Rosa (1994) covered social dances, the Drum, ceremonies, environmental issues, and medicines. In section 4-Summer, he examined water, feelings, and outdoor life.

Rosa's (1994) work has proven valuable in validating the importance of indigenous pedagogy in a holistic circular manner instead of dissecting it and removing it from the rest of American Indian culture. Rosa's writings helped place education within the greater context of American Indian culture. Though Rosa never directly referenced unwritten indigenous knowledge, it was implied to those of us who are part of the community.

This chapter presented a review of relevant literature and provided detailed information on how American Indian research had been previously conducted. Based upon this review there appears to have been no study specifically on the significance of location as it relates to American Indian education in the state of Minnesota. In Chapter 3 the research design for this study including the methodology is described.

Chapter 3. Methodology

Introduction

Although international regulations, federal policies, and state laws all provided clear support for American Indian people to be educated, many of Minnesota's American Indian students are not proficient in reading and mathematics as measured by the MCAs. The study examined the relationship of location of educational setting with mathematics and reading proficiency of Minnesota's American Indian students.

The description of the methodology used for this study is organized in various categories. This chapter included information on research design, central research question, research population, research variables, and data analysis methods.

Research Questions

This study focused on one central research question. The central research question is: "What impact does educational setting have on MCA proficiency scores for American Indian students in the state of Minnesota grades 3-11?" This study analyzed proficiency standards measured by the MCAs collected between 2007 and 2010. The following subordinate questions will further explore perspectives related to the central research question:

- Is there a relationship between the educational setting of schools and MCA proficiency for American Indian students? Does educational setting (i.e., Urban, Metro, Out State, and BIE) have an impact on MCA proficiency for American Indian students?

Research Hypotheses

Giroux (1992) introduced the theory that there is a relationship between physical location and academic success. Through his examination of politics, education, and setting, he identified a connection between academic progress and postcolonial hegemonic systems that dictated the forms and processes of teaching and learning in specific educational settings. The results of this study affirmed the extent of a relationship between educational setting and academic proficiency of American Indian students based upon MCA criteria in the state of Minnesota.

Research Design

This study engaged the research process from a quantitative approach through data collection of secondary sources. Quantitative strategies were chosen for several reasons. Generally speaking, quantitative research relies on empirical or numeric data and close-ended questions that may include information regarding performance, attitude, and statistical analysis. Quantitative research has been selected because of its commitment to identifying variables and their impact on participants.

This study was designed as a case study where the researcher examines the relationships between educational setting, academic subject, and academic proficiency for a specific group of people. This approach was appropriate because a case study is generally bound by time and activity, according to Stake (1995). The research “seeks to discover the direction and magnitude of the relationship among variables” (Gall et al., 2007 p. 636).

Postpositive worldview has had a direct impact on quantitative research. This impact can be seen through an emphasis on experimentation and correlation (Campbell & Stanley, 1963). This study included a model that incorporates multiple variables, analyzing empirical data that include information regarding performance and statistical analysis.

This research project relied on numeric data to test or identify the impact of educational setting on variables of education as they pertain to American Indian students. A primary contributor in choosing quantitative research methodology is the use of standards to help ensure validity and reliability. This study attempted to minimize the researcher's bias by using quantitative research practices in statistical procedures manipulating numerical information. Due to the fact all the data had already been collected and archived by the MDE, quantitative methods were used to measure the data throughout the research project.

Setting

This research explored the relationship between MCA proficiency scores in mathematics and reading for Minnesota American Indian students in grades 3-11 between 2007-2010 in four different educational settings. This time period was chosen because extensive trend data were not available prior to 2007 due to changes made by the MDE. The four educational settings have been chosen based upon parameters identified by and are currently in use by the MDE. These educational settings group all of Minnesota's districts and schools in one of the four following categories: (a) Urban-Minneapolis/St. Paul, (b) Metro-seven-county Metro area, (c) Out State-greater Minnesota, and (d) BIE.

Data Collection

All data used in this research project are public data made available by the MDE. The specific data used in this research had been collected in July 2012 from the MDE's website (<http://education.state.mn.us/mde/index.html>).

Data Analysis

This research project used quantitative and descriptive research methods and statistics to understand the phenomena of American Indian students' proficiency on the MCA test and educational setting. Gall et al. (2007) indicated descriptive methods are an appropriate form of analysis used to carefully examine "what is" questions (p. 301). This research project was committed to generating a description of a potential phenomena involving American Indian educational surrounding educational setting and MCA proficiency as it exists.

This project also provided a foundation of data that involved analyzing data over a four-year period of time (2007-2010). According to Magnusson, Bergman, Rudinger, and Törestad (1991), "the development of an individual cannot be adequately and effectively investigated without using longitudinal research strategies" (p. xiii).

Summary

This research used previous MCA data collected from the MDE on all American Indian students in the state of Minnesota who participated in the MCA test between 2007 and 2010. Traditional research variables such as academic subject and grade level may provide information that could help guide future research regarding American Indian education in Minnesota. This research examined the relationship of educational setting

with mathematics and reading proficiency of Minnesota's American Indian students. The results of this study attempted to affirm the extent of a relationship between educational setting and academic proficiency of American Indian students based upon MCA criteria in the state of Minnesota.

This study was not designed to identify or isolate the cause of MCA test results or the multiply possible reasons for the difference in MCA proficiency scores for Minnesota's American Indian students but rather to explore the relationship between educational setting and proficiency for Minnesota's American Indian students as measured by the MCA.

Chapter 4. Data Collection and Analysis

The purpose of this research project was to establish an understanding of MCA proficiency for American Indian students in the state of Minnesota. The research examined the relationship between educational setting and proficiency in mathematics and reading for Minnesota's American Indian students to help determine what impact educational setting had on MCA proficiency scores for American Indian students in the state of Minnesota grades 3-11 between 2007-2010.

Giroux's (1992) research introduced the theory that there is a relationship between setting and academic success. Through his examination of politics, education, and location, he identified a connection between academic progress and postcolonial hegemonic systems that dictated the forms and processes of teaching and learning in specific settings (Giroux, 1992). Giroux (1992) suggested the level of self-advocacy or agency established amongst a people/setting played a powerful role in the educational system and process by which education occurred, concluding educational setting had a direct impact on education.

This study examined the relationship between educational setting and academic proficiency of American Indian students based upon MCA criteria in the state of Minnesota between 2007-2010. This study included dependent and independent variables and analysis of empirical data using various regression models regarding mathematic and reading proficiency, educational settings, and grade level.

In order to address the research question this research project relied on existing MCA data to test or identify the relationship of educational settings on several variables of education as they pertained to American Indian students in the state of Minnesota between 2007-2010.

Organization of Data Analysis

In an attempt to find the statistical model of best fit, various statistical models were explored for both the mathematic and reading analysis. Both the mathematic and reading analysis used the Rate of Proficiency as the output factor. Two input factors with various levels were also used:

- 1) Educational Setting
 - Urban
 - Metro
 - Out State
 - BIE

- 2) Grade Level in School
 - 3rd Grade
 - 4th Grade
 - 5th Grade
 - 6th Grade
 - 7th Grade
 - 8th Grade
 - 10th Grade (reading only)
 - 11th Grade (mathematics only)

Overview of Regression

Regression is a statistical tool used to identify the effect of one or more input variables (educational setting and grade level) on one or more output variables (mathematic and reading proficiency). Through the use of various regression models, the relationship between variables may be formally stated as an equation, as well as

associated statistical values describing the strength of the relationships present within the data (Read, 1998).

Various models were used to insure the model of best fit. It is important to note the tool of regression assumes a one-way causal effect from input to outputs variables. With this understanding, this study measured the direct effect of educational setting and grade level on proficiency as measured by the MCAs (Read, 1998).

Nonlinear regression was decided upon for the reading analysis because it used a curved line, which best modeled the relationship between the inputs (educational setting and grade level) and the output (reading rate of proficiency). Nonlinear regression is a method of finding and displaying a relationship between the dependent variable (proficiency) and a set of independent variables (grade level and educational setting) (IBM Corporation, 2011). Nonlinear regression provides flexibility and is not restricted to estimating only a linear relationship (IBM Corporation, 2011).

Linear regression was decided upon as the best-fit model for three educational settings (Urban, Metro, and Out State) mathematics analysis because it used a straight line, which best modeled the relationship between the inputs (educational setting and grade level) and the output (mathematic rate of proficiency). The purpose of linear regression was to model the value of a dependent variable based on its linear relationship to one or more predictors (IBM Corporation, 2011).

A linear regression model was not used for the BIE educational setting mathematic analysis because it would have created a negative rate of proficiency for mathematics at the highest-grade levels. Secondly, the BIE educational settings

mathematic data points did not follow a straight line. Because of the nature of a linear regression model, this was not used for the BIE analysis of mathematics. A logistic regression model was used for the BIE educational settings mathematic analysis because it followed the BIE educational setting mathematic data points better than the linear model. Logistic regression was used to predict the presence or absence of a characteristic (mathematic proficiency) based on values of a set of variables (grade level and educational setting) by measuring the relationship between the variables and the characteristic (IBM Corporation, 2011). Based upon this information, a logistic regression model was used to complete the mathematic analysis for the BIE educational setting.

