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An Analysis of 8th Grade Student Achievement of Private and Public Schools in the Dominican Republic in Rural and Urban Settings

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AN ANALYSIS OF 8th GRADE STUDENT ACHIEVEMENT OF PRIVATE
AND PUBLIC SCHOOLS IN THE DOMINICAN REPUBLIC
IN RURAL AND URBAN SETTINGS

by

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A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Education
in the School of Teaching, Learning, and Leadership
in the College of Education and Human Performance
at the University of Central Florida
Orlando, Florida

Summer Term
2018

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ABSTRACT

The purpose of this study was to determine the difference in student academic achievement in private and public schools in the Dominican Republic in rural and urban settings. The 2016 8th Grade National Exams school mean scale scores were analyzed to determine if statistically significant differences existed among the different school types and school settings. There was a lack of literature on student academic achievement in the Dominican Republic, in particular on private and public school and rural and urban school students. The extant literature indicated that in the Dominican Republic, private school students historically had higher academic achievement on standardized exams than public school students. The higher student academic achievement of private school students followed the trend of student academic achievement in Latin America and the Caribbean.

This study found statistically significant differences between private and public schools, rural private and rural public schools, and between urban private and urban public schools, in favor of private schools. These results provide evidence for school district leaders and school administrators to use in decision making about how to raise student academic achievement in rural and urban areas. The findings also contribute to the gap in literature on private and public school student academic achievement in the Dominican Republic and Latin America and the Caribbean.

This work is dedicated to my grandfather, L.L. Boyd, who inspired me to follow in his footsteps; to my wife, who supported me and encouraged me along the way; and to my daughter, in the hopes that she too will fall in love with learning as I did. May you never stop marveling at the goodness of the Lord in creation.

ACKNOWLEDGMENTS

Every man and woman is a beggar before God and I, just as much as anyone, have received all good things from him, including the intellectual and human virtues that have aided me along the way. We are also indebted to those who go before us, whose guidance, care, and patience enables us to thrive. Chief among these are my parents who sacrificed so much that their children might have good lives. I also must acknowledge my seven siblings, what a perfect number, and what perfect friends to have had and to have for my whole life! To all my teachers, from elementary school through my doctoral classes, thank you for stoking the fires of intellectual curiosity and studiousness. You have chosen the noblest profession, thank you!

To Dr. Taylor and Dr. Baldwin, I hold you in the highest esteem for your excellence in your field, but even more so for your personal, ethical, human goodness. You inspire me to be a better man by the way you live, thank you. To Dr. Doherty and Dr. Flanagan, thank you for so selflessly sacrificing your time to help me achieve my dreams.

My friends, especially those in my inner circle, you were supportive of this dream even though it meant less time together. Thank you, for your encouragement, prayers, and continued friendship, even when I was not there for the important moments in your life.

I would be remiss not to thank my in-laws for their support of me, my wife, and their beautiful grandchild as I so often had to spend my time researching and writing. You are a gift from God and I am grateful to you for accepting me so lovingly into your family.

To my little girl, thank you for letting me spend so much time away from you when all I wanted to do was hold you. Now that I am done, I will make up for lost time!

Finally, to my wife and best friend, thank you. I would not want to be on this adventure with anyone else. You are the best, and I love you mucho!

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CHAPTER I: INTRODUCTION

The present study examined the differences in student academic achievement in private and public schools in the Dominican Republic, a developing nation located on the eastern two thirds of the island of Hispaniola. The Dominican Republic had a population of 9,980,243 (Ministerio de Turismo, 2017). In 2010, 7,013,575 of its inhabitants resided in urban areas while 2,431,700 lived in rural areas. (Ministerio de Economía, Planificación, y Desarrollo [MEPD], 2012). As of 2012, over two thirds of the Dominican population, 3,608,626 were of school age (MEPD, 2012).

According to Hanushek and Woessmann (2012) improving the quality of education, as measured by student academic achievement, was one of the essential elements to economic growth needed in a developing country. The assessment used by Hanushek and Woessmann (2012) to determine the quality of education was the 2015 PISA, in which the Dominican Republic ranked last out of 70 participating countries (OECD, 2016). While the difference in student academic achievement between private and public education was the focus of research throughout the Latin America and Caribbean region in general, there was a lack of research on the difference in student academic achievement between private and public schools in the Dominican Republic.

As an example of the differences in student achievement, Luna, Gonzalez, and Wolfe (1990) published a study on mathematics achievement among six types of schools in the Dominican Republic, using data collected during the 1982-83 academic year. The study included rural, urban public, and urban private schools. Rural schools were not divided into private and public categories as the "characteristics of these schools [were] more homogenous than those of the schools in urban areas" (Luna et al., 1990, p. 367). Of note, the scores of the

highest achieving schools, urban private schools, were below the mean scores of all other nations participating in the Second International Mathematics Study [SIMS] exam (Luna, Gonzalez, & Wolfe, 1990).

Two studies from 1991 and 1995 compared private and public school student achievement in the Dominican Republic and other developing nations. For both studies the authors used data from a 1986 study by Luna and Gonzalez (as cited in Jimenez, Lockheed, & Paqueo, 1991). The data from Luna and Gonzalez excluded rural schools (Jimenez & Lockheed, 1995).

Jimenez, Lockheed, and Paqueo (1991) compared the efficiency of private and public schools in developing nations, including the Dominican Republic. Jimenez and Lockheed (1995) studied mathematics achievement in private and public schools in five developing nations, including the Dominican Republic, and did not separate rural schools into private and public categories. In both the 1991 study by Jimenez, Lockheed, and Paqueo and the 1995 study by Jimenez and Lockheed, private schools had higher mean student achievement scores than public schools.

For third grade language achievement on the 1996 Primer Estudio Internacional Comparativo (PEIC) [First Comparative International Study], the Dominican Republic had the lowest mean score out of 11 Latin American and Caribbean countries. The mean raw score for the Dominican Republic was approximately 225 out of 400, approximately 30 points below the mean raw score of the other 11 Latin American and Caribbean countries included in the study (B. Alvarez, 2000, p. 12). In addition to low student academic achievement for that region, the Dominican Republic also had low school enrollment for some populations (B. Alvarez, 2000). In 1996, school enrollment in the Dominican Republic was approximately 80% for ages 7-14

and approximately 40% for ages 15-18 (B. Alvarez, 2000). Approximately 15% of low socioeconomic status 15-18-year old students persisted in school until the 9th grade (B. Alvarez, 2000). By comparison, approximately 65% of students from the highest socioeconomic strata stayed in school until 9th grade (B. Alvarez, 2000).

In 2004, Somers, McEwan, and Willms studied the efficiency of private schools relative to public schools when controlling for peer group characteristics. Somers et al. (2004), acknowledging that private schools typically achieve higher mean scores on standardized tests, argued that "prior studies misrepresent the private school effect by failing to control for the characteristics of student peer groups" (p. 50). The authors used data collected from the 1997 Primer Estudio Internacional Comparativo (PEIC) conducted in 13 Latin American and Caribbean nations and omitted rural school data (Somers et al., 2004, p. 58).

Carola Alvarez (2004) published a report for the Inter-American Development Bank comparing student academic achievement in the Dominican Republic to that of other Latin American countries. The report was based on data from the 1997 Primer Estudio Internacional Comparativo [PEIC] (First International Comparative Study) which did not differentiate between private and public rural schools (C. Alvarez, 2004). The Dominican Republic had the third lowest mean 3rd grade scores in mathematics and the second lowest in language (C. Alvarez, 2004). Alvarez (2004) concluded that despite improvements, the educational system in the Dominican Republic still needed significant improvement to adequately serve students, especially because of growing inequity for rural and marginalized urban populations.

Statement of the Problem

Overall, the discovery of the lack of research on student achievement in private and public schools in the Dominican Republic initiated the need for this study. The present study investigated student achievement by school type (private or public) and location (rural or urban) in the Dominican Republic during the 2015-2016 academic year to respond to the problem of lack of research.

Purpose of the Study

The purpose of this study was to determine the difference in student achievement in private and public schools in the Dominican Republic in rural and urban locations. Data from the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences) were analyzed to ascertain differences in student academic achievement based on school type (private or public) and location (rural or urban).

Significance of the Study

The study was important in that it addressed a gap in research on student achievement in the Dominican Republic and identified in which type school (public or private) and in which location (rural or urban) students achieved the highest scores on the 2016 8th Grade National Exams.

The review of literature also identified no published studies analyzing the differences in student achievement in rural private and rural public schools in the Dominican Republic. In 2016, rural schools accounted for 32.4% of all public school enrollment (Ministerio de Educación de la República Dominicana, 2016a), and yet, Alvarez (2000) identified rural areas of the Dominican Republic as places of particular need for educational improvement where

"poverty and ignorance" (p. 5) endure despite increased access to education. Thus, this study addressed the gap in research on rural private and rural public student academic achievement in the Dominican Republic.

Definitions of Terms

The following terms and their definitions are presented to narrow the scope of the study. These definitions may differ from those employed outside of the Dominican Republic.

8th Grade National Exams

The 8th Grade National Exams are standardized tests administered to all 8th grade students enrolled in schools officially recognized by the Ministry of Education to determine student promotion and provide data on the performance, quality, and learning achievements of the educational system in the Dominican Republic (Ministerio de Educación de la República Dominicana, 2016b).

2010 National Census

The 2010 National Census of Population and Housing was completed on an approximately 10 year cycle by the National Office of Statistics of the Dominican Republic (Ministerio de Economía, Planificación y Desarrollo, 2012). The purpose of the census was to gather economic, social, and demographic data for planning and development purposes (Ministerio de Economía, Planificación y Desarrollo, 2012).

Rural

According to the National Office of Statistics of the Dominican Republic, rural is defined as that which is located outside of the municipal center and municipal districts of the country (Ministerio de Economía, Planificación y Desarrollo, 2012).

Urban

According to the National Office of Statistics of the Dominican Republic, urban is defined as that which is located within the municipal center and municipal districts of the country (Ministerio de Economía, Planificación y Desarrollo, 2012).

Rural Private Schools

A rural private school is any school designated by the Ministry of Education as private and rural, rural-isolated, or rural-touristic (Ministerio de Educación de la República Dominicana, 2016a).

Rural Public Schools

A rural public school is any school designated by the Ministry of Education as public and rural, rural isolated, or rural-touristic (Ministerio de Educación de la República Dominicana, 2016a).

Urban Private Schools

An urban private school is any school designated by the Ministry of Education as private and urban, urban-marginal, or urban-touristic (Ministerio de Educación de la República Dominicana, 2016a).

Urban Public schools

An urban public school is any school designated by the Ministry of Education as both public and urban, urban-marginal, or urban-touristic (Ministerio de Educación, 2016a).

Achievement Gap

The term achievement gap refers to "the observed gap in academic performance between" (Chambers, 2009, p. 417) groups of students from different ethnic, racial, linguistic, or socioeconomic backgrounds (Griner & Stewart, 2013, p. 586).

Disadvantaged Student

The term disadvantaged student or students is used in the literature to refer to students from lower socioeconomic status, underrepresented minorities, and students with "low prior academic performance" (Goldhaber, Theobald, & Lavery, 2015, p. 293).

Conceptual Framework

The present study was organized as a quantitative outcome analysis based on the concepts identified in the literature most related to student academic achievement in private and public schools in the Dominican Republic in rural and urban settings. These concepts include: urban education globally, rural education globally, education and student academic achievement in Latin America and the Caribbean, and education and student academic achievement in the Dominican Republic.

Urban Education

There was no universally agreed upon definition of urban education, so the conceptual framework consists of common themes or features identified in the literature. One such feature

was the presence of an academic achievement gap between groups of students more likely to attend urban schools and groups of students more likely to attend non-urban schools (Boyd, Lankford, Loeb, & Wyckoff, 2013). Additional features of urban education included the influence of low socioeconomic status (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2006; Reardon, 2011; Sass, Hannaway, Xu, Figlio, & Feng, 2012), parental background and involvement (Barton, Drake, & Perez, 2004; Jeynes, 2007, 2012, 2016; Pérez Carreón, Drake, & Barton, 2005), and teacher quality (Merryfield, 2000; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004).

Achievement Gaps

There were achievement gaps among groups of students typical of urban schools and groups of students less typical of urban schools, the former groups being racial and ethnic minorities and students from low socioeconomic status backgrounds (Reardon, 2011, 2016; Reardon & Portilla, 2016). In the USA, the existence of racial/ethnic achievement gaps dated as far back at 1965 (Coleman et al., 1966). On a nationally administered standardized exam given in the USA in 1965, Black students had median scores of 41.8 in mathematics and 42.2 in verbal, Mexican American students had median scores of 44.2 in mathematics and 45.5 in verbal, Puerto Rican students had median scores of 42.6 in mathematics and 43.7 in verbal, and White students had median scores of 51.8 in mathematics and 51.9 in verbal (Coleman et al., 1966). The exam had a mean score of 50 and a standard deviation of 10, out of a sample of approximately 100,000 12th grade students in the fall of 1965 (Coleman et al., 1966, pp. 20, 557). The test scale was not stated (Coleman et al., 1966). The differences in student academic achievement reported in 1966 (Coleman et al., 1966) are represented in Table 1.

Table 1

1965 USA 12th Grade Median Score by Race (N = 97,660)

	White	Black	Puerto Rican	Mexican American
Mathematics	51.8	41.8	42.6	44.2
Verbal	51.9	42.2	43.7	45.5

Note. Median scores by race from Coleman, J. S., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., & York, R. L. (1966). *Equality of educational opportunity*. (Equality of Educational Opportunity No. OE-38001). Washington, DC: U.S. Department of Health, Education, & Welfare.

In the USA, the size of the racial and ethnic achievement gaps decreased since the *Equality of Educational Opportunity* (Coleman et al., 1966) reported gaps in 1966. However, the achievement gaps among Black, Puerto Rican, Mexican, and White students still existed and there was evidence that racial achievement gaps grew as students progressed through school (Hanushek & Rivkin, 2006). In addition to the racial and ethnic achievement gaps, there was an income achievement gap in urban areas between students from the lowest socioeconomic statuses and students from higher socioeconomic statuses (Isenberg et al., 2013; Magnuson & Waldfogel, 2016; Murnane et al., 2006; Reardon, 2011). In the USA, "the income achievement gap [was almost] twice as large as the Black-White achievement gap" (Reardon, 2011, p. 1). At the time of the *Equality of Educational Opportunity* report, the reverse was true, as the Black-White achievement gap was twice as large as the income achievement gap (Coleman et al., 1966). While the income achievement gap appeared to be decreasing in size, it was hypothesized that it may take 60-110 years before the income achievement gap has been eliminated (Reardon & Portilla, 2016, p. 12).

Socioeconomic Status and Achievement

A high percentage of low socioeconomic status [SES] students was characteristic of urban education, and low SES status had a negative effect on student academic achievement (Goodyear et al., 2012; Reardon, 2016; Reardon & Portilla, 2016). While non-urban schools have low SES students, students from urban schools experienced the effects of low SES differently because of the different role money played for urban families, the different experiences and resources available to urban students, and because of the impact of peer groups more common to the urban setting (Cunningham, Corprew III, & Becker, 2009; Hanushek, Kain, Markman, & Rivkin, 2003; Holland, 2011; Miller, Votruba-Drzal, & Setodji, 2013; Reardon, 2016; Sridhar, 2015).

Parental Background and Involvement

Student academic achievement was related to parental background characteristics and level of parental involvement (Jasis & Ordoñez-Jasis, 2012; Luet, 2017; Nevárez-La Torre, 2012). Parents of urban students were more likely to have completed fewer years of schooling or have lower levels of education, and level of parent education was one of the best predictors of student academic achievement (McEachin & Brewer, 2012). This reality led to a vicious cycle of sequentially low levels of educational attainment for racial and ethnic minorities, as well as students from lower socioeconomic statuses (McEachin & Brewer, 2012).

Parents of urban students were also less likely to provide guidance for and give time to their students' education because they were busy dealing with the reality of low socioeconomic status, or because they lacked familiarity with the school system (Ferrara, 2009; Luet, 2017). As a result, parents of urban school students were unable to advocate for their students' needs as well as parents from non-urban backgrounds. Families of urban students also had less money

available to invest in students' cognitive development, a factor which further contributed to low urban student academic achievement and the income achievement gap (Reardon, 2011).

Teacher Quality

Lack of quality teachers, high teacher turnover, and lack of adequate preparation to teach in the urban environment also contributed to low urban student academic achievement. "High quality instruction throughout primary school could substantially offset disadvantages associated with low socioeconomic background" (Rivkin et al., 2005, p. 419). However, urban students were negatively impacted both by lower quality of teachers in urban schools and the higher rate of teacher turnover in urban schools (Hanushek, Kain, & Rivkin, 2004).

Teachers were more likely to leave urban schools than non-urban schools, meaning that urban students lost quality teachers who were replaced with newer teachers, thus depriving urban students of the benefit of experienced teachers (Hanushek, Kain, & Rivkin, 2004; Rockoff, 2004; Ronfeldt, Loeb, & Wyckoff, 2013). In addition to the loss of experience, teacher turnover negatively affected student achievement in a way that could not be accounted for by the loss of quality teachers alone (Ronfeltdt et al. 2013). This suggested that teacher turnover in itself was a disruptive force that negatively impacted student academic achievement (Ronfeldt et al., 2013).

Candidates in teacher preparation programs were frequently not adequately prepared to enter urban teaching positions, and as such were less likely to understand the cultural background and unique needs of their students (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2008; Ladson-Billings, 2006; Merryfield, 2000; Murakami-Ramalho, 2008; Sharkey, Clavijo Olarte, & Ramírez, 2016). In Colombia, the USA, and in international English language schools, racial and ethnic minority teachers and professors were underrepresented compared to

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the percentage of racial and ethnic minorities in urban schools (Cochran-Smith & Villegas, 2016; Merryfield, 2000). Such professors were considered ill-equipped to prepare teacher candidates to work in an urban setting because they lacked the personal experience of being an outsider and a minority (Merryfield, 2000). Conversely, "teacher candidates of color bring to teaching first-hand knowledge about minority cultures" that enabled them to "build the necessary connections between home and schools for students from marginalized communities" (Cochran-Smith & Villegas, 2016, p. 21), thus resulting in greater learning.

Rural Education

Educational research "fails to differentiate between urban and rural schools…the urban setting being taken for granted as the norm" (Hargreaves, Kvalsund, & Galton, 2009, p. 81), yet rural schools faced challenges that were unique to the rural setting (Domingo-Peñafiel & Boix-Tomàs, 2015; Hargreaves et al., 2009; Lind & Stjernström, 2015; Mukeredzi & Mandrona, 2013). These challenges included difficulties in hiring qualified teachers (Lind & Stjernström, 2015; Mukeredzi & Mandrona, 2013), difficulties associated with small schools (Domingo-Peñafiel & Boix-Tomàs, 2015; Hargreaves et al., 2009), teacher absenteeism (Alcázar et al., 2006; Guerrero, Leon, Zapata, & Cueto, 2013), and funding shortages (Hargreaves et al., 2009; Johnson & Strange, 2007).

Education and Student Academic Achievement in Latin America and the Caribbean

In Latin America and the Caribbean (LAC) the literature revealed an intentional emphasis by national governments to increase access to education for all students and improve educational attainment (Anderson, 2005; Casassus, Cusato, Froemel, & Palafox, 2002). There was also a focus on improving the overall quality of education, as LAC had lower student

academic achievement than comparable countries in the developing world on international

achievement exams (Anderson, 2005, 2008; Hanushek & Woessmann, 2012; Wolf & Castro,

2000).

    In LAC, students of private schools tended to achieve higher scores on standardized

test than students of public schools (Jimenez, Lockheed, & Paqueo, 1991; Lockheed &

Jimenez, 1995; Luna et al., 1990; McEwan, 2001; Somers et al., 2004). The majority of

research agreed that the differences in student achievement were due to student and peer group

characteristics (McEwan, 2001; Somers, McEwan, & Willms, 2004) rather than between school

group differences (Henriquez, Lara, Mizala, & Repetto, 2012).

Education and Student Academic Achievement in the Dominican Republic

    As with Latin America and the Caribbean, the Dominican Republic attempted to

increase access to education, increase the number of years of schooling completed, and increase

the overall quality of education (B. Alvarez, 2000; C. Alvarez, 2004; Luna et al., 1990). In

comparison with the rest of the region, the Dominican Republic had the lowest student

academic achievement of the LAC countries which participated in the 2015 PISA, and

performed below than the regional mean on multiple international student achievement exams

(Casassus et al., 2002; Latin American Laboratory for Assessment of the Quality of Education,

2015; OECD, 2016).

    Student academic achievement data from the Dominican Republic followed the same

trend as data from LAC in that private school students had higher academic achievement than

public school students on standardized assessments (Jimenez, Lockheed, Luna, & Paqueo,

1991; Jimenez, Lockheed, & Paqueo, 1991; Lockheed & Jimenez, 1995; Luna et al., 1990;

Somers et al., 2004). However, the highest scoring private school students still had lower mean

academic achievement on international exams than all other participating LAC countries (Flotts et al., 2015).

<center>*Lack of Recent Research and Lack of Research on Rural Education*</center>

Much of the research on education and student academic achievement in the Dominican Republic analyzed data from the 1990s and 1980s (Jimenez, Lockheed, Luna, & Paqueo, 1989; Luna et al., 1990; Somers et al., 2004). In all of the studies identified, rural schools were treated as homogenous or omitted from the study entirely (Luna et al., 1990; Somers et al., 2004).

In the Dominican Republic, 27.8% of the 370,000 8th grade students attended a rural school (Ministerio de Educación, 2016a). By comparison rural school populations from around the world were 30% in Finland, 38% in Norway and 30% in Wales (Hargreaves et al., 2009); 23% in the USA (Johnson & Strange, 2007), and 40% in South Africa (Mukeredzi & Mandrona, 2013). Over one fourth of students in the Dominican Republic attended school in a setting that had not been the focus of an identifiable research study since 1990 (Luna et al., 1990), and the review of literature revealed no research comparing rural private and public school student achievement.

<center><u>Research Questions</u></center>

There was a lack of research on the difference in student academic achievement in private and public schools in either an urban or rural setting in the Dominican Republic. The most recently identified study that compared public and private school student achievement in the Dominican Republic was by Somers et al. (2004), who used data from the 1997 Primer Estudio Internacional Comparativo (PEIC) [First Comparative International Study]. In their study, Somers et al. (2004) excluded rural school data from their analyses. No additional

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studies comparing student achievement in rural private and rural public schools in the Dominican Republic were discovered. The research questions were chosen to fill the research gap on private and public school student achievement in the Dominican Republic in rural and urban settings. Each research question corresponds to the subsequent hypotheses.

Research Question 1: To what extent do the school mean scale scores of private and public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 2: To what extent do the school mean scale scores of rural private and rural public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 3: To what extent do the school mean scale scores of urban private and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 4: To what extent do the school mean scale scores of rural private, rural public, urban private, and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Methodology

This causal-comparative study (Fraenkel, Wallen, & Hyun, 2015, p. 364) compared 2016 8th Grade National Exams school mean scale scores for Spanish language, mathematics, social sciences, and natural sciences based on type of school (private or public) and location (rural or urban) in the Dominican Republic to determine if statistically significant differences

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existed between the four school categories. Causal-comparative research attempts to determine the nature of the differences that exist between or among groups (Fraenkel et al., 2015).

Population

The target population was the 3,675 public and private schools in the Dominican Republic whose 8th grade students participated in the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences). The population included all rural private schools (N = 47), all rural public schools (N = 1532), all urban private schools (N = 1072) and all urban public schools (N = 1024). The total number of 8th grade students enrolled during the 2015-2016 academic year was approximately 360,000. Of the total number of 8th grade students, 59,334 were private school students, of which 2,088 were rural private school students and 57,246 were urban private school students. Public school students accounted for 304,704 of the total number of 8th grade students, of which 100,781 were rural public school students 203,923 were urban public school students (Ministerio de Educación de la República Dominicana, 2016a).

Sampling Method and Sizes

Sampling was used for Research Questions 2 and 4, as Research Questions 1 and 3 used the populations (Fraenkel et al., 2015). For Research Question 2 and 4, all rural private school (N = 47) were used and a sample of 47 schools was selected from the other categories to match the 2016 8th grade enrollment of the rural private schools (Fraenkel et al., 2015). The sampling unit was the school. For Research Question 2, 47 rural public schools were matched on the basis of equal or similar 8th grade enrollment to each of the 47 rural private schools (Fraenkel et al., 2015). For Research Question 4, the 47 rural public schools from Research Question 2 were

used, and 47 urban private and 47 urban public schools were matched on the basis of equal or similar 8th grade enrollment to each of the 47 rural private schools (Fraenkel et al., 2015). When there existed more than one exact or approximate match, a school was selected at random by assigning numbers to the eligible schools and using a random number generator to select from within the possible range of schools (Fraenkel et al., 2015).

Instrumentation

The instrumentation used was the 2016 8th Grade National Exams. The National Exams were a series of standardized tests that gauged student academic achievement in Spanish language, mathematics, social sciences, and natural sciences in alignment with the national curriculum of the Dominican Republic (Dirección General de Evaluación de la Calidad, 2016). The exams were in the Spanish language and given at the end of the academic year, contributing 30% of a student's final grade, the other 70% of which was determined by a student's final school grade resulting from the school based academic plan (Dirección General de Evaluación de la Calidad, 2016).

Each subject exam was given on a different day, over four consecutive days, for two hours each day (Ministerio de Educación, n.d). Students were randomly assigned one of several versions of the test containing different but equivalent test questions which were generated following a curricular analysis and textbook revisions (Ministerio de Educación, n.d.). The exam items were designed to test three different levels of cognitive processes based on Anderson and Krathwohl's (2001) revision of Bloom's taxonomy (Ministerio de Educación, n.d.). The National Exams were analyzed using the Rasch Model Item Response Theory for final calibration and scaling (Ministerio de Educación, n.d.). The Rasch Model Item Response Theory was used to decide if "the scores of an instrument are meaningful, significant, and

purposive" (Tabatabaee-Yazdi, Motallebzadeh, Ashraf, & Baghaei, 2018, p. 129). Item

Response Theory was also used to determine the level of difficulty of an exam item so that

correct or incorrect responses on exam contribute to an individual's total score based on the

item difficulty (Nguyen, Han, Kim, & Chan, 2014). The documents published by the

Dominican Ministry of Education which discussed the reliability of the National Exams did not

include the results of the Rasch Model Item Response Theory to allow independent verification

of the reliability of the exams.

Data Collection

This study used archival data that were available to the public on the Dominican

Ministry of Education website (Lunenburg & Irby, 2008). The school mean scale scores for the

8th Grade National Exams in the Dominican Republic were published in a spreadsheet from

which all data were retrieved for every school included in the study. School mean scale scores

for each subject area exam, Spanish language, mathematics, social sciences, and natural

sciences, were retrieved for the 2016 8th Grade National Exams. Scores were reported as the

mean school score out of 30 possible points.

Data Analysis

The present study analyzed mean school score data from the 2016 8th Grade National

Exams in the Dominican Republic in the subject areas of Spanish language, mathematics,

social sciences, and natural sciences. As 2016 was the most recent year for which the 8th Grade

National Exams data were available, those scores were analyzed (Ministerio de Educación de la

República Dominicana, 2016a).

A series of independent samples *t*-tests and a 2 by 2 factorial ANOVA procedure were used to compare the school mean scale scores of private, public, rural, and urban schools in the Dominican Republic on the 2016 8th Grade National Exams (Steinberg, 2011, p. 349). Effect size, Cohen's *d* for *t*-tests and Eta (η) for the 2 by 2 factorial ANOVA, was calculated to determine the size of the differences.

