

New Perspectives on Rural Educational Inequality

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## ABSTRACT

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New Perspectives on Rural Educational Inequality

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The philosophy of the American public education system, calling for equitable education for all citizens, is both exemplary in scope and rife with contradictions. Educational structures are designed to promote equality, yet inequality is exceedingly produced. Much of the current research has focused on the factors of class, race, ethnicity, and native abilities as responsible for the inequality as indicated by outcome measures such as school completion and post-secondary enrollment. This research explores an alternative approach where educational inequality results partially from structural problems through educational expenditures. A structural model is identified to test the relationship between the independent variables institutional expenditures and school district typologies on the dependent variable percentage of college enrollment through regression analysis. Data from the Ohio Department of Education (ODE) advanced reports and the Ohio board of Regents report of college student enrollment are used. The research findings indicate a possible connection between educational expenditures at the secondary school level and the percentage of college enrollment. Instructional expenditures, specifically, were positively related with an increase in post-secondary enrollment.

## DEDICATION

*This paper is dedicated to my mother and father. Dad, without your insight we would still be at the box factory.*

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## INTRODUCTION

Successful careers in the job market require education and training - low education attainment leaves groups under-qualified, vulnerable to poverty, and restricted from social mobility. Education often provides the human capital needed for upward mobility, and because the gap in educational access is increasing, equal educational access is an issue of growing concern in the United States. Numerous studies examine college enrollment in low-income urban areas, but often marginalized rural settings receive limited focus.

While the majority of educational inequality research has focused on the effect of race, class, and gender inequality on pursuing higher education, few studies have examined spatial inequality and differential educational expenditures. Harold Wenglisky's 1998 groundbreaking study, "How Money Matters: The Effect of School District Spending on Academic Achievement", found that instructional expenditures are the single most important resource in regards to academic success in low income urban schools. Wenglisky's findings suggest that when more resources are focused on instructional expenditures, students experience a higher standard of academic success. While Wenglisky challenges traditional causes of educational inequality, his study explores urban school districts; however, there has been little research conducted on institutional educational issues in low-income, rural regions.

This study explores the relationship between institutional spending designs and higher education enrollment patterns in marginalized, rural school populations. Through the examination of factors that may prevent rural populations from access to higher

education by analyzing the effect of resource allocation on college enrollment.

Specifically, this research investigates differences in college enrollment rates across school districts in Ohio by focusing on how differences in educational expenditures and school spending affect higher education social support, and shows that school systems can increase enrollment and access to higher education when economic resources are allocated towards instructional spending which lowers the student-to-teacher ratio.

Problems explored in this study are the effects of variations in resource allocation in rural low-income school districts and the impact of spatial and cultural differences amongst school district types on the percentage of students who enroll in higher education. Also, focus is drawn to understanding how variation in school spending creates a positive school social environment, one that is supportive of enrollment in higher education. This research hypothesizes that school systems can increase enrollment and access to higher education when economic resources are distributed in a manner advantageous to, enhanced learning opportunities and positive school social environments.

Other educational sociologists have focused on resource allocation within school districts as a contributing factor influencing academic achievement. While there has been limited research conducted on rural populations, the current framework is applicable to rural, impoverished regions. It is hypothesized that educational institutions may create a transformation when their financial assets are allocated in a manner favorable of positive school social environments (Wenglinsky, 1998). Essentially, how money is spent within a school plays a role in the success of its students. There are ways to effectively spend

money that may help students achieve at a higher rate academically. Instructional spending is associated with teacher pay, hiring teachers, and purchasing instructional materials. The teacher-to-student ratio affects the school social setting, and instructional expenses affect the number of educators hired per pupil (Wenglinsky, 1998). When more funding is allocated towards instructional spending, it reduces the ratio of students to teachers and thus increases the educational retention rates and academic achievement. Because of this effect, instructional spending is plausibly the most important aspect in regards to resource allocation and increasing college enrollment rates. When more funding is allocated towards instructional spending, it is predicted that students graduate at a higher rate allowing for movement into post-secondary education. However, rural school districts face many unique challenges and costs that take funds away from instructional support.

Rural populations are in a unique position in regards to spending patterns. Administrative expenditures are also hypothesized to increase the hiring of teachers creating similar predicted outcomes associated with instructional spending; however, rural schools may require different types of administrative expenditures because of their geographic isolation. Many rural schools have to allocate more funds towards transportation because students are bussed from longer distances compared to those in urban populations. Also, when considering the age and structural state of educational buildings in rural settings, more funding is forced to go towards repairs, maintenance, and climate control in these schools. While money has to be spent on these measures, it is

problematic that funding is allocated towards maintenance when it does not contribute as significantly to educational success as instructional spending.

Wenglinsky identified in his research that spending associated with maintaining schools is not necessarily a negative outcome. He explained that when funding is spent on maintaining a school, it can instill pride and a positive social environment which can increase educational success. While maintenance spending is helpful in this way, it is not as strongly associated with academic success as instructional spending in Wenglinsky's work. Still, important to understanding how educational expenditures affect academic success is gaining an understanding of how these spending differences cause different outcomes in rural, suburban, and urban settings.

#### Research Questions

One: What is the relationship between school district institutional spending and college enrollment rates?

Two: How do different types of school districts impact the likelihood of student enrollment in post-secondary education?

## LITERATURE REVIEW

The American public education system has long been held in high regard for its goal of providing a universal education to all citizens. This educational philosophy of educating all citizens with a common education is not easily obtained. Article Six, Section Two of The Ohio Constitution mandates the state of Ohio to develop a system of common schools, in which all schools should provide an equal, common education. Implementing this philosophy is riddled with challenges. While public education systems seek to provide a common equitable education to all, not all students, classrooms, school systems, and communities are equal, and so some structural inequities exist within the system. This research will explore structural issues within the state of Ohio that have an impact upon the educational outcome of college enrollment.

This study is largely framed from Wenglinsky's research on educational expenditures and student success rates. Rather than highlighting race, class, or gender as causes of educational inequality, his study explores the structural barriers to educational attainment, primarily how institutional spending patterns in low-income urban schools shape school structures and impact academic success. Wenglinsky compared how differences in eighth grade math and science success (test scores and course completion) corresponded to differences in how school districts spent their funding; specifically, Wenglinsky looked at how differences in instructional per-pupil expenditures, central administration per-pupil expenditures, school administration per-pupil expenditures, capital outlays per-pupil expenditures, and socioeconomic status affected student success. These variables were chosen with theoretical framing to explain funding avenues to

academic success. Wenglinsky's research suggests a positive association between per-pupil expenditures and academic success due to a reduction in class size. This reduction in class size occurred because increases in instructional per-pupil expenditures resulted in the hiring of more teachers and therefore lowered the student-to-teacher ratio.