Description of Research Population and Data Selection

The research population for this study included all American Indian students in the state of Minnesota, grades 3-11, who participated in MCAs between 2007-2010. The state of Minnesota is required to review and revise state standards every six years. These reviews produced revisions that led to changes in curriculum, testing procedures, and outcome measures. The 2010-2011 academic year was the first year all Minnesota schools were required to implement the 2007 Minnesota Academic Standards for mathematics, which required all 8th grade students to take algebra. The MCA-III was implemented for grades 3-8 and new performance standards based on new mathematics standards were implemented. Based upon this information, this study focused only on data collected between 2007-2010.

Analysis

The objective of this study was to determine the relationship educational setting had on the rate of proficiency as measured by MCA scores for American Indian students in grades 3-11 in the state of Minnesota between 2007-2010. Based upon this objective, four distinct null hypotheses were developed for reading and mathematics:

- Null 1: Grade level has no effect on reading rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.
- Null 2: Educational setting has no effect on reading rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.
- Null 3: Grade level has no effect on mathematic rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.
- Null 4: Educational setting has no effect on mathematic rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.

Reading Analysis

Table 1

Reading Analysis

Analysis of Variance (ANOVA)						
Source	DF	Seq SS	Adj SS	Adj MS	F	P
Regression	8	1.37895	1.3785	0.172368	42.7959	0.000000
Setting	3	0.75608	0.11214	0.037380	9.2807	0.000017
Grade	1	0.38489	0.21114	0.21114	52.4222	0.000000
Setting*Grade	3	0.10763	0.10763	0.035876	8.9074	0.000027
GradeSqrd	1	0.13035	0.13035	0.130345	32.3623	0.000000
Summary of Model						
R-Sq = 76.87%			R-Sq (adj) = 75.08%			

This nonlinear regression introduced a grade-squared term (quadratic term) to the model, which created the curvature. This however, did not imply there was a physical meaning to squaring the grade level. The nonlinear regression analysis for reading showed all input factors: regression (0.000000), setting (0.000017), grade (0.000000), setting*grade (0.000027), and grade squared (0.000000), to be significant with a p value far below 0.05.

The quadratic term (R-Sq) equaled 76.87%, which indicated over 76% of the variability was accounted for in the analysis. Due to the fact that both the R-Sq and the R-Sq adj are both high and approximately the same value, indicated the model was a strong fit for the data.

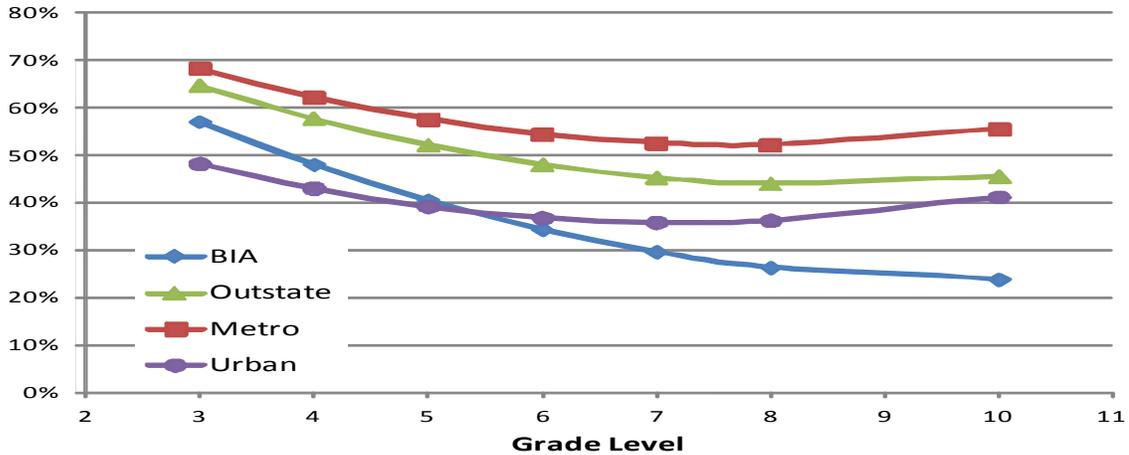


Figure 1. Model of reading proficiency by educational setting and grade level.

Table 2

Average Reading Proficiency Mean 2007-2010

Grade	Urban	Metro	Out State	BIE
3	46.5%	67.4%	65.3%	58.1%
4	40.3%	59.0%	54.4%	49.2%
5	42.6%	59.9%	56.3%	40.7%
6	40.2%	56.3%	49.6%	35.5%
7	36.3%	52.6%	42.1%	23.4%
8	33.1%	53.0%	41.9%	25.0%
10	40.8%	53.4%	47.3%	27.5%

Note. **This chart provides the numeric mean of raw data for grade 3-8 and 10 and all four educational settings referenced in the reading analysis tables.

Urban reading. This study attempted to explore the relationship between educational setting and reading proficiency for American Indian students in the state of Minnesota as measured by the MCAs between 2007-2010. The analysis indicated there were significant predictors present within each educational setting for reading, which

suggested a relationship existed between educational setting and reading proficiency as measured by the MCAs.

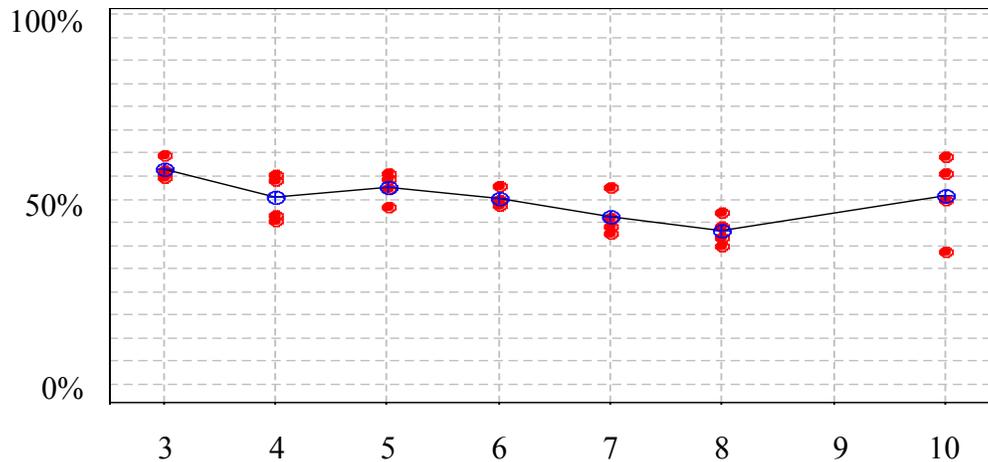


Figure 2. Urban mean rate of reading proficiency by grade.

The analysis indicated the Urban educational setting had the least amount of fluctuation in proficiency for all grades between 2007-2010. According to the data, 3rd grade had the highest overall average rate of proficiency (46.5%) and 8th grade had the lowest overall average rate of proficiency (33.1%). The rate of reading proficiency dropped 13.4% between these grades; however, there was a rebound in reading proficiency to 40.8% in 10th grade which resulted in an overall decrease in reading proficiency of 5.7% between 3rd and 10th grade in the Urban educational setting.

Metro reading. The analysis for the Metro educational setting indicated there were significant predictors present, which suggested a relationship between the Metro educational setting and reading proficiency as measured by the MCAs.

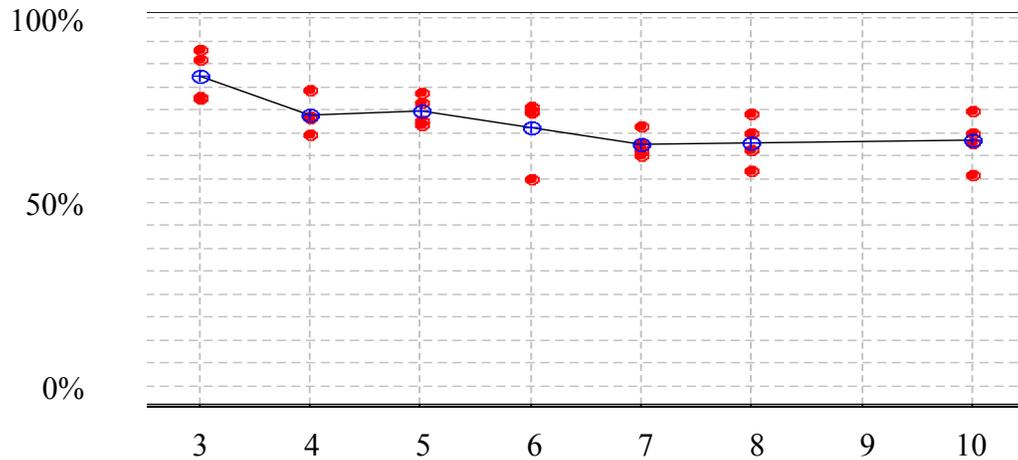


Figure 3. Metro mean rate of reading proficiency by grade.

