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The sins of the father: an historical analysis of race and class equality in educational resource allocation and the implications for future educational technology distribution

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The sins of the father: An historical analysis of race and class equality in educational resource allocation and the implications for future educational technology distribution

by

Patricia Randolph Leigh

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This is to certify that the Doctoral dissertation of

Patricia Randolph Leigh

has met the dissertation requirements of Iowa State University

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For the Major Program

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For the Graduate College

This dissertation is dedicated to

Mabel Randolph Leigh and Thomas Leigh, Jr.

For the love, the nurturing, the great childhood, the strong sense of self....
Thanks for everything Mom and Dad and remember, "it's for school" -- The Kid

and to

Ann D. Thompson and Jackie M. Blount

Your combined wisdom, intelligence, integrity, profound sensitivity and support made this work possible.
Thanks, Ann and Jackie, for your enthusiasm and encouragement -- Pat

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GENERAL INTRODUCTION

Rationale for Study

The provision of equality of educational opportunity has long been an issue in the history of American education (e.g., Coleman, 1966). Presently, while the United States, as well as other nations around the globe, are immersed in what has been termed the information age, the issue of equal opportunity takes on new dimensions. The proliferation of computer, information and communications technologies and their increased presence in educational settings have altered the definition or assessment of equal opportunity as well as changed the variables examined when measuring this construct. One not only needs to examine the availability of hardware and software and the electronic telecommunications connections available to students, but also the types and levels of equipment and how such tools are being used in the classroom (Becker, 1991; Honey & Henriquez, 1993). However, to gain a firm understanding of educational opportunities available in American schools an examination of our history is necessary. This dissertation attempts to do just that by looking at racial and socio-economic factors that played into the distribution of traditional educational tools and environments from the eighteenth century until the now fast approaching millennium.

National incentives and educational goals have an increased focus on the provision of electronic access to informational and educational resources and environments (U. S. Advisory Council on the National Information Infrastructure, 1996). Providing universal access to national and international wide-area computer networks, such as the Internet, is an example of such a goal (p. 9). Issues of equality regarding technology access have been the concerns of many educators in recent decades (e.g., Becker & Sterling, 1987). However, with emphasis on providing this access to all children and citizens gaining momentum, equality concerns should also command increasing attention. A look into the past may well uncover reasons that the distribution of more traditional educational resources (i.e. trained teachers, books) and educational access in general fell short of the fair and equitable standard that most espouse. Without knowledge of the underlying factors that brought about an unjust system, factors that may not be

apparent to the twentieth-century citizen, the mistakes of the past may be inadvertently repeated. Moreover, current situations often carry more information in light of or relative to past events or trends. For this reason, it is important to take a hard historical look at the relationships that are addressed in this study. This research investigates the relationship between economic participation and educational opportunity with specific attention given to the historical connection between educational resource inequalities and race and class discriminatory economic practices. Finally, a brief look at the current situation concerning electronic access to educational resources and environments gives insight into the status of equality of educational opportunity in U. S. schools today.

The underlying premise of this volume is that the American educational and economic systems are intricately tied and educational opportunities correlate to economic participation. This work focuses on the unequal opportunities historically afforded Black Americans and those of low socio-economic status. With the belief that today's educators should not simply hope for equality in educational technology distribution, the overall goal of this research is to unveil the mistakes of the past in order to chart a fair and equitable path for adults and children of the twenty-first century. Old testament scriptures teach that the crimes or mistakes of our fathers (and mothers) often revisit innocent and well-meaning sons (and daughters). This revelation inspired the title of this dissertation volume.

Dissertation Organization

This dissertation is written in the alternate format approved at Iowa State University. It consists of three research papers to be submitted to scholarly journals and contains the same information were the dissertation written in chapter format. The first paper, "Economics and Education: Kindred Inequalities in Kindred Systems," examines the research literature concerning the connection between education and economic factors such as land, labor and capital. Particular attention is paid to the effects of racial and class discrimination upon the allocation and distribution of these factors. There is an extensive examination of how economic models and theories explain the relationship between education and economics and the gaps that occur between racial groups. In addition, national, regional and state survey

data are used to assess racial and socioeconomic group disparities in educational resources from the 1960s through the 1990s.

The second paper, "Segregation by Gerrymander: The Creation of Lincoln Heights High School," traces the formation of a specific school district serving a Black, low-income community in Cincinnati, Ohio. This paper uses a case study approach to support the theory that there is a positive and reciprocal correlation between economic participation and educational opportunity. An historical investigation shows how economic factors influenced the formation of cities and communities and how the formation of school districts was intricately tied to this evolution.

The third paper, "Electronic Connections and Equal Opportunities: An Analysis of Technology Distribution in Public Schools," uses data collected from a national survey sample to conduct quantitative analyses of differences in access to wide-area networks by ethnic or racial identity and socio-economic status. The aim of this research is to provide a current picture of the equality of available educational opportunities as measured by access to technologies important to this age. Using the data from "The Advanced Telecommunications in US Public Elementary and Secondary Schools, 1995" survey (National Center for Education Statistics, 1996), this research is guided and informed by the earlier study and findings of the Equality of Educational Opportunity Report (Coleman, 1966).

The strength of this dissertation research lies in the various approaches and methodologies used to examine the issues in question, the results of which all support common or related hypotheses. The first paper is unique in that it draws from literature not indexed in typical educational data bases or clearinghouses and therefore approaches the issue of economics and education from the perspectives of those with professional concentrations in economics. Because education journals lack in-depth writings that include the viewpoints of economic theorists towards educational opportunities, such a paper is a unique contribution to the body of knowledge. The historical case study methodology, used in the second paper, brings comprehensive data from rich primary and secondary sources and provides deeper understandings of the relationship between economics and education and the evolution of this relationship in light of race and class. In keeping with historical research techniques, data were discovered, rather than

created, as a result of searching books, documents and other accounts surrounding the events in question. It provides the reader with a front row seat as the events of the past unfold to unveil the dynamics of the economic and education relationship in an urban-industrial midwest city. The author of this paper shares the hope of other educational historians. "By studying the past, the historian hopes to achieve a better understanding of present institutions, practices, and issues in education" (Borg and Gall, 1989, p. 806). The case study concerning the creation of the Lincoln Heights community, school district and high school was conducted with the underlying assumption that phenomena uncovered are potentially and likely typical of occurrences in other urban-industrial areas across the nation. The third paper approaches the issue of equality of educational opportunities by race and socio-economic status using a quantitative methodology. This research effort aims to demonstrate the strength of the claim that access to educational resources and tools are dependent on race or class membership. These claims are verified by presenting evidence that the variables have dependence at significant levels ($p < .05$) and therefore are unlikely to occur by chance. The research questions, hypotheses, and expected outcomes are posited in the framework offered by the Equality of Educational Opportunity report of 1966 (Coleman, 1966). There is also a lack of research concerning educational technology distribution that examine national data in such a framework. Together these three papers present a preponderance of evidence from different viewpoints that American economic and educational systems are related; race and socio-economic class membership determines, to a large extent, educational opportunities; and such relationships and unequal opportunities continue to exist today in terms of access to new educational technologies and tools.

The tables, figures and references cited in the three papers are appended and listed at the end of each paper in which they are referenced. References cited in the general introduction and general conclusions sections are also listed at the end of the sections in which they appear.

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ECONOMICS AND EDUCATION: KINDRED INEQUALITIES IN KINDRED SYSTEMS

A paper to be submitted to the Journal of Research on Computing in Education

Patricia Randolph Leigh

Introduction

In surveying the history of American education, evidence of a connection between educational opportunity and economic participation is quite convincing (e.g., Becker, 1964; Bowman, 1991; Weiss, 1995). In many cases this relationship between education and economics affects minority and low-socioeconomic groups adversely, with Black Americans often belonging to both groups. In this paper, I examine the research literature concerning the connection between education and economic factors such as land, labor, and capital. Particular attention is paid to the effects of racial and class discrimination upon the allocation and distribution of these factors.

The 'Education and the Racial Gap in Labor, Land and Capital' section is an extensive examination of how economic models and theories explain the relationship between education and economics and the gaps that occur between racial groups. The section entitled 'Equality and Educational Opportunity' uses large-scale survey data to assess racial and socioeconomic group disparities in educational resources. In this section, the connection is also made between traditional resources such as textbooks and newer, non-traditional resources such as computers and electronic information. Based upon these connections, data from the 1960s through the 1980s are used to reveal patterns of racial and socioeconomic access gaps.

Also in the 'Equality and Educational Opportunity' section, computer network connectivity is paralleled to land distribution in creating and supporting market as well as educational environments and communities. Data from selected state and regional school networking projects are analyzed to determine

if school districts differing in racial or socio-economic make-ups have varying levels of connectivity. The question posited is whether schools or school districts are hindered from joining the new electronic learning environments based upon the predominance of racial identity or socio-economic status of the student bodies. In other words, are Black and low-income students prevented from entering electronic communities by means of technology distribution much the same as they were historically barred from membership in traditional communities by means of land distribution practices and policies. Laws and taboos against selling land to Blacks, in many cases, led to or fostered de facto segregation in communities and school districts. The aim of this analysis is to determine if practices and policies concerning the distribution of computer networking infrastructures are producing de facto segregation even as the boundaries of the classrooms are being redefined. Finally, conclusions and recommendations for further research are made which strongly suggest a need for yet another large-scale survey to evaluate the status of educational access as the advent of the 21st century nears.

Education and the Racial Gap in Labor, Land and Capital

Wages and Labor

If attempting to support the notion that education and economics are related, one must examine individually the important economic factors. Beginning with labor, the measurable variable most closely associated with this factor is salary or wage return; therefore, much of the following discussion will center on worker income in relation to education level. Gary Becker views education as an example of an investment in human capital and much of his research is devoted to determining the rates of return of human capital investments and refining human capital theory. He presents quantitative data demonstrating significant rates of return on education in the form of earnings and thus supports the existence of a relationship between education and economic factors (Becker, 1964). Though Becker does compare education and earnings between racial and minority groups, his primary concern was to study homogenous groups, eliminating confounding variables, to better isolate the effects of education alone. He

states, "[t]he effect of education on income could easily be determined if information were available on the income of units differing only in education, for then differences in income could be attributed solely to differences in education" (p. 70). Using 1940 and 1950 census data, Becker determined that the rate of return of a college education was between 10 and 12 percent per annum and the rate of return of a high school education was 16 to 18 percent per year. Though aware that extraneous factors could not be totally eliminated, he did attempt to adjust the data according to, for example, estimated differences in abilities in drop-outs and graduates. Regarding the rate of return on earnings for Blacks, Becker found it to be lower than for Whites overall. However an interesting discovery was that the rate of return of a college education for Blacks was higher in the South than in the North, indicating less market discrimination. Becker conjectures, "[o]ne possible line of explanation emphasizes that nonwhite college graduates partially avoid white discrimination by catering to their own market, where the discrimination against them is presumably less severe. A relatively large fraction of nonwhite college graduates were, indeed, in occupations that cater to a segregated market..." (p. 100).

Weiss (1995) presents a sorting model to explain the relationship between education and wage levels. Weiss points out that this model includes all aspects of that which comes from human capital theory but goes further by extending the human capital model. While the human capital model explains wage increases as a result of increases in the educational levels of the employee, according to Weiss this model does not explain the effects of what he terms as unobserved employee attributes upon wages. The sorting model is said to account for the signaling effects that increased years of schooling have upon the employee, potential employer and the wages rewarded. Weiss refers to many studies that have attempted but failed to show a significant relationship between the number or types of courses taken in secondary school and the wage level acquired. In addition, studies have failed to demonstrate a significant relationship between learner ability or actual learning and the wages earned after schooling. On the other hand, studies have consistently shown a positive and significant relationship between the number of schooling years completed and the wage level earned for certain types of employment. While the human capital model explains this relationship, it can not explain the lack of a relationship between number and

type of courses taken or student ability upon future employment and wage levels. Weiss contends that the sorting model addresses these issues by explaining the role of signaling that occurs for unobserved or unmeasured employee attributes. In other words, employers use years of schooling to infer the presence of employee characteristics such as perseverance, and students, in turn, choose to stay in school in order to make such implications and thereby separate themselves from other potential applicants.