A review of current literature on educational inequality reveals three major themes. The first theme addresses the structural inequalities in school districts due to student poverty and inequitable school funding. A second theme concerns the rural urban divide. Literature addressing inequality in small towns, rural districts, and urban areas abound. Finally, the third theme in the literature provides an underdeveloped theoretical framework for explaining structural and spatial educational inequalities. The Appalachian region was utilized as an example of the underdevelopment condition of rural regions. Appalachian literature was used to represent a broader rural picture for analysis. Furthermore, the majority of schools in small towns and rural school districts in Ohio are in the Appalachian region. Thus, this literature review uses examples of connections between educational inequality issues in Appalachia to understand disadvantages in providing access to educational opportunities to rural regions.

The literature on educational inequality addresses numerous economic factors. Issues such as school funding, tax base, impact of poverty, and the complications of rural isolation have been addressed. Following the 2008 recession, drastic budget cuts to federal and state educational expenditures have exacerbated this inequality. Additionally, housing market shifts and lower property tax revenues have decreased the local tax structure, providing less school funding against the shrinking state assistance (Gais and

Dadayan, 2012). State and federal aid is becoming increasingly volatile as it competes with other government spending priorities.

Because of the unique nature of U.S. public school funding, this pressure has affected the U.S. educational system in a distinctive way. American public school funding is generated from federal, state, and local bases; however, because almost half of those reserves are produced by local property taxes, the American educational funding structure produces enormous subsidy gaps between wealthy and impoverished populations (Biddle and Berliner, 2003). Because of this funding structure, students in low-income communities are at a tremendous disadvantage in comparison to others. The funding necessary for a high quality education is exceedingly dependent upon the wealth of the school district in which the student is enrolled. To demonstrate the severity of this problem, it is useful to compare the level of funding between low and high-income districts. American students who live in affluent populations or districts are attending public schools where educational funding is set at \$15,000 or more per pupil per year, while other American students, who reside in poor communities in states with lower funding opportunities, are forced to learn with less than \$4,000 per pupil in their districts (Biddle and Berliner, 2003). The United States has created a system of public education that disseminates inequality and perpetuates the current class structure. As summarized by Slavin (1999: 520),

To my knowledge, the U.S. is the only nation to fund elementary and secondary education based on local wealth. Other developed countries either equalize funding (across the state) or provide extra funding for individuals or groups felt to need it. In the Netherlands, for example, national funding is provided to all schools based on the number of pupils enrolled, but for every guilder allocated to a middle-class Dutch child, 1.25 guilders are allocated for a lower-class child and

1.9 guilders for a minority child, exactly the opposite of the situation in the U.S. where lower- class and minority children typically receive less than middle-class white children.

The federally-funded program No Child Left Behind (NCLB) attempted to address educational inequality without addressing structural tax problems. The amount of funding a school receives from this program is largely dependent upon student test scores. NCLB places schools that already experience academic achievement issues and funding problems at a tremendous disadvantage. Schools with academically struggling students will be more likely to lose funding than more affluent schools with higher performing students. As a result, this legislation perpetuates further federal defunding of marginalized schools. The dynamics of poverty and issues of federal funding often confound school funding strategies in both urban in rural areas.

Demographic factors, as noted in the literature, also complicate the tax funding base for school districts. Demographically, the percentage of elderly within a school district has been thought to have a negative impact on educational funding. This topic is a highly contested terrain in the current literature. One side of this debate views the elderly as a cause of educational funding deficits, while the other sees the elderly as a potential source for enhanced educational funding. Panel data for the U.S. states over the 1960-1990 time frame proposes that an increases in the percentage of elderly population in a district correlates with a decreases in educational funding (Porterba, 1996). This problem is thought to be the result of fixed incomes and limited financial ability to support higher property taxes to fund school bond issues. Fixed incomes often make it difficult to meet

basic necessities, making political support for higher property taxes to support local schools problematic.

Other research indicates that the elderly could have a positive impact on educational funding. Research demonstrates that long term elderly citizens provide sources of backing for educational funding while older migrants do not provide the same financial support (Berkman and Plutzer, 2004), demonstrating that elderly residents do provide backing for school financing when there are political and social bonds to the region. This research debunks ideas that the elderly only operate on personal interest. These findings indicate that loyalty, a social bond, among citizens and the regions educational institutions will often times override personal interest (Berkman and Plutzer, 2004). The potential maturing of the American populace, specified by expected increases of the populace share age 65 and higher from 12.5% to 18.7% in 2030, may create increased generational issues that may potentially develop in rural school funding choices (Porterba, 1996). Demographic changes will most likely present opportunities and challenges for school funding in the future.

Rural regions in Ohio are distinctive, as a majority of schools in the small town and rural school districts contain a larger proportion of residents age 65 and older in comparison to the U.S. general population. As a result of these unique demographic factors, it is necessary to be aware of both positive and negative impacts when evaluating educational funding possibilities.

One of the main goals of secondary education is to prepare students for post-secondary education. An increase in post-secondary education enrollment is often viewed

as an important indicator of the success of the public education system. The increased pressure and demands on state and local resources for educational expenditures has highlighted factors contributing to difficulties in meeting college enrollment expectations. Furthermore, between 2008 and 2009, traditional first year college student enrollment at two-year colleges increased by 8.3 percent, motivated largely from those who in an improved economy, would have enrolled in a four year university or college (Hoover, 2011). Because of these changes in higher education, the dependent variable in this study is specified as the percentage of high school students who enroll in a four year college or university. This controls partially for these changes in the academic landscape and newly forming differences in access to higher education. Because of these changes in higher education, a more pronounced understanding of how institutional mechanisms affect college enrollment amongst rural low-income high schools is urgent.