The Metro educational setting most often displayed the highest reading proficiency rate of all educational settings regardless of grade level. However, the Metro educational setting more than doubled the Urban educational setting's fluctuation in reading proficiency for all grades between 2007-2010. According to the analysis, the Metro educational setting's 3rd grade indicated the highest overall average rate of proficiency (67.4%) and 7th grade had the lowest overall average rate of proficiency (52.6%). The rate of reading proficiency dropped 14.8% between these grades; however, there was a slight rebound in reading proficiency to 55.4% in 10th grade, which resulted in an overall decrease in reading proficiency of 14.0% between 3rd and 10th grade in the Metro educational setting.

Out State reading. The analysis for the Out State educational setting indicated there were significant predictors present, which suggested a relationship between the Out State educational setting and reading proficiency as measured by the MCAs.

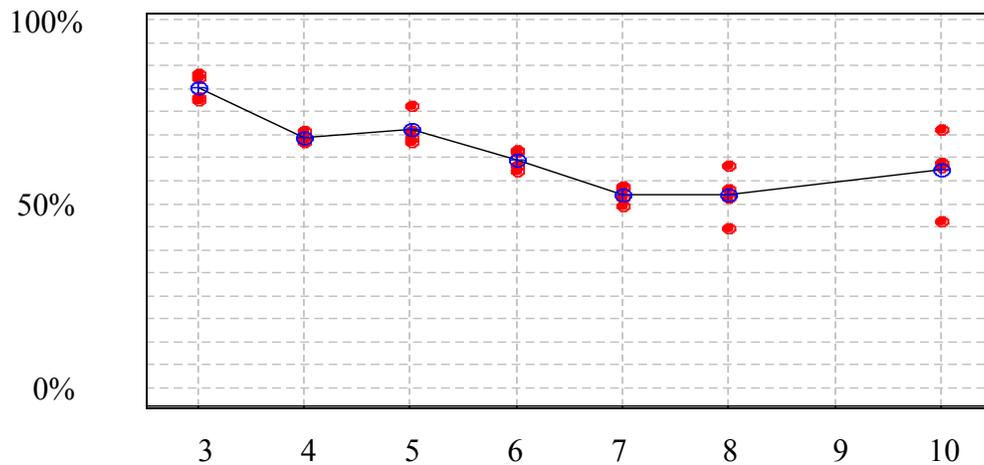


Figure 4. Out State mean rate of reading proficiency by grade.

The Out State educational setting consistently displayed the second highest reading proficiency rate of all four educational settings regardless of grade level. However, the Out State educational setting indicated a high level of fluctuation in reading proficiency for all grades between 2007-2010. According to the analysis, the Out State educational setting's 3rd grade indicated its highest average rate of proficiency (65.3%) and 8th grade had the lowest overall average rate of proficiency (41.9%). The rate of reading proficiency dropped 23.4% between these grades, which was more than triple the Urban educational setting's level of fluctuation in reading proficiency. This educational setting indicated a rebound in reading proficiency to 47.3% in 10th grade, which resulted

in an overall decrease in reading proficiency of 18.0% between 3rd and 10th grade in the Out State educational setting.

BIE reading. The analysis for the BIE educational setting indicated there were significant predictors present, which suggested a relationship between the BIE educational setting and reading proficiency as measured by the MCAs.

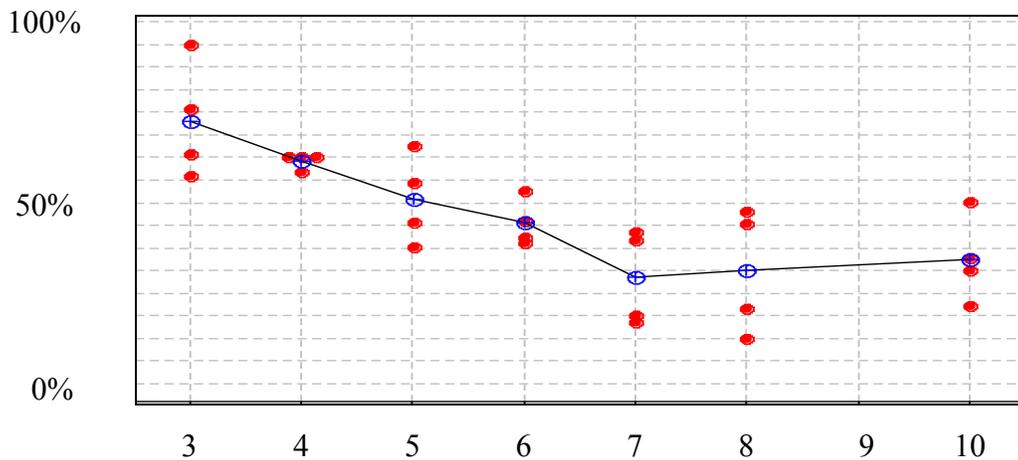


Figure 5. BIE mean rate of reading proficiency by grade.

According to the analysis, the BIE educational setting's 3rd grade indicated the highest overall average rate of proficiency (58.1%) and 7th grade had the lowest overall average rate of proficiency (23.4%). The rate of reading proficiency dropped 34.7% between these grades; however, there was a slight rebound in reading proficiency to 27.5% in 10th grade, which resulted in an overall decrease in reading proficiency of 30.6% between 3rd and 10th grade in the BIE educational setting. Based upon the analysis, the BIE educational setting had the greatest amount of fluctuation in reading

proficiency for all grades between 2007-2010 and the lowest average 10th grade rate of reading proficiency among the four educational settings. Based on the nonlinear regression analysis of MCA reading proficiency during 2007-2010 of American Indian students in the state of Minnesota, null hypotheses 1 and 2 were rejected.

- Reject-Null 1: Grade level has no effect on reading rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.
- Reject-Null 2: Educational setting has no effect on reading rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.

Mathematic Analysis

This study attempted to explore the relationship between educational setting and mathematic proficiency for American Indian students in the state of Minnesota as measured by the MCAs between 2007-2010. The analysis indicated there were significant predictors present within each educational setting mathematics, which suggested a relationship existed between educational setting and mathematic proficiency as measured by the MCAs.

Table 3

Mathematic Analysis (Urban, Metro, and Out State Educational Settings)

Analysis of Variance (ANOVA)						
Source	DF	Seq SS	Adj SS	Adj MS	F	P
Regression	5	1.78065	1.78065	0.35613	154.863	0.000000
Setting	2	0.29003	0.12873	0.06437	27.990	0.000000
Grade	1	1.45307	1.45307	1.45307	631.865	0.000000
Setting*Grade	2	0.03755	0.03755	0.01878	8.165	0.000603
Summary of Model						
R-Sq = 90.85%			R-Sq (adj) = 90.26%			

The linear regression analysis without the BIE educational setting provided a good model fit for the mathematic analysis of the Urban, Metro, and Out State educational settings. According to the analysis, R-Sq was over 90%, which indicated less than 10% of the variability was not accounted for. Due to the fact that both the R-Sq and the R-Sq adj are both high and approximately the same value indicated the model was a strong fit for the data. In addition, all variables (setting, grade, and setting*grade) had a p-value less than 0.05, indicating these factors were significant predictors of the rate of mathematic proficiency.

Table 4

Mathematic Analysis Model for BIE Educational Settings

Logistic Regression Table			
Predictor	Coef	P	
Constant	1.65559	0.000	
Grade	-0.639822	0.000	

Goodness-of-Fit Test			
Method	Chi-Square	DF	P
Pearson	7.92965	5	0.160

The logistic regression analysis showed grade to be significant ($p=0.000$) for rate of mathematic proficiency in the BIE educational setting. According to Paul and Deng (2000), the Pearson score is commonly used to determine goodness-of-fit test of a generalized model with unit dispersion of chi-square statistics. In this case the Pearson test confirmed the goodness of fit for the logistic regression with the p -value = 0.160.

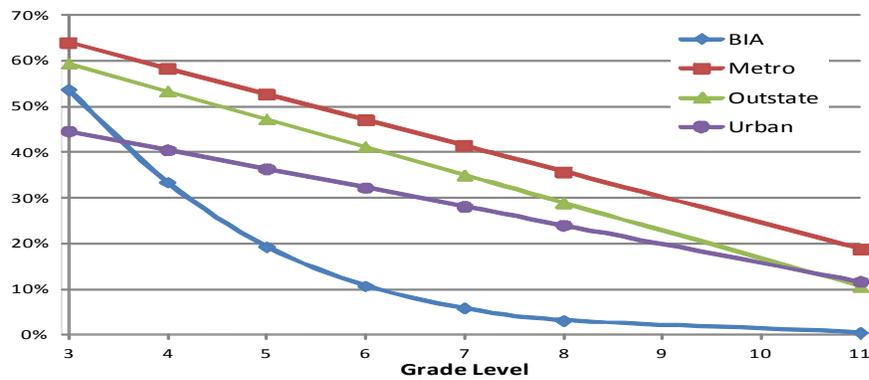


Figure 6. Mathematic proficiency by educational setting and grade level.