An independent samples *t*-test was used for Research Question 1 to first compare the school mean scale scores in Spanish language, mathematics, social sciences, and natural sciences for all private and public schools in the Dominican Republic. Research Question 1 compared all schools because the data for all schools which participated in the 2016 8th Grade National Exams were available. The independent samples *t*-test design table is represented in .

Table 2.

Table 2

T-test Design for Research Question 1, All Private and Public Schools (N = 3,677 Schools, 363,902 8th Grade Students)

	School Type	
	Private	Public
Population of Schools	1,119	2,558
8th Grade Enrollment	59,361	304,541

Notes: All data were obtained from 2016 8th Grade National Exams were published by the Dominican Ministry of Education (Ministerio de Educación de la República Dominicana, 2016a).

For Research Question 2, an independent samples *t*-test was used to compare school mean scale scores in Spanish language, mathematics, social sciences, and natural sciences for all rural private (N = 47) and rural public (N = 47) schools in the Dominican Republic. Forty-

seven rural private schools participated in the 2016 8th Grade National Exams (Ministerio de Educación de la República Dominicana, 2016a) in the Dominican Republic, thus the sample of rural public schools was limited to 47 to maintain equal sample sizes for the independent samples *t*-tests. The independent samples *t*-test design table is represented in Table 3.

Table 3

T-test Design for Research Question 2, Rural Private and Rural Public Schools (N = 94 Schools, 4,176 8th Grade Students)

	School Type	
	Private	Public
Number of Schools	47	47
8th Grade Enrollment	2,088	2,088

Notes: All data were obtained from 2016 8th Grade National Exams were published by the Dominican Ministry of Education (2016a).

For Research Question 3, an independent samples *t*-test was used to compare school mean scale scores in Spanish language, mathematics, social sciences, and natural sciences for all urban private (N = 1,072) and urban public (N = 1,024) schools in the Dominican Republic. Research Question 3 included all urban private and urban public schools because the data for all schools which participated in the 2016 8th Grade National Exams were available. The independent samples *t*-test design table is represented in Table 4.

Table 4

T-test Design for Research Question 3, Urban Private and Public Schools (N = 2,096, Schools,
261,169 8th Grade Students)

	School Type	
	Private	Public
Number of Schools	1,072	1,024
8th Grade Enrollment	57,246	203,923

Notes: All data were obtained from 2016 8th Grade National Exams were published by the
Dominican Ministry of Education (2016a).

For Research Question 4, a 2 by 2 factorial ANOVA procedure was used to analyze
main and interaction effects between rural private, rural public, urban private, and urban public
schools. The primary independent variables were school type (private or public) and school
location (rural or urban) and the primary dependent variables were the school mean scale scores
for the 2016 8th Grade National Exams in Spanish language, mathematics, social sciences, and
natural sciences.

For Research Question 1 the independent variable was school type, private or public,
and the dependent variables were the school mean scale scores on the 2016 8th Grade National
Exam in Spanish language, mathematics, social sciences, and natural sciences. For Research
Question 2, the primary independent variable was rural school type, private or public. The
dependent variables were the school mean scale scores on the 2016 8th Grade National Exam in
Spanish language, mathematics, social sciences, and natural sciences.

For Research Question 3, the independent variable was urban school type, private or
public. The dependent variables were the school mean scale scores on the 2016 8th Grade
National Exam in Spanish language, mathematics, social sciences, and natural sciences. For

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Research Question 4, the independent variables were school type (private or public) and school location (rural or urban). The dependent variables were the school mean scale scores on the 2016 8th Grade National Exam in Spanish language, mathematics, social sciences, and natural sciences. Table 5 summarizes the variables and tests used for the research questions.

Table 5

Research Questions, Variables, and Statistical Tests

Research Question	Independent Variables	Dependent Variables	Test
1. To what extent do the school mean scale scores of private and public schools in the Dominican Republic differ on the 2016 8th Grade National Exams?	Private or Public	8th Grade National Exams School Mean Scale Scores (Spanish language, mathematics, social sciences, natural sciences)	Independent samples *t*-test Effect size: Cohen's *d*
2. To what extent do the school mean scale scores of rural private and rural public schools in the Dominican Republic differ on the 2016 8th Grade National Exams?	Rural Private or Rural Public	8th Grade National Exams School Mean Scale Scores (Spanish language, mathematics, social sciences, natural sciences)	Independent samples *t*-test Effect size: Cohen's *d*
3. To what extent do the school mean scale scores of urban private and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams?	Urban Private or Urban Public	8th Grade National Exams School Mean Scale Scores (Spanish language, mathematics, social sciences, natural sciences)	Independent samples *t*-test Effect size: Cohen's *d*
4. To what extent do the school mean scale scores of rural private, rural public, urban private, and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams?	Rural Private, Rural Public, Urban Private, Urban Public	8th Grade National Exams School Mean Scale Scores (Spanish language, mathematics, social sciences, natural sciences)	2 by 2 Factorial ANOVA Effect size: Eta (η)

<u>Limitations</u>

The validity of the 2016 8th Grade National Exams cannot be determined. The Ministry of Education of the Dominican Republic published a report explaining that the National Exams are calibrated and scaled using the Rasch Model Item Analysis theory and the results of the item analysis were not included (Ministerio de Educación, n.d.).

The results of this study may only be generalizable to schools in the Dominican Republic and not to other countries or geographic regions because of moderator variables unique to the Dominican Republic. The population of rural private schools ($N = 47$) and the comparable samples of rural public, urban private, and urban public schools include 8th grade enrollment ranges from one student to 191 students which may skew the results. The samples include religiously affiliated public schools, a category which may not exist in other countries.

<u>Delimitations</u>

This study analyzed the scores of the 2016 8th Grade National Exams. This study included only those schools that were officially recognized by the Dominican Ministry of Education and classified by the Ministry of Education as either private or public and whose scores were reported. In 2015, the Ministry of Education of the Dominican Republic and the Conferencia Episcopal Dominican [Dominican Conference of Bishops] reached an agreement that provided public funding to schools governed by the Roman Catholic Dioceses within the Dominican Republic (Apolinar, 2015). For the of the 2016 8th Grade National Exam, these Roman Catholic Diocesan schools were classified as public schools (Ministerio de Educación de la República Dominicana, 2016a). Outside of the Dominican Republic, schools governed by the Roman Catholic Church and other sectarian groups may not be considered public.

Assumptions

The data retrieved for the 2016 8th Grade National Exams were assumed accurate. The present study assumes that the exams were administered in the same manner in all locations, that results and data were collected and analyzed in the same manner in all locations, and that the scores were accurately reported.

Summary

The present study was a causal-comparative study using archival data (Fraenkel et al., 2015; Lunenburg & Irby, 2008). The outcomes studied were the school mean scale scores on the 2016 8th Grade National Exams in the Dominican Republic which had four subjects, Spanish language, mathematics, social sciences, and natural sciences. The need for the present study was evident from the lack of recently published research literature on education and academic achievement in the Dominican Republic, as the most recent peer reviewed article identified was published by Somers et al. in 2004 and employed data collected in 1997.

Given the low level of academic achievement in the Dominican Republic (B. Alvarez, 2000), the lack of recent literature on both the Dominican education system in general and rural student academic achievement in particular, the unique challenges faced by urban and rural schools, more research is needed on the differences in student achievement in private and public schools in the Dominican Republic. The present study added to the body of literature and contributed to the understanding of private and public school student academic achievement in both rural and urban locations on the 2016 8th Grade National Exams in the Dominican Republic.

The research questions were supported by a review of literature on topics related to student academic achievement in private and public schools in rural and urban settings. These topics included urban education, rural education, education in Latin America and the Caribbean, and education in the Dominican Republic.

This study was arranged in five chapters. Chapter I included the background of the study, statement of the problem, purpose of the study, definitions of terms, conceptual framework, research questions, limitations, delimitations, and the assumptions of the study. The remainder of the dissertation was organized in the following manner. Chapter II presented a review of the literature, which included the topics of education in developing nations, education in Latin America and the Caribbean, student achievement differences between private and public schools, rural education, and unique educational challenges in a rural setting. Chapter III described the methodology used for this research study and described the selection of schools and data used in the study and the data analysis procedures. Chapter IV presented the study's findings including the results of statistical analyses and Chapter V provided a summary of the entire study, discussion of findings, implications of the findings for theory and practice, recommendations for further research, and conclusions.

CHAPTER II: LITERATURE REVIEW

Chapter two presents a review of the literature relevant to the problem and purpose of this study. The problem identified was a lack of research on student achievement in private and public schools in rural and urban settings in the Dominican Republic. The purpose of the study was to analyze the student achievement of private and public schools in rural and urban settings in the Dominican Republic to identify any statistically significant differences in student academic achievement in the different categories of schools.

The research questions were chosen to fill the gap in literature and update research on private and public school student academic achievement in the Dominican Republic in rural and urban settings. The data analyzed were the 2016 8th Grade National Exams mean scale scores for rural private, rural public, urban private, and urban public schools in the Dominican Republic. The 2016 8th Grade National Exams included four subject area exams: Spanish language, mathematics, social sciences, and natural sciences (Ministerio de Educación de la República Dominicana, 2016b, Ministerio de Educación de la República Dominicana, 2016a).

Research Question 1: To what extent do the school mean scale scores of private and public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 2: To what extent do the school mean scale scores of rural private and rural public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 3: To what extent do the school mean scale scores of urban private and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 4: To what extent do the school mean scale scores of rural private, rural public, urban private, and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

The literature review was divided into four sections based on major themes in the literature. The first and second sections discuss major factors impacting education and student academic achievement in urban and rural settings globally. The third section pertains to education and student academic achievement in Latin American and the Caribbean [LAC], the region to which the Dominican Republic belongs. The fourth and final section pertains to education and student achievement in the Dominican Republic. Included at the end of the fourth section was a review of non-scholarly literature on external participation in education in the Dominican Republic. The literature review ended with a summary of topics relevant to the present study as well as an identification of areas for which there was a lack of research.

Searches in both English and Spanish were conducted initially in 2016 with the assistance of a professional research librarian of the University of Central Florida Library and subsequent searches were conducted to identify newly published literature. Relevant sources cited within the research literature were also included in the present study. The databases used were EBSCOhost (Academic Search Premier, Education Source, ERIC, Professional Development Collection Education, PyscINFO); Google Scholar; HAPI (Hispanic American Periodicals Index); JSTOR; Library of Congress (Handbook of Latin American Studies); Pro-Quest (PAIS International, Dissertations & Theses Global, Pro-Quest Education Journals); OECD Library; Sage Research Methods; Science Direct; UNESCO databases of resources on Education; UCF Libraries Catalogue; UCF Libraries QuickSearch; Web of Science (Thomson

Reuters); World Bank (EdStats: Education Statistics). The terms searched were: academic achievement, achievement, achievement gap, Africa, Asia, barriers, behavior and academic achievement, Caribbean, challenges, difficulties, distance education, distance learning, Dominican Republic, Europe, issues, Latin America, Latin America academic, Latin America achievement, Latin America education, Latin American schools, limitations, NOT health, NOT higher, NOT immigrant, obstacles, online learning, parent engagement, parental involvement, parent participation, private or public, private or public school, private school, problems, public, public schools, race, racial, rural, rural community, rural education, rural positive, teacher preparation, urban, urban education, urban.

Similarities and Differences in Rural and Urban Education

Rural and urban schools shared the following challenges: higher percentages of low socioeconomic status [SES] populations than non-rural and non-urban settings, negative perceptions associated with location, teacher quality, and teacher preparation (Biddle & Azano, 2016; Hanushek & Rivkin, 2006; Hargreaves, 2009; Merryfield, 2000; Miller, 2013; Noblit & Pink, 2007; Reardon, 2016; White, 2008). These challenges were experienced in unique ways in each setting (Hanushek et al., 2004; Hargreaves, 2009; Merryfield, 2000; Miller, 2013; Reardon, 2016) and were therefore treated as prototypical of rural and urban education. For instance, rural schools throughout the United States had a higher percentage of low SES students than urban schools (Albrecht et al., 2000), but student academic achievement was negatively impacted more in urban areas than in rural areas because of low SES (Reardon, 2016).

Globally, both rural and urban schools were described in deficit language, though rural schools were so described for reasons such as remoteness, enrollment, and funding (Hargreaves et al., 2009), while urban schools were so described because of student academic achievement (Noblit & Pink, 2007). Rural schools had challenges in recruiting and retaining quality teachers because of remoteness lack of career mobility (White, 2008), while urban schools experienced the same challenge on account of the perceived difficulty of working with urban students (Cochran-Smith & Villegas, 2016). Teachers were not adequately prepared to work in either setting, as their education did not prepare them for the uniqueness of rural communities and the social isolation (White, 2008), nor for the racial and ethnic diversity of the urban setting (Merryfield, 2000). Table 6 presents a summary of the challenges common to rural and urban education as well as descriptions of how such challenges are uniquely experienced in each setting.

Table 6

Challenges Common to Urban and Rural Schools

	Rural	Urban
Low Socioeconomic Status	Higher percentage of low SES students than urban schools (Albrecht et al., 2000); negative effect on student academic achievement may be diminished (Miller, 2013).	Low SES had a greater negative effect on student academic achievement because of the increased exposure to low SES and low SES peer groups (Reardon, 2016).
Negative Perception	Described in deficit terms and are not the focus of research in proportion to the number of students enrolled (Hargreaves et al., 2009).	Described in deficit terms (Noblit & Pink, 2007); urban schools described with deficit language that attributed low student academic achievement to students (Comeaux & Jayakumar, 2007).
Teacher Quality	Difficulty attracting/retaining qualified teachers (Biddle & Azano, 2016)	Difficulty attracting/retaining qualified teachers (Hanushek & Rivkin, 2006); low quality teachers and teacher turnover had a negative impact on student academic achievement (Cochran-Smith & Villegas, 2016; Hanushek et al., 2004).
Teacher Preparation	Teachers were not adequately prepared to understand and value the rural setting (White, 2008).	Teachers were not adequately prepared to understand and value the urban setting respect to racial and ethnic diversity (Merryfield, 2000).

Urban Education Globally

This subsection presents an overview of the literature related to urban education in the global setting. For the purposes of this study the definition of urban was that used by the Oficina Nacional de Estadística [ONE] (National Office of Statistics of the Dominican Republic) (Oficina Nacional de Estadística [ONE], 2012). Urban was defined as that which was located within the municipal center and municipal districts of the country (Ministerio de Economía, Planificación y Desarrollo, 2012).

The preceding definition notwithstanding, the definitions which the literature employed for urban were different than the definition used in this study. Goodyear et al. (2012), acknowledging the challenges in clearly defining urban schools, cited the U.S. Department of Education's definition which defined urban schools as "those in cities of more than 250,000 population" (p. 20). Instead of a definition, Goodyear et al. (2012) employed a list prototypical features to characterize urban education. Similarly, Noblit and Pink (2007) in the *International Handbook of Urban Education*, acknowledged the difficulty of arriving at a definition that "easily demark[s]" (p. xvii) what was and was not urban. "Urban…is a generalization as much about geography as it is about the idea that urban centers have problems…too many people, too much poverty, too much crime and violence, and ultimately, too little hope" (Noblit & Pink, 2007, p. xv).

In keeping with the approach of Goodyear et al. (2012) and Noblit and Pink (2007), the present study did not attempt to precisely define urban so as to cover the uses of the word in every research article. Rather, the present chapter presented on overview of the literature on

urban education through the lens of the challenges that repeatedly emerged as unique or important to the urban setting. These challenges were taken as prototypical attributes of urban education.

A review of literature on urban education globally led to the identification of the following issues. First, the achievement gap between subsets of students within urban education and non-urban education was a global issue (Reardon, 2011, 2016), and the issues that appeared most related to the achievement gap were low socioeconomic status and its effects (Reardon, 2011; Sridhar, 2015), parental background and involvement (Ferrara, 2009; Jeynes, 2007, 2012, 2016), and teacher quality (Boyd et al., 2008; Hanushek et al., 2004; Rivkin et al., 2005). Table 7 contains a list of references organized by the topics relevant to urban education.

Table 7

Urban Education and Academic Student Achievement Topics and Citations

Topics	Citations
Socioeconomic Status and Student Achievement	Cunningham, Corprew III, & Becker, 2009; Dubow, Arnett, Smith,& Ippolito,2001; Goodyear, Tracey, Claiborn, Lichtenberg, Wampold, & Gutierrez, 2012; Hanushek, Kain, Markman, & Rivkin, 2003; Hanushek & Rivkin, 2006; Holland, 2011; McEwan, 2001; Miller, Votruba-Drzal, & Setodji, 2013; Nelson & DeBacker, 2008; Reardon, 2016; Reardon & Portilla, 2016; Sridhar, 2015; Williams, Davis, & Miller-Cribbs, 2002
Parental Background and Involvement	Ahtaridou, & Hopkins, 2012; Ferrara, 2009; Goodyear et al., 2012; Jasis, & Ordoñez-Jasis, 2012; Jeynes, 2007, 2012, 2016; Luet, 2017; Mapp, Johnson, Strickland, & Meza, 2008; McEachin & Brewer, 2012; Nevárez-La Torre, 2012; Reardon, 2011; Vignoli, 2012
Teacher Quality	Bauml, Castro, Field, & Morowski, 2016; Boyd, Lankford, Loeb, & Wyckoff, 2013; Cochran-Smith & Villegas, 2016; Darling-Hammond & Sykes, 2003; Goldhaber, Theobald, & Lavery, 2015; Hanushek, Kain, & Rivkin, 2004; Isenberg, Max, Gleason, Potamites, Santillano, Hock, & Hansen, 2013; Ladson-Billings, 200, 2006; Merryfield, 2000; Milner, 2012; Murakami-Ramalho, 2000; Rivkin, Hanushek, & Kain, 2005; Ronfeldt, Loeb, & Wyckoff, J. 2013; Sharkey, Clavijo, & Ramírez, 2016

Urban Achievement Gaps

In the study of urban education, the term achievement gap referred to "the observed gap in academic performance between" (Chambers, 2009, p. 417) groups of students from different ethnic, racial, linguistic, or socioeconomic backgrounds (Griner & Stewart, 2013, p. 586). Racial, ethnic, and linguistic majority groups, as well as those from families of a higher socioeconomic status, typically had higher student academic achievement than racial, ethnic, and linguistic minorities and those from families of a lower socioeconomic status (Chambers, 2009; Coleman et al., 1966; Hanushek & Rivkin, 2006; Magnuson & Waldfogel, 2016; Reardon, 2016). There were exceptions to this trend, such as the higher student achievement of Asian and Asian American students in the USA (Chambers, 2009). Throughout this chapter, the term achievement gap was qualified as pertaining to either racial, ethnic, or linguistic backgrounds, or to socioeconomic status/background.

One such achievement gap existed in the USA between Black students and White students and between Hispanic students and White students, with White students having higher academic achievement than either group since at least 1970 (Isenberg et al., 2013; Reardon, 2016). The cause of the difference in student achievement was a matter of debate (Comeaux & Jayakumar, 2007; Fryer Jr. & Levitt, 2006; Reardon, 2016; Rivkin et al., 2005) and the literature revealed correlates such as socioeconomic status and peer group influences (Magnuson & Waldfogel, 2016; Reardon, 2011, 2016; Reardon & Portilla, 2016), parental influences (Barton, Drake, & Perez, 2004; Jeynes, 207, 2012, 2016; Pérez Carreón, Drake, & Barton, 2005) and teacher quality (Boyd, Lankford, Loeb, & Wyckoff, 2013; Isenberg et al., 2013; Rivkin et al., 2005).

The existence of achievement gaps appeared to be a forgone conclusion. The term achievement gap was used with little or no discussion, qualification, or presentation of the nature, extent, or causes thereof, regardless of geographic location (Chambers, 2009; Comeaux & Jayakumar, 2007; Griner & Stewart, 2013; Jeynes, 2016; Murnane et al., 2006; Noguera, 2008). Racial achievement gaps were described as being "by no means new" (Noguera, 2008, p. 90) and in the USA, "persistent features of American life" (Murnane et al., 2006, p. 97).

Appropriateness of the Term Achievement Gap

While recognizing the debate about the appropriateness of the term achievement gap, the present study reported the term in the manner used in the literature. The use of the term achievement gap was contested and a selection of authors in the USA described the term as both offensive and unhelpful (Chambers, 2009; Comeaux & Jayakumar, 2007; Ladson-Billings, 2000, 2006; Milner, 2013; Noguera, 2008). The term achievement gap was considered to be couched in deficit language and insinuated that the failure to achieve was due to either "cognitive and/or" motivational limitations…or because of shortcomings that are socially linked to the student" (Comeaux & Jayakumar, 2007, p. 95). Deficit model language ultimately "blames the students for their academic performance" (Chambers, 2009, p. 427). Instead of the term achievement gap, some authors (Chambers, 2009, Ladson-Billings, 2000, 2006) have instead suggested terms such as receivement gap or educational debts. These terms focused on the educational inputs such as school funding and high-quality teachers that could have been provided to lower achieving groups (Chambers, 2009). Instead of blaming the students, such terms "[move] attention…from the students as the source of these disparities, and towards the larger structures and forces that play a role in their education and development" (Chambers, 2009, p. 418).

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Race and Student achievement

In 1966, the report titled *Equality of Educational Opportunity* presented findings for the USA on racial segregation, equality of educational opportunities with respect to race, student achievement, and the relationship between student academic achievement and schools (Coleman et al., 1966). There were disparities in academic achievement among Black, Mexican, Puerto Rican, and White 12th grade students, with White students having higher academic achievement than the other three groups (Coleman et al., 1966, pp. 3, 20). Black students had median scores of 41.8 in mathematics and 42.2 in verbal, Mexican American students had median scores of 44.2 in mathematics and 45.5 in verbal, Puerto Rican students had median scores of 42.6 in mathematics and 43.7 in verbal, and White students had median scores of 51.8 in mathematics and 51.9 in verbal (Coleman et al., 1966).

Between Black and White students, the differences in student academic achievement were 10 points in mathematics and 9.3 points in verbal, 9.2 points in mathematics and 8.2 points between Puerto Rican and White students, and 7.6 points in mathematics and 6.5 points in verbal between Mexican American and White students (Coleman et al., 1966, p. 20). Results were based on a nationally administered standardized exam in the USA with a mean score of 50 and a standard deviation of 10, out of a sample of approximately 100,000 12th grade students in the Fall of 1965 (Coleman et al., 1966, pp. 20, 557). Among 17-year-olds who participated in the exam, 82.9 percent of White male, 81.0 percent of White female, 62.3 percent of nonwhite male, and 60.8 percent of nonwhite female students were high school seniors in 1959 (Coleman et al., 1966, p. 451). Among those in high school, 84.9 percent of White male, 91.9 of White female, 76.0 percent of nonwhite male, and 84.4 percent of nonwhite female students graduated

from high school in 1959 (Coleman et al., 1966, p. 451). The disparities in student academic

achievement are represented in Table 8.

Table 8

1965 Nationwide 12th Grade Median Score by Race (N = 97,660)

	White	Black	Puerto Rican	Mexican American
Mathematics	51.8	41.8	42.6	44.2
Verbal	51.9	42.2	43.7	45.5

Note. Median scores by race from Coleman, J. S., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., & York, R. L. (1966). Equality of educational opportunity. (Equality of Educational Opportunity No. OE-38001). Washington, D.C.: U.S. Department of Health, Education, & Welfare.

Data from the 8th grade 2000 and the 2015 National Assessment of Educational

Progress [NAEP] from all jurisdictions revealed a decrease in the racial and ethnic achievement

gap over that period in the USA (NAEP, 2015). The mathematics achievement disparity

between Black and White 8th grade students in 2000 was 40 points, compared with 32 points in

2015 (NAEP, 2015). The mathematics achievement disparity between Hispanic and White

students was 31 points in 2000, compared with 22 points in 2015 (NAEP, 2015). The

differences in student academic achievement are represented in Table 9.

Table 9

NAEP 8th Grade Mathematics Mean Scale Scores by Race

Year	Black	Hispanic	White
2015	260	270	292
2000	244	253	284

Note. From NAEP Data Explorer.
https://nces.ed.gov/nationsreportcard/tdw/database/data_tool.asp. NAEP - 2015 Mathematics & Reading - Mathematics - National Results Overview. (2015). Retrieved October 24, 2017, from https://www.nationsreportcard.gov/reading_math_2015/#mathematics?grade=4

Income and the Achievement Gap

In addition to the achievement gap between some ethnic racial minority and White students, there was a documented income achievement gap in the USA between economically disadvantaged and non-disadvantaged students that was comparable in size to what it was in the 1980s (Isenberg et al., 2013; Magnuson & Waldfogel, 2016; Murnane et al., 2006; Reardon, 2011, 2016; Reardon & Portilla, 2016). The income achievement gap was related to different quality of teaching for disadvantaged students (Hanushek & Rivkin, 2006; Isenberg et al., 2013; Murnane et al., 2006), different levels of readiness when students enter kindergarten (Magnuson & Waldfogel, 2016; Reardon & Portilla, 2016), and low socioeconomic status (Reardon, 2016).

Reardon (2011) defined the income achievement gap as "the average achievement difference between a child from a family at the 90th percentile of the family income distribution and a child from a family at the 10th percentile" (p. 1). In 2011, the income achievement gap in the USA was growing and was "…nearly twice as large as the black-white achievement gap.

Fifty years ago, in contrast, the black-white gap was one and a half to two times as large as the income gap" (Reardon, 2011, p. 1).

The students of higher income families, those in the top quintile of socioeconomic status, scored more than a standard deviation above students from families of the lowest quintile of socioeconomic status on standardized mathematics and reading exams (Reardon, 2011, p. 3). The size and rate of growth in the income achievement gap was not static (Reardon, 2011; Reardon & Portilla, 2016). As of 2011 the income achievement gap was growing at a faster rate than the difference in income between the highest and lowest quintiles, possibly because of differences in how parents from the two quintiles invested in their students' cognitive development (Reardon, 2011, p. 5). Alternately, in 2016 there was a reported decrease in the income achievement gap (Magnuson & Waldfogel, 2016; Reardon & Portilla, 2016).

Differentials in teacher quality contributed to the income achievement gap, as low socioeconomic status students, identified as those receiving free or reduced lunch [FRL], had unequal access to quality teachers compared to students not receiving FRL (Isenberg et al., 2013). Students with diminished access to quality teachers, scored on average 28 percentile points lower on end of course English and Language Arts examinations, and 26 percentile points lower on end of course Mathematics examinations (Isenberg et al., 2013, p. 25). These data were from end of course examinations for 4th-8th grade students over a three year period in 29 urban districts in the USA (Isenberg et al., 2013).

The difference in teacher quality in low SES versus high SES schools was "comparable to the difference between a first-year" (Isenberg et al., 2013, p. 28) and a fourth-year teacher, or 0.034 SD in end of course state test scores for English & Language Arts and

0.0234 SD in math. If students had equal access to quality teaching regardless of socioeconomic status, it was hypothesized that low socioeconomic status students would gain approximately two percentage points per year in each end of year subject exam (Isenberg et al., 2013, p. 27).