Weiss contends that signaling occurs more frequently in some segments of the job market than others. Unskilled jobs display less of a relationship between levels of education attained and wage level, and thus fewer indicators are conveyed between employee and employer concerning unobserved attributes that educational attainment would predict. Weiss also points out that employers use educational level to signal measures that may be illegal to measure otherwise. For example, if employers want healthy well-bodied employees they may require certain levels of education that would prove difficult for an individual of ill health to acquire. This sorting model could also be used to explain signaling that may occur concerning class or race discrimination and employment. Jobs requiring levels of education that have no real relationship with actual job performance may serve to eliminate those who cannot afford the actual cost of higher education or the opportunity cost associated with absence from the job market while continuing education. These same requirements may eliminate certain ethnic and racial groups that have been historically denied equal access to educational resources.

Though Bowman (1991) states "equality in opportunities to choose defies empirical measurement as does equity..." (p. 191), she nevertheless attaches significant importance to the examination of these elusive phenomena in efforts to correct injustices. In making connections between education and economics, Bowman also looks at the contributions of Gary Becker and Jacob Mincer and their adaptation of human capital theory to the issue of education and market place productivity and earnings. She offers simplified graphical representations of the difference and unequal earnings over a life-time between the college graduate compared to the high school graduate (p. 195-196). The underlying assumption is that the university graduate is made more productive as a result of time spent in school that justifies the higher earnings. Bowman also outlines the objections of those opposed to the human capital model--those at the

other extreme end of the continuum who uphold the screening or signaling hypothesis (p. 197). Proponents of screening hypothesis contend that the university graduates signal prospective employers concerning their ability to learn rather than concerning anything specific that was learned that leads to increased productivity. Empirical research conducted in the US indicates that signaling occurs more in some areas than others. Bowman points out that there are those who hold to either the human capital or the signaling theory to the extreme while others find themselves toward the middle of the continuum, appreciating the validity of aspects of both theories. Clarifying her position she states, "...I have suggested that the better schooled had been learning to learn, a highly productive capability in a non-static society." (p. 197). Bowman emphasizes the function of education as an investment in the future and poignantly states that "...an underlying concern with respect to equality must be in the *distribution among individuals of power to choose*...to make choices among future goals and routes to their realisation" (p. 206). In classifying constraints upon educational opportunities, Bowman includes:

"...Blatantly discriminatory constraints (e.g. race, ethnicity, sex): a) with respect to access to schools--which constrains access to post-school careers, including post-school investments in human capital; b) with respect to favourable job opportunities (whatever an individual's education). For those affected this can sharply reduce returns to education, with circular effects on educational decisions" (p. 206).

Margo (1986) presents two theories or models for explaining the rise in the Black-White income ratio that occurred between 1930 and 1970. Whereas human capital theory focuses exclusively on schooling, the structuralist or institutionalist model sees schooling as just one factor influencing this ratio. They contend that other equally or more important factors such as unionization, court decisions, and urbanization help explain the reduced gap in income differences reported during those years. Margo finds that reporting school attendance in years or grades completed as done in the census reports does not tell a true and accurate story when comparing racial groups during the years prior to 1910 (when the 40 year old male of the year 1930 would have been in school). She contends that Blacks attended school for a shorter period of time--fewer months out of the year--and were more likely to attend ungraded schools. If asked the grade completed, the Black respondent would equate the number of years attended to the grade

completed (p .195). Margo claims that this type of response further inflates the data because, more often than not, it took the Black student more than a school year to complete the grade. On the other hand, if just years of attendance were used to compare minority to majority schooling, the data for Black students is still inflated by the fact that for them a school year consisted of fewer months than that of their White counterparts.

Margo also points out that the census data are not adjusted for quality of schooling. "Historically, most blacks were educated in the legally segregated school systems of the American South. The quality of black schooling was considerably worse than the national average. Over time, race differences in school quality diminished.... A quality-adjusted series would show a larger decrease over time in the racial schooling gap than the unadjusted series" (p. 190). Overestimation of Black schooling serves to imply that a smaller gap exists between minority and majority groups when measuring this variable. In addition, as Black schooling increased and both months contained in a school year equaled that of White counterparts as well as the number of years needed to complete a grade, the progress made seemed less dramatic than it actually was given the previous years' inflated figures. Because of overestimated schooling in past years, the seemingly small gains in school attendance in subsequent years would only account for a small percentage of the large income gains that Blacks enjoyed. Margo believes that the gap between Black and White school attendance was significantly larger than the data implies and the progress made by Blacks in this area between 1910 and 1970 was thus also significantly greater. Margo attempts to remedy the overestimation by measuring school attendance in what he terms as lifelong months. After doing so, he then points out that human capital theory can explain far more of the increased income than before his adjustment. He concludes, "[c]onsider again males aged 40 to 44 in 1930 and 1970.... The revised estimate accounts for 65 percent...of the rise in the black-white income ratio, nearly double the previous figure of 34 percent" (p. 198).

Sundstrom (1994) is among those who believe we must look beyond a static human capital theory to explain the Black experience in the U.S. labor market. Adjusting for educational requirements Sundstrom demonstrates, using 1940 census data, that certain jobs and occupations could be categorized

as either White or Black because they were occupied almost solely by members of one group or the other. Because educational requirements are adjusted for, differences in jobs and occupations cannot be explained by the human capital model or even the "taste for discrimination" that may operate within this model. Sundstrom looks to social norms to explain what this economic model cannot. Strong taboos against Blacks supervising or showing any superiority to Whites is important in understanding why Blacks were barred from a wide range of jobs. In addition, taboos against even perceived intimate relationships between Whites and Blacks served to exclude Blacks from sales and clerical jobs and from union memberships. Sunstrom contends that upholding taboos is viewed by many employers and employees as both beneficial and cost effective. He states, "[a]s Becker has argued, discrimination can be costly to employers and must in a competitive market confer some offsetting benefits to survive in the long run. But violating powerful social norms of appropriate behavior could itself impose costs on employers, including the withdrawal of effort by workers or exit by workers and customers. Even if the enforcement of norms would not actually impose large costs, employer *beliefs* that the costs were large might delay experimentation and learning" (p. 392).

Residential segregation especially in non-southern states also likely resulted from the real or perceived intimacy taboo. Such segregation further limits the Black worker's job opportunities and possibly the benefits of higher wages. Sunstrom explains this phenomenon of "spatial mismatch" as occurring "...if minority members were required to live in areas remote from important labor markets in which they might find a good employment match. Higher Black unemployment and lower wages would be the consequence" (p. 392). Though Sunstrom takes a broader look at the factors that lead to economic discrimination, he nevertheless shows a link between education attainment and economic participation. The same taboos that bar Blacks from certain types or levels of employment also limit where they reside which in turn affects educational access and quality of educational resources.

Concerning the wage gap between Black and White workers, Maloney (1994) focuses attention on its detailed fluctuations through the decades. He directs attention to the narrowing of the gap in the 1940s as Blacks commanded higher wages, the stagnation in the subsequent decade, the decline in

progress marked by the early 1960s as the gap widened ever so slightly, significant narrowing in the late 1960s and early 1970s and finally the return of stagnation and lack of progress in the latter part of the 1970s and the 1980s (p. 358). Maloney recognizes that factors unrelated to race such as general wage compression and wage distribution may well have affected the above mentioned fluctuations in the Black-White wage ratio throughout the decades. For this reason, he investigates changes in the wage structure to determine their role and influence in hopes of factoring out such effects upon the wage gap. Once non race-related influences are eliminated the contribution of race-related factors, such as Black worker characteristics and labor market discrimination, can be more accurately assessed and understood.

The change in the wage structure that occurred between 1940 and 1950 resulted in a general compression or "...sharp declines in returns to education, in wage differences across occupation, and in the spread of wages within education and occupation groups. In simplest terms, the wage gap between the highest and lowest earners declined sharply over these ten years" (p. 360). Of particular interest is the decline in returns to education. Maloney goes on to report, "...wage differences between high-school graduates and grade-school graduates declined for nearly all experience groups between 1940 and 1950.... In the 1950s, the wages of high-school graduates rose relative to the wages of grade-school graduates among younger workers ...though this wage differential fell slightly for most older workers" (p.360). The reason for this is of particular interest because level of education may be indeed race-related as demonstrated for example in the research of Bowman (1991) discussed earlier. Blacks having less access to educational opportunities resulted in their attaining lower levels of education than their White counterparts. If the relationship between educational attainment and income level is reduced within the human capital model as well as other signaling models as described by Weiss (1995), then one would indeed expect to see the reduction in the Black-White wage gap that occurred in the 1940s.

Maloney's regression analysis demonstrates that wage compression accounted for slightly less than half of the gap narrowing that marked the period between 1940 and 1950. In other words, the improved wages for Blacks were not due to an improved racial climate in the labor market nor to improved Black worker characteristics (i.e. education, occupation). Maloney acknowledges the findings of

Margo and others who have found that a significant relationship between improved educational levels and improved wages. He, however, maintains that these findings cover longer spans of time than just one decade and points out that "[i]n an examination of change in the black-white wage gap in the South between 1940 and 1950, Margo concludes that reductions in the racial schooling gap explain only 5 to 11 percent of the increase in the black-white wage ratio" (p. 363). The remaining percentage of the wage convergence of the 1940s and the subsequent stagnation of the 1950s can be explained by the change in occupational distributions brought on by the war effort and in the migration of Blacks from southern to northern regions. In the 1940s Blacks moved from lower paying service and laborer jobs into operative, craft, and clerical jobs that were vacated by Whites called to serve in the armed forces during World War II. Wage convergence ceased because, as Maloney explains, even though Blacks continued to moved out of laborer jobs between 1950 and 1960, White workers moved into even higher paying professional and managerial jobs (p. 365). Because of this simultaneous movement, the Black-White wage ratio remained constant during the 1950s, with the movement of one group canceling out the effects of the other. Black migration from southern rural areas to northern urban areas also accounts for in increased mean wage for Black workers during the 1940s because typically higher paying jobs were found in northern urban centers. The contributions of these factors notwithstanding, Maloney still concludes that the factor contributing most to the wage convergence in the 1940s was the change in the general wage structure. He states, "[b]etween 40 and 48 percent of the decline in the wage gap would have occurred without any change in black workers' education, without migration out of the South, and without change in the jobs held by black workers" (p.374).

Craig and Fearn (1993) use the whaling industry to examine wage discrimination and to test the tenets of Becker's theory of discrimination. They contend that the whaling industry has all the characteristics of an open competitive labor market necessary to test the competitive hypotheses. According to discrimination theory, in such a market the nature and demands of competition result in equal wage distribution among workers regardless of ethnic or racial membership. Craig and Fearn examined data collected on workers in the whaling industry in the New Bedford area between the years

1850 and 1858 (p. 126). The detailed data on worker characteristics indicated that minority and ethnic groups were highly represented among the crews with Blacks making up the largest minority group. Their analysis indicated that no wage discrimination based upon race or ethnic membership occurred within occupations. On the other hand, Craig and Fearn did show a significant difference the occupations held by majority and minority crewmen with majority crewmen occupying jobs more likely to lead to promotions and minority crewmen occupying jobs outside the promotion ladder. Though these non-ladder service jobs were high paying, the overall wage profile of the minority crewman over time was flatter than that of his White counterpart (p. 133). "Although we found little evidence of wage discrimination within occupations, it does appear that members of certain ethnic groups were crowded into specific occupations. In particular, blacks and Portuguese held a disproportionate share of service jobs, occupations outside of the occupational ladder" (p. 134). So while a competitive market did seem to foster equality concerning wage distribution, it did not seem to eliminate all aspects of racial or ethnic discrimination pertaining to access to job or occupational opportunities.