Table 5

Average Mathematic Proficiency Mean 2007-2010

Grade	Urban	Metro	Out State	BIE
3	48.5%	69.1%	65.3%	56.6%
4	37.9%	55.9%	52.9%	32.7%
5	33.2%	48.7%	42.4%	15.9%
6	32.5%	43.3%	39.0%	9.6%
7	30.3%	43.1%	33.8%	8.1%
8	21.4%	38.4%	27.9%	4.7%
11	13.0%	18.7%	13.7%	0.0%

Note. **This chart provides the numeric mean of raw data for grade 3-8 and 11 and all four educational settings referenced in the mathematic analysis tables.

Urban mathematics. This study attempted to explore the relationship between educational setting and mathematic proficiency as measured by the MCAs 2007-2010 for American Indian students in the state of Minnesota. The analysis suggested similar trends existed within the Urban, Metro, and Out State educational settings regarding the rate of decrease in proficiency by grade in these three educational settings. The rate of decrease in mathematic proficiency within the BIE educational setting was at a faster rate than the Urban, Metro, or Out State Educational settings. The analysis for the Urban educational setting indicated there were significant predictors present, which suggested a relationship between the Urban educational setting and mathematic proficiency as measured by the MCAs.

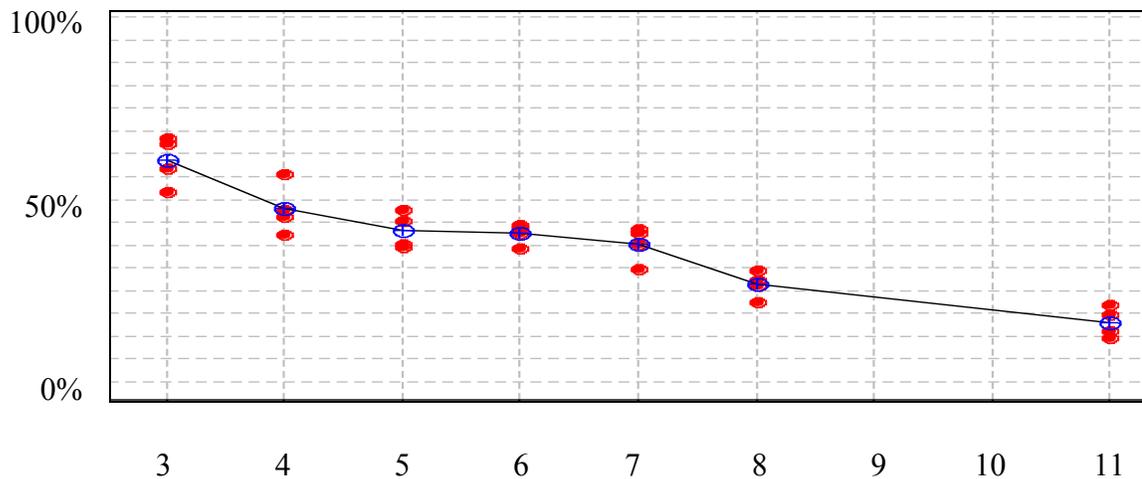


Figure 7. Urban mean rate of mathematics proficiency by grade.

The analysis indicated the Urban educational setting had the lowest drop in proficiency for all grades between 2007-2010. According to the analysis, 3rd grade had the highest overall average rate of proficiency (45.5%) and declined by grade until 11th grade where the lowest overall average rate of proficiency occurred (13.0%). The rate of mathematics proficiency dropped 35.5% between these grades. Unlike reading, there was no rebound in proficiency for mathematics in any educational setting. The data indicated some stability in proficiency rates for the Urban educational setting between 4th grade (37.9%) and 7th grade (30.3%); however, by 8th grade the rate of proficiency had dropped to 21.4%.

Metro mathematics. The analysis for the Metro educational setting indicated there were significant predictors present, which suggested a relationship between the Metro educational setting and mathematics proficiency as measured by the MCAs.

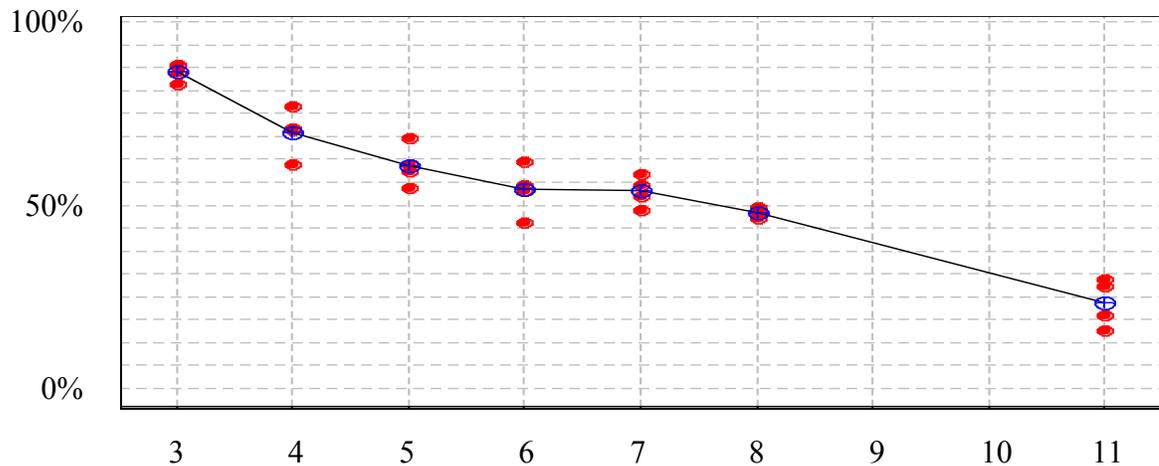


Figure 8. Metro mean rate of mathematics proficiency by grade.

The Metro educational setting displayed the highest mathematics proficiency rate of all educational settings regardless of grade level. According to the analysis, 3rd grade had the highest overall average rate of proficiency (69.1%) and continually declined by grade until 11th grade where the lowest overall average rate of proficiency occurred (18.7%). The rate of mathematics proficiency dropped 50.4% between these grades. The data indicated some stability in proficiency rates for the Metro educational setting between 5th grade (48.7%) and 8th grade (38.4%); however, by 11th grade the rate of proficiency had dropped another 19.7%.

Out State mathematics The analysis for the Out State educational setting indicated there were significant predictors present, which suggested a relationship between the Out State educational setting and mathematics proficiency as measured by the MCAs.

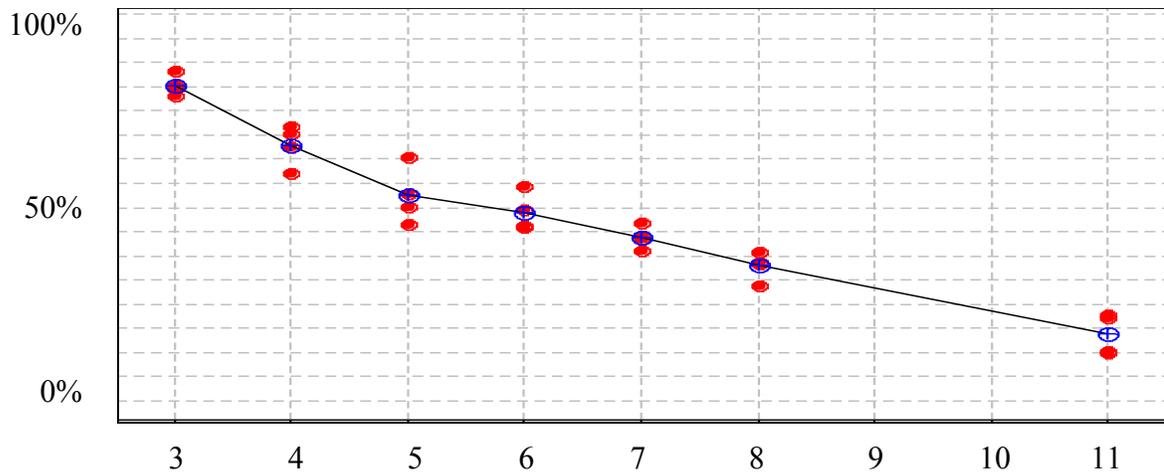


Figure 9. Out State mean rate of mathematic proficiency by grade.

The Out State educational setting consistently displayed the second highest mathematics proficiency rate of all four educational settings regardless of grade level. According to the analysis, 3rd grade had the highest overall average rate of proficiency (65.3%) and continually declined by grade until 11th grade where the lowest overall average rate of proficiency occurred (13.7%). The rate of mathematics proficiency dropped 51.6% between these grades. The data indicated some stability in proficiency rates for the Out State educational setting between 5th grade (42.4%) and 8th grade (27.9%); however, by 11th grade the rate of proficiency had dropped to 13.7%.

BIE mathematics. The analysis for the BIE educational setting indicated there were significant predictors present, which suggested a relationship between the BIE educational setting and mathematics proficiency as measured by the MCAs.