Noticeably, lower income populations and school districts have disproportionately felt the negative effects of the current financial crisis. Additional research validates that the educational quality received by lower-income students is considerably lower than their affluent counterparts (Phillips and Chin, 2003). Students living in poverty have limited educational opportunities outside the classroom when compared to others. Students in families experiencing poverty have access to reduced numbers of books in the home, fewer computing technologies, and overall less learning opportunities outside the school (Mayer, 1997). The educational gap is expanding because of an increase in the percentage of children growing up in regions that do not have the financial capital to provide a quality education or other basic necessities. The percentage of school age

citizens is growing in states with lesser economic volume, decreasing state budgets, and where funding structures were impacted the most from recent recessions (Gais and Dadayan, 2012). This problem has left many school districts facing an increasing number of students with continually decreasing budgets.

Americans often view the educational system as a vehicle of upward mobility. If a student works hard and achieves academic success, he or she can achieve the “American Dream.” Educational opportunity reinforces notions of American individualism. The idea that a hard working student can “lift themselves up by their backpack straps.” However, the literature indicates that this type of upward mobility is increasingly rare in communities experiencing poverty. Growing up in neighborhood experiencing poverty can often produce a lower quality education (Rank, 2005). Rural low-income communities experience significantly reduced opportunities to acquire financial capital and assets, thus greatly limiting the life chances of an individual experiencing poverty. Referring again to the literature, individuals experiencing poverty are often deprived of social and cultural capital. The lack of social capital in low-income regions can be damaging to primary education and further access to higher education for students. Social capital alludes to the degree of the cherished social relations maintained by a social actor (Ritzer, 2010). Networks of civic engagement, such as neighborhood associations, sports groups, and organizations, are all vital forms of social capital, and the denser these collections are, the increased likelihood that individuals of a community will collaborate for reciprocated advantage (Sirianni and Friedland, 1997). Impoverished communities lack many of these civic organizations and social networks, and provide less social

capital for educational success than higher-income regions. Cultural capital is defined as a social relation within a system of exchange, and the term is extended, “To all the goods, material and symbolic, without distinction, that present themselves as rare and worthy of being sought after in a particular social form” (Harker, 1990:13). Because cultural capital provides the proper etiquette and language for navigating social settings, isolated students in low-income regions are often unable to develop the linguistic cues and social norms necessary to function effectively in academic settings. On the other hand, students in higher income regions are more likely to be exposed to structuring norms and cultural influences that foster values and linguistic cues necessary for academic success.

In summary, an increasingly polarizing gap between the educational experience of those in the upper class and those in poverty has developed. This gap goes beyond the classroom, in that it involves the effect of subpar living conditions, such as exposure to environmental toxins that negatively impact the cognitive abilities of those in poverty. Raised levels of lead are related to severely reduced cognitive abilities in children (Rank, 2005). This problem highlights the spatial inequalities prevalent in rural regions that impact education further intensifying the inequalities that limit educational success. The educational playing field has become increasingly uneven inside and outside the classroom. One of the biggest structural factors contributing to the educational gap between the rich and the poor is the amount of educational funding a district can provide a school. The American public educational system is unique whereas the amount of tax funding base within a school district largely impacts the value of its classrooms (Kozol, 1991, Slavin 1999).

Rural regions have experienced acute educational inequality. Frequently in rural areas educators can be uncertified, buildings allowed to diminish, and books and educational materials are rare (Eller, 2008). Instructional materials and educational facilities are increasingly becoming outdated in areas of rural poverty. These educational resource inequalities are again linked to the current educational funding structure. Property taxes which are set and gathered at the school-district location provide nearly 34% of funding for public schools in 2007 (Chetty and Friedman, 2007). These funding provisions have resulted in unequal educational expenditures and school quality that varies drastically depending upon the local tax base. Because of increased financial restrictions on federal and state expenditures, the economic resources for education are increasingly coming from local sources. This contributes to a lower quality of education for those living within areas of high poverty. Levies on local property provide the bulk of financial support for schools, but property tax revenues are significantly lower in areas of poverty. Economic resources are the strongest factor associated with student achievement, and without equal economic resources for all students, the issue of educational inequality will remain. In the 1990s in an impoverished area of Jackson County, Kentucky, one in two elementary pupils were unsuccessful in completing high school and 43 percent of adults had not completed the ninth grade (Eller, 2008). These examples of educational inequality demonstrate that this issue is not a new problem but a historic disparity grounded in past policy disadvantages.

Impoverished rural regions did not escape the harmful effects of neo-liberal expansion and deregulation during the Reagan administration in the 1980s. On the

contrary, most economically depressed regions were affected greatly during this time as a result of eliminated social safety nets that those experiencing poverty desperately needed. The loss of federal and state social programs during the Reagan years increased the burden on state and local governments to meet basic needs in health, education, and community development, while most states were already suffering from a loss of tax revenues resulting from an economic recession. Again, the current trend in federal and state funding is nothing new. This reoccurring cycle leaves the rural regions without resources or capital to fund the basic programs and necessities essential for a community to function.

Educational improvements in low-income rural regions do not promote regional equality, but oftentimes further widen within region educational gaps. There are noteworthy cultural differences between individuals in low-income rural settings, such as Appalachia, compared to those in metropolitan areas. Contemporary, mechanical methods of learning that benefit individualistic competition in comparison to cooperative effort, large detached classrooms, and educational culture highlighting access to consumer products instead of customary values and culture often detach low-income, rural students from education (Eller, 2008). Furthermore, students within rural regions who do take advantage of new federally funded educational advancements such as the increase in community colleges and two year degree programs are frequently forced to relocate to utilize their education.

Merged schools and refining educational institutions deliver financial aid to county officials and their relatives, but offers limited community growth because the

expenses are monumental and the overall advantages are limited, refining educational systems for consolidated schools may facilitate the departure of talented academic power (Eller, 2008). The outmigration of educated individuals has been labeled the “brain drain”, where an already marginalized region loses talented human capital that it urgently needs. A conclusion from preceding research is a crucial necessity to refurbish the rural educational structure and address the chronic underinvestment (Hobart, 2010). The current educational structure in rural America invests the majority of its resources into students who will likely leave the community and contribute little to the already economically and academically deprived regions. This “brain drain” adds original and significant indications about how the crisis, silently, progresses, accelerating in small towns fighting to carve out a place in the “new economy” (Hobart, 2010). In addition, communities invest a large amount of resources to prepare a student to go on to college in the form of advanced coursework, tutoring, and mentoring. When these investments do not return to the area it can create a sense of hopelessness for many low-income rural communities in regards to college educations.