Concerning economic participation, Anderson and Halcoussis (1996) analyze the impact of Jim Crow laws and Blacks in the U. S. labor market. They state, "[w]e model pro-segregation laws as labor market restrictions. Despite the fact that Jim Crow laws failed to explicitly restrict the opportunities available to blacks in the labor market, we argue that these laws actually had this effect" (p. 1). Anderson and Halcoussis hypothesize that if Jim Crow laws were significantly restrictive then Blacks would demonstrate a reluctance to sell their skills in an unfair market and would seek other options. In addition, they aim to determine if another group, Whites, benefited significantly from restrictions placed upon Blacks. They tested their hypotheses by statistically analyzing the relationship between the prevalence of Jim Crow laws in 48 states plus Washington, DC and gainful employment rates as reported in the 1920 and 1930 census. The authors ultimately conclude that the evidence indicates that segregation laws resulted in reduced economic participation for Blacks and significantly increased participation for Whites. This redistribution of labor market opportunities to the group with the power to originate and maintain

such laws explains the existence of the Jim Crow laws in economic and political terms, going beyond the sociological explanations commonly offered.

Anderson and Halcoussis argue that segregation laws had a direct, actual and immediate economic impact on Blacks, despite the prevailing view that Jim Crow laws were economically neutral (p. 5). Hiring Blacks was seen by employers as more costly than hiring Whites. These were costs incurred not necessarily from violating social sanctions, as in the case of selling land to Blacks in the antebellum South but those incurred as a result of providing separate, segregated work and transportation facilities. Similar to the "spatial mismatch" observed by Sunstrom (1994), Anderson and Halcoussis pointed out that Jim Crow laws governing buses and trains served as barriers to the Black worker's commute to the job. Jim Crow laws were costly to the employer and employee alike and served to discourage Whites from hiring Blacks and Blacks from participating in the labor market (p. 6). These authors link educational and economic opportunities by outlining the effects of segregation laws on the preparation of the Black worker for the labor market. They state, "...it is now generally accepted that segregated public schools were separate but *not* equal, black schools being usually significantly inferior to their white counterparts. Thus, blacks tended to receive substandard training and preparation for labor market competition" (p. 9). Again, the implication is that Whites, in general, benefited from the inferior readiness of Blacks to compete in the economic environment and the subsequent demise of Blacks in the marketplace.

Sundstrom's (1992) article concerning Black unemployment during the depression, focuses upon unemployment patterns rather than wages, and he examines the unemployment gap between Blacks and Whites that occurred in cities rather than in rural areas. Data from the 1930 census and a special unemployment 1931 census were examined. He found that, "[a]mong men, black unemployment rates ranged from a third above to about double white rates, averaging 50 percent higher" (p. 418). Data from surveys collected in the winter of 1935/36 and from others collected in 1937 revealed that the unemployment gap had actually widened (p. 420). One explanation for these gaps is related to the fact that in general Blacks were less trained, less educated and less skilled than Whites and therefore occupied jobs more vulnerable to layoffs. Relatedly, it is believed that even when Blacks occupied higher skilled

jobs, they were still in more vulnerable categories such as construction, steel and automobile manufacturing. This explanation may address the gap between Black and White males but does not account for the higher unemployment gaps between Black females and White females within the same level and type of job. Some believe that racist attitudes and discriminatory employment policies worsened during the depression. Such worsening would explain higher lay off rates within the same level or type of job. Sundstrom also outlines an explanation related to New Deal labor policies. Some researchers postulate that mandatory minimum wage requirements for all employees regardless of race led employers to lay off Black workers. When employers could not gain financial benefit from employing Blacks at lower wages, they often replaced them with Whites that were, for various reasons, more highly preferred and valued. This explanation only addresses the exacerbation of the White and Black gap because data indicates that the gap existed well before the New Deal labor policies (p. 422).

Land and Capital

Sutch and Ransom (1973) examine racism as related to labor and the distribution of land in the antebellum South. Like Sunstrum, they believe that the effects of racism are not significantly mitigated in a free market place as some who uphold the notion of a "taste of discrimination" proclaim. They contend, "...racism can have a profound and lasting effect even in the face of competitive market pressures" (p. 134). Whereas Bowman, Margo and Sunstrom focus on wages and job opportunities or occupations, Sutch and Ransom analyze issues regarding "...the costs of information underlying decisions in the labor market..." as well as land and capital distribution in relationship to racial discrimination (p. 134). Examining the atmosphere in the post-bellum South, Sutch and Random find that the White employers viewed Blacks in general as having low productivity potentials and ability levels. As a result, they made employment decisions based upon this free 'information' regardless of the accuracy of the perceptions or stereotypes. Racism not withstanding, White employers act upon cost-free information about groups rather than seek costly information about individual workers. Because Blacks as a group are believed to possess negative characteristics related to employment in a free market, a Black applicant is automatically

assigned a lower employment status than any White counterpart without any opportunity to prove otherwise. Simply stated, obtaining information concerning the ability and productivity of individual Black applicants costs the potential employer whereas acting on attitudes and stereotypes connected to the group in general is virtually cost-free. The end result is that White farmers were unwilling to pay Black and White workers equally, believing that the former, because of group membership, represented lower quality labor than the latter. Sutch and Ransom draw upon the market signaling model to explain this phenomenon. They state, "...in many such situations there will be "signals" or "indexes" of labor productivity available which will provide a great deal of information at a relatively low cost....Whenever there are readily identifiable characteristics, such as race or sex of the applicant, believed to be strongly associated with the ability of the worker, the employer will use this costless index as a guide to the actual ability of the applicant" (p. 135).

Strong taboos and equally strong social sanctions prevented White landowners from selling land to Blacks. A long history of slavery and the low wage earning potential of the freedman assured that Blacks did not have the capital necessary to purchase land even if the strict taboos were removed. In addition, landowners as well as capital lenders shared the views of White employers concerning Black productivity and ability. Low productivity and ability would likely lead to farm failures and mortgage or loan defaults. Consequently, Black buyers were labeled high risk and thus denied the loans necessary for land purchase. "With little opportunity for the lender to spread his risk, and a race 'signal' advising caution, the private seller of land would be unlikely to finance a black farmer at attractive terms" (p. 136). Sutch and Ransom offer indirect evidence that the capital lender also acted in accordance with these same signals and Black people were denied loans for land purchase or capital improvements in the rare cases where they owned farms. Extreme prejudice against Blacks owning land, perceptions of their lack of ability to work independently without supervision and the real lack of entrepreneurial or market experience all severely hindered the freedman from access to capital and land in the antebellum South. Both sellers of land and lenders of capital for land purchase would use cost free race signals in determining their decisions. The net result was that in the late 1800s, Blacks were essentially prohibited

or prevented from owning land and therefore were forced to farm, at comparatively lower wages than Whites, the land owned by others in order to survive in the market place. Sutch and Random make the connection to education by indicating that severe discriminatory practices in the market place discouraged Blacks from seeking education. "Because the black laborer perceived that the market limited his opportunities due to his race, and that the true nature of his skills, experience, and abilities were never measured or tested, he had little incentive to invest in measures which might improve his productivity. The black farmer who did invest in education or training found that the market did not reward his higher skills" (p. 145). The implication is that though the human capital model may work to predict economic participation given education under normal market conditions, it does not stand up in the face of extreme racial discrimination.

Higgs (1973) points out that though it is not surprising that Whites owned significantly more farms and acreage than Blacks only four decades after Black emancipation, the cause and incidence of differing contractual agreements made between White and Black full tenants are not necessarily apparent. His primary aim was to examine the role and impact of racial discrimination in the form and distribution of rental contracts in antebellum South circa 1910 (p. 149). Higgs' data indicates that among Whites that farmed land owned by others, a high percentage of them had entered into share-rent contracts. That is, a share of the product or harvest was paid to the landlord as rent. Blacks, on the other hand, tended to enter into fixed rent contracts whereby a consistent about of cash was paid to the landlord regardless of the level of farming productivity. Higgs does not rule out the role of racial discrimination in the lack of land ownership by Blacks. He states, "[m]any whites refused to sell land to blacks, at any price, which raised the search costs of black buyers and might have held down the average farm size of black owners. More generally, the racial discrimination of southern police and law courts weakened the private property rights of blacks and discouraged them from accumulating capital, particularly in the tangible, immobile form of land" (p. 165). Higgs, however, tends to lean toward the conclusion that the difference in incidence of shared or fixed rent agreements among Blacks and Whites was related less with racial discrimination than other factors. He examines the role of risk and the nature of risk aversion among both landlords and

tenants and concludes that these factors affected both groups equally. He explains that Whites inhabited regions of the South that produced more risky crops and share-rent agreement allows the tenant to share risk with the landlord. It should be pointed out that Higgs does not consider the fact that in a shared rent agreement not only is the risk shared between renter and landlord but there is also an aspect of shared control. White landowners' desires to maintain positions of power and total control over Blacks may have prevented them from entering into shared rent agreements with these citizens and thus discouraged or prevented Blacks from occupying regions that fostered such agreements.

Land and Communities

Throughout history one can see how the economic base or socio-economic concerns shaped communities and the nature of relationships. It is interesting to note that during the primitive-isolated epoch, communities were limited because of the migratory patterns of small tribes of people. The major socio-economic problem was mere survival. In order to obtain food for day to day survival, tribal groups migrated throughout the territories gathering berries and hunting game. Constant movement from place to place prevented any consistent interaction with other groups and thus hindered the formation of larger communities. Thus primitive-isolated communities were limited and determined by geographical location and movement (Gorman, 1971, p. 43-47). Primitive people all over the world lived in this manner for hundreds and thousands of years with very little advancement. It was not until major changes in climate that in turned caused significant shifts in available food supplies that any noticeable progress or advancement in human civilization was seen. It was during the middle ages that climate and land conditions allowed for agricultural farming. Farming in turn led to small surpluses of food that could either be stored or sold. This was an important factor because if a community could produce more food than it needed then everyone did not need to farm or be a food producer. During this agricultural age the nature of the community changed because of the altered duties of the members of the community. Individuals began to cease working the land to become craftspeople or military workers. As this agricultural age progressed and advanced though many centuries, specilizations and techniques improved

resulting in the emergence of craft centers, precursors to urban centers, and increased trade. Those living in the centers were dependent on the farmers for food and the farmers were dependent upon the craftsmen for the new technologies. Because of the lack of transportation technology, the centers were in reasonable traveling distance from the farmland and its dwellers were considered part of the community at large (p. 48-60).

The industrial revolution brought forth the urban-industrial community. The outcome of the Civil War together with the rise of industrialization had the same general effects on urban areas in the United States. The failed farms of rural areas prompted many to seek new opportunities in urban centers. The industrial city involved larger social groupings with the socio-economic base focused upon production. The city's workforce was engaged in reshaping and molding nature's resources into more efficient products to solve problems. Plentiful resources, the discovery of steam power and the advent of the assembly line worker allowed for mass manufacturing and the accumulation of capital. The division of labor and related class differences emerged from this production process. Now there were producers and owners. The nature of land distribution was obviously important to the apportioning of economic power during the agricultural age as addressed in the work of Sutch and Ransom (1973) and Higgs (1973). However, land distribution was also central to the formation of communities and cities during the industrial age and was closely linked to economic factors and the allotment of power. Taylor (1984) attempts to understand the role of land topography and, perhaps more importantly, the power of city policies in the formation of Black-ghetto slum areas. He contends that "[d]uring the industrializing era of the late 19th and early 20th centuries, the city-building process became a primary and fundamental cause, as well as the facilitating mechanism and the primary structural determinant, in the creation of both racial residential segregation and the Black urban ghetto" (p. 44). Taylor depicts, through the use of maps, how Blacks residents tended to live in clusters interspersed among the rest of the working class during the early industrial era. Nevertheless, though they were not as yet segregated, Blacks did occupy the worst of the living quarters in any particular segment or street. He argues that segregation and the rise of the ghetto-slum came only after transportation technology allowed for the spread of the city's population

beyond the terrain barriers and the racial attitudes of those in power were incorporated into the city's building policy. Social sanctions against selling land to Blacks were reinforced by zoning laws and building codes that set standards for residential structures. Blacks limited by available funds, were unable to meet these standards and thus forced to remain in the crowded, squalid areas in the industrial center. A further disadvantage to the urban center resident was the fact that as business and industry expanded in these areas the city dwellers were often dislocated and forced into even more crowded sections of the center. The lack of funds that prevented escape from the overpopulated, substandard residential center was a direct result of low-wage jobs held by most Blacks during this time. The connection to market and educational discrimination and the roles played in city land distribution was not lost to Taylor. He explains, "[t]he evolving land-use structure of the industrializing city thus created a spatially differentiated residential structure in which class and race determined which sections of the city were accessible to different groups of people....the vast majority of blacks--because of exclusionary hiring policies of industry, and educational and other forms of discrimination...were forced to live in...the city's emerging low-income residential district" (p. 54-55).