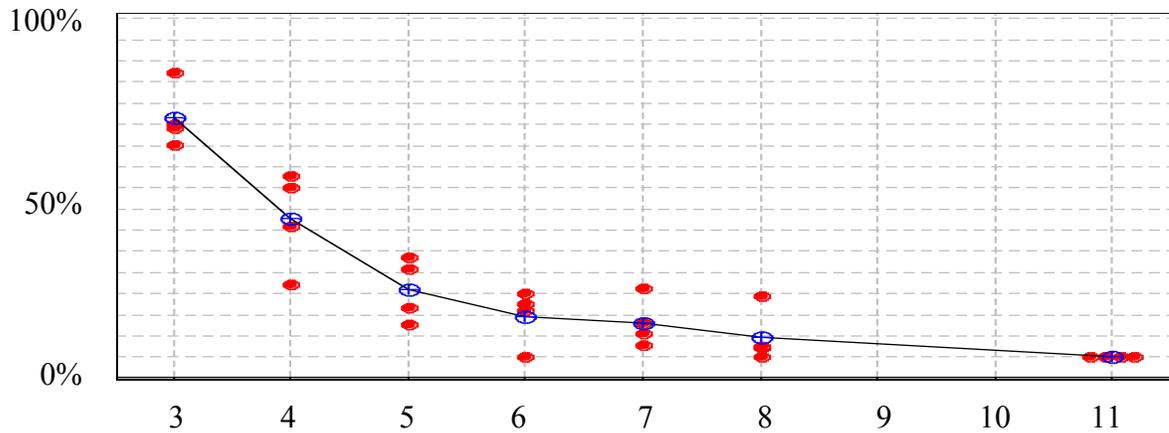


Figure 10. BIE mean rate of mathematic proficiency by grade.

According to the analysis, the BIE educational setting's 3rd grade indicated its highest overall average rate of proficiency (56.6%), which was 8.1% higher than the Urban educational setting mathematics average rate of proficiency; however, by 11th grade 0.00% of the students in the BIE educational setting were proficient. The rate of mathematics proficiency dropped 56.6% between these grades. The data indicated some stability in BIE educational setting proficiency rates between 6th grade (9.6%) and 7th grade (8.1%); however, by 11th grade the rate of proficiency had dropped to 0.00%. This is the only educational setting and subject where students achieved 0.00% proficiency.

Based on the regression analysis of MCA mathematics proficiency during 2007-2010 of American Indian students in the state of Minnesota, null hypotheses 3 and 4 were rejected.

- Reject-Null 3: Grade level has no effect on mathematic rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.
- Reject-Null 4: Educational setting has no effect on mathematic rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.

Summary of Findings

The results of the analysis supported Giroux's (1992) theory that there was a relationship between setting and academic success. According to the analysis, educational setting did have an impact on MCA proficiency for the American Indian students who took the test between 2007-2010 in the state of Minnesota. Based upon the findings from the various analyses completed, the following responses to the four original null hypotheses were identified:

- Reject-Null 1: Grade level has no effect on reading rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.
- Reject-Null 2: Educational setting has no effect on reading rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.
- Reject-Null 3: Grade level has no effect on mathematic rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.

- Reject-Null 4: Educational setting has no effect on mathematic rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.

Chapter 5. Summary and Discussion

This research examined the relationship between educational setting and proficiency as measured by the MCA in mathematics and reading for Minnesota's American Indian students between 2007-2010. Although international regulations, federal policies, and state laws all provided clear support for American Indian people to be educated, many American Indian students in Minnesota were not proficient in reading and mathematics as measured by the MCAs.

Presented in this chapter is a summary of the study's major findings and interpretation, implications of the findings, and limitations of the study. This chapter concludes with recommendations for practice and future research.

Summary of Study

The central research question for this study was, "What impact does educational setting have on MCA proficiency scores for American Indian students in the state of Minnesota grades 3-11?" The following subordinate questions further explored the central research question:

- Is there a relationship between the educational setting of schools and MCA proficiency for American Indian students?
- Does educational setting (i.e., Urban, Metro, Out State, and BIE) have an impact on MCA proficiency for American Indian students?

This study analyzed proficiency standard scores measured by the MCAs collected between 2007 and 2010. This research used quantitative methods through data collection

and descriptive analysis of secondary sources available through the MDE to explore the relationship educational setting had on mathematic and reading proficiency for Minnesota's American Indian students between 2007-2010.

This study incorporated multiple variables, which used empirical data from four educational settings (Urban, Metro, Out State, and BIE) and two academic subjects (mathematics and reading). The analysis used three regression models (linear, non-linear, and logistic), which provided statistical information regarding the relationship between educational setting and proficiency as measured by the MCAs.

Giroux's (1992) research introduced the theory that there is a relationship between educational setting and academic success. Through his examination of politics, education, and educational setting, Giroux (1992) identified a connection between academic progress and postcolonial hegemonic systems that dictated the forms and processes of teaching and learning in specific educational settings. Giroux (1992) suggested the level of self-advocacy or agency established amongst a people/setting played a powerful role in the educational system and process by which education occurred, concluding that educational setting had a direct impact on educational success. This research analysis suggested a relationship existed between educational settings and MCA proficiency scores for American Indian students in the state of Minnesota grades 3-11 between the years of 2007-2010.

Discussion

Based upon the central research question, “What impact does educational setting have on MCA proficiency scores for American Indian students in the state of Minnesota grades 3-11?”, four individual null hypotheses were created and rejected.

- Reject-Null 1 and 3: Grade level has no effect on reading or mathematic rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.

Though no previous research included in the review of literature directly addressed the effect of grade level on reading rate of proficiency for American Indian students, Coburn and Nelson (1987) identified characteristics of American Indian students completing high school, thus aligning high school graduation with academic success for Native students. These characteristics included family support, committed teachers, and a personal belief that education provided the way off the reservation and on to a successful adult life. This information is relevant as a portion of the 10th grade reading MCA is also used in the Minnesota high school graduation assessment for reading. The results indicated that teachers were the most influential factor (Coburn & Nelson, 1987). Other factors included students’ aspirations for postsecondary education, self-confidence, and awareness of the possible consequences connected with dropping out, as well as other extrinsic motivations such as family, friends, and community (Coburn & Nelson, 1987).

- Reject-Null 2 and 4: Educational setting has no effect on reading or mathematic rate of proficiency for American Indian students in the state of Minnesota as measured by MCAs between 2007-2010.

Brown (1991) reviewed the language arts educational process for American Indian students. Brown's (1991) work is specifically important to reading proficiency as the study considered literature, strategic plans, and educational theories as well as the influence of the learning environment. Sampson's (2012) research helped define educational settings as a "complex system" (p. 11). Based upon the need to use various regression models in this research to explore the depth and complexity of the relationship between educational setting and proficiency, Sampson's (2012) understanding of educational settings as "complex systems" appears to be supported in this research (p. 11). Sampson (2012) argued that the understanding of location needed to surpass geography and focus on the "core social fabric of human ecological communities" (p. 11).

The literature reviewed in Chapter 2, as well as this research project, were bound to specific locations and regions and therefore were limited in their ability to suggest the experiences and results from one location are significant or universal for all American Indian students and educational settings. However, when reviewing previous research included in Chapter 2, comparable findings appeared supporting Giroux's (1992) theory.

Churchill's (2004) research documented the boarding school era, which similarly to this research, indicated it was a clearly marked period of time where location impacted American Indian education. Churchill's (2004) work questioned whether or not the

educational policy of the U.S. government had changed from the boarding school era. The findings suggested that regardless of international regulations, federal policies, and state laws, which all have provided clear support for Minnesota's American Indian students to be educated, many American Indian students were not proficient in reading and mathematics as measured by the MCAs. This information brings into question if the MCA is a culturally appropriate assessment for Minnesota's American Indian population. Estrin and Nelson-Barber (1995) focused on whether or not traditional assessments like the MCA test were appropriate tools to measure American Indian academic progress. They advocated effective assessment of indigenous students required both an understanding of socio-cultural perspectives and recognition of differences between community and school in their social and cultural context. Estrin and Nelson-Barber (1995) proposed the argument that such tests may be a better measure of the students' acculturation into Western dominant cultural practices rather than true academic progress.

Research Major Findings and Interpretation

The major research findings portion of this report interpreted information regarding proficiency as measured by the MCAs for Minnesota's American Indian students in four educational settings (Urban, Metro, Out State, and BIE). The following section presents these interpretations regarding the relationship between the educational settings and proficiency.

Reading Analysis Findings

The nonlinear regression analysis for reading showed all input factors: regression (0.000000), setting (0.000017), grade (0.000000), setting*grade (0.000027), and grade squared (0.000000), to be significant with a p-value far below 0.05. According to the R squared statistic of the nonlinear model, over 76% of the variability was accounted for in the analysis with both the R-Sq and the R-Sq adj being high and approximately the same value. Therefore the model was a strong fit for the data. Based upon low p-values and high R-Sq values, the results supported a strong relationship was present between educational settings and reading proficiency.