There has been a fairly large focus on urban poverty and education in the current body of literature. However, analysis of institutional problems in rural poverty is lacking. The literature focusing on the Appalachian region was utilized in this review to explore issues unique to rural poverty. While the educational crisis in urban settings is of concern, the educational plight of the rural poor is of increasing alarm.

## THEORITICAL FRAMEWORKS

Many studies identify disadvantages associated with low-income urban populations, but few studies focus on high poverty rural populations, and still fewer are theoretical frameworks exploring the institutional dysfunctions in educational systems that contribute to educational inequalities in rural low-income regions. Many studies suggest that the most important influence on college enrollment is high school socioeconomic status, but the research does not offer a comprehensive analysis of all issues involved. A more accurate structural analysis of the relationship between student poverty and institutional funding factors upon college enrollment rates is possible through urban focused theoretical frameworks that prove beneficial in understanding rural environments.

Spatial inequalities disadvantage many urban neighborhoods. Differences in neighborhoods cause differences in employment opportunities, parental involvement, mentorship, school tax basis, youth organizations and extracurricular activities, which may affect the educational outcomes and social mobility of youth raised in these neighborhoods. Aintsworth's study on the educational success of urban youth analyzed these various spatial inequalities in what he called the *neighborhood effect* (2002). Aintsworth's theoretical framing explains the selection of school district types for exploration of spatial and cultural inequality of impoverished neighborhoods in comparison to more affluent regions. Aintsworth found mediators, or individuals who provide social capital and mentoring, account for about 40 percent of the neighborhood effect on educational achievement, with collective socialization having the largest effect.

William J. Wilson (1997) argued that the social isolation and disorganization experienced by inner-city residents results from several major social problems, including the prevalence of delinquent subcultures, the weakening of basic institutions, and a lack of social control, all of which contribute to high rates of educational failure in urban inner cities. Wilson identifies the “weakening of basic institutions” - a lack of quality educators and mentors, relevant educational tools, and upgraded educational buildings - as a key factors in understanding educational failures. These disadvantages are inherently tied to funding disparities in marginalized regions, with institutional weakness occurring in rural areas through decreased funding and dysfunctional educational expenditures. Wilson described five interconnected factors, each affected by educational expenditures, that influence educational attainment issues: collective socialization, social control, social capital, differential occupational opportunity, and school characteristics. These factors are related to the cultural and political economy of marginalized rural school districts.

Rural communities may have low social control, and low social control may cause low college enrollment rates. Wilson argues that neighborhoods with high adult time constraints are less involved in organizing community activities that influence the lives of youth (Anderson, 1998; Stewart and Simons, 2006), and so youth are more likely to develop norms from peer influence rather than from adult supervision. Because rural regions often lack stable career options, and because service sector jobs offer low benefits and compensation, adults in these areas often have to work multiple service sector jobs to provide for their families, and have less time and effort to monitor and engage rural youth. Thus, in many ways job markets in rural communities occupy the adult resources

needed for social control, parental attachment, and community mentoring that all provide structuring norms and positive academic influence for youth. While many studies have examined the effects of poverty on academic success, Wilson's analysis demonstrates the need to control for student poverty in order to understand the larger influences of neighborhood effect and other types of spatial inequality on the academic success of local youth.

Rural communities may have low levels of community social capital that reduce higher education enrollment. While professional social ties and networks facilitate career development, social capital also provides many of the resources needed for enrolling in higher education. Students in isolated communities with low populations may have smaller social networks, and communities with high adult time constraints produce fewer youth organizational ties and fewer youth relationships with community leaders. Wilson (1997) argues that children in disadvantaged regions suffer from social networks that diffuse and reproduce skills, values, styles, and habits that are not as conducive to promoting positive social outcomes as stable neighborhoods. While social networks and relationships may develop in online communities, small towns and rural regions are most affected by the digital divide, and many youth may lack the technology needed for developing valuable online social capital. In many ways, isolated communities constrain youth social networks, and students in these communities may experience differences in skills and value sets, information about school programs and funding, organizational scholarship opportunities, value of letters of recommendation, and even the types of education or career advice diffused by school counselors and community mentors.

Rural job markets may provide limited community occupational opportunities, which may affect how community members and youth perceive the value of educational achievement. Occupational opportunities provide direct economic benefits for gaining education credentials; however, limited job markets provide limited incentive for community members to further invest into their human capital. Aintsworth (2002) explains that high volumes of unemployed individuals discourage current and future students from completing their studies or pursuing further education. When faced with increasing rural unemployment, rural youth may not perceive long-term financial advantages in higher education, and may instead take advantage of industrial or service sector jobs to pay bills, support their families, and focus on other short term financial burdens.

The quality and condition of educational resources may also affect academic success and college enrollment rates. Because rural communities may have lower school tax bases and funding, and because rural educational expenditures may be geared toward busing and other educational needs specific to isolated communities, rural school districts may not have ample funding for traditional educational expenditures - thus, some rural school districts may feature older buildings; outdated and worn books; and limited computers, projectors, and technological infrastructure. Because of these conditions, rural schools may be unable to attract, recruit, and retain quality educators, further lowering the quality of education and academic success. Low teacher retention rates further decrease the community's social control, student networks with educational leaders, and the perceived value of local occupational opportunities. Lower quality in these

educational resources may limit learning and disadvantage these students on high school proficiency tests and college placement exams.

Wilnglinsky's analysis suggests that differences in educational expenditures may cause differences in learning and higher education pursuit. Thus, differences in how school districts allocate funding for administrative costs, building and ground maintenance, non-instructional staff, student costs, and teacher costs may cause differences in college enrollment rates.

Wenglisky's research argues that focusing funding on teacher support creates positive school environments for learning - increasing instructional support expenditures attracts and retains higher quality teachers, increases community social control, student networks with education leaders, and provides more mentors. Thus, higher instructional support expenditures should cause higher college enrollment rates. Both Wilson's and Aintsworth's research make the case that while poverty levels affect college enrollment, certain communities feature unique conditions and different types of spatial inequality, and these differences lower academic success. Thus, college enrollment rates should be lower for rural school districts than overall rates. Figure 1 provides a conceptual model for the influence of educational expenditures on higher education enrollment.