In both North and South America, the racial achievement gap was overlaid with the income achievement gap in that the latter partially predicted preschool enrollment and academic preparedness, which in turn contributed to the racial achievement gaps (Magnuson & Waldfogel, 2016; Somers et al., 2004). In the USA, the difference in academic achievement among Black, Hispanic, and White students was partially determined by the difference in academic preparedness when students entered kindergarten (Magnuson & Waldfogel, 2016). Academic preparedness was moderated by family SES and the preschool enrollment gap, an indicator of academic preparedness, was 15% between high and low SES students (Magnuson & Waldfogel, 2016, p. 5). Racial minorities, in particular Black students, made up a disproportionate part of the lowest income quintile at 30%, while White students made up a disproportionate part of the highest quintile at 85% (Magnuson & Waldfogel, 2016, p. 7). Thus, what appeared to be a racial achievement gap may have been hiding an income achievement gap (Magnuson & Waldfogel, 2016). At the current rate of decline of the income achievement gap, "it will take another 60 -110 years for [the gap] to be completely eliminated" (Reardon & Portilla, 2016, p. 12).

Socioeconomic Status and Student Achievement

Low socioeconomic status [SES] was characteristic of both urban and rural education (Goodyear et al., 2012). However, the negative effects of low SES are experienced more acutely by urban students than by rural students (Sridhar, 2015). This was possibly due to the

different role that money played in the urban setting as opposed to the rural setting (Sridhar, 2015). A low SES rural family may be able to grow and harvest their own food while an urban family must purchase food, thus placing greater financial strain on the urban family (Sridhar, 2015, p. 102). Additionally, in urban areas "poverty…may deprive low-income children of important experiences and interactions that are more readily available to disadvantaged families in economically integrated areas" (Miller et al., 2013, p. 1461). Non-urban residents "have more regular contact with middle and upper-income families due to the limited number of businesses, schools, churches, and other resources in rural areas." (Miller et al., 2013, p. 1462).

The effects of low SES also appeared to be experienced more acutely by racial, ethnic, and linguistic minorities, particularly Black and Hispanic students in the USA (Reardon, 2016). In the USA, middle class Black and Hispanic students tended to live in lower SES neighborhoods (neighborhoods with a higher concentration of low income families) than White student of equivalent SES (Reardon, 2016, p. 38). In a study on student achievement including over 300 metropolitan areas and over 1,000,000 students, proximity and exposure to low SES were the factors most strongly correlated with low student achievement levels (Reardon, 2016).

A similar relationship between income and achievement was found in a 2013 study on kindergarten students in the USA in that the "relationship between income and early achievement was greatest for children living in families at the low end of the income distribution" (Miller et al., 2013, p. 1458). Black families may be more likely to experience neighborhood deterioration, defined as decreasing neighborhood SES, and "perceptions of neighborhood deterioration are more powerful correlates of academic outcomes than perception of resources" (Williams et al., 2002, p. 425). Thus, it is possible that Black and Hispanic

students achieved lower than White students of the same SES because minority students had greater exposure to the effects of low SES (Reardon, 2016, p. 38).

Peer Group Effects

As a sub-category of the effects of low SES, peer groups had statistically significant effects on student achievement, and as such were the focus of much literature on urban education (Cunningham et al., 2009; Hanushek et al., 2003; Holland, 2011; Miller et al., 2013; Nelson & DeBacker, 2008; Reardon, 2016; Williams, Davis, & Miller-Cribbs, 2002). The underlying logic of peer group effects on urban education was that being surrounded by higher or lower achieving peers would have a positive or negative effect on the achievement or the desire to achieve of surrounding students, and that schools and students in urban settings had higher numbers of low achieving students (Miller et al., 2013).

Average peer "achievement has a highly significant effect on learning across the test score distribution" (Hanushek et al., 2003, p. 542). Lower student academic achievement found among groups with greater exposure to low SES may have been due to the effects of low SES peer groups (Reardon, 2016). The opposite effect was also reported, as the effect of increased academic expectations of the higher socioeconomic status peer groups accounted for nearly all of the difference in academic achievement between private and public school students in a study on private and public school student achievement in Chile (McEwan, 2001).

Positive peer groups composed of "good quality friendships" (Nelson & DeBacker, 2008, p. 170) were found to be positive predictors of students' motivation for achievement. Students' best friends' perception of academic achievement were positively correlated (.35, p < .001) with students desire to achieve (Nelson & DeBacker, 2008). In a group of 49 Black university students in the USA, students' academic expectations were positively correlated with

their friends' academic expectations (Holland, 2011). The same group of students reported that their friends' decision to go to college, attend class, and attend campus visits influenced their decision to attend college (Holland, 2011, p. 1040). Additionally, a student's belief that one's peer group "will complete the school year is related to student intention to complete the school year" (Williams et al., 2002, p. 425).

In contrast to the previously stated findings, high achieving Black students in the USA were found to be resistant to the effects of negative friends on student academic achievement (Cunningham et al., 2009). However, the resistance was possibly due to the comparatively low rate of negative friends or the high resilience reported among high achieving Black students (Cunningham et al., 2009). For white students, negative friends were more likely to have a negative impact on future academic goals (Dubow, Arnett, Smith, & Ippolito, as cited in Cunningham et al., 2009, p. 283).

Parental Background and Involvement

Student academic achievement was related to parental background and involvement which disadvantaged urban students because the parents of urban students were less likely to be involvement in their student's education (Jasis & Ordoñez-Jasis, 2012; Luet, 2017; Nevárez-La Torre, 2012). The definition of parental involvement used here was that found in the United Code of Law (USCS 7801 (32) as ""the participation of parents in regular, two-way, and meaningful communication, involving student learning and other school activities."

Student academic achievement was related to the educational attainment of their parents (McEachin & Brewer, 2012). "Parent education level, especially the mother's education, is highly correlated with student achievement" (McEachin & Brewer, 2012). This presents a problem for urban areas, as on average, "impoverished and minority populations

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attain lower levels of education" (McEachin & Brewer, 2012). Low educational attainment for minorities and low socioeconomic status groups will continue or worsen without intervention to stop the vicious cycle of less educated parents being less able to help their students achieve academically (McEachin & Brewer, 2012).

In the USA, there was consensus in the that higher levels of parental involvement increased student achievement (Ferrara, 2009; Jasis & Ordoñez-Jasis, 2012; Jeynes, 2007, 2012, 2016; Mapp, Johnson, Strickland, & Meza, 2008). For a variety of reasons, parents from a lower socioeconomic background as well as racial and linguistic minorities may be less likely to become involved in their students' education (Jasis & Ordoñez-Jasis, 2012; Luet, 2017; Nevárez-La Torre, 2012). Parents of lower income families may be less likely to get involved because they are too busy dealing with the struggle of low socioeconomic status to engage in school activities (Luet, 2017, p. 677). Urban parents may also face financial barriers to becoming involved in their students' education as they may be unable to take off work to come to school (Ferrara, 2009). Families with more money may be also more likely to invest in their student's cognitive development, a trend which has led to a widening of the socioeconomic status achievement gap (Reardon, 2011, p. 2).

Parents might also be less likely to get involved in schools because of lack of familiarity with the school system, a previous negative experience, or a sense of shame (Ferrara, 2009; Nevárez-La Torre, 2012). The literature suggests a growing trend of migrants moving towards urban areas (Ahtaridou & Hopkins, 2012; Nevárez-La Torre, 2012; Vignoli, 2012). Ahtaridou and Hopkins (2012) identify that many There was a growing trend of migrants moving towards urban areas, and immigrant families who speak English as a second language had "little

experience of education beyond compulsory early schooling" (Ahtaridou & Hopkins, 2012, p. 136) (p. 136).

In the USA. there were about 800,000 migrant youth in schools in 2012 and the families of these students "lack any English language…skills, [have] less than 7 years of formal schools, and are unfamiliar with the education system in the United States" (Nevárez-La Torre, 2012, p. 6). Schools may not be doing enough to bridge the gap between the classroom and parents who don't know how to becomes involved, as it may "often [be] left to the parents to navigate any cultural differences" (Luet, 2017, p. 677). For some urban parents in the USA, "demographic barriers, barriers of shame" (Ferrara, 2009, pp. 125–126) prevented them from becoming involved in their student's education. In "some cases, teachers or administrators display blatant forms of racism or classism" (Luet, 2017, p. 677). These barriers may be due to language or to negative experiences that parents have had in the past with schools (Ferrara, 2009). Such negative experiences are antithetical to trusting and communal environment that must exist if parents are to engage in the life of the school (Mapp et al., 2008).

Teacher Quality

In addition to the effects of low socioeconomic status and various parental effects, urban students were more likely to have low quality teachers compared with students of non-urban schools (Hanushek & Rivkin, 2006). Within the school, teachers were the variable that had the greatest influence on student achievement (Milner, 2012, p. 700). "High quality instruction throughout primary school could substantially offset disadvantages associated with low socioeconomic background" (Rivkin et al., 2005, p. 419). However, while "teacher quality is critical to students' achievement, urban, poor, and minority students are the least likely to have well qualified teachers" (Cochran-Smith & Villegas, 2016, p. 11).

One cause of low teacher quality in urban schools was lack of teacher retention or teacher attrition (Hanushek et al., 2004). In a study of all Texas public schools, teachers were more likely to leave urban schools than teachers in non-urban schools (Hanushek et al., 2004). This included new teachers, which meant that students lost the benefit of veteran teachers who could draw on one or more years of teaching experience (Hanushek et al., 2004). When teachers left urban schools, such schools "have a difficult time attracting new teachers and so end up hiring inexperienced and less prepared teachers" (Darling-Hammond & Sykes, as cited in Ronfeldt et al., 2013, p. 6), thus perpetuating the cycle of urban students having ineffective/low quality teachers.

The negative impacts of teacher attrition were not limited to the loss of quality or experienced teachers, as student academic achievement was found to decrease even when teachers were replaced with an equally or more effective teacher (Ronfeldt et al., 2013). In a study that examined the effects of teacher turnover on over 850,000 students in New York City over eight years, "teacher turnover [had] a significant and negative impact on student achievement…turnover [was] particularly harmful…in schools with large populations of low-performing and Black students" (Ronfeldt et al., 2013, p. 30). When teachers leave there may have been a "disruptive impact of turnover beyond composition changes in teacher quality" (Ronfeldt et al., 2013, p. 31). This disruptive impact could explain why students' academic achievement continued to decline even when controlling for variances in teacher effectiveness (Ronfeldt et al., 2013).

In addition to leaving urban schools more frequently, effective teachers were less likely to work in urban schools or schools with large populations of low socioeconomic or minority students (Rivkin et al., 2005). Economically disadvantaged students were found to have less

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access to effective teaching than non-urban students (Isenberg et al., 2013). In a 2013 study on teacher quality in urban schools in the USA, 27 out of 29 school districts had gaps in teacher effectiveness that disadvantaged urban students, and 19 out of 29 school districts had the same problem in mathematics (Isenberg et al., 2013, p. 42). Teacher quality was found to be "inequitably distributed across every indicator of student disadvantage—free/reduced-price lunch status, underrepresented minority, and low prior academic performance" (Goldhaber et al., 2015, p. 293) and in every level of school.

Teacher Preparation

While urban schools had higher teacher attrition and on average lower quality teachers than non-urban schools, urban schools also had to cope with teachers who were not prepared to appreciate, understand, and value the diversity that was characteristic of urban education (Merryfield, 2000; Ladson-Billings, 2006; Gross, 2008; Milner, 2012; Murakami-Ramalho, 2008; Bauml, 2016; Cochran-Smith & Villegas, 2016; Sharkey, Clavijo Olarte, & Ramirez, 2016).

In the USA, "despite increasing demands for teachers to teach for equity, diversity and global interconnectedness, colleges of education [were] not producing teachers with such knowledge and skills (Merryfield, 2000, p. 429). Urban education was reported as being cast in deficit type language in which White students were viewed as the exemplar by which Black students were measured (Ladson-Billings, 2006). The minority cultures which made up urban areas were not valued per se but were seen as deficit versions of the majority culture (Milner, 2013).

Urban schools, "even if they are multicultural, tend to have a homogenous staff and student group and therefore may be creating biased environments for learning. Such

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environments may…perpetuate the divide" (McKenzie, as cited in Murakami-Ramalho, 2008, p. 90) between the majority and minority cultures. A study on teacher professional development in Colombia found that when urban teachers were prepared to appreciate the cultural differences of students, teachers reported feeling closer to students and had a better understanding of the culture in which they worked (Sharkey et al., 2016, pp. 310–311). Students of such teachers were also reported to have higher levels of participation, engagement, and interest by their students, including those who had been in danger of failing or who had previously not frequently participated (Sharkey et al., 2016).

In the USA, the teaching population was found to be "largely White, monocultural…and K-12 students…do not share their teachers' cultural identities" (Bauml, Castro, Field, & Morowski, 2016). In a study of 20 preservice teachers' attitudes towards teaching in an urban school, White preservice teachers felt unprepared to work with students of a different cultural, ethnic, racial, socioeconomic or linguistic background, and/or held "common stereotypes about urban families and schools" (Bauml et al., 2016). These preservice teachers also tended to believe that special skills were needed to teach urban students and that the behavior problems of such students were more severe and frequent than at a non-urban school (Bauml et al., 2016, pp. 12–13).

Urban teacher preparation programs in the USA were inconsistent in their approach and were reported to be not preparing candidates with the "skills, attitudes, dispositions, practices, and worldview to develop curriculum rigor and other necessities for urban teaching" (Gay, as cited in Milner, 2012). One possible cause of the shortcomings of teacher preparation programs for urban educators was the lack of diversity among professors of education:

…it is difficult to have a conversation about discrimination in urban education when those participating have never experienced discrimination themselves. My point is that we need to be concerned about the racial demography of teacher educators. It is wrong to assume that teacher educators are committed, capable, or prepared automatically to prepare teachers to meet the complex needs of students in P-12 urban environments; it certainly cannot be assumed that they are committed philosophically, theoretically, practically, or empirically to develop, enact, and study a curriculum that is consistent with the needs of students in urban education, for example. (Milner, 2012, p. 701)

In the USA, "the overwhelming majority of the nation's teacher educators are middle class and White, more male than female" (Merryfield, 2000, p. 441). As most teacher educators lacked an understanding of the minority experience, they may have been unable to educate others to do so (Merryfield, 2000). While these teacher educators "may interact with people different from themselves, it is almost always from a privileged position. It is unlikely that the majority of white middle class teacher educators will ever experience life on the margins" (Merryfield, 2000, p. 441).

In addition to a lack of diversity among teacher educators, the teaching force in the USA was found to lack diversity, as "students of color accounted for over 44% of total enrollments in all U.S. public schools…while teachers of color comprised only 17% of the teaching force…" (Cochran-Smith & Villegas, 2016, p. 17). Teachers who came from a majority experience "have lived their lives in racially and economically insulated communities…they bring with them…little understanding of the day-to-day realities, interest, concerns, and struggles of students from racial/ethnic, economic, and linguistic minority backgrounds" (p. 17).

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There was also a noted lack of emphasis on low SES students within the context of urban teacher preparation programs (Cochran-Smith and Villegas, 2016, p. 25). While there was a focus within the research literature on preparation for diversity, the coincidence of low-income and racially/ethnically diverse populations was seen as evidence that teachers should be prepared to "understand the life situations and needs of students living in poverty" and to "unpack their [own] assumptions…of poverty" (Cochran-Smith & Villegas, 2016, pp. 25–26).

Additional Factors Noted

Topics such a behavior (Ahtaridou & Hopkins, 2012; Murakami-Ramalho, 2008; Rose & Gallup, 2003) and environmental factors like low quality housing, inadequate public services, drugs and alcohol (Ahtaridou & Hopkins, 2012; Gross, 2008; Murakami-Ramalho, 2008; OFSTED, 2000; Sharkey et al., 2016) were also identified in a selection of the literature. However, while present in the urban setting, the literature did not reveal a unique impact on urban education, nor that these factors were experienced globally in the same ways.

Summary

Education in the urban setting faced the challenges of decreasing student academic achievement gaps, and dealing with the issues of socioeconomic status [SES], parental background and involvement, and teacher quality. Academic achievement gaps existed among different racial, ethnic, cultural, and linguistic minority and majority groups, as well as among students from families of differing SES groups. Low SES was the strongest indicator of achievement gaps and impacted urban students in various ways. Parental involvement was related to student academic achievement and increasing parental involvement could play a role in improving urban student achievement. Additionally, urban education was found to have

problems teacher retention and teacher quality. Improving teacher retention, quality, and pre-service preparation could help improve student academic achievement in urban schools.

<div align="center">Rural Education Globally</div>

The definition used by the U.S. Census (Ratcliffe, Burd, Holder, & Fields, 2016, p. 2) and stated in the first chapter of this study was that rural was defined as that which was not urban. Rural education, as with urban education, was difficult to define and the term includes multiple contexts in a variety of locations and population levels (Greenough & Nelson, 2015). Some rural schools are similar to the typical school in the USA in enrollment, student academic achievement, and socioeconomic status while other rural schools are smaller and have challenges foreign to the urban environment (Greenough & Nelson, 2015). There were calls for more flexibility in defining both rural and urban schools, including greater use of the distance between urban and rural areas (Gross, 2008). As with urban education, this section will not adhere to a strict definition of rural, but instead will use the term as it was found in the literature and cover prototypical characteristics.

Introduction

The challenges that appear unique in their occurrence or effects to rural education include issues related to teachers and the geographical and demographic realities of the rural context (Albrecht, Albrecht, & Albrecht, 2000; Hargreaves, Kvalsund, & Galton, 2009). Teacher issues include the difficulty of attracting and retaining qualified teachers, providing appropriate pre-service preparation as well as on-going professional development, and the issue of teacher absenteeism (Banerjee & Duflo, 2006; White, 2008). Issues related to geographical and demographic realities of urban life include funding for rural schools, rural socioeconomic

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status, and the enrollment and remoteness of rural schools (Lowrie, 2007). Table 10 contains a

list of references organized by the topics relevant to rural education.

Table 10

Rural Education and Academic Student Achievement Topics and Citations

Topics	Citations
Perception of Rural Education	Blanks et al., 2013; Hargreaves, Kvalsund, & Galton, 2009; Hazel & McCallum, 2016; Howley & Gunn, 2003; Hunt, 2009; Isbell, 2005; Johnson & Howley, 2015; Lind & Stjernström, 2015; Spring, 2013; Williams, 1973
Challenges Related to Teachers	Alcazar et al., 2006; Banerjee & Duflo, 2006; Biddle & Azano, 2016; Chaudhury et al., 2006; Duflo & Hanna, 2005; Glover et al., 2016; Guerrero et al., 2013; Hu et al., 2016; Johnson & Howley, 2015; Johnson & Strange, 2007; Lind & Stjernström, 2015; McCracken & Barcinas, 1991; Mukeredzi & Mandrona, 2013; Roberts, 2004; White, 2008
Rural Communities: Funding, Socioeconomic Status, Enrollment, and Distance	Albrecht, Albrecht, & Albrecht, 2000; Banerjee & Duflo, 2006; Biddle & Azano, 2016; Domingo-Peñafiel & Boix-Tomàs, 2015; Duflo & Hanna, 2005; Greenough & Nelson, 2015; Hargreaves, Kvalsund, & Galton, 2009; Howley & Gunn, 2003; Hu et al., 2016; Johnson & Howley, 2015; Johnson & Strange, 2007; Kvalsund, 2004; Lind & Stjernström, 2015; Liyanagunawardena et al., 2014; Lowrie, 2007; Macintyre & Macdonald, 2011; McCracken & Barcinas, 1991; Miller, Votruba-Drzal, & Setodji, 2013; Roberts, 2004; Sherman, 2006; Sherman & Sage 2011; Strange, Johnson, & Finical, 2009; Ussher 2016; Walker-Gibbs, Ludecke, & Kline, 2015; White, 2008; Yettick et al., 2014

Perception of Rural Education

Research on rural education "fails to differentiate between urban and rural schools…the urban setting being taken for granted as the norm" (Hargreaves et al., 2009, p. 81). In the parts of the world such as the United Kingdom, research on rural schools appeared to be declining (Hargreaves et al., 2009). There were discernible biases in the literature against education in the rural setting as well as a tendency to normalize urban education to the deficit of rural education (Howley & Gunn, 2003; Johnson & Howley, 2015; Lind & Stjernström, 2015).

The rural setting was viewed as deficient with respect to urban schools, and "this prejudice is difficult to unseat because metropolitan norms have been established as universal norms (Williams, as cited in Howley & Gunn, 2003, p 85). Likewise, Johnson and Howley (2015) argue that challenges to rural education result from "policy infrastructure that fails to account for the characteristics of the rural context," (Johnson & Howley, 2015, p. 226). Such policy "initiatives are nearly always ill-formed because of the ignorance and lack of care for rural places" (Johnson & Howley, 2015, p. 226). Governmental regulations were similarly unfairly biased and made it difficult for rural schools to satisfy funding requirements, thus fiscally disadvantaging rural schools (Lind & Stjernström, 2015).

There was a dearth of literature promoting rural schools and celebrating their positive aspects (Blanks et al., 2013). In the USA, among the positive aspects highlighted were the strength of the community, the perceived role of the school in the community, and rewarding student-teacher relationships (Hunt, 2009; Isbell, 2005; Spring, 2013). Rural school teachers and administrators reported feeling supported by the community and felt they could depend on active family involvement in the school (Hunt, 2009). New teachers, after an initial period of self-perception as an outsider, reported feeling welcomed and supported by the community

(Hazel & McCallum, 2016). Elementary and secondary teaching staff in rural communities reported close professional relationships because of the cohesion in the community (Spring, 2013). From the perspective of the communities, rural schools were the bonding factor which further enhanced the relationship between school personnel and the community (Spring, 2013). Rural school teachers developed longstanding relationships with their students due to sustained contact throughout their K-12 academic (Hunt, 2009; Isbell, 2005). Due to the longstanding student-teacher relationships, teachers could witness the steady improvement of their students over time (Isbell, 2005). Among the literature identified, there were no studies that indicated increased student academic achievement due to rural education or related factors.

Challenges Related to Teachers

The literature review revealed that rural schools faced three major teacher related challenges. The first subsection reviewed the rural school challenge of recruiting and retaining quality teachers (Biddle & Azano, 2016). The following subsection reviewed the problem of providing adequate preparation and professional development for teachers in the rural setting (White, 2008). The final subsection reviewed the problem of rural teacher absenteeism (Alcazar et al., 2006).

Recruiting and Retaining Quality Teachers

Attracting and retaining rural teachers was a challenge faced by rural schools in counties around the world, including Australia, Finland, Norway, Sweden, South Africa, and the USA (Hargreaves et al., 2009; Johnson & Strange, 2007; Mukeredzi & Mandrona, 2013; Roberts, 2004). Recruiting and retaining teachers was considered key to the success of rural schools in Australia (White, 2008). Also in Australia, facing an impending lack of teachers for

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rural and remote regions, procuring well prepared, permanent staff was described as "the most significant factor in education" (Roberts, 2004, p. 4).

The strongest disincentives for rural teachings positions reported in a survey of 265 Australian teachers were isolation from family and friends (49% responded either a 1 or 2 on a scale of 5, with 1 being the highest disincentive), distance from a major city (65% responded either 1 or 2), and limited access to services such as health care (85% responded either 1 or 2) (Roberts, 2004, p. 236). Thirty percent of survey respondents said they anticipated leaving their rural or remote area within 1-2 years, and 47% reported that after meeting their minimum service requirement in a rural area for loan payback, they planned to transfer to a city (Roberts, 2004, pp. 215, 216).

In the USA, rural schools struggled to find quality teachers, as "rural school districts are simply at a competitive disadvantage in the market for teachers. There are many factors in this challenge, but low teacher salaries is certainly among them" (Johnson & Strange, 2007, p. 12). As in Australia, one of the major issues facing rural schools in the USA was the challenge of recruiting, retaining, and preparing teachers (Biddle & Azano, 2016),

Rural teaching positions in South Africa were shunned because of their relative isolation, socioeconomic conditions, and because of a deficit view of rural education (Mukeredzi & Mandrona, 2013). Likewise, in Norway, Sweden, and Finland, rural schools had difficulty finding quality teachers because of their geographic isolation and distance from major urban areas (Lind & Stjernström, 2015).

Adequate Preparation and Professional Development for Rural Teachers

This section addresses both teacher preparation and professional development for rural education. Rural teachers around the world were found to not have received rural-specific

professional development (White, 2008). Additionally, the quality of professional development in rural areas was considered low (Hu, Roberts, Leng leong, & Guo, 2016; Johnson & Howley, 2015; Roberts, 2004).

Neither teacher preparation programs nor professional development in Australia adequately prepared nor attracted teachers to rural education posts (Roberts, 2004; White, 2008). Limited access to professional development, due in part to the cost of transportation and the isolation of rural posts, was a cause of dissatisfaction with rural teaching positions (Roberts, 2004). Lack of professional development was perceived as damaging teachers' chances for promotion (Roberts, 2004). Teachers in Australia were not prepared to value and understand the rural settings and culture to the point that rural teaching positions were not attractive for pre-service teachers (White, 2008).

According to Johnson and Howley (2015), rural educators in the USA did not receive quality professional development because rural schools were far from providers such as university professors. The professional development that rural teachers received was generic and not designed for rural schools (Johnson & Howley, 2015, p. 227). Of note, in contrast to the findings of Johnson and Howley, Glover et al., (2016) found that professional development opportunities for rural and non-rural teachers in the USA were similar in terms of quality.

In rural China there was a lack of adequate teacher preparation for early elementary teachers (Hu et al., 2016). In a study of 217 early education programs in a rural province of China, 11% of the teachers had a junior high or middle school level education, 35% held an associate degree, 8.3% held a bachelor's degree, and 30.9% of teachers reported majoring in early education (Hu et al., 2016, p. 823). "The programs included in the study reported little and/or poor professional development, due in part to "tight budgets and weak connections with

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university experts who might provide complimentary training" (Hu et al., 2016, p. 823).

Kindergarten teachers were identified as being particularly underprepared, as "about 27.2% of the kindergarten teachers reported receiving no professional training whatsoever as part of their current position" (Hu et al., 2016, p. 824).

Teacher Absenteeism

Teacher absenteeism was found to be a problem for rural schools around the world (Alcazar et al., 2006; Banerjee & Duflo, 2006; Chaudhury, Hammer, Kremer, Muralidharan, & Rogers, 2006; Duflo & Hanna, 2005; Guerrero, Leon, Zapata, & Cueto, 2013). In India, the absence rate for rural teachers was 44% (Banerjee & Duflo, 2006, p. 119). For many of the rural schools, there was only one teacher and the schools were so remote that school authorities could not verify attendance (Banerjee & Duflo, 2006; Duflo & Hanna, 2005). After an intervention in which teachers were given a bonus on their salary for documenting their presence for a full school day using a digital camera, teacher absences declined 20 percentage points to 22%. The decline in teacher absences coincided with an increase in student achievement of 0.17 standard deviations, measured using a pre, mid, and post intervention test (Duflo & Hanna, 2005, p. 21).

In a study on rural teachers in Bangladesh, Ecuador, India, Indonesia, Peru, and Uganda, rural teachers were four percent more likely to be absent than urban teachers (Chaudhury et al., 2006). When teachers were present, "only about one-half of teachers were actually teaching when enumerators arrived at the schools" (Chaudhury et al., 2006, p. 91). Teachers were rarely dismissed from their positions for being absent from work (Chaudhury et al., 2006).

In rural Peruvian schools, there was a general absence rate of 11% for all teachers studied, and 21% for rural teachers (Alcazar et al., 2006). Teachers who were habitually absent faced "virtually no risk of being dismissed" (Alcazar et al., 2006, p. 121). In a sample of 100 schools, "4 headmasters reported ever having fired a teacher for excessive absence, late arrival, or early departure; the comparison survey in India found 1/3000 had ever done so" (Alcazar et al., 2006, p. 122). Among the reasons for absences, teachers reported dissatisfaction with being separated from their immediate relatives (Alcazar et al., 2006). In Bangladesh, Ecuador, India, Indonesia, Peru, and Uganda, the reasons for high teacher absenteeism were the remoteness of the school measured by distance from the nearest paved road, rurality itself, and distance from family (Alcazar et al., 2006; Guerrero et al., 2013).