Equality in Educational Opportunity

Computer Access Surveys

Though cause and effect is difficult to determine, the above mentioned research strongly supports the existence of a relationship, a positive correlation, between educational attainment and various economic factors including land ownership. The work of Becker (1964), for example, shows a sizable return on education in the form of earnings. Margo (1986) addresses the issues of the quality of education afforded Blacks as opposed to Whites and how alleged inequalities may have contributed to the wage gap. He also contends that as schooling for both groups approached equality, the wage gap narrowed. The issue of equal educational opportunity commanded particular attention after the passage of the Civil Rights Act of 1964. Section 402 of the act called for a national survey "...concerning the lack of availability of equal

educational opportunities for individuals by reason of race, color, religion or national origin in public educational institutions at all levels in the United States, its territories and possessions, and the District of Columbia" (Coleman, 1966 p. iii). The resulting data and associated interpretations comprised the "Equality of Educational Opportunity" report (Coleman, 1966). Of particular interest is the data concerning the nature of school facilities, services and curricula accessible to various racial groups. Such educational resources can be used to assess the level of equity. While the minority elementary student is more likely to have access to an on-site library with a full-time librarian than a White student, the former is less likely to attend a school with sufficient textbooks. "Only 84 percent of the Negro elementary pupils attend schools having enough texts, compared to 94 percent of the white pupils in the same counties" (p.76). Minority secondary students are less likely to attend schools offering college preparatory curricula than White students. "Eighty-eight percent of Negro students are in secondary schools offering college preparatory curriculums, while the comparable figure for whites in the same county is 97 percent" (p. 96). The 1966 report tabulated no data concerning family income but did analyze the prevalence of household items found in minority versus White homes. For example, ninety-five percent of White secondary students in the Northeast had a telephone at home whereas only seventy-nine percent of Black students had this simple technology at home.

The advent of computer technology raised more questions of equity as educators struggled with attempts to integrate these powerful devices into the classrooms. National surveys concerning computer use were conducted in 1984, 1989 and 1993 (U.S. Census Bureau, 1984; 1989; 1993). Data collected from U.S. households included family income, race, gender , occupations as well as presence and uses of computers at home and at school. The 1984 data shows that 1.7 percent of households with incomes less than $10,000 own computers. This percentage rises to 8.4 when the household income is between $20,000 and 24,999 and to 17.4 percent for household incomes between $35,000 and $48,999. The 1989 data shows that the percentages increased overall, but the ownership gaps between income levels also increased. This fact is demonstrated by the percentages of 4.8, 14.5 and 27.8 respectively for the same income levels mentioned above. Computer ownership changed only slightly in 1993 for incomes less than

$10,000 and between $20,000 and $24,999 but more drastically for income between $35,000 and $48,999. The 1993 percentages are 5.8, 15.4 and 31.1 respectively (see Figure 1). By the same token, a computer access gap existed in 1984 between 3 to 17 year old Blacks and Whites with 6.1 percent of Blacks having computers at home compared to 17.1 percent of Whites. The percentage of enrolled Black children using computers at school was 15.9 and the percentage of Whites was 30.3. The 1989 data shows that 10.6 percent of Blacks and 26.7 percent of Whites had home computers and that 35.1 percent of enrolled Blacks used computers at school compared to 48.2 of Whites. Percentages for Black and White home computer ownership reported in 1993 were 13 and 35.8 respectively while percentages for school use were 50.9 and 62.7. The gap increased regarding home access but slightly decreased for school usage (see Figure 2 and Figure 3).

It is difficult to establish patterns of gap narrowing or widening for any educational resource within a time span limited to one decade. However, the fact remains that microcomputers used at home or school were not significantly prevalent until the 1980s, making an analysis over a longer time span impossible. On the other hand, if computers are analogous to other resources that existed prior to the 1980s then the time period can be extended. Comparing home and school access to computers to access to textbooks gives a starting point prior to the eighth decade for examining access gaps. Though such a comparison cannot be used to obtain valid statistical results, it can aid in providing a picture or description of access from the 1960s, a period when equality of resources was a major concern, into this ninth decade. Again, the data from the 1966 survey indicates a 10 percent gap between Black and White students' access to sufficient numbers of textbooks. When access to textbooks is equated to access to home computers we find that, using the 1984 data, the gap between Blacks and Whites remained fairly static at a 11 percentage point difference and then increasing to a 16.1 percentage gap in 1989 and again to a 22.8 gap in 1993. Similarly, when textbook access is equated to computer access at school, the 10 percent gap of 1966 widened to 14.4 in 1984, narrowed slightly to a 13.1 percentage gap in 1989 and decreased even more to 11.8 in 1993. Thus, including the 1966 data about traditional educational resources, a different picture concerning the patterns of the access gaps emerges (see Figure 4).

Networking Projects

Examining computer connectivity in schools also shows gaps along racial and socio-economic lines and again raises issues of equality and equity. Technologies that link computer servers and individual workstations into intricate networks have commanded increasing attention in recent decades as educators seek to incorporate these information and communication technologies in the teaching and learning process. These communication and information technologies redefine learning environments in many of the same ways as they affect economic environments and markets. In the past two decades information has literally exploded. That is, the amount of available information about particular topics continues to increase at tremendous rates. Correspondingly, the technology that makes the information available and accessible to individuals regardless of their geographic location has kept pace with the growth itself. The increasing significance of quality, up-to-date information in a modern economy has led many to refer to the current era as the information age (e.g., U.S. Advisory Council on the National Information Infrastructure, 1996). Expansive international computer communications networks provide a means of exchanging information and carrying on business in what has come to be termed the global economy. Such networking also allows teachers and students to collaborate in ways formerly not possible and has the potential of changing the nature and boundaries of the learning communities. Teachers and learners can communicate and share information with others in classrooms across the hall, district, nation and globe.

Historically markets were built around communities or, conversely, communities grew out of market centers. Land use and distribution were important factors in the evolution of communities and cities and later had direct effects upon the nature and dynamics of school districts. Taylor (1993) traces the evolution of communities in Cincinnati during the industrial revolution and links race and class to the distribution of land and economic powers. The nature and composition of communities and the school districts built around them were largely determined by who had access to the land. Taylor shows how initially Blacks were not allowed to purchase land at all and later were restricted to certain areas of the

city. At the same time, Blacks were confined to low-wage jobs, a fact which further limited the ability to afford housing in any but the most depressed segments of the city. Consequently, the school districts that encompassed the Black communities were also economically disadvantaged. Such an analysis makes apparent the affect of land distribution on the nature and composition of teaching and learning environments. As pointed out earlier, computer, information and communication technologies have the potential of creating new learning environments and redefining learning communities. In this way, these technologies and their distribution can be equated to land distribution and examined to determine how such allotments are made according to race and class.

In efforts to connect schools electronically, networking projects increased across the nation. The Iowa Distance Education Alliance's Star Schools Project is an example of a state effort (Sorensen et.al., 1996). Though funding was justified by the intent to connect economically disadvantaged schools, the data tables of the project reports do not bear out such results (p. 106-152). Figure 3 represents the tabular data reported by Sorensen, Maushak, and Lozada (1996) of three area education agency (AEA) school district groupings and the number of Iowa Communications Network (ICN) classrooms and Internet sites available within the AEA groupings. For this paper, one group is labeled high poverty because of its high percentage of districts within poverty-rated counties (24 of 24 districts) and/or report student eligibility for free lunches (21 of 24 districts). The group designated low-poverty, conversely, has a low percentage of districts within poverty-rated counties (0 of 35 districts) or districts reporting student free lunch eligibility (5 of 35 districts). The AEA district grouping labeled high-minority has, relative to other AEA groups, a high percentage of districts reporting significant minority student enrollments (8 of 22 districts). The selected data indicates that racial and socio-economic disparities exist in access to technology classrooms as well as Internet resources (see Figure 5). Extensive analysis of this data and data from other networking projects is needed to determine if these disparities are indeed significant. Likewise a thorough examination of the social, political or economic factors that lead to unequal computer connectivity may aid in determining if communities built around computer technology and access are subject to the same influences as the communities built around land distribution and access.

Conclusions

The basic conclusion derived from the first section, 'Education and the Racial Gap in Land, Labor and Capital' is that the literature supports the hypothesis concerning the existence of a relationship between the educational and economic systems in the United States. Though the authors cited in this section approached the subject from various perspectives, often using different economic models to explain their reasoning, they nevertheless concurred in demonstrating strong connections between aspects of education and one or more economic factors. Proponents of the human capital, sorting and structuralist models not only linked land, labor or capital to education but also pointed out how racial discriminatory practices operate concerning these economic factors. The resulting effects upon education were either explicitly stated or implied from the relationship set forth. This literature provides supporting evidence to the premise that economic participation determines or influences educational opportunities. Furthermore, it demonstrates how discrimination against Black Americans concerning acquisition of land, labor and capital has historically limited their educational attainment.

The analyses in the last section of this paper seem timely in light of the increased interests in integrating technologies into classrooms and well as providing entrance into computer networks. As educators struggle with determining the most effective ways of using these technologies and connections in teaching and learning they must also be concerned with issues of equality. Drawing parallels with more traditional resources and environments may aid in revealing patterns of group disparities that may be otherwise overlooked for technologies with such young histories. Interestingly, even though the 1984 data indicates that the racial gap increased more significantly for school computer access than home access, the reverse is true for the 1989 data and even shows a slight decrease in the gap for school computer access. More research is needed to determine which policies or practices, if any, provided the correcting factors in reducing the gap as witnessed toward the end of the 80s and early 90s. Of course, knowing the causes of

such disparities in access would lend more light in resolving issues of equality. Updated information is also needed to continue to track these gap patterns as we approach the end of the 1990s.