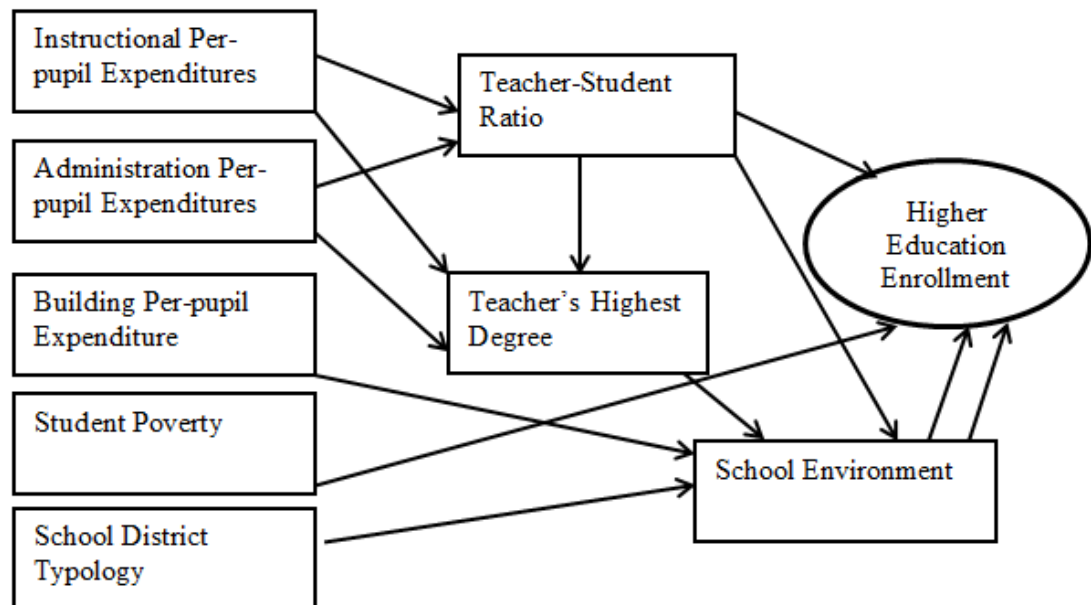


Figure 1. Conceptual Model

## DATA

To explore the influence of educational expenditure and school district type on college enrollment, data was gathered from the 2011 Ohio Board of Regents Educational Report, the 2011 Ohio Department of Education (ODE) advanced reports, and the 2013 Typology of Ohio School Districts. The Board of Regents report provides college enrollment rates for all school districts in Ohio. The ODE reports provide comprehensive profiles on each school district throughout Ohio, providing information on funding for staff support, pupil support, instructional expenditures, administrative expenditures, and building expenditures. Additionally, the ODE profiles provide student poverty rates and school district type. The Typology of Ohio School Districts categorizes school districts based on student population size, student poverty rates, and school district location - the 2013 typology provides higher detail than previous sets.

### Dependent Variable

The dependent variable is the percentage of high school students who enroll in a four year college or university. This information was collected from the 2011 Ohio Board of Regents educational report of high school graduates in 2011 enrolling as college students. The focus is solely on four year college enrollment because findings reveal that a four year college degree drastically advances potential earning ability and produces increased access to an abundance of occupational opportunities (Kolesnikova, 2009; Long & Kurlaender, 2009; Monk-Turner, 1990).

### Independent Variables

The independent variables for this study are school district educational expenditures and school district type. School district educational expenditures are divided between staff support expenditures, pupil support expenditures, instructional expenditures, administrative expenditures, and building expenditures. Definitions of each expenditure from the 2011 ODE district reports are listed below:

- *Staff support expenditures* are distributed by school district central offices and include services for district staff members, instructional improvement services, and overall meeting expenses for all staff.
- *Pupil support expenditures* are defined as expenditures meeting students' needs outside the classroom and beyond their academic instruction. This expenditure provides guidance counseling, help in the media center or library, college advising, field trips, and psychological testing. Pupil support may be operated out of the district offices, though these functions must ultimately serve the child in his or her particular school.
- *Instructional expenditures* include funding for teachers, teacher aides, or paraprofessionals, as well as materials, computers, books and other consumable materials that are used with students in the classroom setting. Instructional expenditures are expected to lower the student-to-teacher ratio. This variable is hypothesized to impact institutional characteristics of neighborhood contexts by increasing the quality of educational materials such as books, educational technology, and teachers.

- *Administrative expenditures* denote the functions of the principal's office costs incurred as the principal's office decides goals and directions, and from making key decisions for the building. This office also motivates staff, makes recommendations for the hiring of staff members, evaluates personnel, deals with crises, and concerns itself with the surrounding environment (FY2011 District Profile Report, 2011). Administrative expenditures are predicted to impact institutional characteristics by also lowering the student-to-teacher ratio.
- *Building expenditures* include funding to facilitate operations in school buildings and central offices. It is made up of multiple functions, which combine both capital goods (buildings, buses, heating equipment, etc.) and the resources necessary to operate, clean, repair and improve them. Spending on the lunchroom, which is the largest percentage of this expenditure, is also included.
- *School district type* categorizes schools based on poverty level, student population, and location. Eight typology categories are listed below in Table 1:

Table 1

*ODE School District Typologies*

2013 Typology Code	Major Grouping	Full Descriptor	Districts in Typology	Students in Typology
1	Rural	Rural-High Student Poverty & Small Student Population	124	170,000
2	Rural	Rural-Average Student Poverty & Very Small Student Population	107	110,000
3	Small Town	Small Town- Low Student Poverty & Small Student Population	111	185,000
4	Small Town	Small Town-High Student Poverty & Average Student Population Size	89	200,000
5	Suburban	Suburban-Low Student Poverty & Average Student Population Size	77	320,000
6	Suburban	Suburban-Very Low Student Poverty & Large Student Population	46	240,000
7	Urban	Urban-High Student Poverty & Average Student Population	49	225,000
8	Urban	Urban-Very High Student Poverty & Very Large Student Population	6	185,000

## Control Variable

*Student poverty* is a variable used to measure the amount of poverty in school districts. This is utilized as a proxy for socioeconomic status (SES). It is a measurement

with four distinct characteristics. First, the percentage of students in a school who are eligible to receive free or reduced lunch. Secondly the percentage students who reside in a household in which members of the family (e.g) siblings are eligible for free or reduced lunch. Thirdly, the percentage of students in a school who are known to be recipients or whose guardians are recipients of public assistance programs. Finally, the percentage of students whose guardians have completed a Title 1 student income form and meet specified requirements. This definition also came from 2011 ODE Advanced Reports variable descriptions. Socioeconomic status has been identified in previous literature as a key factor in the likelihood of college enrollment.