Mathematic Analysis Findings

The linear regression analysis of the Urban, Metro, and Out State educational settings for mathematics showed all input factors: regression (0.000000), setting (0.000000), grade (0.000000), and setting*grade (0.000603), to be significant with a p-value far below 0.05. According to the R squared statistic of the linear model, over 90% of the variability was accounted for in the analysis with both the R-Sq and the R-Sq adj being high and approximately the same value. Therefore the model was a strong fit for the data from the Urban, Metro, and Out State educational settings.

The BIE analysis used a logistic regression model, which showed grade to be significant ($p=0.000$) for rate of mathematic proficiency. The Pearson goodness-of-fit test confirmed logistic regression to be a good model with the $p\text{-value} = 0.160$. Based upon low p-value for grade the results supported a strong relationship was present between educational settings and mathematic proficiency.

Implications of the Findings

Through the examination of the relationship between educational setting and proficiency in mathematics and reading for Minnesota's American Indian students, the data suggested there was a statistical significance, which indicated a relationship between educational settings and MCA proficiency scores for American Indian students in the state of Minnesota grades 3-11 between the years of 2007-2010.

The results of all the regression analyses (linear, nonlinear, logistic) supported Giroux's (1992) theory that there was a relationship between setting and academic success. According to the analysis, educational setting did have an impact on MCA proficiency for the American Indian students who took the test between 2007-2010 in the state of Minnesota.

The analysis surrounding each individual educational setting indicated both common and unique characteristics were present amongst the educational settings. These characteristics supported Giroux's (1992) theory that politics, education, and location impact academic progress (proficiency) in postcolonial hegemonic systems and may have on some level dictated the overall shape and processes of teaching and learning in specific education settings. Giroux (1992) suggested the level of self-advocacy or agency established amongst a people/setting played a powerful role in education, concluding that educational setting had a direct impact on education. Based upon the finding from the various regression analyses completed, all four original null hypotheses were rejected.

Based upon the result of this study, which included significant relationships between educational settings and MCA proficiency scores, low MCA proficiency scores

in both mathematics and reading, and declining MCA proficiency in both mathematics and reading by grade level, it is clear the 2009 recommendation from the Advisory Task Force on Minnesota American Indian Tribes and Communities and K-12 Standards-Based Reform have not taken place and are still needed (Fraedrich & Brown, 2009). The task force suggested a comprehensive study take place involving American Indian students and their families. They proposed the study should focus on best practices in curriculum content, effective instructional strategies, culturally relevant pedagogy and assessment, and that further legislative recommendations should be developed from the results of the study (Fraedrich & Brown, 2009).

Limitations of the Study

The limitations of this study were consistent with those typically encountered in regression model based studies. One limitation of regression analysis is the measure of proficiency per grade level and academic subject may change through time. Thus, the relationships between variables found during one period may not be consistent as time passes, making it difficult to infer consistency of the correlations between educational setting and proficiency (AnalystNotes.com, n.d.). Research findings may be “arbitraged away in future periods” (AnalystNotes.com, n.d., n.p.). The findings of this study can only be assumed to be accurate for the data collected between 2007-2010. From a research perspective, it would be important to measure possible changes which may have occurred in the various educational settings and within various American Indian communities and which may impact the relationship between American Indian students and their lived experience within the educational setting. In other words, the relationship

between educational setting and Minnesota's American Indian students may not be that of other American Indian populations. Giroux (1992) highlighted several variables (self-advocacy, agency, politics, social economics, education, and the presence and role of postcolonial hegemonic systems on the processes of teaching and learning) that could change over time, which added to the limitation of this study.

Another possible limitation may be that the variables (i.e., educational setting, grade level, proficiency, population, demographics, class size) may not always behave in the same way as they did between 2007-2010. The fact that extensive trend data are not available due to Minnesota's required review and revision of state standards every six years often led to changes in curriculum, testing procedures, and outcome measures (i.e., Minnesota's 2007 academic standards for mathematics, which require for the first time all 8th grade students must take algebra). Possible changes in variables may impact the ability to identify goodness-of-fit analysis models.

Implications for Practice

Based upon the findings in this study, several stark realities appear to be present for Minnesota's American Indian students regardless of international regulations, federal policies, and state laws, which all have provided clear support for Minnesota's American Indian students to be educated. One concern is whether or not these laws and regulations are creating a political façade, which masks the educational policy of the U.S. government. Based upon the analysis, it is hard to see where the U.S. government has actually brought forth any real policy that has been fully enacted and which has produced meaningful change in the lived educational experience of Minnesota's American Indian

students since the boarding school era. This lack of MCA proficiency brings into question whether or not effective instructional strategies, culturally relevant pedagogy, and culturally appropriate assessment are in place for Minnesota's American Indian population.

The primary recommendations moving forward would be to have the entire educational community in Minnesota (Minnesota Department of Education, Minnesota Office of Higher Education, educators, administrators, and government) review the United Nations Resolution 61/295 (United Nations, 2007) to gain a better understanding of how well Minnesota is complying with the resolution. The main questions suggested for review based upon the resolution would be:

1. Have Minnesota's Indigenous peoples established and controlled their educational systems and institutions?
2. Is education being provided in their own languages?
3. Is education being provided in a manner appropriate to Indigenous cultural methods of teaching and learning?
4. Do Indigenous individuals, particularly children, experience all levels and forms of education without discrimination?
5. What effective measures has Minnesota, in conjunction with Indigenous peoples, taken in order for Indigenous individuals, particularly children, including those living outside their communities, have access an education in their own culture and provided in their own language? (United Nations, 2007, n.p.)

In addition to the United Nation resolution, it is important to review and complete the recommendation set forth by the Advisory Task Force on Minnesota American Indian Tribes and Communities and K-12 Standards-Based Reform (Minn. Gen. Laws, 2007). The Advisory Task Force on Minnesota American Indian Tribes and Communities and K-12 Standards-Based called for a comprehensive study involving American Indian students and their families to better understand culturally relevant best practices focused on curriculum content, effective instructional strategies, culturally relevant pedagogy, and assessment. Once the review of the United Nations resolution and the completed recommendations brought forth in 2009 from the Advisory Task Force on Minnesota American Indian Tribes and Communities and K-12 Standards-Based are fulfilled, further legislation should be developed that holds the U.S. and Minnesota governments responsible to fulfill the intent of American Indian Education, which is to provide quality culturally relevant education that prepares Minnesota's American Indian students to be effective members of both their tribal unit and the state of Minnesota.

Ultimately, for Minnesota's American Indian students to become academically successful, the education system must first complete what was started with the United Nations and the Advisory Task Force. Once this has been completed, research-based decision making can occur surrounding what best practices, curriculum content, effective instructional strategies, culturally relevant pedagogy, and culturally relevant assessment actually look like for Minnesota's American Indian students. Once best practices, curriculum content, effective instructional strategies, culturally relevant pedagogy, and culturally relevant assessment are better understood, a plan of implementation could be

developed. One possible approach could be adapted from Demmert's (1994) pragmatic ideology, *Blueprints for Indian Education: Languages and Cultures*, which he compiled from the Indian Nations At Risk Task Force and the White House Conference on Indian Education. Demmert's (1994) work suggested the need to commit to saving and revitalizing indigenous languages as well as the need to value indigenous cultures as national resources. For effective education system change to occur for Minnesota's American Indian students, education must change from a comprehensive assimilation plan designed to eliminate indigenous culture into a culturally rich integration of indigenous identity and culture that benefits all of Minnesota's students through education.

Beaulieu (2011) provided several examples of programs, which were based upon best practices, curriculum content, effective instructional strategies, culturally relevant pedagogy, and culturally relevant assessment. Beaulieu (2011) indicated a connection between best practices, curriculum content, effective instructional strategies, culturally relevant pedagogy, culturally relevant assessment, and academic achievement for American Indian students.

Three examples (TDB, Rock Point, and Rough Rock) from Beaulieu (2011) provided educational settings that could be further explored to better understand possible instructional models that may help meet the unique educational needs of Minnesota's American Indian students. According to Beaulieu (2011), best practices, curriculum content, effective instructional strategies, culturally relevant pedagogy, and culturally relevant assessment did not come at the cost of the children's acquisition of English or

their academic achievement. In these cases the American Indian students who participated outperformed their peers from English-only programs in English reading, writing, and mathematics based upon local and state assessments.

Recommendations for Future Research

This study used pre-existing data collected by the MDE to examine the relationship between educational setting and proficiency of mathematics and reading as measured by the MCAs for Minnesota American Indian students between 2007 and 2010. While the focus of this research project was on proficiency data, information about population size also appeared within the MCA data. Though the data did not provide any definitive reason for the changes within population between educational setting and grades, future research using population data may help provide a more complete picture of the American Indian education experience within the state of Minnesota.