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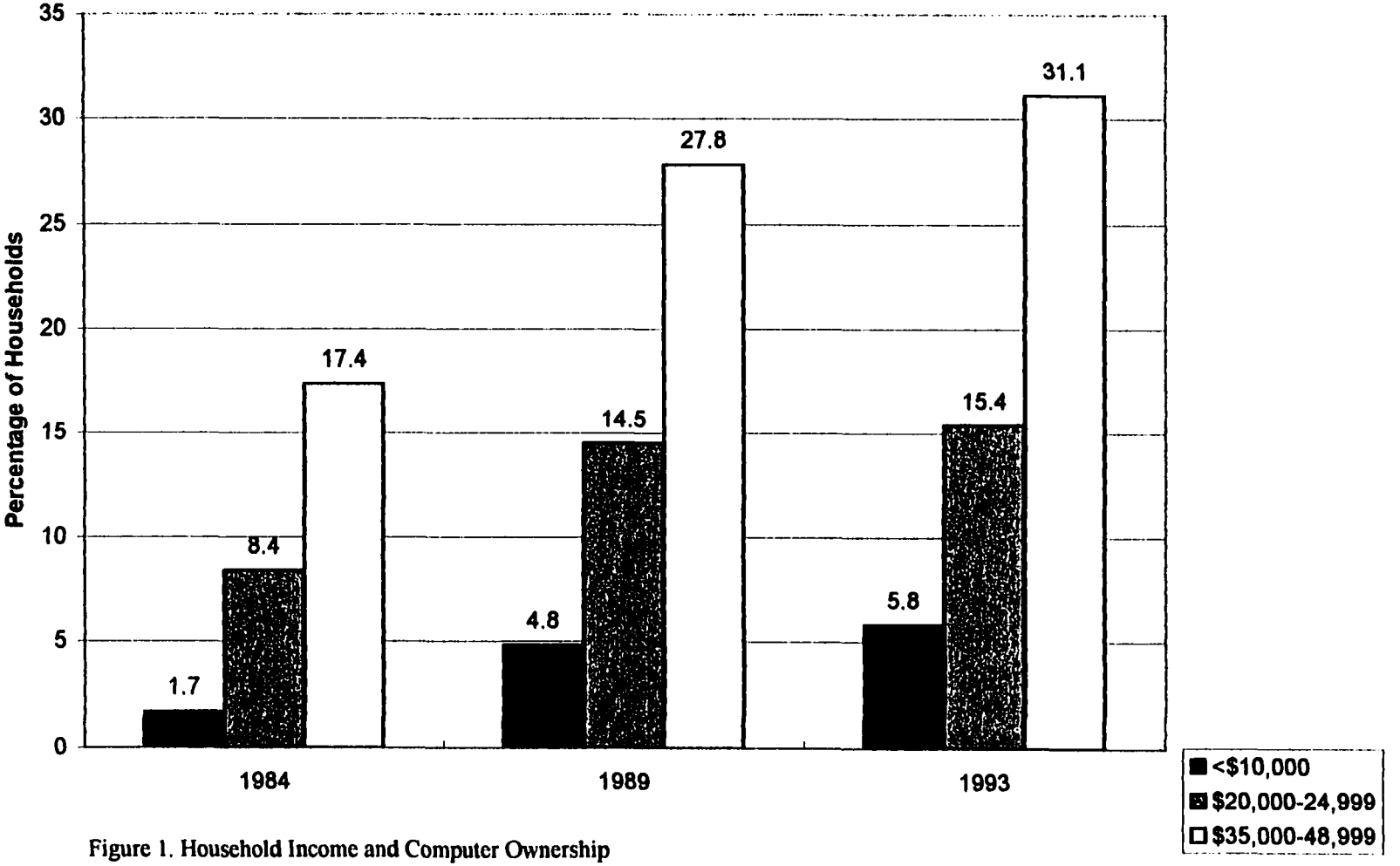

Figure 1. Household Income and Computer Ownership
Source: U.S. Census Bureau. Chart by author