Rural Communities: Funding, Low Socioeconomic Status, Enrollment, and Distance Education

Rural schools faced challenges stemming from the following factors: the changes in rural population, lower rural property values, federal policy that disadvantaged rural schools, small rural school enrollment, extreme remoteness, and low socioeconomic status [SES] families (Biddle & Azano, 2016; Hargreaves et al., 2009; Johnson & Howley, 2015; Johnson & Strange, 2007; Lind & Stjernström, 2015; McCracken & Barcinas, 1991; Strange, Johnson, & Finical, 2009; Yettick, Baker, Wickersham, & Hupfeld, 2014). These factors loosely converged in four patterns that were found to influence rural schools: funding, low SES, enrollment, and distance.

Rural School Funding

Rural schools faced funding problems stemming from low property values, shrinking rural population and enrollment, higher transportation costs, less access to state and federal aid,

and increased cost due to loss of scale (Johnson & Howley, 2015; Johnson & Strange, 2007; Lind & Stjernström, 2015; McCracken & Barcinas, 1991; Yettick et al., 2014). In the USA, rural areas were frequently taxed at a lower rate and assessed value than urban areas, leading to decreased tax revenue and ultimately, decreased school funding (Jordan, Chapman, & Wrobel, 2014). Declining rural populations and enrollment also contributed to lower tax revenue (Hargreaves et al., 2009; Johnson & Howley, 2015). The decrease in enrollment made it difficult for smaller urban schools to offer "upper-level courses…requiring special competence" (Lind & Stjernström, 2015, p. 1). High transportation costs resulted in "low instructional spending in rural schools" (Johnson & Strange, 2007, p. 13), as money that could have been spent on instruction was instead used for long distance transportation.

Rural schools had a harder time securing federal or state funding that was available to all schools but more easily accessible to urban schools (Strange et al., 2009). Title 1 funding for economically disadvantaged students was more difficult for rural schools to obtain because of different funding formulae, resulting in less Title 1 funding for the same number of eligible students (Strange et al., 2009). There were smaller pools of money available for economically disadvantaged rural school students compared to comparable urban schools, and the money was harder to obtain because of communication difficulties with state and local agencies (Yettick et al., 2014).

Low Socioeconomic Status in Rural Areas

Both urban and rural schools had high numbers of low socioeconomic status [SES] students, but students in rural schools were more likely to come from low SES families (Albrecht et al., 2000). There were higher rates of low SES families in rural areas, in part due to loss of employment in rural communities that was not replaceable (Albrecht et al., 2000). In

1990, 16.4% of nonmetropolitan dwellers in the USA were low SES, compared with 11.7% of urban dwellers (Albrecht et al., 2000, p. 89). In 2003, the rate of low SES families in nonmetropolitan counties in the USA (13.4%) exceeded metropolitan counties (10.8%), though only in a "modest" (Howley & Gunn, 2003, p. 86) way.

In a study of a low SES rural communities in northern California that had experienced economic decline due to the cessation of the logging industry in the area, rural families were found to "experience persistent poverty…and are as likely to be in poverty as those in central cities" (Sherman, 2006, p. 4). Low SES members of rural communities were hesitant to accept government assistance due to social norms and pressures that were unique to the rural setting, such as the stigma attached to receiving government assistance (Sherman, 2006; Sherman & Sage, 2011). As a result, it was theorized that rural communities may have experienced the negative effects of low SES more acutely than non-rural areas (Sherman, 2006; Sherman & Sage, 2011).

Despite the reality of low SES for rural communities, rural students were found to be less affected by low SES than urban students who lived in the same conditions (Miller et al., 2013). Both rural and urban students alike were found to have low access to additional resources that could increase student achievement (Miller et al., 2013). However, because rural communities have fewer outlets for social interaction, "rural residents have more regular contact with middle and upper-income families" (Miller et al., 2013, p. 1462) and as a result, may have been less affected low SES related factors. While the literature indicated that rural students might be less effected by low SES than urban students, there was no indication that rural students were altogether unaffected. The negative effects of low SES on student academic achievement are presented in the section of urban education.

Rural School Enrollment

A hallmark of rural school around the world was small school enrollment, though there were exceptions (Greenough & Nelson, 2015; Hargreaves et al., 2009; Hu et al., 2016; Johnson & Howley, 2015; Kvalsund, 2004). The literature reported a lack of research on the effects of small enrollment and small class sizes on student academic achievement (Hargreaves et al., 2009). Small school enrollment was reported in Africa, Asia, Australia, Europe, North America, and South America (Banerjee & Duflo, 2006; Domingo-Peñafiel & Boix-Tomàs, 2015; Hargreaves et al., 2009; Johnson & Howley, 2015; Johnson & Strange, 2007; Roberts, 2004; Yettick et al., 2014). Small rural school enrollment carried negative connotations and possibly contributed to funding issues (Hargreaves et al., 2009; Johnson & Howley, 2016). Additionally, small school enrollment led to school closure, school combination, multi-grade classrooms, one room school houses, and the use of distance education programs (Hargreaves et al., 2009; Kvalsund, 2004; Liyanagunawardena, Adams, Rassool, & Williams, 2014; Lowrie, 2007; White, 2008).

The National Center for Education Statistics of the U.S. Department of Education defined three rural school subtypes: rural fringe, rural distant, and rural remote (Keaton, 2012). Rural fringe schools were within five miles of an urbanized area or within 2.5 miles of an urban cluster (Keaton, 2012). Rural distant schools were within five to 25 miles from an urbanized area or were 2.5 to 10 miles from an urban cluster (Keaton, 2012). Rural remote schools were more than 25 miles from an urbanized area or more than 10 miles from an urban cluster (Keaton, 2012). An urbanized area was defined by the U.S. Department of Commerce, Bureau of the Census as having 50,000 or more people, while an urban cluster had at least 2,500 people and less than 50,000 people (Qualifying Areas for the 2010 Census, 2012). These definitions

are included in Table 11**.** The mean enrollment of a rural fringe school was 583, which was

above the national average school enrollment of 517 (Greenough & Nelson, 2015). In

comparison, rural distant schools had a mean enrollment of 307, while rural remote schools had

a mean enrollment of 170 (Greenough & Nelson, 2015).

Table 11

U.S. Department of Education Rural School Subtypes for the 2009-2010 School Year

Rural Subtype	U.S. Department of Education Definition
Fringe	Rural territory that is less than or equal to 5 miles from an urbanized area, as well as rural territory that is less than or equal to 2.5 miles from an urban cluster
Distant	Rural territory that is more than 5 miles but less than or equal to 25 miles from an urbanized area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an urban cluster
Remote	Rural territory that is more than 25 miles from an urbanized area and is also more than 10 miles from an urban cluster

Note. Definitions obtained from the *Documentation to the NCES Common Core of Data Public Elementary/Secondary School Universe Survey: School Year 2009-10*. Keaton, P. (2012). *Documentation to the NCES Common Core of Data Public Elementary/Secondary School Universe Survey: School Year 2010-11*. (No. NCES 2012-338rev.). Washington, DC: U.S. Department of Education. Retrieved from https://nces.ed.gov/ccd/pdf/psu102agen.pdf

In North America, Europe, and Australia, those outside of the rural context perceived

small school enrollment as an economic waste (Hargreaves et al., 2009; Johnson & Howley,

2015; Walker-Gibbs, Ludecke, & Kline, 2015). Small rural schools in Great Britain, Finland,

Norway, and Sweden were seen as an economic waste because they were inefficient to manage

(Hargreaves et al., 2009). In the USA, "policies have rendered smaller schools and districts

inefficient (by largely erroneous reputation) and ineffective (by nearly universal allegation)"

(Johnson & Howley, 2015, p. 228).

Small enrollment was seen as a blessing and a curse; small class enrollment was

considered positive but low school enrollment was linked to isolation and a lack of resources

(Walker-Gibbs et al., 2015). Small school enrollment and limited funding put "pressure on a

few teachers to cover wide age ranges and the whole curriculum" (Hargreaves et al., 2009, p.

82). In small schools where teachers were required to teach multiple subjects, the teachers were

unlikely to be an expert in every subject area (Domingo-Peñafiel & Boix-Tomàs, 2015). Small

schools, especially those with only one teacher, may have been more negatively impacted by

teacher absenteeism, as the entire school might have closed for the day if the teacher was

absent (Banerjee & Duflo, 2006).

Rural school districts faced decisions of closing or amalgamating small rural schools

to improve efficiency, although doing so increased transportation costs (Hargreaves et al.,

2009; Johnson & Howley, 2015). There was a lack of research on how rural schools "capitalize

pedagogically" (Hargreaves et al., 2009, p. 82) on small classes and "there [was] little research

on the teaching and learning processes that might account for differential levels of

performance" (Hargreaves et al., 2009, p. 82). As such, it was unclear if small school

enrollment was beneficial or harmful to rural students. When small rural schools did not close,

students of different ages and grades were in some instances combined together (Domingo-

Peñafiel & Boix-Tomàs, 2015; Hu et al., 2016; Kvalsund, 2004). The smallest rural schools, in

developing and developed nations, were single room school houses and had a single teacher

(Banerjee & Duflo, 2006; Domingo-Peñafiel & Boix-Tomàs, 2015). It was unclear what effect,

positive or negative, school closure and combined-grade classes may have had or have in the future on student academic achievement (Hargreaves et al., 2009).

Distance Education

In situations where students were so distant from a physical school that they were unable to attend or be transported, some rural districts resorted to distance education (Domingo-Peñafiel & Boix-Tomàs, 2015; Johnson & Howley, 2015; Macintyre & Macdonald, 2011; Roberts, 2004; Ussher, 2016; White, 2008). The methods used for distance education included multimedia technology such as printed materials and physical media recordings, and Internet communication technology (Domingo-Peñafiel & Boix-Tomàs, 2015; Johnson & Howley, 2015; Macintyre & Macdonald, 2011; Roberts, 2004; Ussher, 2016; White, 2008). The literature did not present distance learning as a problem for rural schools, but rather addressed the challenges inherent in distance learning such as lack of infrastructure and financial burden to families (Lowrie, 2007; Ussher, 2016)

In a case study of four families in rural Australia, the quality of education was reported to be dependent upon the quality of Internet access and technology, the partnership fostered by the school community, and the ability of the parents to supervise their own student (Lowrie, 2007, p. 38). Distance education was also found to place a financial burden on families if they were required to invest in more technological resources (White, 2008).

Additionally, there was inadequate infrastructure for Internet based distance education in rural areas of both developed and developing nations. In the case study of four rural families in Australia, some families had adequate or limited Internet access while one family had no form of Internet access (Lowrie, 2007). In remote areas of Scotland, adequate Internet access was a barrier to distance education (Macintyre & Macdonald, 2011). In Sri Lanka, distance

education for university students suffered from a lack of adequate Internet technology infrastructure, presenting a barrier for rural students to achieve degrees over the Internet (Liyanagunawardena et al., 2014), and the lack of access to the Internet may have similarly affected rural K-12 students.

Summary

The review of literature revealed that rural schools faced various challenges. Rural schools had difficulty attracting and retaining teachers, did not provide adequate pre-service preparation to understand the rural milieu, and struggled to provide quality professional development for rural teachers. Rural communities also struggled with low funding because of decreasing rural populations, decreasing enrollment, and lower property values. Rural communities had higher levels of low socioeconomic status families than non-rural communities in some parts of the world. Rural schools were smaller and had fewer teachers overall, which led to classroom contexts for students that were not sufficiently researched with respect to student academic achievement. Finally, some rural students were so remote that they were unable to attend a physical school and instead used distance education. The technology required presented a financial burden to rural families and the infrastructure for adequate Internet access was at times lacking entirely.

Education and Student Academic Achievement in Latin America and the Caribbean

In the Latin America and the Caribbean [LAC] region, there were efforts to improve access to education and attainment, as measured by years of education completed Anderson, 2005) More recently there were efforts to improve the quality of education as measured by student academic achievement (B. Alvarez, 2000; C. Alvarez, 2004; Anderson, 2005; Hanushek & Woessmann, 2012). Achievements in access to education were noted though gaps in attainment and achievement still existed between low socioeconomic status [SES] and high SES and between rural and urban students (Anderson, 2005; Casassus et al., 2002; Reimers, 1999; Wolff et al., 2000). Table 12 contains a list of references organized by the topics relevant to rural education.

Table 12

Latin American Education and Student Academic Achievement Topics and Citations

Topics	Citations
Educational Access and Attainment	B. Alvarez, 2000; C. Alvarez, 2004; Anderson, 2005, 2008; Casassus, Cusato, Froemel, & Palafox, 2002; Hanushek & Woessmann, 2012; OECD, 2016; Reimers, 1999; Wolff & Castro, 2000; Wolff, Schiefelbein, & Valenzuela, 1994
Student Academic Achievement in Latin America and the Caribbean	Anderson, 2005; Bos, Elías, Vegas, & Zoido, 2016; Casassus, Cusato, Froemel, & Palafox, 2002; Hanushek & Rivkin 2006; Hanushek & Woessmann, 2012; Latin American Laboratory for Assessment of the Quality of Education, 2015; Mizala & Romaguera 2004; OECD, 2016; Reardon & Portilla, 2016; Reimers, 1999; Wolff & Castro, 2000; Wolff, Schiefelbein, & Valenzuela, 1994
Disparity in Private and Public Student Achievement	Gamboa & Waltenberg, 2012; Latin American Laboratory for Assessment of the Quality of Education, 2015; McEwan, 2001; Reimers, 1999; Somers, McEwan, & Willms, 2004; Wolff, Schiefelbein, & Valenzuela, 1994
Rural and Urban Student Academic Achievement	Casassus, Cusato, Froemel, & Palafox, 2002; Latin American Laboratory for Assessment of the Quality of Education, 2015; Luschei & Fagioli 2016; Treviño et al., 2016

Educational Attainment in Latin America and the Caribbean

Since the 1970s countries in the Latin America and the Caribbean [LAC] region attempted to address the issue of low access to primary education (B. Alvarez, 2000; C. Alvarez, 2004; Anderson, 2005; Casassus et al., 2002). The majority of LAC made progress in increasing access to primary education and improving attainment, measured in average years of education completed (Bos, Elías, Vegas, & Zoido, 2016; Casassus et al., 2002). Despite the improvements, low levels of educational attainment were still prevalent among low socioeconomic status [SES] and rural communities (Anderson, 2005; Wolff & Castro, 2000; Wolff, Schiefelbein, & Valenzuela, 1994). Additionally, while attainment had increased, the quality of education, as measured by student academic achievement on standardized exams, remained lower than both regional competitors and most developed nations (Anderson, 2005, 2008; Hanushek & Woessmann, 2012; Wolff & Castro, 2000).

From the 1970s until the 1990s, gross educational enrollment and attainment in the LAC region more than doubled for primary school-age students, and increased 62 percent for secondary school (Anderson, 2005). However, there was an imbalance in the number of years of school attained based on SES and rural/urban status, with low SES and rural students having lower attainment (Reimers, 1999; Wolff & Castro, 2000). The countries with the highest rates of income inequality had the largest SES based gaps in educational attainment (Reimers, 1999). The difference in years of education completed by the lowest and highest SES groups was as much as eight years in Brazil, Mexico, El Salvador, and Panama (Reimers, 1999).

Low educational enrollment and attainment in secondary schools were noted problems in LAC, especially in rural areas (Wolff & Castro, 2000). As of 1995, gross enrollment in LAC regions was 55% of the school age population (Wolff & Castro, 2000, p. 28) Secondary

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educational enrollment was "much lower than in the region's chief competitors; large numbers of over-age students and young adults are enrolled, mainly as a result of repetition…the poor, especially those in rural areas, are grossly underrepresented [in secondary education]" (Wolff & Castro, 2000, p. 15).

Grade repetition was associated with low attainment and impacted millions of students in Latin America; out of approximately 9,000,000 students "entering first grade in Latin America, some four million fail the first time around" (Wolff et al., 1994, p. 2). Rural and low SES urban students were more likely to repeat a grade, and as such rural and urban low SES students did not continue to secondary education at the same rate as high SES urban students (Reimers, 1999). The high rates of grade repetition and dropout were indicated as concerns by educational leaders in the LAC region, in addition to "low overall quality of public schools, especially in poor neighborhoods" (Anderson, 2005, p. 210).

Low student academic achievement was related to grade repetition, as the TERCE results revealed that grade repetition, after socioeconomic factors, was the most negative influence on student academic achievement (Latin American Laboratory for Assessment of the Quality of Education, 2015). The Tercer Estudio Regional Comparativo y Explicativo [TERCE] (Third Regional Comparative and Explanatory Study) was an international study of student achievement on a standardized exam which included 15 countries and one large school district in Latin America and the Caribbean region.

Overall, the LAC region had low educational access and attainment in comparison with comparable regions of the world (OECD, 2016). On the 2015 Programme for International Student Assessment [PISA], 68% of 15 year-old students in the LAC region participated, compared with a global average of 89% of 15 year-old students (OECD, 2016). The PISA was

a triennial, international academic achievement exam in which 72 countries participated in 2015.

Student Academic Achievement in Latin America and the Caribbean

Student academic achievement in Latin America and the Caribbean was indicated as an area of major concern, as LAC nations performed worse on average than both developed and developing nations throughout the world (Anderson, 2005; Casassus et al., 2002; Hanushek & Woessmann, 2012; Wolff et al., 1994). Education in the LAC region was reported "to be beset by inadequate achievement. LAC countries do significantly worse in terms of achievement than the developed world, and…many developing countries in Asia" (Wolff et al, 1994, p. 2).

On the 2015 PISA, every member of the LAC region scored below the PISA Organization for Economic Cooperation and Development [OECD] average and the LAC countries "were again positioned at the bottom of the international ranking on education quality" (Bos, Elías, Vegas, & Zoido, 2016, p. 1). The LAC mean for the PISA was 409.8 in science, 417.9 in reading, and 394.2 in mathematics compared with science, reading, and mathematics means on the PISA of 493, 493, and 490, respectively (OECD, 2016, p. 5). The LAC and average PISA scores are depicted in Table 13. There was no maximum score for the PISA; the results were scaled to have means of approximately 500 and standard deviations of 100 (OECD, 2016, p. 64).

Table 13

2015 PISA 15-year-old Mean Scale Scores

Category	Science	Reading	Mathematics
LAC	409.8	417.9	394.2
PISA OECD	493.0	493.0	490.0

Note. Data from PISA 2015 Results in Focus. OECD. (2016). PISA 2015 Results (Volume I). Paris: OECD Publishing. https://doi.org/10.1787/9789264266490-en

According to the 2015 PISA results, it was hypothesized that at the current "rate of improvement, it will take decades for the [LAC] region to achieve high performance" (Bos et al., 2016, p. 2). Chile was the nation with scores closest to the PISA OECD average, with a science score of 447 compared to a mean of 493, a reading score of 459 compared to a mean of 493, and a mathematics score of 423 compared to a mean of 490. The results of the Tercer Estudio Regional Comparativo y Explicativo [TERCE] (Third Regional Comparative and Explanatory Study) indicated that Latin America was, "despite economic growth…still the region of the world with the greatest indices of inequality," (Latin American Laboratory for Assessment of the Quality of Education, 2015, p. 4). Such inequality was due in part to inequalities of student academic achievement between low and high socioeconomic status students (Anderson, 2005, p. 227)

Explanations for Low Student Achievement in Latin America and the Caribbean

Low student academic achievement in Latin America and the Caribbean was related to the following factors: low teacher quality, school resources, and the effects of low socioeconomic status [SES] (Anderson, 2005, 2008; Mizala & Romaguera, 2004; Reimers,

1999; Wolff et al., 1994). See the sections on urban and rural education for a more extensive discussion of how teacher quality and SES affect student achievement.

Teachers in LAC were found to be insufficiently prepared, frequently unqualified, and lacking necessary classroom resources (Wolff & Castro, 2000). Teacher pedagogy was also found to be "outdated, based on frontal lectures with insufficient student participation" (Wolff & Castro, 2000, p. 18). In Argentina, 39% of teachers had university degrees, and in Panama, 9% (Wolff & Castro, 2000). Low teacher salaries and the pay systems were indicated as partial explanations for low quality teachers, as teachers' salaries were too low to attract qualified candidates and teachers were rewarded for years of service, not quality (Mizala & Romaguera, 2004; Wolff & Castro, 2000). Additionally, good teachers were incentivized to leave the classrooms, as professional development came in the form of promotions (Mizala & Romaguera, 2004)

With respect to school resources, in a study of interventions that have improved student academic achievement in LAC, programs which provided textbooks and libraries and professional development for teachers were the most efficient in raising student academic achievement (Anderson, 2005). Textbook distribution was noted for decreasing the learning gap between low SES and high SES students (Anderson, 2005).

Disparity in Student Achievement Based on Socioeconomic Status and School Type

In Latin America and the Caribbean [LAC], there was disparity in achievement between students of low and high socioeconomic status [SES] (Reimers, 1999). In a study of Chilean schools, the disparity in achievement between low and high SES students overlapped with the disparity in achievement between public and private school students (McEwan, 2001). In parts of LAC, private schools seemed to exist as exclusive educational opportunities for

students of high socioeconomic status (McEwan, 2001; Somers et al., 2004). Results from the Tercer Estudio Regional Comparativo y Explicativo [TERCE] (Latin American Laboratory for Assessment of the Quality of Education, 2015) indicated that low student academic achievement in LAC was disproportionately present in public schools and in low SES populations (Latin American Laboratory for Assessment of the Quality of Education, 2015). There was also an academic achievement gap between private and public school students in much of LAC (Latin American Laboratory for Assessment of the Quality of Education, 2015). Students in private schools in LAC "score significantly higher than public schools in internationally comparable tests of achievement" (Wolff et al., 1994, p. 2).

In LAC, the quality of educational opportunities available to low SES students was not on par with those offered to high SES students (Gamboa & Waltenberg, 2012; Reimers, 1999). Academic achievement of low SES students was, to a degree, predetermined by two types of circumstances: level of parent education and school type (Gamboa & Waltenberg, 2012, p. 707). As discussed in the section on urban education, level of parent education was part of a cyclical relationship which engendered and entrenched low SES and low student academic achievement (McEachin & Brewer, 2012). Low student achievement in LAC was reported to be caused by low SES, as in "any given generation, the levels of education are related to levels of income" (Reimers, 1999, p. 546), and the reality that "countries with the greatest educational equality also have the greatest social equality" (Reimers, 1999, p. 547). Data from the TERCE indicated that differences in achievement and SES between private and public school students overlapped (Latin American Laboratory for Assessment of the Quality of Education, 2015):

Meanwhile, there are enormous differences in the average socioeconomic level of the populations that attend these different types of schools. In all countries, rural schools

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receive the most vulnerable population, followed by urban public schools, while the

urban private schools receive the population with the highest socioeconomic level. On

the other hand, when comparing the learning results of urban public schools with rural

schools and those of the urban public schools with urban private schools, it has been

observed that the differences tend to disappear, lessen, or, in some cases, they are even

reversed when considering the students' socioeconomic level. (Latin American

Laboratory for Assessment of the Quality of Education, 2015, p. 13)

Because of low quality of educational opportunities offered to low SES students,

"children of the poor develop insufficient skills and knowledge to gain access to high

productive jobs…their low education levels 'cause' poverty to be reproduced between

generations" (Reimers, 1999, p. 535) This vicious cycle (Anderson, 2005; Hanushek & Rivkin,

2006; Reardon & Portilla, 2016) was described as one wherein low SES was linked to low

student achievement and low student achievement was linked to low SES in subsequent

generations.

Rural and Urban Student Academic Achievement

On international exams, rural students tended to have lower academic achievement

than urban students (Casassus et al., 2002; Latin American Laboratory for Assessment of the

Quality of Education, 2015). The differences in student academic achievement between rural

schools and urban schools typically diminished or disappeared when controlling for

socioeconomic level or other background variables (Casassus et al., 2002; Latin American

Laboratory for Assessment of the Quality of Education, 2015; Luschei & Fagioli, 2016). Rural

schools were found to receive the most vulnerable populations with respect to SES, a factor that

was found to predict low student academic achievement (Latin American Laboratory for Assessment of the Quality of Education, 2015, p. 13).

The Primer Estudio Internacional Comparativo [PEIC] and the Tercer Estudio Regional Comparativo y Explicativo [TERCE] were studies that employed standardized exams to measure student achievement across LAC and included 15 countries and one municipal district of Mexico. The PERCE and the TERCE revealed a gap in student academic achievement throughout Latin America and the Caribbean between rural and urban schools, with urban schools out-performing rural schools in almost all scenarios (Casassus et al., 2002; Latin American Laboratory for Assessment of the Quality of Education, 2015).

The results from the PEIC show that in both language/reading and mathematics, rural school had a lower percentage of students who reached either a level one, two, or three in proficiency compared to urban schools (Casassus et al., 2002). For the highest level of language/reading, a level three, 31.8% of rural students met the criteria as compared with 44.63% of urban students and 54.16% of mega-city students (Casassus et al., 2002, pp. 29–30). For level three mathematics, 11.92% of rural students met the criteria as compared with 13.40% of urban students and 19.92% of mega-city students (Casassus et al., 2002, pp. 29–30). The lower student academic achievement of rural schools was not "due to the fact that they are rural, but rather to the educational processes prevailing within them" (Casassus et al., 2002, p. 23).

In contrast to the findings of Casussus et al. (2002), Luschei and Fagioli (2016) reported that though rural school students throughout most of LAC had lower average scores in international studies than urban students, the causes were found to be outside of the school and classroom setting. "Rural schools are not inherently worse than urban schools; rather, the

conditions in which rural students live, combined with the composition of their peer groups, tend to place a drag on their test score performance" (Luschei & Fagioli, 2016, p. 731). After controlling for background factors of rural and urban students, "rural schools in several countries actually outperformed urban schools. This was the case in…the Dominican Republic" (Luschei & Fagiolo, 2016, p. 730).