## METHODS

To control for differences in private funding effects, private high schools were excluded from the data set. After controlling for these differences, there were a total of 658 cases. The percentage of college enrollment was converted to a ratio with a logit transformation to allow for regression analysis. When the function's parameter signifies a probability, the logit function returns the log-odds (Fleiss, Levin, and Paik 2003). When the percentage is converted to the log-odds ratio, regression analysis is appropriate. To compare differences amongst typologies, variables were collapsed from the original eight types into a set of four. The variables were collapsed to reflect spatial and cultural similarities within the district types. Variables were connected between the eight typologies by their major groupings for collapsing, see Table 2:

Table 2

*Compressed School District Typologies*

2013 Typology Code	Major Grouping	Full Descriptor	Districts in Typology	Students in Typology
1	Rural	Rural-High and Average Student Poverty & Small and Very Small Student Population	231	280,000
2	Small Town	Small Town- Low and High Student Poverty with Small and Average Student Population	200	385,000
3	Suburban	Suburban-Low and Very Low Student Poverty & Average and Large Student Population Size	123	465,000
4	Urban	Urban-High and Very High Student Poverty & Average and Very Large Student Population	55	410,000

Type one and two were combined creating the rural variable, while type three and four were combined creating the variable small town. Type five and six were combined to create the variable suburban, and type seven and eight were combined to create the variable urban. Once collapsed, these four types constitute the independent variable category of district typologies. The total sample contained 658 cases (N=658). The variable rural contained 234 cases, approximately 280,000 students in this variable type. Small town included 205 cases, approximately 385,000 students. The variable suburban

involved 151 cases, approximately 560,000 students. The variable urban contained 67 cases, approximately 410,000 students.

Comparison between these types (rural, small town, suburban, and urban) allow for analysis of the effects of the independent variables on the dependent variable by region. This comparison is important in understanding the specific regional impacts on college enrollment of students. Focus is maintained on the rural variable by including it as a reference variable in regression analysis.

Table 3

*Descriptive Statistics*

Variables	Full Sample (N=658) Mean (SD.)	Rural (N=234) Mean (SD.)	Small Town (N=206) Mean (SD.)	Suburban (N=151) Mean (SD.)	Urban (N=67) Mean (SD.)
College Enrollment %	0.67(0.21)	0.64(0.22)	0.68(0.21)	0.73(0.18)	0.66(0.19)
Student Poverty %	0.38(0.18)	0.41(0.14)	0.38(0.15)	0.21(0.12)	0.66(0.14)
Admin Expenditures (hundreds of USD)	617(289)	604(185)	588(183)	643(453)	694(360)
Building Expenditures (hundreds of USD)	1,745(703)	1,807(633)	1,641(660)	1,775(786)	1,777(832)
Staff Expenditures (hundreds of USD)	214(279)	173(160)	183(198)	232(236)	408(623)
Pupil Expenditures (hundreds of USD)	1,163(505)	1,060(358)	1,129(404)	1,370(739)	1,160(447)
Instructional Support (hundreds of USD)	5,588 (1,825)	5,241(1,098)	5,296(1,218)	6,299(2,944)	6,094(1,576)

Note: USD= United States dollars.

The descriptive information confirms the problem previously addressed in regards to spatial educational inequality. The college enrollment rate of students in the rural

school district is lagging in compassion to the other school district types: small town, suburban, and urban in Table 3. The difference in college enrollment rates, while small, is still an issue of concern when exploring educational issues in rural environments. Table 3 documents that student poverty is more concentrated in the urban school districts with an average of 0.66%, significantly above average student poverty rates in the other school district types.

For the per-pupil expenditure measures, the largest share from the full sample goes to instructional support at \$5,588 per-pupil, with much smaller shares going to the other expenditure categories as follows: the second largest amount within the full sample was spent on building expenditures at \$1,745 per-pupil. Succeeding is pupil support expenditures in the amount of \$1,163 per-pupil. The next largest amount is administrative support expenditures at \$617 per-pupil. Finally, \$214 staff support expenditures is spent per-pupil. Building expenditures may seem high at \$1,745 per-pupil and when looking at the rural typology, this number increases to \$1,807 per-pupil. This is noteworthy when exploring the issues of spatial inequality amongst rural schools. It is hypothesized that because rural schools are more spread out and students must be transported from farther distances in comparison to other typologies. This finding may take away funds from other necessary expenditures to increase the quality of education and college enrollment rates of college students.

Table 4

Correlation Matrix

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	1.00										
2.	-.137***	1.00									
3.	.015	-.502***	1.00								
4.	.148***	.405***	-.368***	1.00							
5.	-.013	-.250***	-.227***	-.184***	1.00						
6.	-.076*	.137***	.000	-.522***	.509***	1.00					
7.	-.055	-.034	-.068	.049	.090*	.021	1.00				
8.	-.054*	.066*	-.099**	.023	.016	.082*	.507***	1.00			
9.	-.027	-.108**	-.074*	.036	.234***	.173***	.417***	.297***	1.00		
10.	.018	-.152***	-.046	.255***	-.002	-.158***	.592***	.472***	.240***	1.00	
11.	.040	-.141***	-.108**	.213***	-.093**	-.081*	.749***	.418***	.336***	.614***	1.00

Note: \* $p \leq .05$ . \*\*  $p \leq .01$  \*\*\*  $p \leq .001$ .

## VARIABLES

1. College Enrollment %
2. Rural
3. Small Town
4. Suburban
5. Urban
6. Student Poverty
7. Administrative Expenditures
8. Building Expenditures
9. Staff Support Expenditures
10. Pupil Support Expenditures
11. Instructional Support Expenditures

A correlation matrix was constructed to explore the zero-order correlations amongst variables. Analysis was conducted to explore if variables were highly correlated to one another which could possibly affect the outcome of the regression models in Table 5. The highest correlation between variables in Table 4 was .614 amongst pupil support expenditures and instructional support expenditures, which does not suggest multicollinearity.