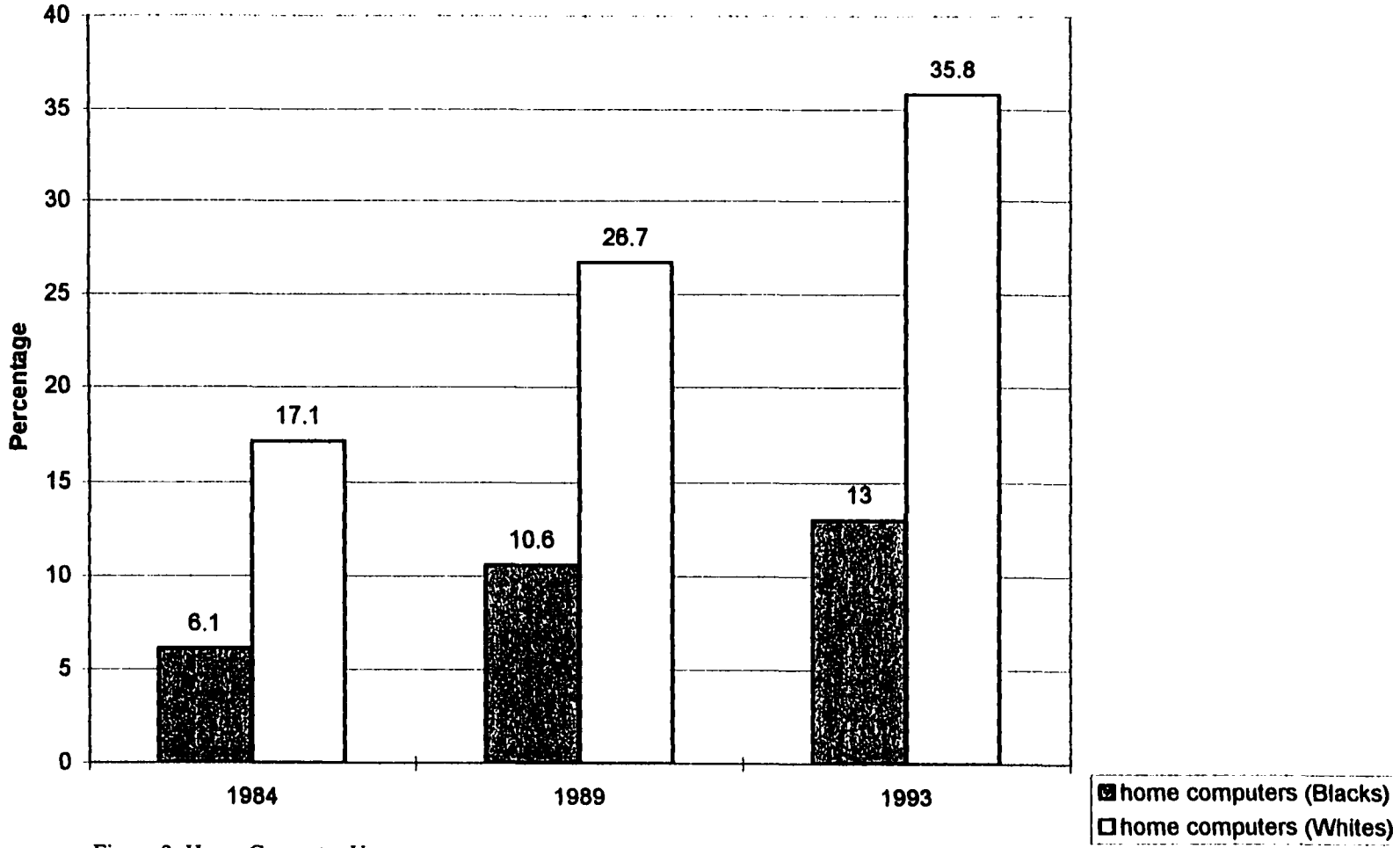

Figure 2. Home Computer Use
Source: U.S. Census Bureau. Chart by author

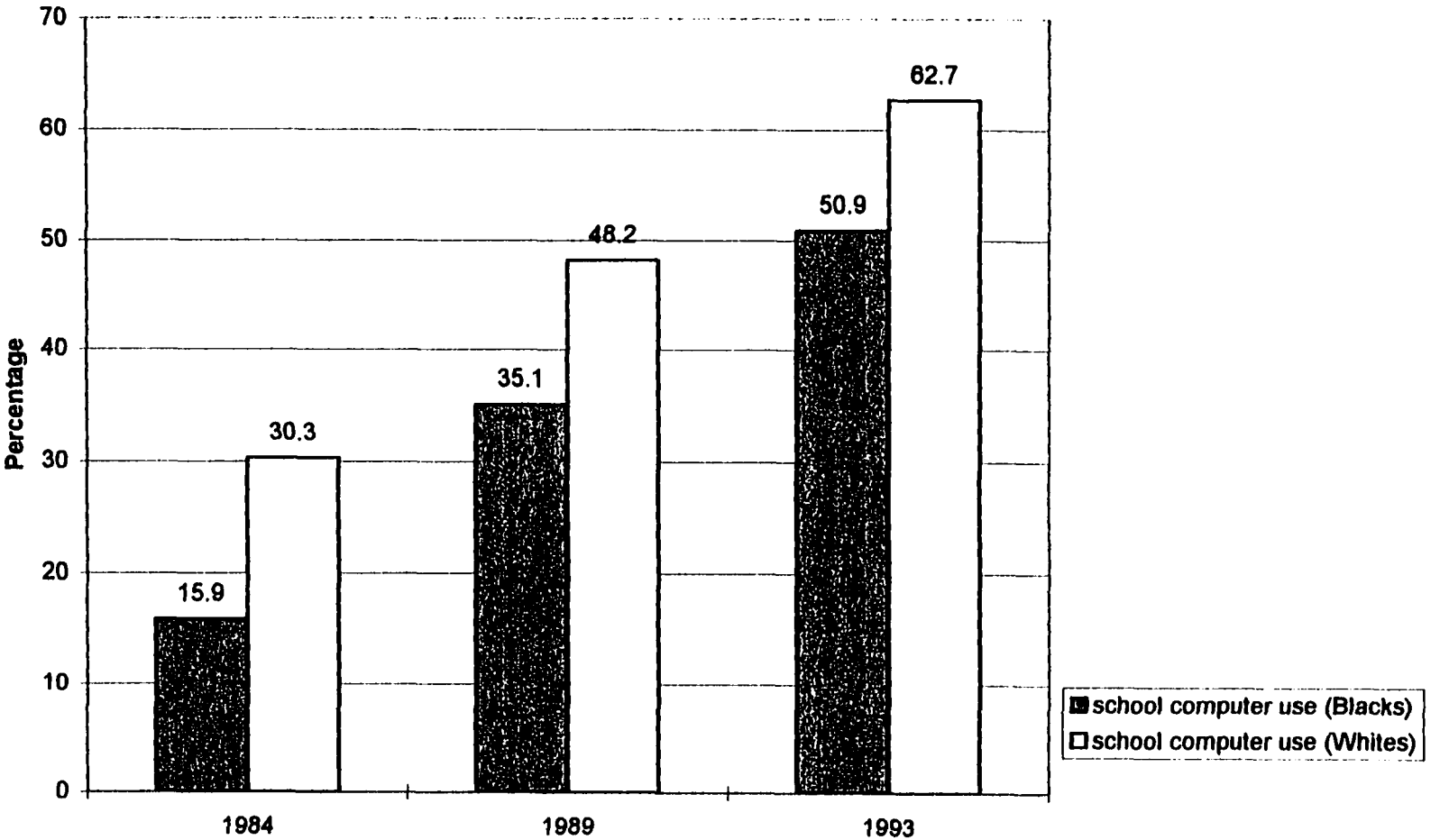

Figure 3. School Computer Use
Source: U.S. Census Bureau. Chart by author

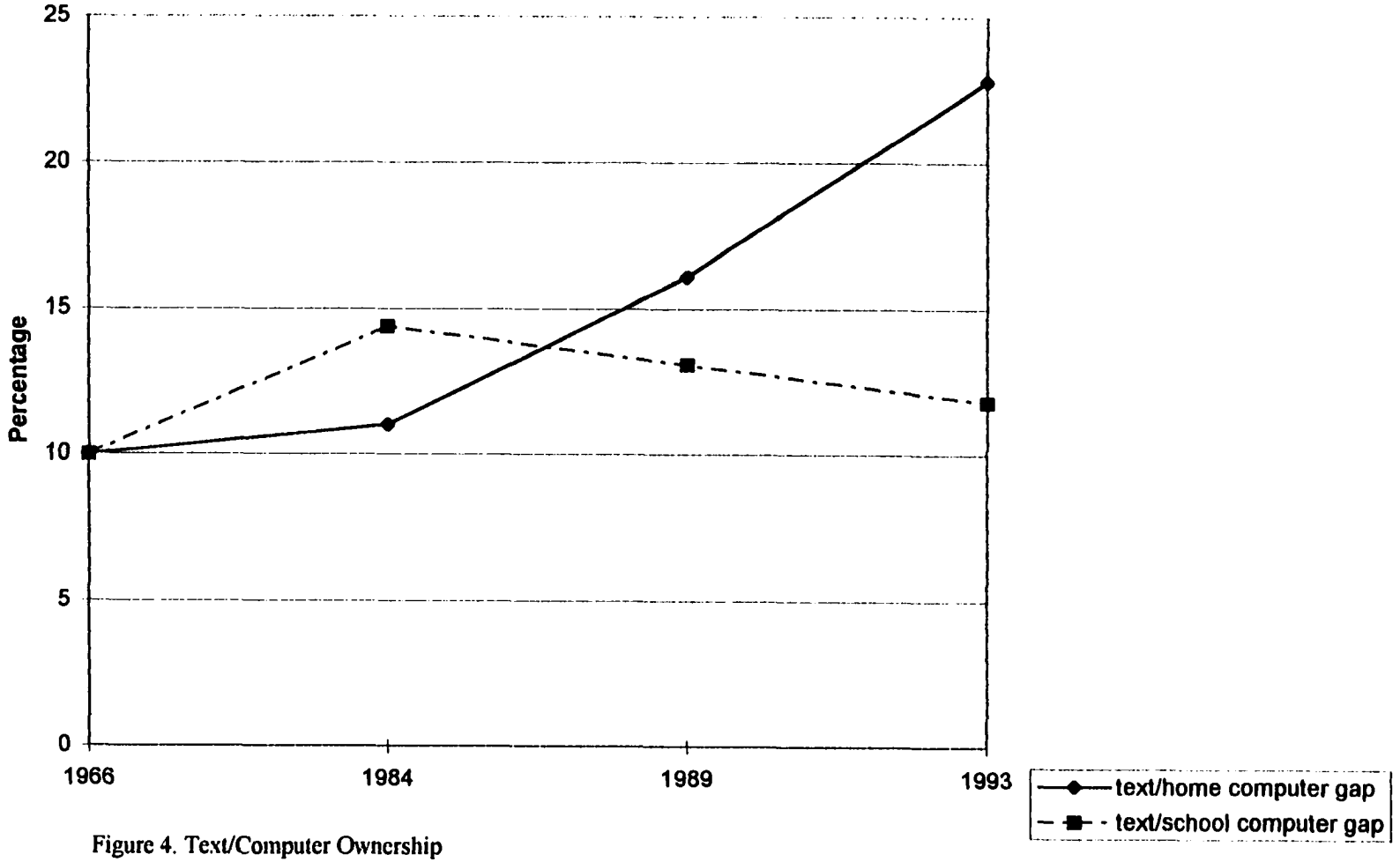

Figure 4. Text/Computer Ownership
Source: U.S. Census Bureau. Chart by author

Table 1. Iowa Networking Project

	schools	free lunches	poverty county	minority enrollments	ICN classes	Internet Sites
high poverty	24	21	24	1	34	12
low poverty	35	5	0	6	60	33
high minority	22	8	9	8	27	0

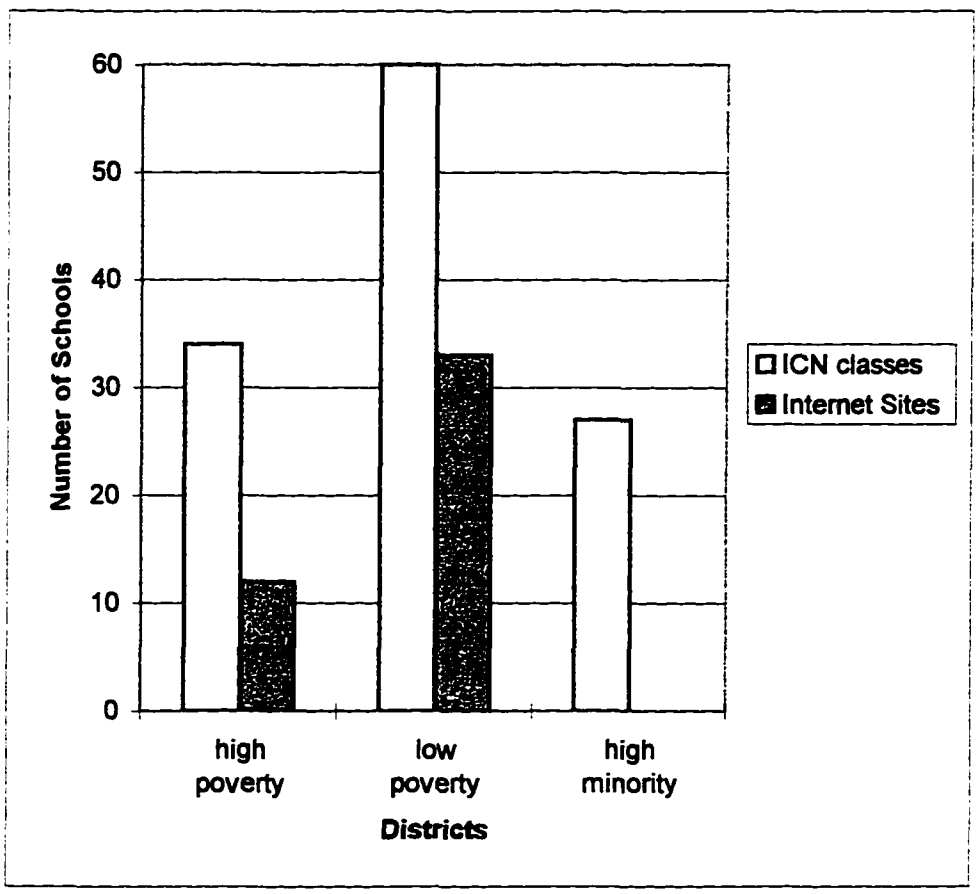

Figure 5. ICN Classrooms and Internet Sites
Source: Sorensen, Maushak and Lozada, 1996. Chart by author

SEGREGATION BY GERRYMANDER: THE CREATION OF LINCOLN HEIGHTS HIGH SCHOOL

A paper submitted to the Journal of Negro Education

Patricia Randolph Leigh

Abstract

This article traces the formation of a specific school district profoundly influenced by political, sociological, and economic factors in determining its nature. It provides an historical case study that confirms the relationship between economic participation and educational opportunities and makes apparent the causes for the emergence of race and class segregated communities and school districts. The prologue is autobiographical in nature, for the author brings a personal history to this research. An analysis of the racial, political, and economic environments that prevailed in Cincinnati, Ohio from the turn of the century through the 1950s illuminates factors that played in the formation of a school district serving a predominantly low-income Black community and student body.

Introduction

Historical Background and Rationale for Study

Though the American educational system has been touted throughout its history as an institution providing equal access to all citizens, a review of the research literature points convincingly to a link between the educational and economic systems in this country. Such a relationship, by its nature, inhibits the equality of educational opportunities available to all Americans. The association between educational attainment and economic status as outlined by Bowman (1995), for example, supports my belief that a positive and reciprocal correlation exists between the level of participation in the economic system and level of access to quality education. That is, the quality and level of available educational opportunities are

influenced by the degree of afforded participation in the economic system and the benefits enjoyed as a result of this participation. One underlying premise of this research is that this linkage has served as a means of disenfranchising the Black American from slavery to citizenship; from then to now.

During slavery, the relationship between economic participation and educational opportunity was obvious. Efforts to teach Black slaves to read and write were virtually nonexistent. The slave participated in the economic system not as an individual entity with rights, privileges, and benefits afforded to human participants but rather as a material object or inanimate cog in the production process at worst or as an agent to a privileged participant at best. While there were groups such as the Quakers who defied these practices, this was the general state of affairs for slaves. If the Black slave's duties of agency required literacy, then the appropriate training and education would be provided by the slave owner. Such a case was chronicled by Webber (1978) in his work on slave education between 1831 and 1865. "Some few masters appear to have taken an active interest in the education of a select few slaves. J. H. Curry's father was taught to read and write by his master who was a doctor so that he could take the addresses of visiting patients" (p. 132).

After the Civil War and during the period of Reconstruction, Blacks enjoyed a larger share in the economic organizations and structures. As would be predicted by the hypothesized correlation, Black residents also created and partook of increased educational opportunities. Booker T. Washington (1901) attests to this phenomenon by documenting his personal observations during this period of Reconstruction. He recalls, "[f]ew people who were not right in the midst of the scenes can form any exact idea of the intense desire which the people of my race showed for an education....it was a whole race trying to go to school.... Day-school, night-school, Sunday-school, were always crowded, and often many had to be turned away for want of room" (p.30). Though this period was short lived, it demonstrated the positive relationship between the economic and educational systems. When Congress restored political rights and powers to ex-Confederates, the temporary enfranchisement of the Black American was thus removed or seriously compromised. At best, the freed Black southern dweller was afforded marginal engagement in social systems and institutions. Perhaps diminished expectations explain Washington's committed work at

Tuskegee Institute, a school offering industrial education to Blacks. The Institute's founders aimed to give Tuskegee students , "...such a practical knowledge of some one industry, together with the spirit of industry, thrift, and economy, that they would be sure of knowing how to make a living after they had left us" (p. 126). Realizing that employment requiring a liberal arts education would not be open to Blacks, Washington likely knew that such an education would not be provided by the same controlling powers. Even if liberal arts education were provided it would nevertheless prove useless to the Black student because of the job discrimination practices that were in place. Consequently, the newly freed slaves sought economic freedom and autonomy by preparing themselves for employment that would conceivably be open to them. Here we see both the quality and type of education provided and sought after were influenced by the expected level of accessibility to the economic system. It should be pointed out that all did not agree with this view. W. E. B. Du Bois, another noted Black educator of this era, criticized Washington's emphasis on industrial education for Blacks. He states, "...if we make money the object of man-training, we shall develop money-makers but not necessarily men; if we make technical skill the object of education, we may possess artisans but not, in nature, men" (Du Bois, 1903, p. 31). Du Bois did not seem to accept the realities that Washington was attempting to circumvent.

The relationship where economic position influences educational opportunity is intensely demonstrated in a biographical sketch of a Black Cincinnatian, Richard Cammack, whose family came to Ohio in 1869. "Negro schooling was very scarce in those days. Young Cammack got a little of it. The schools for 'colored' were only open a few months. The school board would say, 'You Negroes don't pay enough taxes to have schools like white folks'..."(Dabney, 1926, p. 239).

The end of the Civil War brought large numbers of Blacks to urban areas seeking the American dream. However, White Americans, including those whose political and military stances brought an end to physical bondage, were not ready or willing to provide Blacks full and equal participation in the economic system. Because of low wages and the intermittent absence of income, the Black resident of the urban centers could afford only the worst of living quarters and education was still scarce for Black children. During the industrial era that followed, many middle- and upper-class White citizens in various

sections of the country continued to send their children to private schools in hopes of providing them with a quality liberal arts education. "[F]rom the early 1900s through the 1940s about 50 to 60 percent of Harvard and about 70 to 90 percent of Princeton freshmen were private school graduates" (Synnott, 1979, p. 5). Such an education would serve to assure these students the level of participation in the economic system that their parents were enjoying. As the public schools' curricula and methodologies began to emulate factory life, lower or working class citizens were locked into their socio-economic status. However, the White working class citizen who took full advantage of this educational opportunity could at least maintain his current position in the economic system. The Black worker was often denied even this opportunity. At this time the school was not only seen as a factory but the reorganized school boards were being run and controlled by businessmen. There was a heightened concern for implementing cost effective practices and efficiency principles in the schools to more closely resemble the efficiency movement underway in business. These business leaders also strongly supported the drive for vocational education. Many saw the educational system as a tool for training future laborers (Callahan, 1962). Businessmen who discriminated against Blacks in their hiring and promotion practices would likely see education for these citizens as a waste of resources. Concerns for expending educational resources on individuals not likely to benefit increased after the 1909 publication of Leonard Ayres' book, Laggards in Our Schools.

During the years of economic depression, these concerns for efficiency pervaded the educational system thus influencing the curricula, methodologies and policies that continued to marginalize the Black student and hamper participation. By the time the economic depression exerted its full effect upon American society, urban Blacks were locked into low-paying job and substandard housing -- in general the lowest rung of the socio-economic ladder. Sundstrom (1994) explains, "Blacks who migrated to the North found improved economic opportunities, but job segregation remained significant. Indeed, in 1910 the relative underrepresentation of blacks in the crafts and industrial operative jobs was greater in the North than the South" (p. 384). In addressing the issue of the Depression and lower classes, Urban and Wagoner point out that "the economic suffering of these groups during the 1920s was also accompanied by a substantial degree of educational deprivation....And Black Americans suffered, both economically

and educationally, even more than their white working-class or farm counterparts" (1996, p. 242). The reason for this may well be that the city planners in many urban areas had successfully segregated the population along racial lines (Taylor, 1993). School boards were then free to establish districts and accomplish de facto segregation without the appearance of malice. Blacks, because of restricted economic participation, were relegated to communities and districts with minimal and substandard educational resources. After all, the quality of the educational system depended to a great extent on the financial status of the district.