According to the results of the TERCE, students in rural schools from all but one participating nation (Uruguay) and district performed worse or no better than urban public students in all subjects: natural sciences, reading, and mathematics (Treviño et al., 2016, p. 135). The TERCE exam had an average of 700 points with a standard deviation of 100 points (Treviño et al., 2016, p. 56). In natural sciences, rural public school students in six of 16 participating countries performed worse than urban public school students by more than 30 points (Treviño et al., 2016). In reading, rural public school students in 11 of 16 countries performed worse than urban public school students by 25 points or more (Treviño et al., 2016). In mathematics, rural public school students from 8 of 16 countries performed worse than urban public school students by 20 points or more, except in the Dominican Republic where the difference was 12 points (Treviño et al., 2016). When controlling for SES, rural students had higher academic achievement in two countries in natural sciences, no difference in reading, and higher achievement in four countries in mathematics. In most cases, the higher student achievement of urban public schools disappeared, though in Guatemala the difference persisted for urban public schools in reading. Figure 1, Figure 2, and Figure 3 are graphs of the mean differences in achievement between rural and urban students in natural sciences, reading, and math for the participating countries. The gray/dark line indicates the differences in student

achievement before considering socioeconomic level while the blue/dark line indicates the

differences in student achievement after considering socioeconomic level.
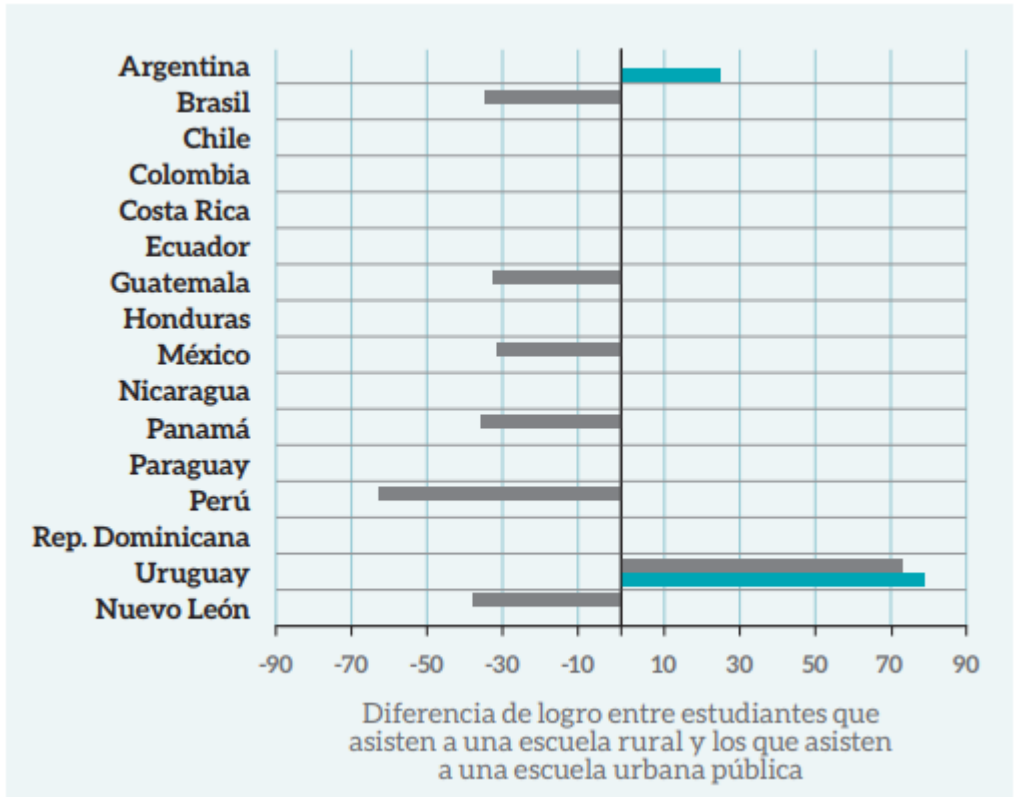
Figure 1. TERCE Differences in 6th Grade Rural and Urban Natural Sciences Student
Achievement. Unadjusted student achievement levels are depicted in grey and student
achievement levels adjusted for socioeconomic level are depicted in blue. Reprinted from
Graphic 45, *Informe de resultados TERCE: Factores asociados* (Treviño et al., 2016, p. 135).In
the public domain.
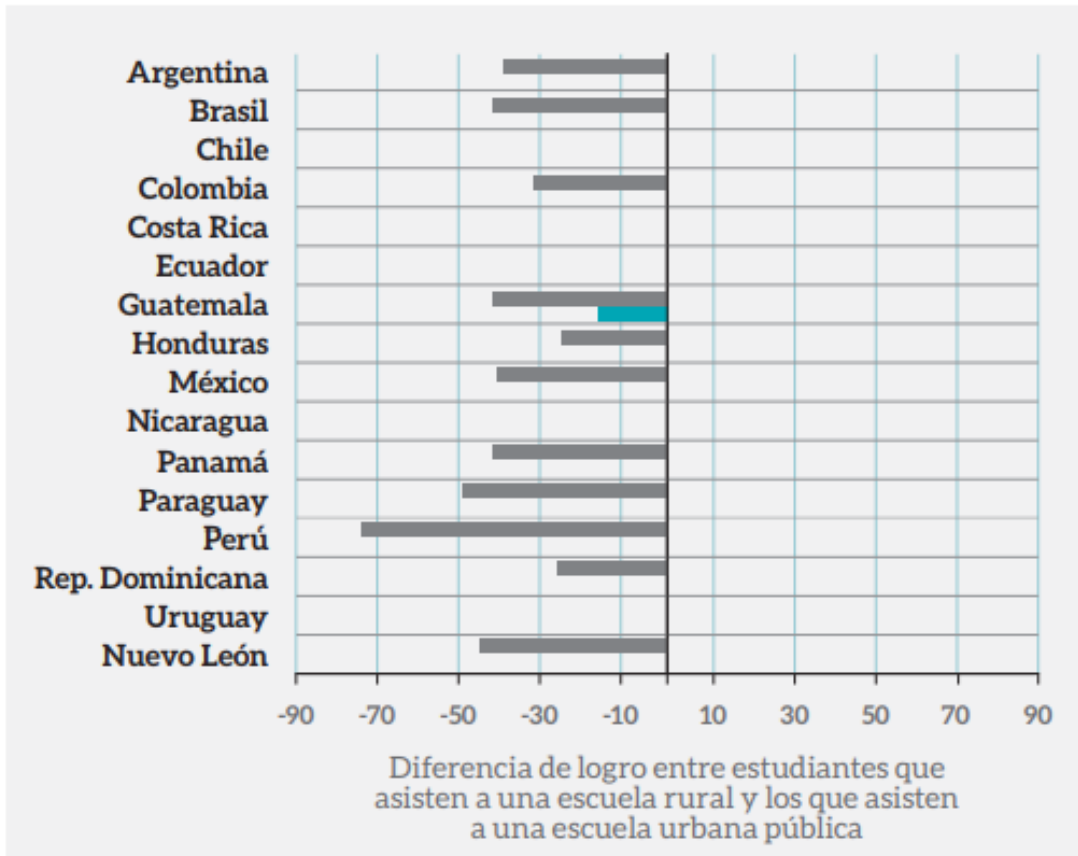
Figure 2. TERCE Differences in 6th Grade Rural and Urban Reading Student Achievement. Unadjusted student achievement levels are depicted in grey and student achievement levels adjusted for socioeconomic level are depicted in blue. Reprinted from Graphic 45, Informe de resultados TERCE: Factores asociados (Treviño et al., 2016, p. 135). In the public domain.
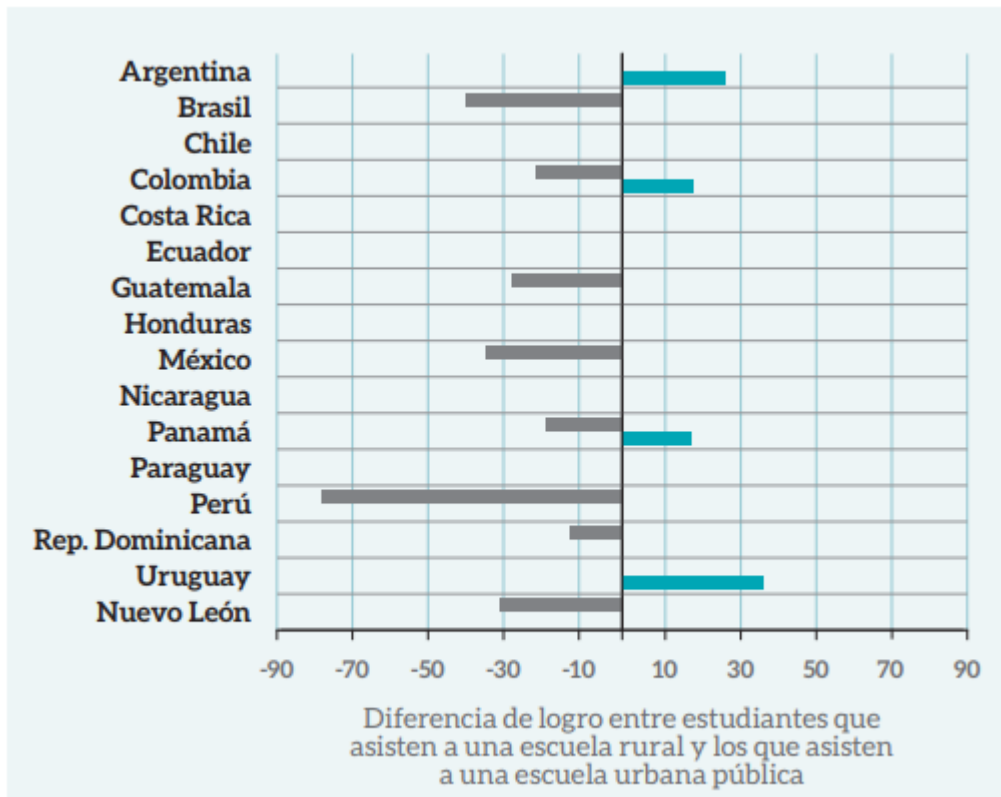
Figure 3. TERCE Differences in 6th Grade Rural and Urban Mathematics Student Achievement. Unadjusted student achievement levels are depicted in grey and student achievement levels adjusted for socioeconomic level are depicted in blue. Reprinted from Graphic 45, Informe de resultados TERCE: Factores asociados (Treviño et al., 2016, p. 135). In the public domain.

Summary

The review of literature revealed that the major problems affecting education in Latin America and the Caribbean [LAC] region included limited access to education and low educational attainment, low student academic achievement compared with developing and developed nations, and disparities in academic achievement between high and low socioeconomic statuses [SES] students and between rural and urban students. There were advances in access to education and increases in the average number of years of schooling completed in the LAC region, though there were still disparities between students from high and low SES groups and from urban and rural settings. The disparity in achievement between

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high and low SES students overlapped with the disparity in academic achievement between private and public school students. Student academic achievement differences between both private school and public schools, higher and lower SES students, and between rural and urban school students diminished or disappeared when controlling for socioeconomic status or other background variables.

<center>Education in the Dominican Republic</center>

The Dominican Republic has, since the 1980s, improved access to education and increased educational enrollment and attainment, though with inequitable results across low socioeconomic status [SES] and rural populations (B. Alvarez, 2000; C. Alvarez, 2004; Luna et al., 1990). The quality of education in the Dominican Republic did not appear to have kept pace with increased access to education (B. Alvarez, 2000). In comparison with the rest of Latin America and the Caribbean, the Dominican Republic had lower student academic achievement and lower than expected student academic achievement considering its economic growth (B. Alvarez, 2000; C. Alvarez, 2004; Bos, Elías, Vegas, & Zoido, 2016; Jimenez & Lockheed, 1991, 1995; Luna et al., 1990). There was inequity with respect to student academic achievement, as private school students had on average higher academic achievement on national and international standardized exams than public school students.

No studies were identified in which rural private schools in the Dominican Republic were the focus of a study on student academic achievement and as a result, the effects and efficiency of rural private schools in the Dominican Republic were unknown. Of the studies included in the literature review, rural private schools were either considered homogenous with rural public schools and therefore not analyzed separately or all rural schools were excluded

entirely (Jimenez & Lockheed, 1991, 1995; Luna et al., 1990; Somers et al., 2004). Table 14 contains a list of references organized by the topics relevant to education in the Dominican Republic. The following sections present the findings of literature related to the factors affecting public and private education in the Dominican Republic in rural and urban settings: enrollment and attainment, student academic achievement, public and private school student academic achievement, and lack of recent research on rural education (B. Alvarez, 2000; C. Alvarez, 2004; Bos, Elías, Vegas, & Zoido, 2016; Jimenez & Lockheed, 1995, 1991; Luna et al., 1990). This section ends with a discussion of external participation in education in the Dominican Republic.

Table 14

Dominican Republic Education and Student Academic Achievement Topics and Citations

Topics	Citations
Enrollment and Attainment	Alvarez, 2000; Alvarez, 2004; Anderson, 2005; Bos, Elías, Vegas, & Zoido, 2016; Casassus et al., 2002; Jimenez et al., 1989; Latin American Laboratory for Assessment of the Quality of Education, 2008, 2015; Luna, Gonzalez, & Wolfe, 1990; OECD, 2016
Student Academic Achievement	Anderson, 2005; Jimenez & Lockheed, 1995; Jimenez et al., 1989; Jimenez et al., 1991; Jimenez, Lockheed, & Paqueo, 1991; Lockheed & Jimenez, 1994; Luna, Gonzalez, & Wolfe, 1990; McEwan, 2001; Roncagliolo Jones, 2010; Somers, McEwan, & Willms, 2004
Private and Public School Academic Achievement	Hausman et al., 2011; Jimenez & Lockheed, 1995; Jimenez et al., 1989; Jimenez, Lockheed, & Paqueo, 1991; Luna, Gonzalez, & Wolfe, 1990; Roncagliolo Jones, 2010; Somers, McEwan, & Willms, 2004
Recent Research on Rural Education	Jimenez, Lockheed, Luna, & Paqueo, 1991; Roncagliolo Jones, 2010; Somers, McEwan, & Willms, 2004
External Participation in Education	Diocese of Orlando Office of Catholic Schools, 2016; Doulos Discovery Ministries, Inc., 2016; How We Serve – Diocese of Orlando, Florida, 2017, November 28; Solid Rock International, 2017

Enrollment and Attainment in the Dominican Republic

As with much of Latin America and the Caribbean [LAC], one of the major educational improvements in the Dominican Republic during the 1980s-1990s was increased access to education (B. Alvarez, 2000; C. Alvarez, 2004; Anderson, 2005; Casassus et al., 2002). The Dominican Republic was like "an 'educational funnel'…only a small proportion of the population entering the first grade…completes eight years of schooling" (Luna, Gonzalez, & Wolff, 1990, p. 363). In the 1980s, for every 1000 students, 160 would complete 8th grade, of which only 30 students would complete high school (Luna et al., 1990, p. 363). Those who completed eight years of schooling constituted an "instructed elite" (Luna et al., 1990, p. 376) who primarily attend private schools for higher socioeconomic status students (Jimenez et al., 1989). Since the 1990s, the Dominican Republic has experienced improvement in the area of educational access:

> As was the case for the rest of Latin American countries, the last the last decade of the twentieth century was for Dominican education a period of improvement in several areas, particularly in basic education. Preschool enrollment rates increased from 14.7 percent in 1989 to 33.1 percent in 1997. Almost 80 percent of the primary school age children had access to school in 1996 in comparison to 67 percent in 1991. At the beginning of the decade, the dropout rate of primary school students was over 23 percent. This rate decreased to less than half in 1995. (B. Alvarez, 2000, p. 8)

Even with improvement in educational access, there were still "substantial differences in educational attainment between rich, middle class, and poor children…most poor children do not complete basic education (B. Alvarez, 2000, p. 8). Despite improvements in access to education, the Dominican Republic "still lags behind countries with similar economic

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conditions, and equity is still a challenge, particularly for children in rural areas" (B. Alvarez, 2000, p. ii).

As of 2004, the enrollment rates of the Dominican Republic had improved and were "one of the highest in the region" (C. Alvarez, 2004, p. 9). The increase in enrollment was attributed to "more flexibilities of schedule and types of schooling" (C. Alvarez, 2004, p. 9), including educational programs during the evening and night. Rural school enrollment and attainment remained low compared to urban areas (C. Alvarez, 2004). In 2004, 44% of rural schools offered no higher educational level than 4th grade, as compared with 14% of urban school (C. Alvarez, 2004). If students wanted to continue attending school after 4th grade, many would be unable to do so or would be forced to travel to an urban area (C. Alvarez, 2004).

Students in the Dominican Republic were commonly found to be overage which coincided negatively with the probabilities of academic success (C. Alvarez, 2004). As of 2004, less than 60% of six and seven year-old students entered school on time which had direct consequences for the probability of academic success and future progression (C. Alvarez, p. 14). Rural students were more prone than urban students to leave school early, and also more prone to leave school permanently (C. Alvarez, 2004, p. 20). Such students may have artificially increased rural school student academic achievement which was reported to be on par with urban school student achievement in the Dominican Republic (C. Alvarez, 2004).

Student Academic Achievement in the Dominican Republic and Latin American and the Caribbean

The Dominican Republic had lower student academic achievement than almost all other Latin American and Caribbean countries on standardized, international exams (B. Alvarez, 2000; Bos et al., 2016; Casassus et al., 2002; Latin American Laboratory for

Assessment of the Quality of Education, 2015). Dominican students were found to "perform below the median of their counterparts in neighboring countries…in regional Latin American comparisons of school achievement" (C. Alvarez, 2000, p. 10). The results of the Primer Estudio Regional Comparativo y Explicativo [PERCE] (First Regional Comparative and Explanatory Study) and of the Tercer Estudio Regional Comparativo y Explicativo [TERCE] (Third Regional Comparative and Explanatory Study) revealed that the Dominican Republic achieved the lowest scores of all participating LAC nations (Casassus et al., 2002; Latin American Laboratory for Assessment of the Quality of Education, 2015). The PERCE and TERCE were academic achievement examinations in which 15 LAC countries/states participated (Casassus et al., 2002; Latin American Laboratory for Assessment of the Quality of Education, 2015). The PERCE had a mean score of 250 and a standard deviation of 50; the TERCE had a mean score of 700 and a standard deviation of 100 (Casassus et al., 2002; Latin American Laboratory for Assessment of the Quality of Education, 2015).

Similarly, on the 2015 Program for International Student Assessment [PISA], the Dominican Republic performed the worst of all participants (OECD, 2016). Schools from the Dominican Republic averaged approximately 0.7 standard deviations below the LAC mean score of approximately 400, placing the Dominican Republic mean score at 332 (OECD, 2016). Peru, the next closest LAC country, had a mean score of 397 (OECD, 2016). The mean score on the PISA was approximately 500 and the standard deviation was approximately 100 (OECD, 2016).

Student Academic Achievement in the Dominican Republic

Student achievement data from the Dominican Republic followed the same trend as data from Latin America and the Caribbean [LAC] (Somers et al., 2004). Students from private

schools tended to have higher academic achievement on standardized assessments than students from public schools (Anderson, 2005; Jimenez & Lockheed, 1995, 1991; Jimenez et al., 1989; Jimenez, Lockheed, & Paqueo, 1991; Luna et al., 1990; McEwan, 2001; Somers et al., 2004). The review of literature identified no peer reviewed research on student academic achievement in the Dominican Republic after 2004 and no studies that employed data collected later than 1997 (Somers et al., 2004). Seven of the studies employed the same data set on mathematics student academic achievement from 1982-1983 (Jimenez & Lockheed, 1995, 1991; Jimenez et al., 1989; Jimenez, Lockheed, Luna, & Paqueo, 1991; Jimenez, Lockheed, & Paqueo, 1991; Lockheed & Jimenez, 1994; Luna et al., 1990). The studies identified in the literature review did not perform separate analysis of rural private schools and rural public schools (Luna et al., 1990; Roncagliolo Jones, 2010; Somers et al., 2004).

Private and Public School Student Achievement in the Dominican Republic

Students in private schools in the Dominican Republic typically performed better on standardized exams than students from public schools (Jimenez & Lockheed, 1995; Jimenez et al., 1989; Luna et al., 1990). A study on student academic achievement in mathematics found that private school students on average had higher academic achievement than public school students (Jimenez et al., 1989). In the study, student academic achievement was moderated by control variables such as socioeconomic status [SES] and past student achievement to isolate the effect of attending a private school (Jimenez et al., 1989, p. 21). The results of the study indicated that a typical 8th grade public school student would be expected to score 7.47 points higher in an F-type school and 3.08 points higher in an O-type school on a 40 point mathematics examination, not considering other variables (Jimenez et al., 1989, p. 20). F-type private schools were authorized by the Ministry of Education to give the national exams while

O-type private schools were not so authorized (Jimenez et al., 1989). The study also moderated

for school, classroom, and teacher practice variables and found that "the advantage falls to 4-5

points for F-type and 2-3 points for O-type, though [the advantage] still exists" (Jimenez et al.,

1989, p. 25). In this and other studies, the private school effect did not "disappear [when

controlling for other variables], the implication being that there are unmeasured practices,

teacher characteristics, [and] factors that motivate teacher performance" (Jimenez et al., 1989,

p. 25; Luna et al., 1990) and that private schools were more effective at educating students.

Private schools were also hypothesized to take advantage of the positive impact of high SES

peer groups on student academic achievement (Jimenez et al., 1989, p. 36; Somers et al., 2004).

The section on urban education presents the effects of peer groups in more detail.

In a 2010 dissertation on time spent teaching mathematics in the Dominican Republic,

private school students were found to have higher mean scores than public school students on

standardized achievement exams in mathematics (Roncagliolo Jones, 2010). For example, the

mean achievement of 5th grade public school students was "lower than the achievement

of…75% of the children in private schools. In addition, there are no significant differences in

mean achievement levels between urban and rural schools of the public sector" (Roncagliolo

Jones, 2010, p. 61).

Contrary to previous studies, a report on the Segundo Estudio Regional Comparativo y

Explicativo [SERCE] (Second Regional Comparative and Explanatory Study) reported no

statistical differences between private and public schools for the majority of the exams, the

exception being third grade mathematics and reading where the difference was small (Hausman

et al., 2011). No statistically significant difference was found between rural and urban schools

in the Dominican Republic (Hausman et al., 2011, p. 88). The SERCE was an international

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academic achievement exam in which 17 LAC countries/states participated; the exam had a mean of 500 and a standard deviation of 100 (Latin American Laboratory for Assessment of the Quality of Education, 2008). The low quality of education in the Dominican Republic was reported as evidence of a problem for the entire system of education in the Dominican Republic, which scored the lowest of all participating countries on the SERCE and subsequent TERCE (Hausman et al., 2011; Latin American Laboratory for Assessment of the Quality of Education, 2015).

Lack of Recent Research on Rural Private Schools

The review of literature identified zero studies which isolated and analyzed the academic achievement of rural private school students. In the literature, all rural schools were treated as homogenous or excluded from analysis (Jimenez, Lockheed, Luna, et al., 1991; Roncagliolo Jones, 2010; Somers et al., 2004). The purpose of this study was to fill the gap in research on rural private education and student academic achievement in the Dominican Republic.

External Participation in Education in the Dominican Republic

A google search for Dominican Republic mission schools yielded 2,700,000 results. Three financial reports were located for organizations operating educational programs in the Dominican Republic with education expenses or collections ranging from $100,000 to approximately $1,000,000. Doulos Ministries reported spending $340,762 in 2015 and $171,578 in 2016 on educational programs including teachers, scholarships, and development (Doulos Discovery Ministries, Inc., 2016). The Diocese of Orlando Office of Catholic Schools reported donations of $448,000 during the 2015-2016 academic year in support of the diocesan

mission in the Dominican Republic (Diocese of Orlando Office of Catholic Schools, 2016, "How We Serve – Diocese of Orlando, Florida," 2017). The mission schools of the Diocese of Orlando included 4 elementary schools and one middle school enrolling 420 students (Diocese of Orlando Office of Catholic Schools, 2016, "How We Serve – Diocese of Orlando, Florida," 2017). Solid Rock International Reported ministry expenses, including education outreach, of $1,107,946 in 2016-2016, although the organization did not report the exact expenses for education (Solid Rock International, 2017).

CHAPTER III: METHODOLOGY

Introduction

The purpose of the present study was to analyze private and public school student achievement in urban and rural settings on the 2016 8th Grade National Exams in the Dominican Republic and thereby address the need for greater research on private and public schools in rural and urban settings in that nation. The research questions were formulated to address the gap in research on the student academic achievement of private and public schools in rural and urban settings in the Dominican Republic. The research questions were as follows.

Research Question 1: To what extent do the school mean scale scores of private and public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 2: To what extent do the school mean scale scores of rural private and rural public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 3: To what extent do the school mean scale scores of urban private and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 4: To what extent do the school mean scale scores of rural private, rural public, urban private, and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

This study was organized as a causal-comparative study in which potential differences between different school types (rural private, rural public, urban private, urban public) were

analyzed to determine if any differences existed between the school types and whether the differences were the result of random chance or some other factor (Fraenkel, Wallen, & Hyun, 2015). The methodology of this study was described in this chapter and was divided into four parts: (a) selection of participants, (b) instrumentation, (c) data collection, and (d) data analysis. The selection of participants included a description of the population and sampling procedures used to select the groups on whom data was to be collected (Fraenkel et al., 2015). The instrumentation section explained the instrument chosen for providing data on the population (Fraenkel et al., 2015). The description of data collection explained the procedure used to gather and compile all data on the study participants, and the data analysis section explained the statistical procedures used to determine if any differences existed between the groups and whether those differences were due to random chance or some other factor (Fraenkel et al., 2015).

<div align="center">Population and Sample Selection</div>

Participants were chosen based on the public availability of standardized exam data representing the participants' student academic achievement in rural private, rural public, urban private, and urban public schools in the Dominican Republic. The population from which the participants' schools were drawn was all 3,675 public and private schools in the Dominican Republic which participated in the 2016 8th Grade National Exams (Ministerio de Educación de la República Dominicana, 2016a, Ministerio de Educación de la República Dominicana, 2016b).

For Research Question 1, all private ($N = 1,119$) and public schools ($N = 2,556$) in the Dominican Republic were included. Research Question 2 included all rural private schools ($N = 47$) and a sample of rural public schools ($N = 47$). For Research Question 3, the participants

included all urban private ($N = 1{,}072$) and urban public ($N = 1{,}024$) schools. Research Question 4, included the rural private ($N = 47$) and rural public ($N = 47$) schools from Research Question 2, along with samples of urban private ($N = 47$) and urban public ($N = 47$) schools.

The total number of 8th grade students during the 2015-2016 academic year was approximately 360,000 (Ministry of Education, 2016a). Of the total number of 8th grade students, 59,334 were private school students, of which 2,088 were rural private school students and 57,246 were urban private school students. Public school students accounted for 304,704 of the total number of 8th grade students, of which 100,781 were rural public school students 203,923 were urban public school students (Ministerio de Educación de la República Dominicana, 2016a). Table 15 represents the total number of schools in the population and samples, as well as the 8th grade enrollment and the number and percentage of students present for the 2016 8th Grade National Exams.

Table 15

Population and Sample 2016 8th Grade Enrollment in the Dominican Republic

Category	*N*	Enrolled	Present	
Private	1119	59,334	30,563	51.51%
Public	2556	305,431	143,422	46.96%
Urban Private	1072	57,246	29,291	51.17%
Rural Private	47	2,088	1,126	53.93%
Urban Public	1024	204,555	93,817	45.86%
Rural Public	1532	177,738	84,955	47.80%

Note. (Ministerio de Educación de la República Dominicana, 2016a)

Sampling

Research Question 1 included all private ($N = 1{,}119$) and all public ($N = 2{,}556$) schools in the Dominican Republic. Research Question 2 included the entire population of rural private schools ($N = 47$) and a sample of rural public schools ($N = 47$). Research Question 3 included all private ($N = 1{,}119$) and all public ($N = 2{,}556$) schools in the Dominican Republic and no sample process was used. The entire population of rural private school was chosen to maximize the number of participants, maximize the degrees of freedom, and thereby decrease the statistical value at which the analytical results were statistically significant (Steinberg, 2011, p. 200). Gay, Miles, and Airasian (2006), as cited in Lunenberg and Irby (2008, p. 179), offer guidelines for choosing sample sizes and state that when a population is 100 or fewer, the entire population should be included. The samples of rural public schools, and the sample of urban

private and urban public schools for Research Question 4, were selected using the following procedure.

A database was created with all schools within each category (rural public, urban private, urban public). For each rural private school, a school from each category was chosen as a match based on 2016 8th grade population (Fraenkel et al., 2015). If there was no exact numerical match for the 2016 8th grade population, the school with the closest numerical 2016 8th grade population was chosen from each category. If there were multiple schools whose 2016 8th grade populations were the same or equally different from the target rural private school population, a school was selected using a random number generator from among all such schools (Fraenkel et al., 2015). For instance, if the targeted rural private school had a 2016 8th grade population of 50 and the closest rural public school 8th grade populations were 47 and 53, one of the two rural public schools would be randomly selected for inclusion in the analysis.