Although this study did not attempt to establish a correlation between population size and proficiency, the data set included in the appendix indicated several changes in population, which may be noteworthy to explore the shift of population size per grade. Based upon the data set located in the appendix, there appeared to be a 19.52% decrease in overall population between 3rd grade and 11th grade for American Indian students in the state of Minnesota. The Metro educational setting's 11th grade population was larger than its 3rd grade population; all other educational settings indicated a smaller 11th grade population than their 3rd grade population. The largest variation occurred within the BIE educational setting (-63.56%). The data did not provide the reasons for population changes. Future research could examine several possible reasons for the changes:

mobility, dropout, birthrates, and mortality rates and their possible relationship to proficiency.

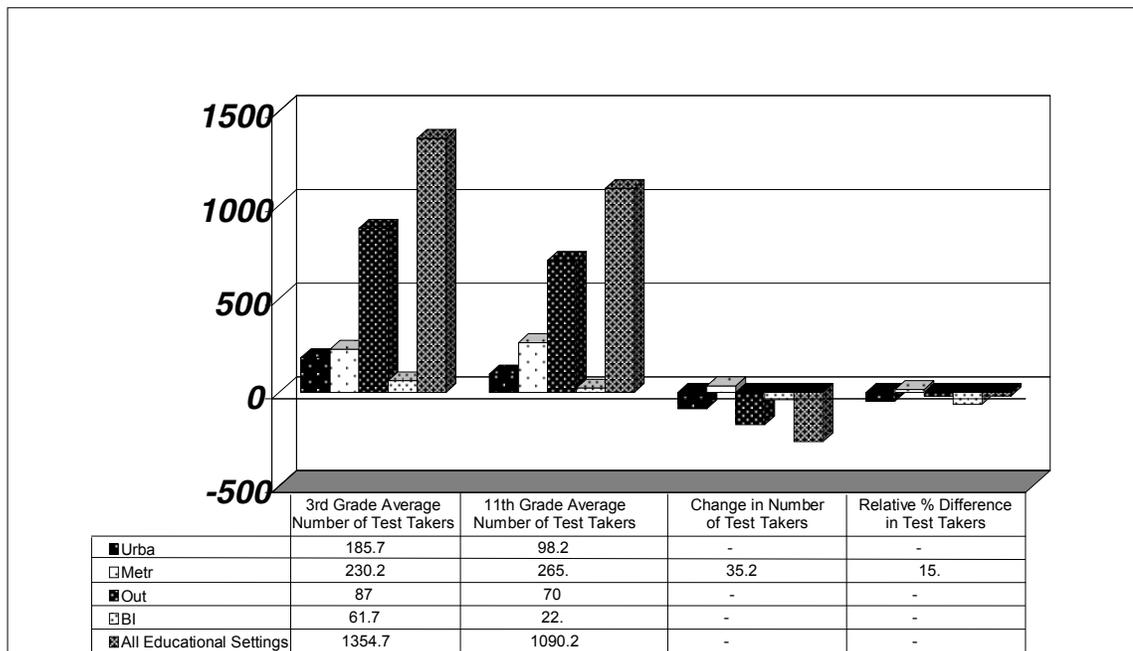


Figure 11. Change in population size between 3rd and 11th grade.

Based upon the information not included in the raw data set, several possible additional research questions remain. Some of the remaining questions which future research may help to better understand the relationship between educational setting and proficiency include:

- Does school/district population size have an effect on American Indian students' MCA proficiency? For example, are American Indian students'

MCA proficiency rates equal in schools/districts with large or small populations?

- What is the effect of racial diversity on MCA proficiency for American Indian students? Is there a racially identified environment in which American Indian students' MCA proficiency results are high or low?
- Is there a difference in MCA proficiency between genders of American Indian students?

Previous research models used with other indigenous groups may, if replicated, also provide meaningful insight into Minnesota's American Indian educational experience. For example, Barnhardt's (1994) work explored multiple factors, including various intelligence styles, culturally diverse and respectful student support services, family and community support, educational and life experiences, and individual efforts. McEachern's (1990) work reviewed emergent literacy and its impact on young American Indian students, and Coburn and Nelson (1987) identified characteristics of American Indian students completing high school.

In addition to these questions, a deeper understanding of beliefs and values of Minnesota's American Indian students directly connected to what Giroux (1992) identified as key educational setting elements (politics, education, economics, self-advocacy, or agency) may also help more fully understand the educational experience of American Indian students in Minnesota. Future research using these questions may provide a deeper understanding of the identified relationship between educational setting and proficiency of American Indian students in Minnesota.

Final Thoughts and Conclusion

Although international regulations, federal policies, and state laws all provided clear support for American Indian people to be educated, many American Indian students were not proficient in reading and mathematics as measured by the MCAs. Based upon the data and analysis of Minnesota's American Indian student population between 2007-2010, all four educational settings indicated higher proficiency in reading over mathematics in varying degrees. According to the data, the highest average percent proficiency in both mathematics and reading was located within the Metro educational setting. The greatest average percentage point difference was identified within the BIE educational setting. This suggested the largest gap between reading proficiency and mathematics proficiency was located within the BIE educational setting.

According to MDE's data for this time period, nearly 18,000 American Indian students in the state of Minnesota not only made up the largest population per capita of students receiving special education services (22.6%), but also over 70% of this population received either free or reduced lunch. In addition, this group appeared not to be achieving high levels of mathematic and reading proficiency as measured by the MCAs.

Based upon the research completed, Minnesota's American Indian population may benefit from educational reform that included critical elements identified in Giroux's 1992 theory (politics, education, economics, self-advocacy, or agency). This research affirms the proposed request of 2009 Advisory Task Force findings. American Indian education in the state of Minnesota may also benefit from future legislation developed to

support or reform current educational law (No Child Left Behind through Title VII. SEC. 7101), which indicated the intent of the U.S. to fulfill their legal responsibility to provide the highest quality programs to address the unique culturally and educational related needs of American Indian children.

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Appendix

Data Set

		Grade	All Tested Grades			
			% Proficient	Not Proficient	Proficient	Total
Mathematics	2010	Urban	34.24%	749	390	1139
		Metro	47.84%	916	840	1756
		Outstate	43.98%	3411	2678	6089
		BIE	27.53%	208	79	287
	2009	Urban	33.49%	697	351	1048
		Metro	45.95%	941	800	1741
		Outstate	41.42%	3538	2502	6040
		BIE	20.44%	253	65	318
	2008	Urban	32.26%	693	330	1023
		Metro	43.67%	988	766	1754
		Outstate	38.19%	3663	2263	5926
		BIE	23.68%	237	72	304
	2007	Urban	30.44%	761	333	1094
		Metro	41.50%	1029	730	1759
		Outstate	36.39%	3646	2086	5732
		BIE	18.75%	247	57	304

		Grade	03			
			% Proficient	Not Proficient	Proficient	Total
Mathematics	2010	Urban	52.23%	107	117	224
		Metro	70.45%	65	155	220
		Outstate	68.17%	289	619	908
		BIE	54.17%	33	39	72
	2009	Urban	46.77%	99	87	186
		Metro	66.36%	74	146	220
		Outstate	64.73%	321	589	910
		BIE	55.00%	27	33	60
	2008	Urban	53.33%	77	88	165
		Metro	68.89%	70	155	225
		Outstate	63.15%	314	538	852
		BIE	67.35%	16	33	49
	2007	Urban	41.67%	98	70	168
		Metro	70.70%	75	181	256
		Outstate	65.16%	292	546	838
		BIE	50.00%	33	33	66

		Grade	04			
			% Proficient	Not Proficient	Proficient	Total
Mathematics	2010	Urban	37.63%	121	73	194
		Metro	61.51%	92	147	239
		Outstate	56.73%	392	514	906
		BIE	42.86%	28	21	49
	2009	Urban	45.51%	91	76	167
		Metro	56.71%	100	131	231
		Outstate	55.34%	389	482	871
		BIE	40.00%	27	18	45
	2008	Urban	32.34%	113	54	167
		Metro	56.37%	113	146	259
		Outstate	52.49%	410	453	863
		BIE	30.77%	45	20	65
	2007	Urban	36.26%	116	66	182
		Metro	48.92%	118	113	231
		Outstate	47.00%	441	391	832
		BIE	16.98%	44	9	53

		Grade	05			
			% Proficient	Not Proficient	Proficient	Total
Mathematics	2010	Urban	29.59%	119	50	169
		Metro	48.96%	123	118	241
		Outstate	50.29%	428	433	861
		BIE	23.68%	29	9	38
	2009	Urban	30.30%	115	50	165
		Metro	54.62%	118	142	260
		Outstate	42.81%	513	384	897
		BIE	11.67%	53	7	60
	2008	Urban	37.65%	101	61	162
		Metro	47.41%	132	119	251
		Outstate	40.09%	508	340	848
		BIE	20.75%	42	11	53
	2007	Urban	35.40%	104	57	161
		Metro	43.67%	129	100	229
		Outstate	36.56%	524	302	826
		BIE	7.69%	48	4	52