The matrix paints an interesting picture in regards to the spatial issues surrounding college enrollment rates. Referring to Table 4, the rural typology was negatively associated with the college enrollment rate, while the suburban typology was positively correlated with college enrollment. This confirms the previously discussed issues with educational funding, and student access to higher education. Fundamentally, the location of a students' school district has an impact on the quality of public education they may receive and this in turn has an impact on the likelihood of that student attending college. In lower income rural regions, chances of college attendance are lower while students in higher income suburban regions have an increased chance of attending college. While other factors are likely at play, this is an important finding in regards to spatial educational inequality.

Table 5

*Stepwise Regression Model*

	<u>Factors that Influence College Enrollment</u>					
	Model 1(Beta)		Model 2(Beta)		Model 3 (Beta)	
Student Poverty	.051*	(-.076)	.963	(.002)	.746	(.017)
Typology Variables <sup>a</sup>						
Small Town			.030*	(.096)	.048*	(.088)
Suburban			.000***	(.193)	.001***	(.175)
Urban			.351	(.043)	.461	(.035)
Expenditure Variables						
Administrative Expenditures					.034*	(-.138)
Building Expenditures					.468	(-.034)
Staff Support Expenditures					.734	(-.015)
Pupil Support Expenditures					.865	(.009)
Instructional Support Expenditures					.043*	(.128)
Adjusted R <sup>2</sup>	.004		.023		.027	
Significance of F	3.83		4.92		3.04	

Notes: \*  $p \leq .05$ . \*\*  $p \leq .01$  \*\*\*  $p \leq .001$ .

a. Reference category is rural

A stepwise regression was preformed to explore the relationship between the proxy variable for socioeconomic status and its impact on college attendance rates as well as its impact when introduced to the different model specifications. Stepwise regression models were employed, with student poverty entered in the first model, the school district type variables entered in the second model, and finally the addition of expenditure

variables--administrative expenditures, building expenditures, staff support expenditures, pupil support expenditures, and instructional support expenditures in the third model. The rural school district is the excluded reference category school district variable specification in the regression analysis. The adjusted R-squared increased slightly when the independent variables were introduced stepwise into the model, indicating that the model's explanatory power increased with each additional independent variable entry.

### Model One

*Student Poverty*, was used as a control variable and is a proxy for socioeconomic status. Socioeconomic status has been identified in the current literature as a key variable in understanding educational inequality and, specifically, the likelihood of attending college. This variable is theoretically grounded in Wilson's neighborhood effect theory. High levels of student poverty influence the social and cultural contexts in which education occurs. The student experience results from what Wilson describes as a lack of occupational prospects and peer influence which impact academic success rates. This occurs because students see no advantage in furthering education if there are no employment opportunities readily available. This vision, Wilson explains, is often justified from the analysis of their peer networks' limited opportunities. As expected, student poverty was found to be statistically significant at the .05 level. This coincides with the majority of literature which frames aspects of socioeconomic status as an important variable in understanding educational problems.

### Model Two

However, when the independent variables for location were introduced, the proxy variable for socioeconomic status, the percentage of student poverty, lost its statistical explanatory power. This indicates that along with the importance of socioeconomic status, there are other issues affecting college enrollment in different school district types. Both Wilson and Aintsworth, in line with neighborhood effect ideas, theorized that additional mediating factors contribute to spatial and cultural inequality, which perpetuate educational inequality in low-income regions. These spatial and cultural factors are operationalized in the various school district typology variables. The focus is on what Wilson calls “social isolation”, where isolation and disorganization are experienced by individuals in low-income settings, which promotes delinquent subcultures. Wilson argues that social isolation provides the conditions for the weakening of basic institutions, which negatively impact academic success and college enrolment rates. Wilson’s framing of social isolation is applicable to rural settings.

School district typology variables were introduced in the second step of the regression model. School district typologies were utilized to explore the impact of spatial inequalities and cultural differences on college enrollment rates of budding college students. The regression results indicate that school district location impact the likelihood of college attendance. The small town and suburban district variables are found to have a positive impact on the college enrollment at the .05 and .001 significance level, respectively.

### Model Three

The expenditure variables were introduced in the third and final step of the regression model. Expenditure variables were utilized to explore possible patterns of resource allocation within school districts that may impact college enrollment of college students. Of the five expenditures examined in this study, two were found to be significantly associated with increases in college enrollment. Administrative support expenditures were significant at the .05 level. However, the beta level indicated a negative association with the dependent variable. Administrative expenditures are hypothesized to increase college enrollment by strengthening the decision making capacity of school administration and by offering additional money to boost the amount of teachers a school can hire, thus lowering the student-to-teacher ratio. However, negative association of administrative expenditures and college enrollment is conducive with previous studies, which indicate that administrative spending may be uneconomical in regards to increasing academic success and for the purposes of this study, to increase the likelihood of college enrollment.

Instructional support expenditures were found in Table 5 to have a positive statistical association with the dependent variable of college enrollment. This independent variable is hypothesized to have an effect on the dependent variable by lowering the student-to-teacher ratio and also through increased salary options for teachers, allowing for the hiring of more experienced and highly qualified teachers. Further lowering the student-to-teacher ratio heightens these effects. These factors were predicted to possibly increase college enrollment by exposing students to educators who

promote higher education and increase graduation rates, thus allowing for likely increases in college enrollment in this study, the importance of instructional expenditures was also found to have some significance on college enrollment because of hypothesized factors in line with previous research.

## DISCUSSION

- *Research Question One:* What is the relationship between school district institutional spending and student college enrollment rates? The data findings indicate that some spending may have more of an impact on college enrollment rates than others. Instructional support expenditures were found to be statistically associated with the dependent variable and have a positive effect on college enrollment rates. Administrative expenditures were found to have a negative impact on college enrollment rates while other expenditure variables were not found to be statistically associated with the dependent variable.
- *Research Question Two:* How do different types of school districts impact the likelihood of enrollment in post-secondary education? The regression results indicate that the school district location as operationalized in the school district typology of a student can potentially have some impact on the likelihood of enrollment in higher education. The results from model two in the regression model indicate that location might be a factor that impacts the likelihood of college enrollment. Both the suburban and small town typology variable were found to be positively associated with the likelihood of enrollment in higher education. These findings support the notion that regional location, ascribed with spatial and cultural school district characteristics, are important factor in regards to college enrollment and educational access.