City plans and community lines set during the early decades of the twentieth century assured the compromise of the Black student's future. Inferior elementary and secondary education would limit the types of jobs open to the Black individual and would supply employers with a ready excuse for denying Black applicants the more favored or sought after positions. Lack of college preparatory curricula offered by the schools in poorer districts also jeopardized chances for college or university entrance, either by certificate or examination. For those students who were accepted into institutes of higher learning, inadequate preparation put their college success at risk. Moreover, the economic opportunities denied parents, in many cases, guaranteed that college education was not financially feasible for their children. All these factors in turn would limit economic participation afforded the children, which would then limit the educational opportunities afforded the grandchildren. This is the reciprocal linkage and positively correlated relationship between economics and education that has endured throughout American history.

Purpose of the Study

In this paper, I trace the formation of a specific school district profoundly influenced by political, sociological and, most importantly, economic factors in determining its nature. The purpose is to provide an historical case study that confirms the existence of the relationship described above and makes apparent the causes for the emergence of race and class segregated communities and school districts. By examining one particular geographical area in historical context, I hope to provide evidence of not only the existence of the reciprocal correlation hypothesized but also make obvious the disenfranchisement this

relationship has born to the Black child and adult. I also bring to this research a personal history as well as personal concerns and unanswered questions. For this reason, the prologue is autobiographical in nature as I explain how I came to address these issues as well as outline the research biases I bring to the study. The remainder of the paper analyzes the racial, political and economic environment that prevailed in Cincinnati, Ohio from the turn of the century through the 1950s in an effort to understand all that led to the formation of a school district and the building of a high school that served a predominantly low-income Black community and student body.

Segregation by Gerrymander: The Creation of Lincoln Heights High School

Prologue

I guess you could say that we were 'better off' than some families in Lincoln Heights but certainly not 'well off'. Of course, I never thought of us poor either. To be honest, I always thought we were middle class--I suppose I was thinking average class. It was not until I was well into adulthood that I realized the error in my thinking, proving again that many things are relative. Growing up in one of the largest self-governed Black communities in the nation was unique in many ways, but most of my memories are extremely pleasant. I recall the first day I went off to kindergarten my biggest concern was being separated from my mother. What I remember most vividly was coming home and telling my mother that I missed her. She said she had missed me too and I was relieved. My concern stemmed from overhearing a friend of hers say how nice it would be for my mother when I started school, that is, to have all the kids out of the house. My mother had agreed that it would be good to have some time to herself. I of course was appalled. I could not imagine my mother not wanting me clinging to her all day as I was in the habit of doing. I am the youngest of three children so I was the last to venture off to Lincoln Heights Elementary School. I soon stopped missing my mother and enjoyed many wonderful experiences there.

My father was involved in several business enterprises but his main occupation during my early school years was building houses. These were wonderful homes well known for their smooth, solid

plastered walls and finished hardwood floors. If the city did not provide a street or sidewalk to face his newly built string of bungalows, then my father would simply pour them himself. As a result of his passion for houses, we moved more than most--probably more than any family in the history of Lincoln Heights. The moving stopped when my mother grew weary of packing and refused to budge again. At any rate, one of our moves took us quite a distance from the public school I was attending, so I began third grade at St. Simon's Episcopal School in the 'upper sub' of Lincoln Heights. From that point, our family homes were in comfortable walking distance of this elementary school.

In our household, if you wanted money for some purchase you simply needed to say "It's for school". That was a standing family joke. For some reason, that little phrase wielded such leverage in securing small cash amounts when even a remote connection to education could be made. I enjoyed school for the most part and did not have to be coerced into attending or studying. On the other hand, it was also nice that I could use the "it's for school" tag to acquire some of life's perks. This of course worked because my parents valued education and wanted to be sure that we had all needed supplies for class, field trips or projects. My father's education had largely consisted of informal apprenticeships under his father's tutelage. Although he was basically self-taught in the many areas in which he did well, he considered the provision of formal education for his children a top priority. My mother had enjoyed her high school years and shared stories of her experiences as we were growing up. She attributed equal import to her children's formal schooling, however, she did not fall victim to the "it's for school" phrase as often as my father.

It is very difficult to remember and articulate my feelings during my seventh- and eighth-grade years. Much has been blocked out and blurred. The stress was adult enough but my stress management techniques were still so young and undeveloped. A new high school was built in Lincoln Heights. It was scheduled to open soon and I would have to go there. I understood that much. I also understood that the school would have limited resources and would not offer the quality of education that my sister was enjoying. Prior to the construction of the new high school practically all school districts were open to the children of Lincoln Heights. Since my sister would be entering her junior year in a public high school in another district in Cincinnati, she would be allowed to complete her studies there. My brother, who is a

year my senior, and I on the other hand would have our options severely limited and would not take part in the open district benefits. My family was upset. I was upset.

I bring to this research many questions --questions that have their roots in adolescence but nevertheless continue to haunt me as an adult. What events led up to this situation that from my perspective was so unfortunate, so unfair? I had internalized the view that education was the great equalizer and the sure means of attaining success. So why were my dreams being deferred, aspirations scattered, future doomed to mediocrity? Why was this happening to me? Like many other families who were concerned about the quality of education the new Lincoln Heights High School might deliver, my parents found a solution to the problem in the parochial school system. I have had many educational experiences since that time, but the turmoil that I felt in 1958 through 1959 still lurks in the corners of my memories. I still want to know why. I want to know who or what had put my hopes and the hopes of others in such jeopardy. I decided to explore the events of the time period to see if I could find some answers and finally put the issue to rest for myself. Entering this study, I confess to my own biases and pre-formulated hypotheses. I was sure I would discover that Lincoln Heights school was built to keep Black Lincoln Heights students there. I did not know if I would be able to document or validate my suspicions, but I was convinced that somehow the leaders in the community had failed its residents by either knowingly selling out to the segregationists (a yet unidentified group in my mind) or they had unknowingly accepted monies disguised as 'philanthropic gifts' that would lead to the further marginalization of the children and future citizens of Lincoln Heights. I truly felt the situation that caused me so much distress was no accident and had somehow come about as a result of the manipulations of some group of White leaders intent on barring Lincoln Heights students from their schools. This is the attitude with which I entered this investigation.

In attempting to gain insight into the historical background of my educational predicament, I looked at events that occurred during and just prior to that time period. Almost immediately I was led to accounts of the creation of Lincoln Heights school district in 1950 and the creation of Lincoln Heights as a city in 1951. From the documents examined, I gathered that the intents of these events were not to

benefit Lincoln Heights. I began stepping back into history. What was in the Cincinnati Master Plan of 1948 that influenced the events of 1950 and 1951? Did the economic, land use and motorways plans drafted by the same commission have an effect? What, if any, effect did the developments in 1935 under Roosevelt's greenbelt project have on Lincoln Heights and what factors led to this project? The more I examined, the further I would have to go back in history to try to establish the origin and nature of the attitudes of those who had so profoundly affected me. My backward steps landed me in nineteenth century Cincinnati. It is from there that I will begin in order to bring the reader forward to 1958.

Pre-Industrial Education

To say that schooling in Cincinnati was racially segregated prior to the close of the Civil War would be an understatement at best. Historical accounts published as early as the 1920s look back at schooling for Cincinnati's Black residents in the mid 1800s and find it virtually non existent. Dabney (1926) gives a chilling account of the violent birth and necessarily clandestine spread of educational institutions for Blacks in this commercial center. White teachers from Oberlin College would travel to nearby Cincinnati for the express purpose of providing instruction for Black children. These same teachers generally held abolitionist views and endured the animosity and oftentimes the mob threats of those holding strong opposing opinions. In fact, the original student body of Oberlin College consisted of those who had abandoned Lane Seminary in Cincinnati subsequent to the order that forbade the discussion of slavery (Dabney, 1926; Fletcher, 1943). The order came as a result of groups of citizens storming the institution grounds in violent protest. This same violent display reared its head once these teachers began their instructional missionary journeys to Cincinnati. It should be pointed out that segregation was not the issue in 1834. What these Cincinnatians and neighboring Kentuckians found so repugnant was the education of the Black youth at all. The teachers were often refused lodging and other services if their identities were made known. Buildings where instruction took place attracted riot-like behavior and threats of burning. Establishments that might have otherwise been predisposed to offering space for classrooms were thus discouraged from doing so.

Such were the prevailing attitudes of those occupying or neighboring Cincinnati in its early years. A closer look at the emergence of this commercial and industrial center uncovers political, social and economic dynamics also relevant to the history of Black education in this city.

The Commercial Center

> When the General Assembly incorporated Cincinnati as a city in 1819, the state conferred an expected and deserved distinction upon the most important urban center in the valley. From a squalid river settlement, Cincinnati had been transformed into a commercial mart of 10,000 people, and her phenomenal growth during the next nineteen years seemed to justify the action of the legislature. (Aaron, 1992, p. 80)

Prior to industrialization, Cincinnati was an important commercial center lying on the banks of the Ohio River. Its spontaneous, amoeba-like growth appeared as a direct result of the steamboat traffic, the buying, selling, trading of goods and the presence of shops of various kinds. During the early 1800s, there were no city planning commissions, zoning laws or building codes. The principle of supply and demand seemed to apply to the growth of this commercial area. Cincinnati's center was relatively small in area, limited by its very terrain. This factor proved of critical importance as Cincinnati entered the industrial era and experienced tremendous population growth. The growth-limiting terrain had direct effects upon the city building policies that in turn influenced the events of the nineteenth century. Bounded by the River on the south, creeks on its western and eastern perimeters and hills to the north, Cincinnati provided confined space for its new inhabitants to settle and take up residence. In addition, there was limited space available for new factories, offices and businesses that proliferated in the early 1900s. In describing the Cincinnati of this period, Dabney (1926) states, "[i]t is situated on the north bank of the Ohio river, opposite the mouth of the Licking river, which enters the Ohio between Newport and Covington, Kentucky. This city is near the eastern extremity of a valley about twelve miles in circumference, surrounded by beautiful hills, which rise to the height of 300 feet by gentle and varying slopes, and mostly covered with native forest trees" (p. 16).

The commercial center did expand into the industrial center, taking up all available areas that lay within the river and creek beds and the base of the hills. Transportation technology had not yet advanced

enough to provide the city's work force efficient daily travel over these barriers. Blacks, Whites, Immigrants, businesses and factories were all competing for the same space during these years of Cincinnati's history (Taylor, 1984; Taylor, 1993). This is an important fact when analyzing the growth of ghettos in general, the emergence of Lincoln Heights in particular and in understanding the attitudes of race that influenced city planning policies and the emergence of school districts.

The Industrial Center

The outcome of the Civil War together with the rise of industrialization had the same general effects on urban areas in the United States. The failed farms of rural areas prompted many to seek new opportunities in centers such as Cincinnati. Among those pursuing the American dream were Blacks migrating from agrarian to urban areas. Because of the lack of residential space in Cincinnati's industrial center, Whites, Blacks and immigrants of various origins lived among and in close proximity to each other in the early 1900s. Blacks in particular were not yet segregated to certain segments of the city or even streets at this time. According to Taylor's (1993) account, this was not due to the lack of racial animosity or discrimination practices but due to a lack of space. In fact, other historians report many job discrimination practices in the factories and businesses. For example, Sundstrom (1994) states, "[i]t is well known that blacks were underrepresented in the more skilled and higher-paid jobs....Blacks were underrepresented in the skilled, professional, and clerical categories in both the North and the South. The virtual exclusion of black women from clerical and sales jobs is notable" (p. 385). Not only were Black Cincinnatians hired for the lowest paying jobs and denied upward movement, but the reluctance of White laborers to work along side of Blacks exacerbated the problem. "White laborers there, as in other Northern cities during this period, easily reached the position of thinking that it was a disgrace to work with Negroes. This prejudice was so much more inconvenient to the Negroes of Cincinnati than elsewhere because most of the menial labor in that city was done by Germans and Irishmen. Since the Negroes could not follow ordinary menial occupations there was nothing left for them but the lowest form of 'drudgery,' for which employers often preferred colored women" (Dabney, 1926, p. 84).