		Grade	06			
			% Proficient	Not Proficient	Proficient	Total
Mathematics	2010	Urban	33.73%	110	56	166
		Metro	49.63%	136	134	270
		Outstate	44.23%	517	410	927
		BIE	14.89%	40	7	47
	2009	Urban	29.19%	114	47	161
		Metro	43.08%	148	112	260
		Outstate	39.59%	528	346	874
		BIE	10.87%	41	5	46
	2008	Urban	32.65%	99	48	147
		Metro	44.26%	131	104	235
		Outstate	36.11%	559	316	875
		BIE	0.00%	49	0	49
	2007	Urban	34.29%	92	48	140
		Metro	36.33%	163	93	256
		Outstate	35.92%	546	306	852
		BIE	12.50%	28	4	32

		Grade	07			
			% Proficient	Not Proficient	Proficient	Total
Mathematics	2010	Urban	32.65%	99	48	147
		Metro	46.86%	144	127	271
		Outstate	36.79%	567	330	897
		BIE	7.89%	35	3	38
	2009	Urban	30.13%	109	47	156
		Metro	44.35%	138	110	248
		Outstate	34.09%	584	302	886
		BIE	2.86%	34	1	35
	2008	Urban	33.59%	85	43	128
		Metro	39.06%	156	100	256
		Outstate	33.37%	587	294	881
		BIE	5.41%	35	2	37
	2007	Urban	24.85%	124	41	165
		Metro	41.98%	152	110	262
		Outstate	31.08%	601	271	872
		BIE	16.22%	31	6	37

		Grade	08			
			% Proficient	Not Proficient	Proficient	Total
Mathematics	2010	Urban	21.21%	104	28	132
		Metro	39.68%	152	100	252
		Outstate	28.35%	642	254	896
		BIE	0.00%	16	0	16
	2009	Urban	24.43%	99	32	131
		Metro	37.21%	162	96	258
		Outstate	30.88%	602	269	871
		BIE	2.08%	47	1	48
	2008	Urban	17.45%	123	26	149
		Metro	38.02%	163	100	263
		Outstate	28.70%	621	250	871
		BIE	14.29%	36	6	42
	2007	Urban	22.35%	139	40	179
		Metro	38.82%	156	99	255
		Outstate	23.69%	654	203	857
		BIE	2.56%	38	1	39

		Grade	High School (Mathematics: 11 & Reading: 10)			
			% Proficient	Not Proficient	Proficient	Total
Mathematics	2010	Urban	16.82%	89	18	107
		Metro	22.43%	204	59	263
		Outstate	17.00%	576	118	694
		BIE	0.00%	27	0	27
	2009	Urban	14.63%	70	12	82
		Metro	23.86%	201	63	264
		Outstate	17.78%	601	130	731
		BIE	0.00%	24	0	24
	2008	Urban	9.52%	95	10	105
		Metro	15.85%	223	42	265
		Outstate	9.78%	664	72	736
		BIE	0.00%	14	0	14
	2007	Urban	11.11%	88	11	99
		Metro	12.59%	236	34	270
		Outstate	10.23%	588	67	655
		BIE	0.00%	25	0	25

		Grade	All Tested Grades			
			% Proficient	Not Proficient	Proficient	Total
Reading	2010	Urban	40.39%	676	458	1134
		Metro	59.23%	724	1052	1776
		Outstate	53.76%	2881	3350	6231
		BIE	43.09%	167	131	304
	2009	Urban	41.98%	633	458	1091
		Metro	58.02%	741	1024	1765
		Outstate	51.08%	3003	3136	6139
		BIE	34.54%	208	105	304
	2008	Urban	41.21%	602	422	1024
		Metro	58.31%	743	1039	1782
		Outstate	51.32%	2921	3080	6001
		BIE	46.38%	180	141	304
	2007	Urban	36.84%	720	420	1140
		Metro	53.15%	833	945	1778
		Outstate	47.47%	3141	2838	5979
		BIE	36.18%	201	110	304

		Grade	03			
			% Proficient	Not Proficient	Proficient	Total
Reading	2010	Urban	45.74%	121	102	223
		Metro	62.95%	83	141	224
		Outstate	62.57%	341	570	911
		BIE	45.83%	39	33	72
	2009	Urban	46.28%	101	87	188
		Metro	62.56%	82	137	219
		Outstate	63.11%	335	573	908
		BIE	50.85%	29	30	59
	2008	Urban	49.40%	84	82	166
		Metro	70.98%	65	159	224
		Outstate	68.24%	269	578	847
		BIE	75.00%	12	36	48
	2007	Urban	44.71%	94	76	170
		Metro	73.15%	69	188	257
		Outstate	67.30%	274	564	838
		BIE	60.61%	26	40	66

		Grade	04			
			% Proficient	Not Proficient	Proficient	Total
Reading	2010	Urban	35.42%	124	68	192
		Metro	58.58%	99	140	239
		Outstate	53.36%	424	485	909
		BIE	50.00%	25	25	50
	2009	Urban	45.18%	91	75	166
		Metro	58.37%	97	136	233
		Outstate	55.95%	385	489	874
		BIE	46.67%	24	21	45
	2008	Urban	36.53%	106	61	167
		Metro	64.37%	93	168	261
		Outstate	53.78%	397	462	859
		BIE	50.00%	31	31	62
	2007	Urban	44.20%	101	80	181
		Metro	54.74%	105	127	232
		Outstate	54.56%	379	455	834
		BIE	50.00%	26	26	52

		Grade	05			
			% Proficient	Not Proficient	Proficient	Total
Reading	2010	Urban	45.56%	92	77	169
		Metro	61.57%	93	149	242
		Outstate	61.33%	336	533	869
		BIE	52.63%	18	20	38
	2009	Urban	42.17%	96	70	166
		Metro	63.85%	94	166	260
		Outstate	53.42%	416	477	893
		BIE	35.59%	38	21	59
	2008	Urban	44.24%	92	73	165
		Metro	57.71%	107	146	253
		Outstate	55.93%	375	476	851
		BIE	44.23%	29	23	52
	2007	Urban	38.27%	100	62	162
		Metro	56.65%	101	132	233
		Outstate	54.34%	379	451	830
		BIE	30.19%	37	16	53

		Grade	06			
			% Proficient	Not Proficient	Proficient	Total
Reading	2010	Urban	42.94%	93	70	163
		Metro	60.74%	106	164	270
		Outstate	51.52%	448	476	924
		BIE	42.55%	27	20	47
	2009	Urban	39.88%	98	65	163
		Metro	59.54%	106	156	262
		Outstate	51.32%	425	448	873
		BIE	31.11%	31	14	45
	2008	Urban	39.46%	89	58	147
		Metro	59.83%	94	140	234
		Outstate	48.40%	452	424	876
		BIE	36.00%	32	18	50
	2007	Urban	38.57%	86	54	140
		Metro	44.92%	141	115	256
		Outstate	47.15%	454	405	859
		BIE	32.35%	23	11	34

		Grade	07			
			% Proficient	Not Proficient	Proficient	Total
Reading	2010	Urban	35.86%	93	52	145
		Metro	52.57%	129	143	272
		Outstate	43.46%	510	392	902
		BIE	33.33%	26	13	39
	2009	Urban	34.19%	102	53	155
		Metro	56.50%	107	139	246
		Outstate	41.26%	521	366	887
		BIE	15.15%	28	5	33
	2008	Urban	42.52%	73	54	127
		Metro	50.00%	128	128	256
		Outstate	43.89%	496	388	884
		BIE	31.58%	26	12	38
	2007	Urban	32.52%	110	53	163
		Metro	51.14%	129	135	264
		Outstate	39.61%	526	345	871
		BIE	13.51%	32	5	37

		Grade	08			
			% Proficient	Not Proficient	Proficient	Total
Reading	2010	Urban	34.11%	85	44	129
		Metro	59.13%	103	149	252
		Outstate	48.21%	463	431	894
		BIE	35.29%	11	6	17
	2009	Urban	37.04%	85	50	135
		Metro	51.34%	127	134	261
		Outstate	43.07%	493	373	866
		BIE	16.67%	40	8	48
	2008	Urban	31.54%	102	47	149
		Metro	54.85%	121	147	268
		Outstate	41.47%	508	360	868
		BIE	38.10%	26	16	42
	2007	Urban	29.83%	127	54	181
		Metro	46.67%	136	119	255
		Outstate	34.66%	560	297	857
		BIE	10.00%	36	4	40

		Grade	High School (Mathematics: 11 & Reading: 10)			
			% Proficient	Not Proficient	Proficient	Total
Reading	2010	Urban	39.82%	68	45	113
		Metro	59.93%	111	166	277
		Outstate	56.33%	359	463	822
		BIE	40.00%	21	14	35
	2009	Urban	49.15%	60	58	118
		Metro	54.93%	128	156	284
		Outstate	48.93%	428	410	838
		BIE	25.00%	18	6	24
	2008	Urban	45.63%	56	47	103
		Metro	52.80%	135	151	286
		Outstate	48.04%	424	392	816
		BIE	17.24%	24	5	29
	2007	Urban	28.67%	102	41	143
		Metro	45.91%	152	129	281
		Outstate	36.07%	569	321	890
		BIE	27.59%	21	8	29