Instrumentation

The instrumentation used were the 2016 8th Grade National Exams. The National Exams were a series of standardized tests used to gauge student academic achievement in Spanish language, mathematics, social sciences, and natural sciences, in alignment with the national curriculum of the Dominican Republic (Dirección General de Evaluación de la Calidad, 2016). The order of subject areas were listed throughout this study in the order presented in the database of 2016 8th Grade National Exams scores published by the Ministry of Education (Ministerio de Educación de la República Dominicana, 2016a).The exams were given at the end of the academic year and contributed 30% to each student's final grade, the remaining 70% of which was determined by the student's final school grade resulting from the school based academic plan (Dirección General de Evaluación de la Calidad, 2016).

Each subject test was given on a different day for four consecutive days for two hours each day (Ministerio de Educación, n.d.). Students were randomly assigned one of several versions of the test containing different but equivalent exam items (Ministerio de Educación, n.d.).

Validity

The validity of an instrument is a measure of how accurately an instrument actually "measures what it purports to measure" (Fraenkel, Wallen, & Hyun, 2015; Lunenburg & Irby, 2008, p. 181). Fraenkel et al. (2015) also state that validity refers to "defensibility of the inferences researchers make from the data collected through the use of an instrument…to be of any use, these inferences must be correct. All researchers, therefore, want instruments that permit them to draw warranted, or valid conclusions…" (p. 113). The General Directorate of Evaluation and Control of the Quality of Education of the Ministry of Education of the Dominican Republic [MOE] stated that the validity of the National Exams implied that the exams must account for the learning achieved by students and that what is being evaluated is in accordance with the current curriculum (Ministerio de Educación, n.d.).

To establish the validity of the National Exams, the MOE did the following. The Ministry of Education undertook an analysis of the curriculum, followed by a revision of the national textbooks (Ministerio de Educación, n.d., p. 15). The MOE then created a table of the specific content for each area of the curriculum for each subject and weighted the content to determine the necessary content items for the exam as well as the percentages of different items to be included based on taxonomical level (Ministerio de Educación, n.d., p. 15).

The exam items were designed to test three different levels of cognitive processes based on the Anderson and Krathwohl (2001) revision of *Bloom's Taxonomy of Educational Objectives* (Bloom, 1969; Ministerio de Educación, n.d., p. 13). The Department of the National Exams created a bank of exam items based on the table of weighted content items elaborated by the MOE (Ministerio de Educación, n.d., p. 15). Technical specialists from each subject area selected items from the bank and validated new items based on the judgement of subject area experts and in accord with results from the pilot exams (Ministerio de Educación, n.d., p. 15).

Reliability

"Reliability is the degree to which an instrument consistently measures whatever it is measuring" (Lunenburg & Irby, 2008, p. 182). The General Directorate of Evaluation and Control of the Quality of Education of the Ministry of Education of the Dominican Republic stated with respect to the reliability of the National Exams that all students must be examined in the same conditions and under the same criteria of correction (Ministerio de Educación, n.d., p. 14).

From 2010 to 2016, the reliability of the National Exams was analyzed using the Rasch Model Item Response Theory for final calibration and scaling (Ministerio de Educación, n.d., p. 16). Item Response Theory was used to determine the level of difficulty of an exam item so that correct or incorrect responses on exams contribute to an individual's total score based on the item difficulty (Nguyen, Han, Kim, & Chan, 2014). The Rasch Model Item Response Theory takes into account the difficulty level of the item and the ability demonstrated by the student's response (Ministerio de Educación, n.d., p. 16). The Rasch Model Item Response Theory ultimately helps the researcher determine if the results of an instrument are "meaningful,

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significant, and purposive" (Tabatabaee-Yazdi, Motallebzadeh, Ashraf, & Baghaei, 2018, p. 129). The document which discussed Rasch Model Item Response Theory did not include the results of the Rasch Model Item Analysis to allow for independent verification of the reliability of the National Exams; no reliability coefficient was reported (Ministerio de Educación, n.d.). The document included a list of the exam items analyzed using the Rasch Model Item Response Theory percentage of correct responses for each item; items left blank; items answered correctly by almost all students; items answered correctly by very few students; biserial point correlation and other estimates of the discrimination of each item; measure of difficulty of each item; and preferred response options (Ministerio de Educación, n.d., p. 17).

National Exam Participation

Of the entire 2016 8th grade population in the Dominican Republic, 52.57% of private school students and 47.92% of public school students participated in the 2016 National Exams (Ministerio de Educación de la República Dominicana, 2016a). Rural private school students were both convoked, or invited, (55.08%) and present (53.93%) at the highest rate followed by private urban (52.22% convoked and 51.17% present) and public rural (48.8% convoked and 47.8% present). Urban public students were both convoked (46.81%) and present (45.86%) at the lowest rate for the National Exams. Table 16 shows the total number of students enrolled, convoked, and present in 8th grade in all schools by type and location.

Table 16

2016 8th Grade Enrollment and National Exams Participation by School Type and Location

Category	*N*	Enrolled	Convoked		Present	
Private	1119	59,334	31,191	52.57%	30,563	51.51%
Public	2556	305,431	146,355	47.92%	143,422	46.96%
Urban private	1072	57,246	29,895	52.22%	29,291	51.17%
Rural private	47	2,088	1,150	55.08%	1,126	53.93%
Urban public	1024	204,555	95,758	46.81%	93,817	45.86%
Rural public	1532	177,738	86,743	48.80%	84,955	47.80%

Note. (Ministerio de Educación de la República Dominicana, 2016a)

The rural private school category included 47 schools out of of 3,675 total schools in the Dominican Republic, approximately 1.3 percent of all schools. The number of rural public, urban private, and urban public schools was comparable in that all three categories are over 1,000. The mean 8th grade enrollment for urban public schools (199) was approximately four times that of urban private schools (53) and approximately three times that of rural public schools (66). There were approximately 60,000 students enrolled in private schools in the Dominican Republic, the majority of which were enrolled in urban private schools. Public school enrollment in the Dominican Republic was approximately 305,000 students, the majority of which were enrolled in urban public schools. Figure 4 shows the total number of schools by category in the Dominican Republic. Figure 5 shows the mean 8th grade enrollment by school category in the Dominican Republic.
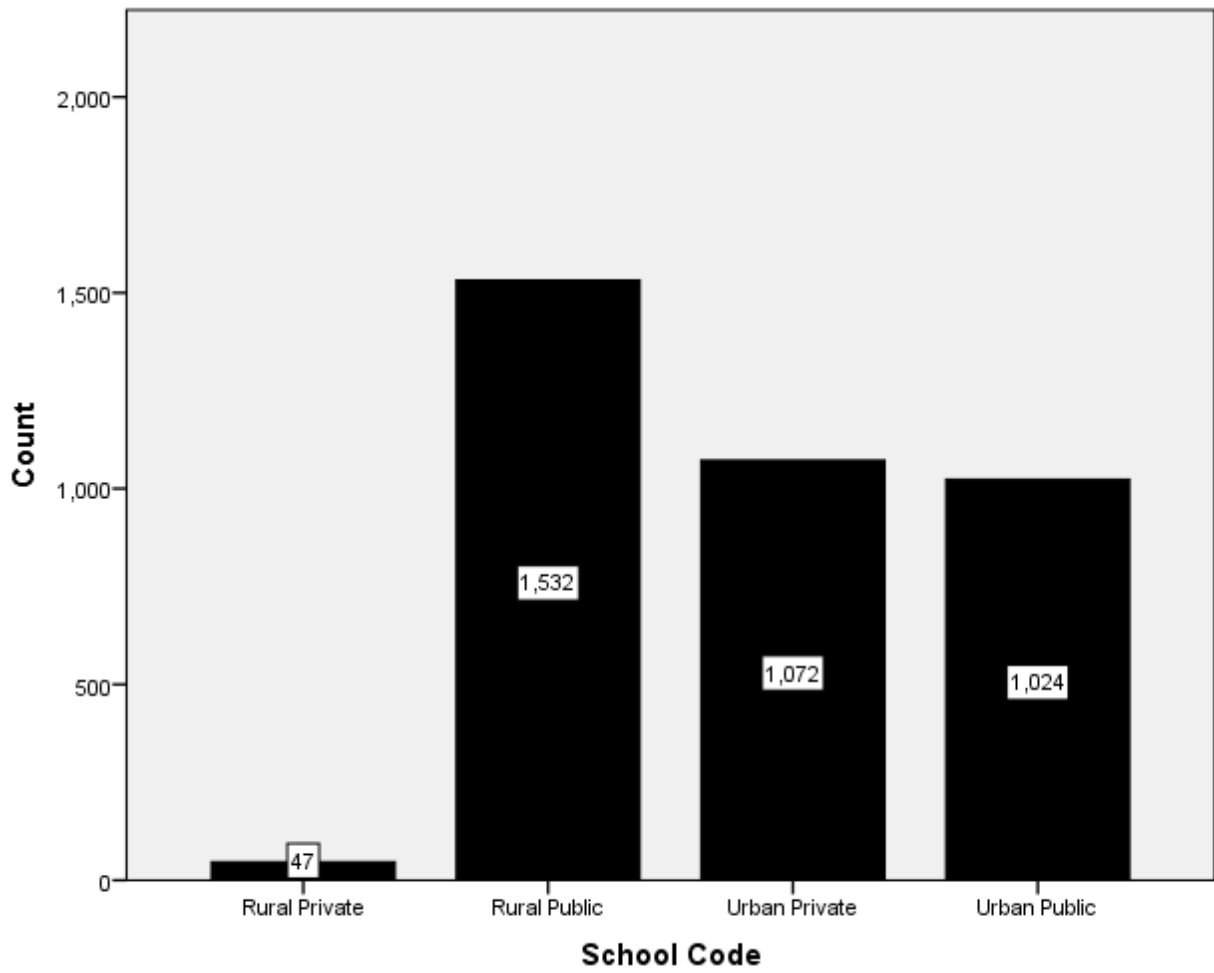
Figure 4. Number of schools by category in the Dominican Republic in 2016
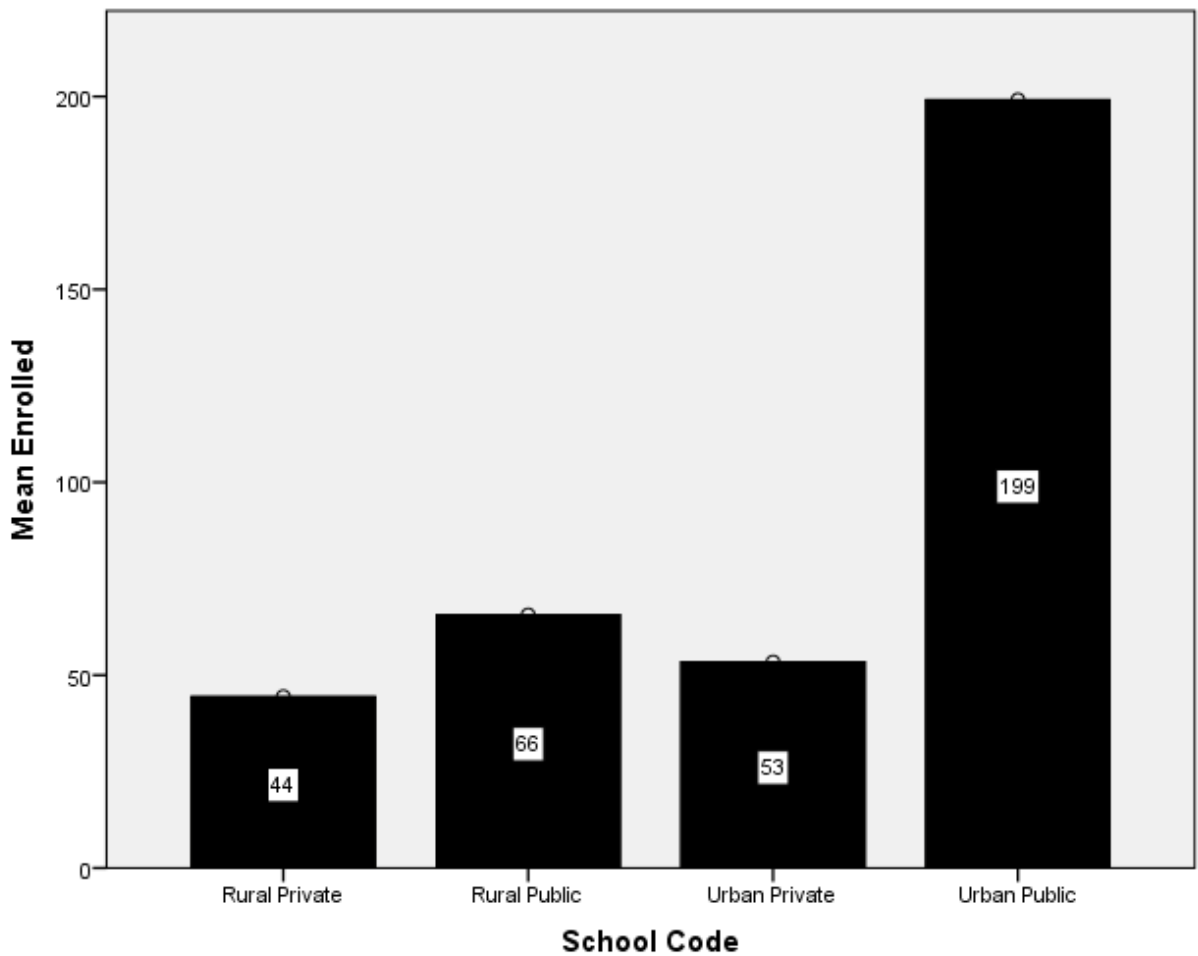
Figure 5. 2016 Mean 8th grade enrollment by school category

Rural private, rural public, and urban private schools were comparable with over 60%

of enrolled students present for the 2016 8th Grade National Exam while urban public schools

had approximately 52% of enrolled students present. Rural private schools had a mean of 24

students present for the 2016 8th Grade National Exams, 66% of the mean 8th grade

enrollment. Rural public schools had a mean of 32 students present, 64% present. Urban private

schools had a mean of 27, 66% present. Urban public schools had a mean of 91 students, 52%

present. Figure 6 shows the mean percent in decimal form of students present for the 2016 8th

Grade National Exams and Figure 7 shows mean school total of students present in schools by category (rural private, rural public, urban private, urban public).
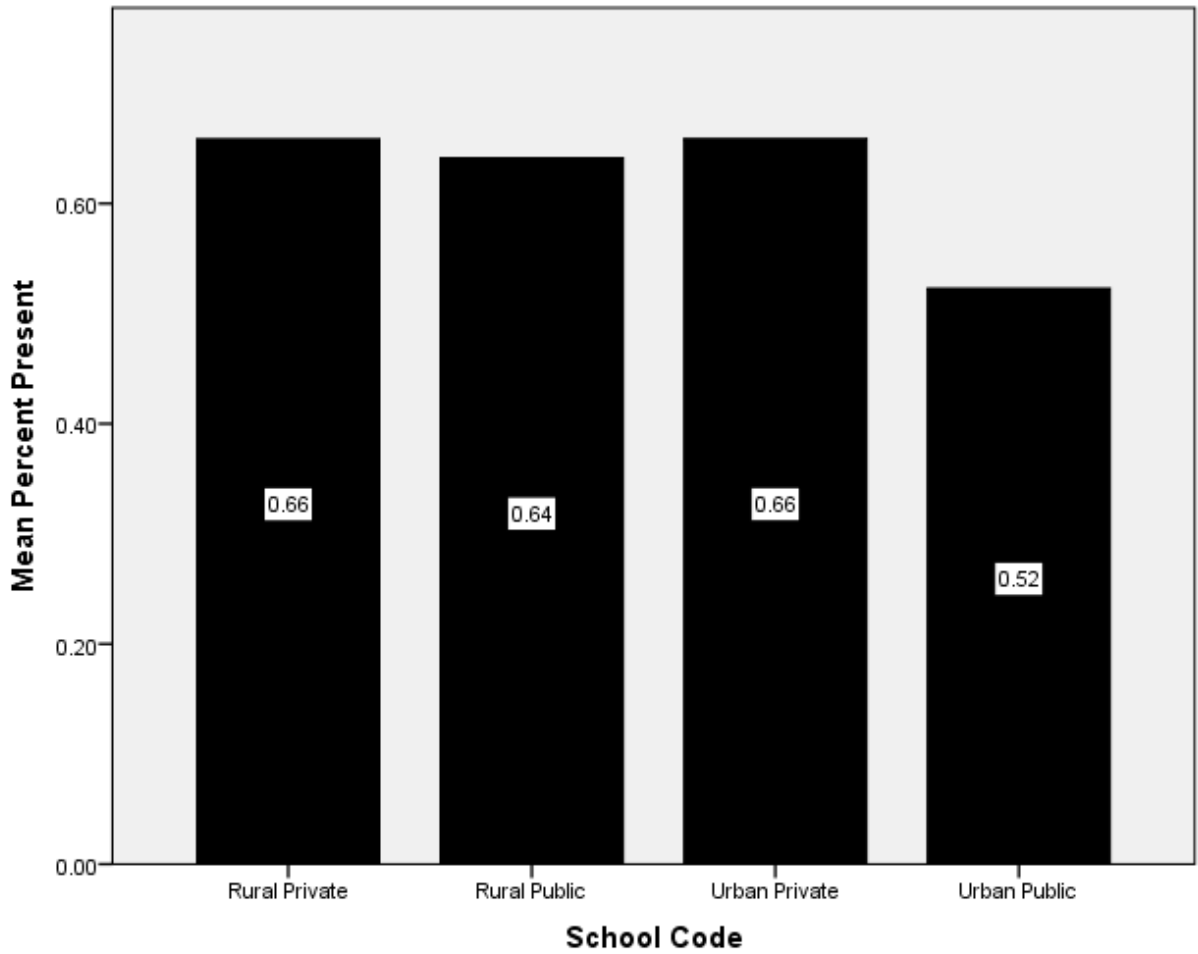
Figure 6. Mean percentage of students present for the 2016 8th grade national exams by school category
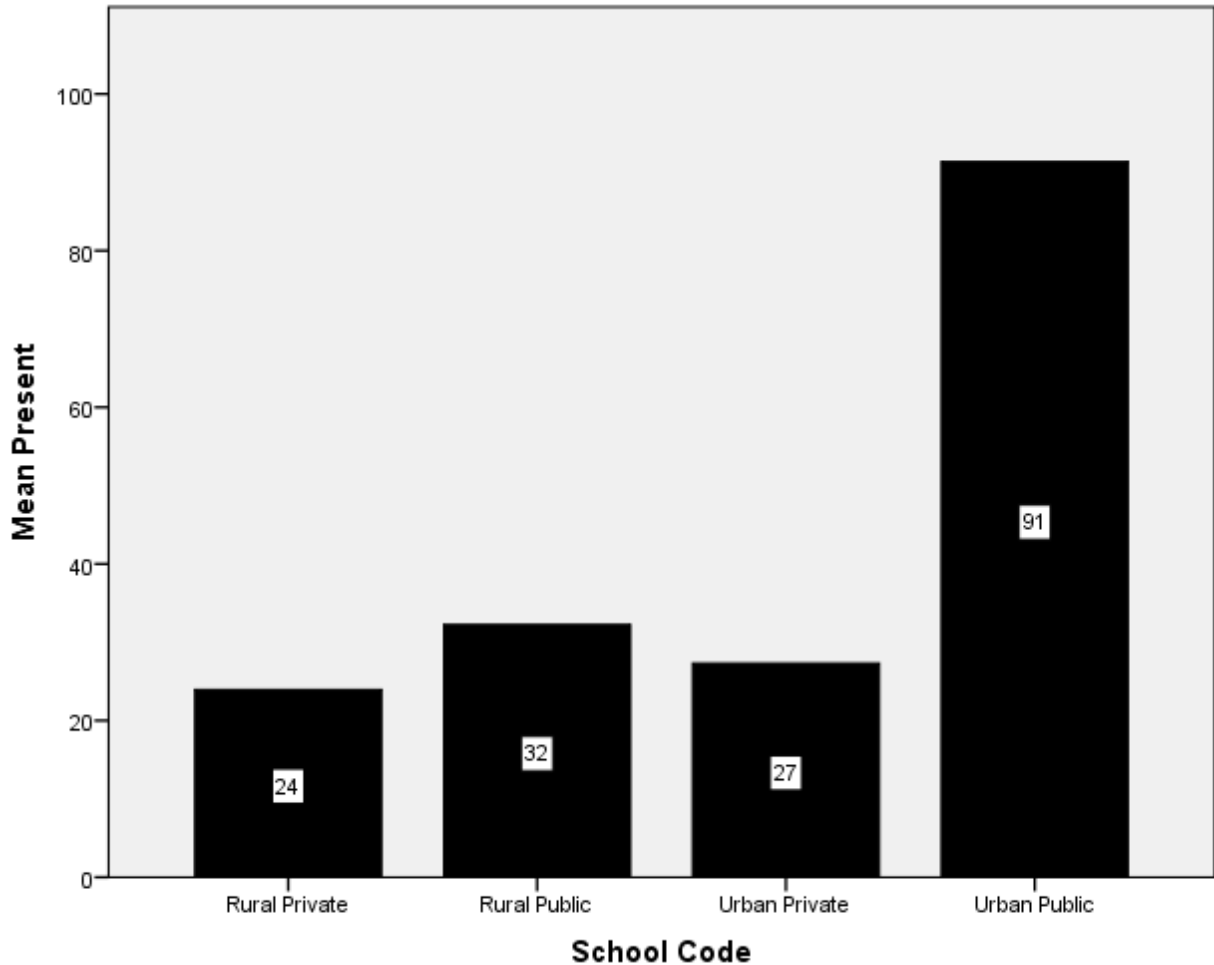
Figure 7. Mean number of students present for the 2016 8th grade national exams by

school category

Data Collection

The present study required the 2016 8th Grade National Exams data to analyze the

populations and samples included. The data included in the present study were publicly

available on the website for the Ministry of Education of the Dominican Republic [MINERD]

(Ministerio de Educación de la República Dominicana, 2016a). Data were published in a

spreadsheet format with the mean school score for each of the four subject area exams; Spanish

language, mathematics, social sciences, and natural sciences. Scores were reported as a mean

out of 30 total points. The data included in the present study were downloaded into a database using only the data published by the MINERD and no other data. No other data were collected apart from accessing the 2016 8th Grade National Exams data.

Raw Data Collection

Raw data for all schools for the 2016 8th Grade National Exams scores were downloaded from the website for the Ministry of Education of the Dominican Republic (MINERD). The following selections were made on the drop-down menus in the spreadsheet downloaded from the MINERD. The period selected was 2016, all convocations and districts were selected, and the basic level was selected. For zones, all rural and all urban schools were selected. For sectors, all private and all public schools were selected. For an outline of this process, see Appendix B.

Data for all schools in the four categories included in the study (rural private, rural public, urban private, and urban public) were selected from the raw data to create a master database. On separate sheets within a spreadsheet software program, all schools within each category were sorted in ascending order by 2016 8th grade enrollment. The master database was compared to the original source data to ensure that no duplicate schools or districts existed and that the total number of schools in each category in the original source data matched the total number of schools in each category in the master database. All samples were drawn from the master database.

Data Analysis

Two statistical analyses were used to analyze the student achievement of rural private, rural public, urban private, and urban public schools in the Dominican Republic on the 2016 8th

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Grade National Exam. Research Questions 1, 2, and 3 used an independent samples *t*-test and

Research Question 4 used a 2 by 2 factorial analysis of variance [ANOVA] (Steinberg, 2011).

An independent samples *t*-test reports a statistic that is a measure of the differences

between two samples to determine if the difference is due to sampling error or due to

something else, such as the independent variable (Steinberg, 2011, p. 232-233). Results were

reported in the format of $T(X) = Z, p < Y$, where X is the degrees of freedom, Z is the reported

T score, and Y represents the confidence interval (Steinberg, 2011, p. 240). In addition to the *t*

statistic, using Cohen's *d*, effect size was calculated for each independent samples *t*-test

(Steinberg, 2011). Effect size helps answer the question "'What constitutes a meaningful

difference, as opposed to merely a statistical difference?'" (Steinberg, 2011, p. 395). Thus,

while the *t* statistic is a measure of the statistical significance of the differences between two

samples, effect size is a measure of how meaningful the difference is between two samples.

Cohen (1988) suggests the following guidelines for evaluating effect sizes. An effect size of .2

is considered small, an effect size of .5 is considered medium, and an effect size of .8 or more

is considered large (Cohen, 1988).

Research Question 1

The independent variables in Research Question 1 were the school categories private

schools ($N = 1,119$) and public schools ($N = 2,556$). The dependent variables were the school

mean scale scores on the 2016 8th Grade National Exam in each of the four subject areas

(Spanish language, mathematics, social sciences, and natural sciences) reported as a mean score

out of 30 total possible points (Ministerio de Educación, n.d.; Ministerio de Educación de la

República Dominicana, 2016a). For Research Question 1, four separate independent *t*–tests

were conducted for each subject area exam, corresponding to the four subject area exams:

Spanish language, mathematics, social sciences, and natural sciences. The independent

variables for Research Question 1 are displayed in Table 17.

Table 17

Research Question 1 Variables (N = 3,675)

Independent Variable	*n*	Dependent Variable			
		Spanish Language	Mathematics	Social Sciences	Natural Sciences
Private Schools	1,119				
Public Schools	2,556				

Note. Total school populations: Private (*N* = 1,119); public (*N* = 2,556). Ministerio de Educación de la República Dominicana. (2016a). Cubo Pruebas Nacionales 2011-2016. Retrieved from http://www.minerd.gob.do/sitios/pnacionales/Documentos%20Pruebas%20Nacionales/CUBO%20PRUEBAS%20NACIONALES%202011-2016.zip

Research Question 2

The independent variables in Research Question 2 were the school categories rural

private (*N* = 47) and rural public (*N* = 47). The dependent variables were the school mean scale

scores on the 2016 8th Grade National Exam in each of the four subject areas (Spanish

language, mathematics, social sciences, and natural sciences) reported as a mean score out of

30 total possible points (Ministerio de Educación, n.d.; Ministerio de Educación de la

República Dominicana, 2016a). For Research Question 2, four separate independent *t*–tests

were conducted for each subject area exam, corresponding to the four subject area exams:

Spanish language, mathematics, social sciences, and natural sciences. The independent

variables for Research Question 2 are displayed in Table 18.

Table 18

Research Question 2 Variables (N = 94)

		Dependent Variable			
Independent Variable	*n*	Spanish Language	Mathematics	Social Sciences	Natural Sciences
Rural Private	47				
Rural Public	47				

Note. Total school populations: Rural private (*N* = 47); rural public (*N* = 1,532). Ministerio de Educación de la República Dominicana. (2016a). Cubo Pruebas Nacionales 2011-2016. Retrieved from http://www.minerd.gob.do/sitios/pnacionales/Documentos%20Pruebas%20Nacionales/CUBO%20PRUEBAS%20NACIONALES%202011-2016.zip

Research Question 3

The independent variable in Research Question 3 were the school categories urban private (*N* = 1,072) and urban public (*N* = 1,024). The dependent variables were the school mean scale scores on the 2016 8th Grade National Exam in each of the four subject areas (Spanish language, mathematics, social sciences, and natural sciences) reported as a mean score out of 30 total possible points (Ministerio de Educación, n.d.; Ministerio de Educación de la República Dominicana, 2016a). For Research Question 3, four separate independent *t*–tests were conducted for each subject area exam, corresponding to the four subject area exams: Spanish language, mathematics, social sciences, and natural sciences. The independent variables for Research Question 3 are displayed in Table 19.