This finding reinforces the notion from previous research that funding problems in education are largely a spatial issue. As noted by Biddle and Berliner (2003) Public school funding in America comes from federal, state, and local sources, but because

nearly half of those funds are generated by local property taxes, the American system generates funding inequalities between wealthy and impoverished communities. Because of these factors, a student's success and likelihood of enrolling in college is largely impacted by the location of the school he or she attends. This is possibly related to the amount of money a school district has to allocate. Referring back to Table 3, the suburban school district type allocates on average \$6,299 in instructional support expenditures per pupil, compared to \$5,241 in the rural school districts an over \$1,000 plus difference. This funding disparity in educational funding further reinforces the notion that spatial inequality is a contributing factor to educational inequality, specifically college enrollment rates.

Therefore, from these research findings it can be concluded that some institutional expenditures positively impact college enrollment rates while others have a lesser impact. The hypothesized importance of instructional expenditures on enrollment in higher education, linked to a lower student-to-teacher ratio and an increase in the number of more experienced educators who can in turn positively promote higher education by providing structuring norms, is supported by these data findings. In addition, the hypothesized effect of the location of a school district and its impact on college enrollment is support by the research findings.

It is has been identified in this research that socioeconomic status does have a statistical association with college enrollment rates when exploring its effect exclusively on the dependent variable. Also, instructional expenditures in low income, rural regions are a potential factor to explore when analyzing educational access issues. Instructional

expenditures were found in Wenglinsky's research to increase academic achievement by decreasing the teacher-to-student ratio and allotting for the hiring of more experienced educators (Wenglinsky, 1998). The effect of instructional expenditures on college enrollment rates is a result that has potential policy implications and calls for further analysis of educational funding issues.

Another finding in this study is the impact of administrative expenditures on college enrollment. Administrative expenditures divert resources away from instructional expenditures and have a negative statistical association with college enrollment rates. The current body of literature states that administrative expenditures have no significant impact on academic success, but this negative association is a finding requiring further research to explore this variable's possible effect on college enrollment rates.

## CONCLUSION

The results from this research raise further interesting research questions. Mainly, exploring the effect of administrative expenditures on college enrollment rates and how this relationship is possibly negatively associated. This research finding is the main opportunity for further research from the results of this study. Additionally, college enrollment rates are a complex issue to address. Understanding educational access and issues that prevent college enrollment in rural regions of students is a dynamic problem that requires further research.

The interconnectedness of regional poverty and educational inequality raise future questions about the relationship between educational expenditures, community politics, and the local economy. With major construction and development companies, to what extent are local workers employed and local businesses contracted for building expenditures in impoverished school districts? In a globalized market, to what extent do resource expenditures (such as textbooks and technology) occur through community businesses? Additionally, how might community leaders and local political interests affect school boards and budgetary decisions? These questions require further investigation into educational expenditures and their reciprocal relationship with local institutions.

This study worked to identify how school districts make decisions about allocation of resources among different expenditure categories and how that may help counter the problem of low college enrollment rates. However, further research with more independent variable exploration is needed to shed light on this difficult topic.

While the research questions were explored, more research is required to understand the impact of institutional expenditures and spatial impacts on college enrollment rates in rural regions. Another issue that may have affected this study is the general lack of reliable data on college enrollment. Further scholarly research should focus on the percentage of students who enroll in college and the tracking of those students throughout their academic career. Much like dropout rates being highlighted in the literature as falsified, college enrollment rates might be grossly exaggerated.

Another limitation of this research is the small focus; replication of this research on a larger scale could potentially answer more questions about the impact of educational expenditures, the location of a school district, spatial and cultural implications, and these variables' impact on college enrollment. Recreating this study on a regional scale rather than a state size sample could help explain institutional educational issues and regional differences more thoroughly.

Summarizing this data indicates that when funding is allocated towards instructional spending, it reduces the student-to-teacher ratio, and thus increases the educational retention rates and increases the likelihood of college enrollment. Instructional spending is a central factor in regards to resource allocation and increasing educational advancement through college enrollment. When more funding is allocated towards instructional spending, students retain more information and graduate at a higher rate, thus allowing students to move onto post-secondary education.

From the existing body of literature, it is apparent that factors identified as preventing students in poverty from becoming academically successful are interwoven

problems. At the heart of these issues are structural failings that limit educational funding to regions that urgently need relief. The current tax structure has created an environment where education quality depends on the wealth of the school district a student attends. Additionally, educational funding is not stable regions that depend on federal and state expenditures to help meet educational funding requirements oftentimes lose funding. In times of economic crisis or a political regime change funding can be severely cut with little warning.

Furthermore, there is limited research and theoretical framing to analyze the institutional educational crisis in rural settings. However, the current model to analyze urban poverty has proven applicable to the rural region, specifically neighborhood effect theory and current research focused on resource allocation and its relation to academic success. In regards to neighborhood effect theory, many of the factors are pertinent to rural regions. Mainly, the focus on institutional characteristics, such as the type and quality of schools that students have access to, including the condition and quality of educators, buildings, and educational tools impact on college enrollment. As highlighted in the data, without these institutional issues being addressed, students may experience lower academic success and therefore are less likely to attend college. Wenglinsky's research on institutional spending and its connection to academic success is vital to understanding educational issues in rural areas. This theoretical framework has proven relevant in analyzing educational issues in regions of rural poverty.

To conclude, this research is significant in the sense that it explores an increasingly concerning problem of unequal educational opportunities in the United

States. Much of the literature focusing on education inequality looks into urban educational issues. While this is of concern and student poverty is highly concentrated in urban regions, there is limited focus on structural educational issues in rural settings. Building from the current literature, this research attempts to bring insight as to why college enrollment rates are lower in rural settings.

This study advances awareness of the dynamic of educational spending and higher education enrollment rates in rural settings. The findings indicate that some educational expenditures have a significant effect on college enrollment rates of students. While socioeconomic status has a significant impact on a student's likelihood of attending college, this research suggests that schools might increase a student's chances of attending college through specific spending. Specifically, higher instructional expenditures, were the highest predictors for college enrollment after controlling for student poverty.

This research works to remedy preconceived ideas and fallacies surrounding poverty and education in rural environments. This exercise is useful for challenging the notion that low socioeconomic status and lower college enrollment rates are inevitably correlated. Additionally, this research provides initial insights into resource allocation for rural school systems and possible policy implications regarding educational funding. As seen in this research, there are institutional factors that need to be explored in order to understand educational inequality in marginalized regions, and is vital that these questions be raised about the future of schooling for students.

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