Table 19

Research Question 3 Variables (N = 2,096)

		Dependent Variable			
		Spanish			
Independent Variable	*n*	Language	Mathematics	Social Sciences	Natural Sciences
Urban Private	1,072				
Urban Public	1,024				

Note. Total school populations: Urban private ($N = 1,072$); urban public ($N = 1,024$). Ministerio de Educación de la República Dominicana. (2016a). Cubo Pruebas Nacionales 2011-2016. Retrieved from http://www.minerd.gob.do/sitios/pnacionales/Documentos%20Pruebas%20Nacionales/CUBO %20PRUEBAS%20NACIONALES%202011-2016.zip

Research Question 4

For Research Question 4, a 2 by 2 factorial analysis of variance [ANOVA] was used (Steinberg, 2011, p. 335). The independent variables for Research Question 4 were school category: rural private schools ($N = 47$), rural public schools ($N = 47$), urban private schools ($N = 47$), and urban public schools ($N = 47$). The dependent variables were the school mean scale scores on the 2016 8th Grade National Exam in each of the four subject areas (Spanish language, mathematics, social sciences, and natural sciences) reported as a mean score out of 30 total possible points (Ministerio de Educación, n.d.; Ministerio de Educación de la República Dominicana, 2016a). The 2 by 2 factorial ANOVA for Research Question 4 is depicted in Table 20.

Table 20

The 2 by 2 Factorial ANOVA design for Research Question 4: School Type and Location (N = 188)

	Private		Public	
School Location	Rural (*N* = 47)	Urban (*N* = 47)	Rural (*N* = 47)	Urban (*N* = 47)

Note. Total school populations by category: Rural private (*N* = 47); urban private (*N* = 1,072); rural public (*N* = 1,532); urban public (*N* = 1,024). Ministerio de Educación de la República Dominicana. (2016a). Cubo Pruebas Nacionales 2011-2016. Retrieved from http://www.minerd.gob.do/sitios/pnacionales/Documentos%20Pruebas%20Nacionales/CUBO%20PRUEBAS%20NACIONALES%202011-2016.zip

The factorial analysis of variance [ANOVA] was chosen because of its ability to analyze the differences among three or more different groups; "With three or more groups, no single number represents the mean difference across all groups" (Steinberg, 2011, p. 289). An ANOVA "can test the statistical significance between all the groups simultaneously while holding the Type 1 error level constant" (Steinberg, 2011, p. 290). "The factorial ANOVA combines several different hypotheses in a single analysis" (Steinberg, 2011, p. 337). The factorial ANOVA tested the hypothesis that each independent variable had an effect on the independent variable, and it tested the hypothesis that each independent variable moderated or controlled the effects of other independent variables upon a dependent variable (Steinberg, 2011, p. 337). The effect of an independent variable upon the dependent variable was referred to as a main effect (Steinberg, 2011, p. 337). The factorial ANOVA calculated an *F* statistic which was a determination of the "amount of between-group variance relative to the amount of within-group variance" (Steinberg, 2011, p. 294). The *F* statistics for Research Question 4 were compared to an *F* table to determine the statistical significance. Results were reported in the

format of $F (X, Y) = Z$, p < Y where X is the degrees of freedom between groups, Y is the degrees of freedom with groups, Z is the reported F score, and Y represents the confidence interval (Steinberg, 2011, p. 308).

In addition to the *F* statistic, effect size eta or η was calculated (Steinberg, 2011). Effect size helps answer the question "'What constitutes a meaningful difference, as opposed to merely a statistical difference?'" (Steinberg, 2011, p. 395). Whereas the *F* statistic was the "amount of between-group variance relative to the amount of within-group variance" (Steinberg, 2011, p. 294), effect size was a measure of how meaningful the differences are between three or more groups. According to Steinberg (2011), "…most statisticians have settled on similar guidelines" (p. 398) for gauging effect size, which are as follows. An effect size less than or equal to .25 is considered small, an effect size of more than .25 but less than .40 is considered medium, and an effect size of .40 or more is considered large (Field, 2009).

Summary

The methodology section describes the causal-comparative study method, the selection of participants, the instrumentation, the data collection, and the data analysis (Fraenkel, Wallen, & Hyun, 2015). The participants were drawn from the population of all schools in the Dominican Republic which participated in the 2016 8th Grade National Exams and included rural private schools ($N = 47$), rural public schools ($N = 1,532$), urban private schools ($N = 1,072$), and urban public schools ($N = 1,024$) (Ministerio de Educación, n.d.; Ministerio de Educación de la República Dominicana, 2016a). When sampling was needed, schools were selected and matched with rural private schools based on similar 2016 8th grade enrollment (Fraenkel et al., 2015). The instrument whence the data came was the 2016 8th Grade National Exams in the Dominican Republic which included the subjects of Spanish

language, mathematics, social sciences, and natural sciences (Ministerio de Educación, n.d.).

The results of the 2016 8th Grade National Exams were made publicly available on the website

of the Ministry of Education of the Dominican Republic, whence the data were downloaded

(Ministerio de Educación de la República Dominicana, 2016a). The data analyses included a

series of independent samples t-tests and a 2 by 2 factorial ANOVA. Results of the analysis

were presented and discussed in the following chapters.

CHAPTER IV: FINDINGS

Introduction

The problem that initiated the need for the present study was the lack of research on

student academic achievement in private and public schools in the Dominican Republic. The

purpose of the present study was to determine the differences in student academic achievement

among rural private, rural public, urban private, and urban public school students in the

Dominican Republic on the 2016 8th Grade National Exams in the subject areas of Spanish

language, mathematics, social sciences, and natural sciences. This chapter presents the results

of the data analysis for the four research questions. The descriptive statistics are reported first,

followed by test statistics corresponding to the research questions. The research questions are

as follows.

Research Question 1: To what extent do the school mean scale scores of private and

public schools in the Dominican Republic differ on the 2016 8th Grade National Exams

(Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 2: To what extent do the school mean scale scores of rural private

and rural public schools in the Dominican Republic differ on the 2016 8th Grade National

Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 3: To what extent do the school mean scale scores of urban private

and urban public schools in the Dominican Republic differ on the 2016 8th Grade National

Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 4: To what extent do the school mean scale scores of rural private,

rural public, urban private, and urban public schools in the Dominican Republic differ on the

2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

The order of subject areas (Spanish language, mathematics, social sciences, and natural sciences) and all corresponding statistics are listed throughout this study in the order presented in the database of 2016 8th Grade National Exams scores published by the Ministry of Education (Ministerio de Educación de la República Dominicana, 2016a).

Descriptive Statistics

In Spanish language, as in all subject areas, urban private schools had the highest mean scale score at 18.67 with the highest standard deviation of 2.52, indicating the greatest variance and least consistency (Fraenkel et al., 2015). Rural private schools had the second highest score at 17.60 with a standard deviation of 2.00. Urban public schools had a mean scale score in Spanish language of 16.73 and a standard deviation of 1.87. Rural public schools had a mean scale score of 16.70 and a standard deviation of 1.88 in Spanish language. Table 21 presents a rank order of Spanish language mean scale scores for the four school categories.

Table 21

Rankings of Spanish Language 2016 8th Grade National Exam Mean Scale Scores

Rank	School Category	*n*	*m*	*SD*
1	Urban Private	1,072	18.67	2.52
2	Rural Private	47	17.60	2.00
3	Urban Public	1,024	16.73	1.87
4	Rural Public	1,532	16.70	1.88

In mathematics, urban private schools had the highest mean scale score at 17.40 with the highest standard deviation of 2.49, indicating the greatest variance (Fraenkel et al., 2015). Rural private schools had a mean score of 16.64 with a standard deviation of 2.06. Rural public schools had a mean scale score in mathematics of 16.57 and a standard deviation of 2.34. Urban public schools had a mean scale score of 16.09 and a standard deviation of 2.37 in mathematics. Unlike in Spanish language, the smallest standard deviation was in rural private school mean scale scores at 2.06, indicating the least variation (Fraenkel et al., 2015). Table 22 presents a rank order of mathematics mean scale scores for the four school categories.

Table 22

Rankings of Mathematics 2016 8th Grade National Exam Mean Scale Scores

Rank	School Category	*n*	*m*	*SD*
1	Urban Private	1,072	17.40	2.49
2	Rural Private	47	16.64	2.06
3	Rural Public	1,532	16.57	2.34
4	Urban Public	1,024	16.09	2.37

In social sciences, urban private schools had the highest mean scale score, 17.21, with a standard deviation of 1.99. Rural public schools had a mean scale score of 16.74 and the highest standard deviation, 2.02, indicating the greatest variation in mean scale scores (Fraenkel et al., 2015). Rural private schools had a mean score of 16.52 and the lowest standard deviation, 1.70, indicating the least variation in mean scale scores (Fraenkel et al., 2015). Urban public schools had a mean scale score in social sciences of 16.22 and a standard deviation of 2.01. Unlike in in Spanish language, mathematics, and natural sciences, the urban private school standard deviation (sd = 1.99) was lower than the standard deviation of rural public schools (sd = 2.02) and of urban public schools (sd = 2.01), indicating less variation in mean scale scores (Fraenkel et al., 2015). Table 23 presents a rank order of social sciences mean scale scores for the four school categories.

Table 23

Rankings of Social Sciences 2016 8th Grade National Exam Mean Scale Scores

Rank	School Category	n	m	SD
1	Urban Private	1,072	17.21	1.99
2	Rural Public	1,532	16.74	2.02
3	Rural Private	47	16.52	1.70
4	Urban Public	1,024	16.22	2.01

In natural sciences, urban private schools had the highest mean scale score, 17.14, with the highest standard deviation of 1.94, indicating the greatest variation in mean scale scores (Fraenkel et al., 2015). Rural public schools had a mean scale score of 16.62 and a standard deviation of 1.90. Rural private schools had a mean score of 16.52 and a standard deviation of

1.70. Urban public schools had a mean scale score in natural sciences of 16.07 and the smallest

standard deviation, 1.49, indicating the least variance in mean scale scores (Fraenkel et al.,

2015). Table 24 presents a rank order of natural sciences mean scale scores for the four school

categories.

Table 24

Rankings of Natural Sciences 2016 8th Grade National Exam Mean Scale Scores

Rank	School Category	*n*	*m*	*SD*
1	Urban Private	1,072	17.14	1.94
2	Rural Public	1,532	16.62	1.90
3	Rural Private	47	16.54	1.77
4	Urban Public	1,024	16.07	1.49

Research Question 1

Research Question 1: To what extent do the school mean scale scores of private and

public schools in the Dominican Republic differ on the 2016 8th Grade National Exams

(Spanish language, mathematics, social sciences, and natural sciences)? The independent

samples *t*-test for Research Question 1 included 1,119 private schools and 2,556 public schools.

Scores for all subjects were reported as school mean scale scores on a 30-point scale. In all

subject areas, private schools had numerically higher mean scale scores on the 2016 8th Grade

National Exams than public schools. Public schools had numerically smaller standard

deviation, meaning that the scores are closer together and that public school mean scale scores

were more consistent (Fraenkel et al., 2015).

All statistics for skewness and kurtosis were within the acceptable ranges of skew < |1.96| and kurtosis <|3.29| (Field, 2009, p. 139). Levene's test was used to test the assumption of equality of variances which is accomplished when the *p* value is more than .05 (Field, 2009, p. 150). When Levene's test shows a significant difference between the variances, the assumption of equal variances is not met the and degrees of freedom are decreased (Field, 2009). For Research Question 1, the assumption of equality of variances was satisfied by Levene's test for social sciences only. Equal variances were not assumed for Spanish language, mathematics, or natural sciences and the degrees of freedom were reduced (Field, 2009). The results were as follows: for Spanish language, *F* (3,673) = 181.89, *p* = .00, for mathematics, *F* (3,673) = 30.60, *p* = .00, for social sciences, *F* (3,673) = 3.379, *p* = .066, for natural sciences, *F* (3,673) = 15.75, *p* = .00.

Spanish Language

The largest difference among school categories was in Spanish language where the private school mean scale score was 18.62 with a standard deviation of 2.51 and the public school mean scale score was 16.71 with a standard deviation of 1.77. The difference in school mean scale scores was statistically significant in favor of private schools; *t* (1,625.92) = 23.082, p < 0.01, and effect size was large, *d* = 0.88 (Cohen, 1988).

Mathematics

For mathematics, the private school mean scale score was 17.37 with a standard deviation of 2.47, and the public school mean scale score was 16.38 with a standard deviation of 2.15. The difference in school mean scale scores was statistically significant in favor of

private schools; $t(1,887.20) = 11.599$, $p < 0.01$, and effect size was medium, $d = 0.43$ (Cohen, 1988).

Social Sciences

The smallest difference was in social sciences where the private school mean scale score was 17.18 with a standard deviation of 1.98 and the public school mean scale score was 16.53 with a standard deviation of 1.89. The difference in school mean scale scores was statistically significant in favor of private schools; $t(3,673) < 9.45$, $p < 0.01$, and effect size was medium, $d = 0.34$ (Cohen, 1988).

Natural Sciences

In natural sciences, the private school mean scale score was 17.12 with a standard deviation of 1.94 and the public school mean scale score was 16.40 with a standard deviation of 1.77. The difference in school mean scale scores was statistically significant in favor of private schools; $t(1,964.90) = 10.64$, $p < 0.01$, and the effect size was medium, $d = 0.39$ (Cohen, 1988).

For all subjects, there were positive, statistically significant differences between private school and public school mean scale scores on the 2016 8th Grade National Exams in the Dominican Republic, favoring private schools. Table 25 shows the descriptive statistics and results of the independent samples *t*-tests of private and public school mean scale scores for the 2016 8th Grade National Exams in all subject areas.

Table 25

Results of Independent Samples Tests and Descriptive Statistics for Private and Public Schools for the 2016 8th Grade National

Exams (N = 3,675)

| | | | Descriptive statistics | | | | | Independent samples test | | | | |
| | | | | | | | | | | | 95% CI | |
Subject	Type	*n*	*M*	*SD*	*SE*	*Skew*	*Kurt-osis*	*t*	*df*	*p*	*LL*	*UL*
Spanish Language	Private	1,119	18.62	2.51	0.08	0.37	0.14	23.08	1,625.92	0	1.75	2.07
	Public	2,556	16.71	1.77	0.04	0.62	1.07					
Math-ematics	Private	1,119	17.37	2.47	0.07	0.69	0.69	11.59	1,887.19	0	0.82	1.16
	Public	2,556	16.38	2.15	0.04	1.02	1.78					
Social Sciences	Private	1,119	17.18	1.98	0.06	0.62	0.58	9.45	3,673.00	0	0.51	0.78
	Public	2,556	16.53	1.89	0.04	0.9	1.44					
Natural Sciences	Private	1,119	17.12	1.94	0.06	0.5	0.31	10.64	1,964.88	0	0.59	0.85
	Public	2,556	16.4	1.77	0.03	0.84	1.33					

Research Question 2: To what extent do the school mean scale scores of rural private and rural public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)? The independent samples *t*-test included 47 rural private schools and 47 rural public schools. The 47 rural private schools comprised the rural private school population in the Dominican Republic. The 47 rural public schools were matched with the 47 rural private schools by 2016 8th grade enrollment from the rural public school population, $N = 1,532$. Scores for all subjects were reported as school mean scale scores on a 30-point scale. The mean school scale score distributions for all subjects for rural private and rural public schools satisfied both skewness and kurtosis requirements.

All statistics for skewness and kurtosis were within the acceptable ranges of skew < |1.96| and kurtosis <|3.29| (Field, 2009, p. 139). Levene's test was used to test the assumption of equality of variances which is accomplished when the *p* value is more than .05 (Field, 2009, p. 150). When Levene's test shows a significant difference between the variances, the assumption of equal variances is not met the and degrees of freedom are decreased (Field, 2009). For Research Question 2, the assumption of equality of variances was satisfied by Levene's test for all subject areas. The results were as follows: for Spanish language, $F (92) = .37$, $p = .55$, for mathematics, $F (92) = .29$, $p = .60$, for social sciences, $F (92) = 1.15$, $p = .29$, and for natural sciences, $F (92) = .17$, $p = .70$.

Spanish Language

The largest difference was in Spanish language where the rural private school mean scale score was 17.60 with a standard deviation of 2.00 and the rural public school mean scale

score was 16.62 with a standard deviation of 1.69. The difference in school mean scale scores was statistically significant in favor of private schools, t (92) = 2.57, $p < .02$. The effect size was medium, d = .53 (Cohen, 1988).

Mathematics

For mathematics, the rural private school mean scale score was 16.64 with a standard deviation of 2.06, and the rural public school mean scale score was 16.53 with a standard deviation of 1.89. The difference was not statistically significant, t (92) = 0.25, $p < .80$.

Social Sciences

Rural public schools had a higher mean scale score than rural private schools in social sciences. The rural private school mean scale score was 16.52 with a standard deviation of 1.70 and the rural public school mean scale score was 16.93 with a standard deviation of 1.95. The difference was not statistically significant, t (92) = -1.07, $p < .29$, though the p value of .29 indicates that there is approximately a 71% chance that the difference in mean scale scores was the result of an actual difference between the groups and not due to random chance, in favor of rural public schools.

Natural Sciences

As with social sciences, rural public schools had higher mean scale scores for natural sciences. The rural private school mean scale score was 16.54 with a standard deviation of 1.77 and the rural public school mean scale score was 16.75 with a standard deviation of 1.84. The difference was not statistically significant, t (92) = -0.57, $p < .57$.

For Spanish language there was a positive, statistically significant difference between private school and public school mean scale scores on the 2016 8th Grade National Exams in the

Dominican Republic, favoring private schools. Non-statistically significant differences existed between school mean scale scores in the other subject areas and the difference in social sciences school mean scale scores began to approach statistical significance.

Table 26 shows the descriptive statistics and results of the independent samples *t*-tests of rural private and rural public school mean scale scores for the 2016 8th Grade National Exams in all subject areas.

Table 26

Results of Independent Samples Tests and Descriptive Statistics for Rural Private and Rural Public Schools for the 2016 8th Grade National Exams (N = 96)

								Independent samples test				
											95% CI	
			Descriptive statistics									
Subject	Type	*n*	*M*	*SD*	*SE*	*Skew*	*Kurt-osis*	*t*	*df*	*p*	*LL*	*UL*
Spanish	Private	47	17.60	2.00	0.29	0.18	1.02	2.57	92	.02	0.22	1.74
Language	Public	47	16.62	1.69	0.25	-0.03	0.51					
Math-	Private	47	16.64	2.06	0.30	0.41	0.47	0.25	92	.80	-0.71	0.91
ematics	Public	47	16.53	1.89	0.28	0.80	1.63					
Social	Private	47	16.52	1.70	0.25	0.38	0.47	-1.07	92	.29	-1.16	0.35
Sciences	Public	47	16.93	1.95	0.28	0.85	0.37					
Natural	Private	47	16.54	1.77	0.26	0.38	1.61	-0.57	92	.57	-0.95	0.53
Sciences	Public	47	16.75	1.84	0.27	0.21	0.24					

Research Question 3: To what extent do the school mean scale scores of urban private

and urban public schools in the Dominican Republic differ on the 2016 8th Grade National

Exams (Spanish language, mathematics, social sciences, and natural sciences)? The

independent samples *t*-test included 1,072 urban private schools and 1,024 urban public

schools. Scores for all subjects were reported as school mean scale scores on a 30-point scale.

In all subject areas, urban private schools had numerically higher mean scale scores on the

2016 8th Grade National Exams than urban public schools. The mean school scale score

distributions for all subjects for urban private and urban public schools were satisfied both

skewness and kurtosis requirements.

All statistics for skewness and kurtosis were within the acceptable ranges of skew <

|1.96| and kurtosis <|3.29| (Field, 2009, p. 139). Levene's test was used to test the assumption

of equality of variances which is accomplished when the *p* value is more than .05 (Field, 2009,

p. 150). When Levene's test shows a significant difference between the variances, the

assumption of equal variances is not met the and degrees of freedom are decreased (Field,

2009). For Research Question 3, the assumption of equality of variances was not satisfied by

Levene's test for any subject, thus equal variances were not assumed and the degrees of

freedom were reduced (Field, 2009). The results were as follows: for Spanish language, *F*

(1,822.62) = 176.94, *p* = .00, for mathematics, *F* (1,941.241) = 86.09, *p* = .00, for social

sciences, *F* (2,046.375) = 32.69, *p* = .00, for natural sciences, *F* (2,003.715) = 68.43, *p* = .00.

Spanish Language

The largest difference was in Spanish language where the urban private school mean

scale score was 18.67 with a standard deviation of 2.52 and the urban public school mean scale

score was 16.73 with a standard deviation of 1.60. The difference in school mean scale scores was statistically significant in favor of private schools; t (1,822.63) = 21.11, p < .01, and effect size was large, d = .92 (Cohen, 1988). The difference of 1.94 in school mean scale scores of urban schools was nearly twice the size of the difference in school mean scale scores of rural schools, .98, though both were statistically significant. This difference was reflected in effect size, as the effect size of the difference for rural schools was d = .53, which was considered medium (Cohen, 1988).

Mathematics

For mathematics, the urban private school mean scale score was 17.40 with a standard deviation of 2.49, and the urban public school mean scale score was 16.09 with a standard deviation of 1.78. The difference in school mean scale scores was statistically significant, favoring private schools; t (1,941.24) = 13.88, p < .01, and the effect size was medium, d = 0.61 (Cohen, 1988).

Social Sciences

The smallest difference was in social sciences where the urban private school mean scale score was 17.21 with a standard deviation of 1.99 and the urban public school mean scale score was 16.22 with a standard deviation of 1.63. The difference in school mean scale scores was statistically significant in favor of private schools; t (2,046.38) = 12.46, p < .01, the effect size was medium, d = 0.54 (Cohen, 1988). The smallest difference in school mean scale scores also coincided with the small difference in standard deviation.

This difference in school mean scale scores varies from the difference between rural private and public school mean scale scores in social sciences. Rural public schools had a larger mean scale score (m = 16.93) than rural private schools (m = 16.93) and the difference was not

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statistically significant ($p < .29$). In the urban setting, the private school mean scale score was .99 points larger than the urban public school mean scale score.

Natural Sciences

In natural sciences, the urban private school mean scale score was 17.14 with a standard deviation of 1.94 and the urban public school mean scale score was 16.07 with a standard deviation of 1.49. The difference in school mean scale scores was statistically significant in favor of private schools; t (2,003.72) = 14.21, $p < .01$, and the effect size was medium, $d = 0.62$ (Cohen, 1988).

For all subjects, there were positive, statistically significant differences between urban private and urban public school mean scale scores on the 2016 8th Grade National Exams in the Dominican Republic, favoring private schools. Table 27 shows the descriptive statistics and results of the independent samples t-tests of urban private and urban public school mean scale scores for the 2016 8th Grade National Exams in all subject areas.

Table 27

Results of Independent Samples Tests and Descriptive Statistics for Urban Private and Urban

Public Schools for the 2016 8th Grade National Exams (N = 2096)

								Independent samples test				
			Descriptive statistics								95% CI	
Subject	Type	*n*	*M*	*SD*	*SE*	*Skew*	*Kur-tosis*	*t*	*df*	*p*	*LL*	*UL*
Spanish	Private	1,072	18.67	2.52	.08	.36	0.11	21.11	2,094	.00	1.76	2.11
Language	Public	1,024	16.73	1.60	.05	.65	1.00					
Math-	Private	1,072	17.40	2.49	.08	.69	0.66	13.88	2,094	.00	1.12	1.49
ematics	Public	1,024	16.09	1.78	.06	.79	1.12					
Social	Private	1,072	17.21	1.99	.06	.62	0.57	12.45	2,094	.00	0.83	1.14
Sciences	Public	1,024	16.22	1.63	.05	.99	1.91					
Natural	Private	1,072	17.14	1.94	.06	.50	0.27	14.21	2,094	.00	0.92	1.22
Sciences	Public	1,024	16.07	1.49	.05	.84	1.06					

Research Question 4

Research Question 4: To what extent do the school mean scale scores of rural private, rural public, urban private, and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

The analyses included 47 schools from each category, rural private, rural public, urban private, and urban public matched by the 8th grade enrollment of the 47 rural private schools in the Dominican Republic. The order of subject areas (Spanish language, mathematics, social sciences, and natural sciences) and all corresponding statistics are listed in the order presented

in the database of 2016 8th Grade National Exams scores published by the Ministry of Education (Ministerio de Educación de la República Dominicana, 2016a).

For Spanish language, urban private schools had the highest mean scale score of 18.91 with the highest standard deviation of 2.64. Rural private schools had a mean scale score of 17.60 with a standard deviation of 2.00. Urban public schools had a mean scale score of 17.56 with a standard deviation of 1.87. Rural public schools had a mean scale score of 16.62 with a standard deviation of 1.69. As the school mean scale scores decreased, there was an observation of generally decreasing standard deviations, indicating that the school categories with lower mean scale scores produced more consistent results (Fraenkel et al., 2015). Urban public schools ($m = 17.65$, $sd = 1.87$) had a higher mean yet lower standard deviation than rural schools overall ($m = 17.11$, $sd = 1.91$). Table 28 presents a rank order of the Spanish language exam mean scale scores for all school categories.

Table 28

ANOVA Sample 2016 8th Grade National Exam Mean Scale Score Rankings for Spanish Language

Rank	School Category	*n*	*m*	*SD*
1	Urban Private	47	18.91	2.64
2	Rural Private	47	17.60	2.00
3	Urban Public	47	17.56	1.87
4	Rural Public	47	16.62	1.69

Urban private schools had the highest mathematics mean scale score of 17.32 with a standard deviation of 2.93. Rural private schools had a mean scale score in mathematics of

16.64 with a standard deviation of 2.06. Urban public schools had a mean scale score in mathematics of 17.20 with a standard deviation of 2.37. Rural public schools had a mean scale score in mathematics of 16.53 with a standard deviation of 1.89. As the school mean scale scores decreased, there was an observation of generally decreasing standard deviations, indicating that the school categories with lower mean scale scores had less variance in school mean scale scores (Fraenkel et al., 2015). Urban public schools ($m = 17.20$, $sd = 2.37$) had a higher mean yet lower standard deviation than private schools overall ($m = 16.98$, $sd = 2.54$). Table 29 presents a rank order of the mathematics exam mean scale scores for all school categories.

Table 29

ANOVA Sample 2016 8th Grade National Exam Mean Scale Score Rankings for Mathematics

Rank	School Category	*n*	*m*	*SD*
1	Urban Private	47	17.32	2.93
2	Urban Public	47	17.20	2.37
3	Rural Private	47	16.64	2.06
4	Rural Public	47	16.53	1.89

In social sciences, urban public schools had the highest mean scale score of 17.40 and a standard deviation of 2.01. Urban private schools had a mean scale score in social sciences of 16.98 and the highest standard deviation, 2.34. Rural public schools had a mean scale score in social sciences of 16.9 and a standard deviation of 1.95. Rural private schools had a mean scale score in social sciences of 16.52 with the lowest standard deviation, 1.70. In contrast with the results of the means and standard deviations of Spanish language and mathematics exams, there

was no observed increase or decrease between higher/lower school mean scale scores and standard deviations in social sciences. The school category with the lowest mean (rural private, $m = 16.52$) had the lowest standard deviation ($sd = 1.70$), indicating less variance in school mean scale scores (Fraenkel et al., 2015). Table 30 presents a rank order of the social sciences exam mean scale scores for all school categories.

Table 30

ANOVA Sample 2016 8th Grade National Exam Mean Scale Score Rankings for Social Sciences

Rank	School Category	n	m	SD
1	Urban Public	47	17.40	2.01
4	Urban Private	47	16.98	2.34
5	Rural Public	94	16.93	1.95
8	Rural Private	47	16.52	1.70

Urban private schools had the highest natural sciences mean scale score of 17.34 with a standard deviation of 2.11, also the highest. Urban public schools had a mean scale score of 17.28 with the lowest standard deviation,1.71. Rural public schools had a mean scale score of 16.75 with a standard deviation of 1.84. Rural private schools had a mean school scale score of 16.54 with a standard deviation of 1.77. As the school mean scale scores decreased, there was an observation of generally decreasing standard deviations, indicating that the school categories with lower mean scale scores had less variance in school mean scale scores (Fraenkel et al., 2015). Urban public ($m = 17.28$, $sd = 1.71$) schools had a higher mean and lower standard deviation than the overall total school mean ($m = 17.02$, $sd = 1.79$), which had a higher mean

and lower standard deviation than the private overall total ($m = 16.98$, $sd = 1.88$). Table 31

presents a rank order of the natural sciences exam mean scale scores for all school categories.

Table 31

ANOVA Sample 2016 8ᵗʰ Grade National Exam Mean Scale Score Rankings for Natural

Sciences

Rank	School Category	n	m	SD
1	Urban Private	47	17.34	2.11
3	Urban Public	47	17.28	1.71
6	Rural Public	47	16.75	1.84
8	Rural Private	47	16.54	1.77

For all subjects, the distributions of mean school scale scores satisfied the

requirements for skewness and kurtosis. The statistics were within the acceptable ranges for

skew, $<|1.96|$, and kurtosis, $<|3.29|$ (Field, 2009, p. 139). Table 32 displays the statistics for

skewness and kurtosis for the 2 by 2 factorial ANOVA.

Table 32

Skewness and Kurtosis for the 2 by 2 Factorial ANOVA Sample Distributions (N = 188)

School Category	*n*	Spanish Lang.		Mathematics		Social sciences		Natural sciences	
		Skew	Kurtosis	Skew	Kurtosis	Skew	Kurtosis	Skew	Kurtosis
Rural private	47	0.18	1.02	0.41	0.47	0.38	0.47	0.38	1.61
Urban private	47	0.48	1.22	0.85	0.85	0.67	1.09	0.12	0.21
Rural public	47	-0.03	0.51	0.80	1.63	0.85	0.37	0.21	0.24
Urban public	47	0.36	-0.69	0.69	0.94	0.20	-0.24	0.12	-1.03
Total	188	0.63	1.45	0.86	1.40	0.58	0.53	0.22	0.18

A 2 by 2 factorial ANOVA was conducted to determine if there were statistically significant differences in mean school scale scores in Spanish language, mathematics, social sciences, and natural sciences among rural private, rural public, urban private, and urban public schools. Additionally, effect size eta [η] was calculated for all significance main and interaction effects. An effect size eta less than or equal to .25 was considered small, an effect size eta of more than .25 but less than .40 was considered medium, and an effect size eta of .40 or more was considered large (Cohen, 1988). The assumption of equality of variances can be satisfied by Levene's test when the *p* value greater than .05 (Field, 2009, p. 150). The assumption of equality of variances was satisfied by Levene's test for all subjects. The results were as follows: for Spanish language, $F(3, 184) = 1.664$, $p < .176$, for mathematics, $F(3, 184) = 2.638$, $p < .051$, for social sciences, $F(3, 184) = .796$, $p < .498$, for natural sciences, $F(3, 184) = .580$, $p < .629$.

Spanish Language

There was a main effect for school type (private or public) and school location (rural or urban) for Spanish language. The difference in mean scale scores between private schools ($m = 18.25$) and public schools ($m = 17.09$) was statistically significant in favor of private schools, F_{Type} (1, 184) = 14.71, $p < .01$.

There was a main effect for school location (rural or urban) for Spanish language. The difference in mean scale scores between urban schools ($m = 18.24$) and rural schools ($m = 17.11$) was statistically significant favoring urban schools, $F_{Location}$ (1, 184) = 13.83, $p < .01$.

The interaction effect was not statistically significant, $F_{Type * Location}$ (1, 184) = 0.36, $p < .55$. The absence of an interaction effect indicates that neither independent variable increased or decreased the effect of the other independent variable. The effect size eta of school type was medium, $\eta = .27$ (Field, 2009). The effect size eta of school location was medium, $\eta = .26$ (Field, 2009). Table 33 displays the results of the 2 by 2 factorial ANOVA for Spanish language.

Table 33

The 2 by 2 Factorial ANOVA Summary Table for Spanish language School Mean Scale Scores

(N = 188)

Factor	*SS*	*df*	*MS*	*F*	*p*	η
Type	63.76	1.00	63.76	14.71	.00	.27
Location	59.96	1.00	59.96	13.83	.00	.26
Type * Location	1.57	1.00	1.57	0.36	.55	.04
Within	797.79	184.00	4.34			
Total	59629.23	188.00				

Mathematics

There was not a main effect for school type (private or public) for mathematics. The difference in mean scale scores between private schools (m = 16.98) and public schools (m = 16.87) was not statistically significant and likely due to random chance, F_{Type} (1, 184) = 0.11, p < .74.

There was a main effect for school location, (rural or urban) for mathematics. The difference in mean scale scores between urban schools (m = 17.26) and rural schools (m = 16.59) was statistically significant in favor of urban schools, $F_{Location}$ (1, 184) = 3.92, p < .05.

The interaction effect did not approach significance, $F_{Type * Location}$ (1, 184) = .00, p < .98. The absence of an interaction effect indicates that neither independent variable increased or decreased the effect of the other independent variable. The effect size eta of school location was small, η = .14 (Field, 2009). Table 34 summarizes the results of the 2 by 2 factorial ANOVA for mathematics.

Table 34

The 2 by 2 Factorial ANOVA Summary Table for Mathematics School Mean Scale Scores (N = 188)

Factor	*SS*	*df*	*MS*	*F*	*p*	η
Type	0.59	1.00	0.59	0.11	0.74	0.02
Location	21.58	1.00	21.58	3.92	0.05	0.14
Type * Location	0.01	1.00	0.01	0.00	0.98	0.00
Within	1011.75	184.00	5.50			
Total	54880.36	188.00				

Social Sciences

There was no main effect for school type (private or public) or school location (rural or urban) for social sciences. The difference in mean scale scores between private schools (*m* = 16.75) and public schools (*m* = 17.17) was not statistically significant and likely due to random chance, F $_{Type}$ (1, 184) = 2.01, *p* < .16.

There was no main effect for school location (rural or urban). The difference in mean scale scores between urban schools (*m* = 17.19) and rural schools (*m* = 16.73) was not statistically significant and likely due to random chance, F $_{Location}$ (1, 184) = 2.54, *p* < .12.

The interaction effect did not approach significance, F $_{Type * Location}$ (1, 184) = 0.00, *p* < .98. The absence of an interaction effect indicates that neither independent variable increased or decreased the effect of the other independent variable. Table 35 displays the results of the 2 by 2 factorial ANOVA for social sciences.

Table 35

The 2 by 2 Factorial ANOVA Summary Table for Social Sciences School Mean Scale Scores (N = 188)

Factor	*SS*	*df*	*MS*	*F*	*P*	η
Type	8.13	1.00	8.13	2.01	0.16	0.02
Location	10.16	1.00	10.16	2.51	0.12	0.14
Type * Location	0.01	1.00	0.01	0.00	0.97	0.00
Within	745.67	184.00	4.05			
Total	54827.40	188.00				

Natural Sciences

There was not a main effect for school type (private or public) for natural sciences. The difference in mean scale scores between private schools (*m* = 16.94) and public schools (*m* = 17.02) was not statistically significant and was likely due to random chance, F $_{\text{Type}}$ (1, 184) = 0.08, *p* < .78.

There was a main effect for school location (rural or urban) for natural sciences. The difference in mean scale scores between urban schools (*m* = 17.31) and rural schools (*m* = 16.64) was statistically significant, F $_{\text{Location}}$ (1, 184) = 6.03, *p* < .02.

The interaction effect did not approach significance, F $_{\text{Type * Location}}$ (1, 184) = 0.00, *p* < .97. The absence of an interaction effect indicates that neither independent variable increased or decreased the effect of the other independent variable. The effect size eta of school location was small, η = .18 (Field, 2009). Table 36 displays the results for the 2 by 2 factorial ANOVA for natural sciences.

Table 36

The 2 by 2 Factorial ANOVA Summary Table for Natural Sciences School Mean Scale Scores

(N = 188)

Factor	*SS*	*df*	*MS*	*F*	*p*	η
Type	0.27	1.00	0.27	0.08	0.78	0.02
Location	20.97	1.00	20.97	6.03	0.02	0.18
Type *Location	0.88	1.00	0.88	0.25	0.62	0.04
Within	640.11	184.00	3.48			
Total	54855.51	188.00				

There existed statistically significant differences among rural private, rural public, urban private, and urban public school mean scale scores for Spanish language, mathematics, social sciences, and natural sciences. For Spanish language, there was a statistically significant main effect for school type, (private or public) and for school location (rural or urban). Private schools ($m = 18.25$), had statistically significantly higher mean scale scores than public schools ($m = 17.09$), and urban schools ($m = 18.24$), had statistically significant higher mean scale scores than rural schools *(m = 17.11).*

There was a statistically significant main effect for school location (rural or urban) for mathematics. Urban schools ($m = 17.26$) had statistically significantly higher mean scale scores than rural schools ($m = 16.59$).

In social sciences, there were no statistically significant main or interaction effects. There was a statistically significant main effect for school location (rural or urban) for natural

sciences. Urban schools (m = 17.31) had statistically significantly higher mean scale scores than rural schools (m = 16.64).

<center>Summary</center>

Chapter 4 presented the results of statistical analyses to determine if there were statistically significant differences in student academic achievement in the Dominican Republic based on school category (rural private, rural public, urban private, urban public). The results of the analyses indicated that there were statistically significant differences in some subject areas and categories and no statistically significant differences in others.

The results of the independent samples t-tests for Research Question 1 revealed a statistically significant difference in school mean scale scores for all subject areas, favoring private schools. The school mean scale scores for private and public schools were, respectively: 18.61 and 16.71 in Spanish language; 17.37 and 16.38 in mathematics; 17.18 and 16.53 in social sciences; 17.12 and 16.40 in natural sciences. The effect sizes for school type ranged from large (Spanish language), d = .88, to medium (social sciences), d = .44 (Cohen, 1988).

In Research Question 2, the independent samples t-tests revealed a statistically significant difference in Spanish language school mean scale scores, favoring rural private schools. Rural private schools had a higher mathematics mean scale score (m = 16.64) than rural public schools (m = 16.53); the difference was not statistically significant. Rural public schools had higher mean scale scores in social sciences (m = 16.93) and natural sciences (m = 16.75) than rural private schools (social sciences, m = 16.52, natural sciences, m = 16.54); the differences were not statistically significant. The effect size for school category on Spanish language was medium, d = .53 (Cohen, 1988).

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The independent samples *t*-tests for Research Question 3 revealed a statistically significant difference in school mean scale scores for all subject areas favoring urban private schools. The school mean scale scores for urban private and urban public schools were, respectively: 18.67 and 16.73 in Spanish language; 17.40 and 16.09 in mathematics; 17.21 and 16.22 in social sciences; 17.14 and 16.07 in natural sciences. The effect sizes ranged from large (Spanish language), *d* =.92, to medium (social sciences), *d* =.54 (Cohen, 1988).

The 2 by 2 factorial ANOVA for Research Question 4 revealed statistically significant differences for some subjects based on school type (private or public) and location (rural or urban). For Spanish language school mean scale scores, there were statistically significant main effects favoring private and urban schools. In mathematics, there was a main effect for school location which was statistically significant in favor or urban schools. For social sciences school mean scale scores there were no main or interaction effects. In natural sciences, there was a statistically significant main effect for school location only in favor or urban schools. Table 37 summarizes the findings of the research questions. This chapter presented the results of quantitative analyses to answer Research Questions 1, 2, 3, and 4. Chapter 5 was a discussion of the findings of these analyses, implications for practice, recommendation for further research, and a conclusion of the present study.

Table 37

Summary of Major Findings

Research Question	Findings
1. To what extent do the school mean scale scores of private and public schools in the Dominican Republic differ on the 2016 8th Grade National Exams?	Statistically significant differences in mean scale scores favored private schools. Effect sizes ranged from $d = .88$ for Spanish language, $d = .34$ for social sciences (Cohen, 1988).
2. To what extent do the school mean scale scores of rural private and rural public schools in the Dominican Republic differ on the 2016 8th Grade National Exams?	Statistically significant differences in Spanish language school mean scale scores, favored rural private schools. The effect size for school category on Spanish language was $d = .53$ (Cohen, 1988).
3. To what extent do the school mean scale scores of urban private and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams?	Statistically significant differences in school mean scale scores favored urban private schools. Effect sizes for school category ranged from (Spanish language), $d = .92$, to (social sciences), $d = .54$ (Cohen, 1988).
4. To what extent do the school mean scale scores of rural private, rural public, urban private, and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams?	Statistically significant main effects for school type for Spanish language, favoring private schools and for school location for Spanish language, mathematics, and natural sciences, favoring urban schools.

CHAPTER V: SUMMARY, DISCUSSION, AND CONCLUSIONS

Introduction

Chapter 5 consists of a summary of the study, discussion of the findings, implications for practice, recommendations for further practice, and conclusions. In alignment with the purpose of the study, the intent was to contribute to the gap in research on the differences in student achievement among rural private, rural public, urban private, and urban public schools in the Dominican Republic. This chapter will conclude with a short summary.

Summary of the Study

The problem identified for this study was a lack of research on student academic achievement in private and public schools in rural and urban settings in the Dominican Republic. Determining the differences in student academic achievement in private and public schools in the Dominican Republic in rural and urban locations was the purpose of this study. The research questions and hypotheses which the present study sought to answer are as follows.

Research Question 1: To what extent do the school mean scale scores of private and public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 2: To what extent do the school mean scale scores of rural private and rural public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

Research Question 3: To what extent do the school mean scale scores of urban private and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

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Research Question 4: To what extent do the school mean scale scores of rural private, rural public, urban private, and urban public schools in the Dominican Republic differ on the 2016 8th Grade National Exams (Spanish language, mathematics, social sciences, and natural sciences)?

For Research Questions 1, 2, and 3, an independent samples test was used to determine the differences in school mean scale scores. For Research Question 1, 2, and 3, the independent variables were school type, (rural/urban) private and (rural/urban) public, and the dependent variables were school mean scale scores for Spanish language, mathematics, social sciences, and natural sciences.

For Research Question 4, a 2 by 2 factorial ANOVA was used to determine the differences in school mean scale scores. The independent variables were school category, rural private, rural public, urban private, and urban public and the dependent variables were school mean scale scores for Spanish language, mathematics, social sciences, and natural sciences.

Discussion of the Findings

This section discusses findings for research questions considering the results of the quantitative analyses. The present section also compares the results of the analyses with the concepts presented in Chapter 2 to illustrate how and why the present study conforms or deviates from the findings of related studies.

Private School and Public School Student Academic Achievement

The findings from the research questions indicate a statistically significant difference overall between private and public schools in mean scale scores on the 2016 8th Grade National Exams. When comparing all private and public schools in both rural and urban areas, private

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schools had numerically higher school mean scale scores than public schools in all subject

areas and the differences were statistically significant in favor of private schools. As with the

analyses of overall private and public school mean scale scores, urban private school mean

scale scores were higher than urban public school mean scale scores in all subject areas. The

differences were statistically significant in favor of urban private schools. These findings

indicate that the differences in student academic achievement were not due to random chance

and were likely due to differences in student or school variables such as teacher quality,

socioeconomic status, peer group status, and parental involvement (Cochran-Smith & Villegas,

2016; Hanushek, Kain, Markman, & Rivkin, 2003; McEachin & Brewer, 2012; Reardon,

2016).

In rural private and public schools, the difference in Spanish language mean scale

scores was statistically significant in favor of private schools. The difference in social sciences

mean scale scores began to approach statistical significance in favor of public schools.

The findings were consistent with prior research in Latin America and the Caribbean

[LAC] and in the Dominican Republic in that private schools typically had higher student

academic achievement than public schools (Anderson, 2005; McEwan, 2001; Reimers, 1999;

Somers et al., 2004). The findings deviated from one study that found no statistically

significant differences in private and public school scores from the Dominican Republic on the

Segundo Estudio Regional Comparativo y Explicativo (Second Regional Comparative and

Explanatory Study) [SERCE], except among third grade mathematics scores (Hausman et al.,

2011).

In other parts of LAC, private schools frequently served high socioeconomic status

students (McEwan, 2001). The quality of educational opportunity available to low

socioeconomic status students was also reported to be comparatively lower (Gamboa &
Waltenberg, 2012; Somers et al., 2004). If such was the case in the Dominican Republic, the
differences in student academic achievement may be explained by differences in
socioeconomic status (Reardon, 2011). Additionally, parental background characteristics, level
of parent involvement, and peer group characteristics may be related to socioeconomic status
and may simultaneously explain differences in student academic achievement (Gamboa &
Waltenberg, 2012; Goodyear et al., 2012; McEachin & Brewer, 2012; McEwan, 2001;
Reardon, 2016; Reimers, 1999).

Rural Private and Rural Public School Student Academic Achievement

The results of analyses on rural private and rural public school mean scale scores were
notable in that they partially deviated from other findings in this study and from prior research.
Rural private schools had higher mean scale scores in Spanish language and the difference was
statistically significant in favor of private schools. This indicates that the difference in student
academic achievement in Spanish language was not due to random chance and was instead due
to differences between rural private and rural public school student background variables.
Variables that were found to negatively affect student academic achievement in rural
populations included socioeconomic status [SES] and teacher quality (Luschei & Fagioloi,
2016; White, 2008). However, the research did not indicate that SES and teacher quality
influences student academic achievement only in specific subject areas such as Spanish
language.

Rural private schools did not have higher school mean scale scores in all subject areas
as was the case with urban private schools in the Dominican Republic and private schools
throughout LAC (McEwan, 2001; Somers et al., 2004). There was no precedent discovered in

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the literature for rural private schools having statistically significantly higher mean scale scores for Spanish language, nor for rural public schools having numerically higher, though not statistically significant, mean scale scores in social sciences. Previous research on student academic achievement in the Dominican Republic found statistically differences between private and public school students in mathematics, though these studies did not differentiate between rural private and rural public school students (Jimenez, Lockheed, Luna, et al., 1991). There limited research on student academic achievement in the Dominican Republic, especially with respect to rural private and rural public school educational outcomes.

Rural School and Urban Student Academic Achievement

The findings from the 2 by 2 factorial ANOVA indicated a statistically significant main effect for school location, rural or urban, in favor of urban schools in Spanish language, mathematics, and in natural sciences school mean scale scores. There was not a statistically significant difference between the social sciences school mean scale scores based on rural or urban location. There is less than a 1% chance that the difference in Spanish language school mean scale scores was due to random chance; less than a 5% chance that the difference in mathematics school mean scale scores was due to random chance; and less than a 2% chance that the difference in natural sciences school mean scale scores was due to random chance.

The differences between rural and urban schools in Spanish language, mathematics, and natural sciences mean scale scores were likely due to differences between the groups. These findings are mostly consistent with the findings on student academic achievement in Latin America and the Caribbean [LAC] (Latin American Laboratory for Assessment of the Quality of Education, 2015; Luschei & Fagioli, 2016).

In previous studies, the lower socioeconomic status [SES] of rural students was found to be a moderating variable for the lower academic achievement of rural schools (Latin American Laboratory for Assessment of the Quality of Education, 2015). In particular, rural schools in the Dominican Republic were found to have higher student academic achievement on the 1997 Primer Estudio Regional Comparativo when controlling for SES and SES related background variables (Luschei & Fagiolo, 2016).

The exception to the consistency of the findings of this study with the findings of other studies on student academic achievement in LAC was in the absence of a statistically significant difference between rural and urban schools in social sciences scores. As with the findings on rural private and rural public schools, there was no precedent in the literature for the absence of a statistically significant difference in natural sciences mean scale scores.

Implications for Practice

The findings of the present study have implications for improving student academic achievement in the Dominican Republic, Latin America and the Caribbean [LAC], developing nations, and throughout other parts of the world where private school student achievement was higher than public school student achievement. Consistent with the related research, this study found that private school student achievement was higher than in public schools (overall, in urban schools, and in a limited manner in rural schools) (Anderson, 2005; Lockheed & Jimenez, 1994; Somers et al., 2004). The topics that, if addressed, seem the most likely to positively influence student academic achievement are the effects of low-socioeconomic status, peer group characteristics, parental background characteristics and levels of involvement, and teacher quality (Hanushek et al., 2003; Jeynes, 2012; McEwan, 2001; Reardon & Portilla, 2016).

1. For all school categories that have lower student academic achievement, student achievement may be increased by providing supplemental funding to offset the effects of low socioeconomic status [SES] (Reardon & Portilla, 2016). This may be particularly helpful for minority groups in urban areas and for all rural students, for whom low SES was found to explain comparatively lower academic achievement when compared to urban students (Latin American Laboratory for Assessment of the Quality of Education, 2015; Miller et al., 2013).

2. As a subset of the effects of SES, peer groups were found to explain part of the difference in student academic achievement between private and public school students (Jeynes, 2012). Where private school students have higher academic achievement than public school students, it is possible that by allocating public or private funds to allow more students to attend private school, student academic achievement will increase because of the effects of private school peer group characteristics (Hanushek et al., 2003; Holland, 2011). Alternatively, funding could be used to implement programs to change school culture to such a degree that public school peer groups have similar characteristics to private school peer groups so as to harness the positive effects of peer groups on student academic achievement (Jeynes, 2012; Nelson & DeBacker, 2008). Funding could also be provided to raise the overall quality of education in public schools by focused professional development for existing teachers and high quality preparation for teacher candidates.

3. Parental involvement and parental background characteristics were found to moderate student academic achievement (Liyanagunawardena et al., 2014; Miller et al., 2013). Supplemental funding should also be provided to offset the effects of parent involvement and background characteristics.

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3. Additionally, low SES students were found to be more likely to have low quality teachers (Austin, 2010; Rivkin et al., 2005). Teachers were the variable within schools that had the greatest influence on student academic achievement, and as such additional funding could be provided to prepare or attract more highly qualified teachers (Milner, 2012).

Recommendations for Further Research

1. Future researchers may wish to expand upon this study by analyzing data for the 8th Grade National Exams for all years that such data are publicly available. By analyzing the data longitudinally, future researchers may also be able to discover trends in the data with respect to private and public school student academic achievement in rural and urban settings. Data from all years of the Trends in International Mathematics and Science Study [TIMMS] or the Tercer Estudio Regional Comparativo y Explicativo [TERCE] (Third Regional Comparative and Explanatory Study) could also be analyzed to contribute to the research on student academic achievement in LAC and the Dominican Republic. Additional experimental research could also be conducted to corroborate the findings of this study.

2. The findings of this study do not explain why there is a difference in student academic achievement, and answering that question should be one of the next steps in the research in LAC and the Dominican Republic. One approach could be to gather demographic data on private and public school students in the Dominican Republic. The most relevant variables for which to collect data are student socioeconomic status, levels of parent education and involvement, and peer group characteristics. If possible, this data should be collected at the student level to examine possible relationships with student academic achievement. Additionally, school and classroom practices should be studied to determine if there are differences in how private and public, urban and rural schools teach and are managed.

3. Research Question 2 found that rural private school students had statistically significantly higher mean scale scores in Spanish language than rural public school students. Additionally, Research Question 2 found that rural public school students had numerically higher mean scale scores in social sciences, though the difference was not statistically significant. In contrast, Research Question 3 found that urban private schools had statistically significantly higher school mean scale scores than urban public schools in social sciences. These results were unexpected based on related research and future researchers may wish to examine why rural private school students had higher student academic achievement in Spanish language and why rural public school students had higher student academic achievement in social sciences. This finding, along with all other findings, should also be corroborated by experimental research

<u>Summary</u>

The conclusion of this study was that overall, private schools in the Dominican Republic had higher student academic achievement than public schools and the difference was statistically significant at $p < .01$ in all subject areas. Urban private schools had higher student academic achievement in all subject areas, while rural private schools had higher academic achievement in Spanish language alone. The differences between urban private and urban public schools were statistically significant at $p < .01$, and the difference in Spanish language for rural private schools was statistically significant at $p < .02$.

When private schools, urban private schools, and rural private had higher mean scale scores than their public counterparts, private schools had higher standard deviation in mean scale scores. For instance, the largest difference mean scale scores (between private and public, urban private and urban public, and rural private and rural public) was in Spanish language.

The private school Spanish language $m = 18.62$; $SD = 2.51$, compared with public school

Spanish language $m = 16.71$; $SD = 1.77$. The urban private Spanish language $m = 18.67$; $SD = 2.52$, compared with the urban public Spanish language $m = 16.73$; $SD = 1.60$. The rural private

Spanish language $m = 17.60$; $SD = 2.00$, compared with the rural public Spanish language $m = 16.62$; $SD = 1.69$. This indicates that while public schools had lower mean scale scores, they

had less variation in scale scores than private schools (Fraenkel et al., 2015).

This study identified that statistically significant differences exist for some or all

subjects between various categories of schools in the Dominican Republic. This study did not

provide insight into the causes of such differences. Recommendations for further research

include investigation into the underlying causes for disparity in student academic achievement

among all categories of schools so as to improve academic achievement for all students.

APPENDIX A: INSTITUTIONAL REVIEW BOARD EXEMPTION LETTER

NOT HUMAN RESEARCH DETERMINATION

From :   **UCF Institutional Review Board #1**
        FWA00000351, IRB00001138

To   :   **Daniel E. Boyd**

Date :   **October 03, 2017**

Dear Researcher:

On 10/03/2017 the IRB determined that the following proposed activity is not human research as defined by DHHS regulations at 45 CFR 46 or FDA regulations at 21 CFR 50/56:

Type of Review:	Not Human Research Determination
Project Title:	AN ANALYSIS OF 8TH GRADE ACHIEVEMENT OF PRIVATE AND PUBLIC SCHOOLS IN THE DOMINICAN REPUBLIC IN RURAL AND URBAN SETTINGS.
Investigator:	Daniel E. Boyd
IRB ID:	SBE-17-13428
Funding Agency:	
Grant Title:	
Research ID:	N/A

University of Central Florida IRB review and approval is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are to be made and there are questions about whether these activities are research involving human subjects, please contact the IRB office to discuss the proposed changes.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Gillian Morien on 10/03/2017 02:48:22 PM EDT

IRB Coordinator

APPENDIX B: OUTLINE OF STEPS TAKEN IN RAW DATA COLLECTION

Raw data for all school districts and schools for the 2016 8th Grade National Exams scores were downloaded from the website for the Ministry of Education of the Dominican Republic (MINERD). The following selections were made on the drop-down menus in the spreadsheet downloaded from the MINERD.

a. Periodos [periods]: 2016

b. Convocatorias [convocations]: All

c. Distritos [districts]: All

d. Niveles [level]: Basica [basic]

e. Zonas [zones]

    i. For rural schools, rural, rural-aislada [rural-isolated], and rural-turistica [rural-touristic] were selected

    ii. For urban schools, urban, urban-marginal, and urban-turistica [urban-touristic] were selected

f. Sectores [sectors]

    iii. For private schools, privado [private] was selected

    iv. For public schools, publico [public] was selected

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