In another study by Taylor (1984), he depicts, through the use of maps, how Black residents tended to live in clusters interspersed among the rest of the working class during the early industrial era. Nevertheless, though they were not as yet segregated, Blacks did occupy the worst living quarters in any particular segment or street. He argues that segregation and the rise of the ghetto-slum came only after transportation technology allowed for the spread of Cincinnati's population beyond the terrain barriers and the racial attitudes of those in power were incorporated into the city's building policy. These critical events occurred between 1910 and 1940.

Outward Migration

The overcrowded and squalid conditions of the tenement houses of Cincinnati captured the attention of housing reformers and led to the passage of a building code in 1898 which was later strengthened in 1916. Reformers also sought to encourage workers to move out of the basin area into the hilltop and valley areas that were becoming more accessible because of advances in the transportation industry. Transportation advances also opened up areas for new factory and business locations away from the banks of the Ohio River and the original industrial core. These new locations served as encouragement for residents to relocate in closer proximity to new job opportunities. Taylor (1993) points out that it was mainly White workers who moved out of the Cincinnati basin leaving behind practically the entire Black Cincinnati population and thereby setting in motion the emergence of the Black segregated ghetto in the west end of Cincinnati's basin area. One factor that was directly related to Blacks' failure to migrate outward were the job discrimination practices that were in place. Blacks had the lowest paying jobs since their arrival in Cincinnati and therefore could only afford the cheapest housing. The cheapest housing was where they were currently living and they could not afford the single family homes being erected in the hilltop and valley areas. In addition, the racial attitudes that so adversely affected Blacks' job opportunities likewise affected their housing opportunities. The group of city planners who were being organized encouraged only White workers to move out of the basin area. As they abandoned the "superior" living units, the planners thought that these units would trickle down to the Black residents remaining. Taylor

gives an incredible account of an incident in which a charitable group of Cincinnatians, whose primary concern was relieving the plight of the Black slum dweller, was advised to participate and contribute to the trickle down housing philosophy.

> The BHL [Better Housing League] told blacks and their supporters that 'it is impossible to build houses directly for the colored people because the facts show that their wages are insufficient to pay the cost of present-day construction'. The BHL then suggested that friends of African Americans should be encouraged to invest their money in the building of new houses for whites. 'This,' the BHL indicated, 'while not relieving colored families directly would tend to relieve them indirectly by drawing white families out of the district now occupied for the most part by colored people'. Confinement in the basin and trickle-down housing were to become the cornerstones of the housing reformers' strategy for dealing with the black housing problem. (p. 176)

In the minds of White Cincinnatians, the squalid conditions of the West End became so intricately linked to the Black residents that were left behind that the place and the people were synonymous (Taylor, 1993). Whites believed that Blacks naturally lived in such conditions and would likely bring the slums with them if they were to relocate. Cincinnatians held Blacks responsible for the conditions that were, in reality, forced upon them. Many of the real estate developers had written rules against selling lots to or building houses for Blacks outside the basin. The new White homeowners supported these racist policies believing that their investments were being protected. As more working class residents became homeowners they became more concerned with property values. Typically mortgage loans were granted by banks for a period of two to five years and were not renewed automatically. Renewal depended in part on the property in question maintaining its original value. Failure to attain loan renewal would mean that the resident would lose the home and perhaps all that had been invested (p. 167). Since Blacks and slums were viewed as inseparably linked, homeowners were adamant about maintaining segregated neighborhoods in the belief that their property values were being safeguarded. In addition, when federal money became available for public housing projects, it was used to rescue the deserving. Since Blacks were believed to create slum environments they were not viewed as deserving of better housing conditions. The few Blacks that, against all odds, were able to secure land in

the newly developing areas were only financially able to erect shacks. This was seen as a threat to the future of Cincinnati and a scourge on its esthetics. These shacks also served to reinforced negative attitudes about Black residents. In 1923, Cincinnati's first zoning laws were enacted controlling the quality and types of structures that could be built in various parts of the city. These laws further inhibited Blacks' outward migration from the basin. Two years later the first city plan was published by the Cincinnati Planning Commission incorporating the same principles that guided the previously established building codes and zoning laws. "The colored population is continuing to increase fairly rapidly, while the number of houses in which they may live is remaining stationary. Nearly 3,500 new colored people have come into Cincinnati since 1920. This is bound to remain a problem for several decades to come" (Cincinnati City Planning Commission, 1925, p. 50). Actually, 18,000 additional Blacks had moved to Cincinnati in 1920. Most of these residents found themselves occupying the already crowded West End basin area, this being their only option. Taylor (1993) attributes zoning laws and building codes as major contributors to the rise of this ghetto slum. He makes a strong case by pointing out that extreme racism existed in Cincinnati for years, but it was not until certain city planning, zoning and residential building laws were enacted incorporating this racism that the ghetto slum emerged. Actually, the trickle down housing philosophy suggested by the BHL found its way into the text of the 1925 city plan almost verbatim.

> The only way in which the housing shortage can be substantially relieved is by producing more homes. Single-family houses can not be built to sell for less than $5,000, including the land....It is therefore obvious that the construction of single-family houses can not meet the needs of the mass of the colored population and the white low-wage earners....[T]he only way housing accommodations can be provided for them is by relieving the pressure higher up. In other words, as fast as the families in better circumstance move out of the older tenements and houses, they will become available for housing the lower wage earners. This means that it is not feasible now to give any consideration as a part of the City Plan to providing housing for low-wage earners, and that attention should be concentrated now on the amelioration of living conditions in the older parts of town by zoning protection and by the provision of parks, playgrounds, community centers and open spaces. (Cincinnati City Planning Commission, 1925, p. 51)

The authors of this plan also illuminated the relationship between the city planners and the boards of education. This plan included determinations of which schools would be eliminated as well as

where new schools would be constructed. The implication was clear that the planners had superior access to relevant knowledge as well as wisdom concerning the designation of school locations and school districting.

> [W]ith the limited data on population growth and distribution that the Board of Education can normally have at its disposal, it is impossible for them to prognosticate the rate and distribution of future growth as accurately as can a City Planning Commission....It is the function of a City Planning Commission to determine the location and districts, public buildings and other features of the City Plan in the best interest of the community as a whole... (p.182)

It is likely that these same racist building plans and public policies led to the birth of the Black haven, community, and finally the city of Lincoln Heights, located north of the industrial center in what was known as Cincinnati's upper valley.

The Upper Valley

In 1923 the Haley Livingston Land Company, contrary to accepted policy, sold lots to Blacks and thus offered an option other than the congested West End Basin. Numbers of Blacks erected homes in this part of the northern millcreek valley, an area that would later be identified as tract C30A in the 1940 census and come to be known as Lincoln Heights. Of course, again limited by available funds, these residential structures did not meet the standards of city planners and housing reformers. Taylor reveals the attitudes that city leaders had towards these Black dwellings:

> Standish Meacham, of the BHL referred to them as 'bad Spots' which were potential slums. He called... the black Lockland suburb (Lincoln Heights) "the ugliest collection of shacks I have ever seen." The director of buildings for the city, Clifford M. Stegner, called these low-income residential settlements a "menace to the city". (Taylor, 1993, p. 175)

Despite the negative attitudes of outsiders, the Lincoln Heights community grew and improved over the years. Remaining close to 100 percent Black, it became one of the largest African-American communities in the nation. Lincoln Heights remained economically poor relative to its White neighboring communities and continued to draw the criticism of the more fortunate. Also relevant to this historical

research are the activities and events that transpired between 1930 and 1940 in a nearby community. In 1935 President Roosevelt initiated the greenbelt program which operated under the auspices of the Resettlement Administration. Miller (1981), describes this program as another attempt to solve the problems of the overcrowded cities by specifically addressing the use of rural lands and had as its goal the establishment of communities in fertile land areas that lie on the outskirts of the cities. The hope was to build and develop these communities and lure city dwellers from the urban centers to the more spacious outlying areas. Such communities were thought to serve to rescue those trapped in the slums. The program founders also hoped to provide a means of escape to inhabitants of failed farms that were likely to migrate to more industrial areas. The program stipulated that protected parks or forests would surround or lie adjacent to the new communities. These protected areas would allow for controlled growth and prevent overpopulation. Cincinnati was one of three cities in the United States funded by the Resettlement Administration to develop such a community. As a result, the community of Greenhills was established and subsequently charted as a municipality in 1939.

It is interesting to note the geographic proximity of this community to the developing community of Lincoln Heights, unplanned and receiving no federal monies. "Greenhills, was located on a 5,930-acre tract of farmland eleven miles north of downtown Cincinnati, in Springfield Township, Hamilton County, Ohio. The site lay northeast of Mt. Healthy and west of Glendale, a nineteenth century commuter suburb and the home of some of the wealthiest and most influential people, but not far either from the factories of Mill Creek industrial belt" (p. 7). Lincoln Heights lies east of Greenhills and south of Woodlawn, a community that separates it from the wealthy Glendale area described above (see Figure 1).

Another point of interest is the racial make-up of the Greenhills community. "In the 1940s the town developed into a white, middle-income suburb, despite the fact that Cincinnati's slums, whose inhabitants were supposed to be among Greenhills' major beneficiaries, contained large numbers of blacks" (p. 8). The 1940 census reported 718 occupied units with 1 unit occupied by non-whites (U.S. Bureau of the Census, 1940). Details were not reported for what would be the Lincoln Heights area,

however, the 1950 census reported Lincoln Heights with a total of 1328 occupied units with 1305 occupied by non-Whites (U.S. Bureau of the Census, 1950).

Plans for the future development and expansion of the Greenhills area were reflective of the principles underlying the Cincinnati Metropolitan Master Plan of 1948. The Master Plan outlined the city's reorganization and called for self-contained communities of 20,000 to 40,000 inhabitants connected by a network of highways. The 1948 plan also specified sites for public housing as well as industrial development and made clear the intent to keep industrial and residential areas segregated. Clearing out the slum areas was also a stated goal of the authors of the 1948 plan, and the Greenhills area was slated as a recipient of federal public housing (Miller, 1981, p. 10 - 13).

It seems that the attitudes concerning housing for Blacks held by the authors of the first Master Plan of 1925 and the authors and implementors of the 1948 Master Plan had not changed significantly, if at all. The years 1951 and 1952 were marked by much effort to purchase the greenbelt community and surrounding properties from the government and to expand and develop the northern Greenhills area. The Cincinnati leadership involved and committed to this development included many of the same leaders that authored or consulted on the 1948 Master Plan and were committed to its implementation. Memoranda and interviews, as documented by Miller (1981), confirmed that this leadership was well aware that the expressway system proposed in the 1948 plan would dislocate a large portion of the residents of the Black West End. Despite acknowledgment of this fact, no resolutions were made to offer relocation housing to the group most at risk. Miller concludes "...the implication seems clear. North Greenhills would not provide housing for blacks uprooted from their inner-city neighborhoods" (p. 20).

The 1948 Master Plan was also explicit in slating sites for industrial development. It is interesting to note that the areas for high industrial development lie adjacent but outside of what would soon become the city of Lincoln Heights (Cincinnati City Planning Commission, 1948, p. 74; Figure 2). Lincoln Heights had been recently incorporated into a village but without the valuable properties named in the petition. "In 1946, after deleting the industrial portion of the territory sought, the County Commissioners granted incorporation to a total land area of 0.804 square miles. By 1950, the Federal

Census showed a population of at least five thousand. City status was imminent. But efforts to annex valuable industrial property were blocked, and in 1951, when Evendale incorporated, Lincoln Heights became land-locked in a rich industrial area without a further chance for expansion and without opportunity to share proportionately in the taxable wealth of the industrial community" (Miami University, 1961, p. 6).

Other pertinent activities were taking place in the upper valley area during this time period. In 1950, by strange coincidence or strategic intent, the Hamilton County Board of Education upon petition from Woodlawn citizens abolished the Woodlawn local school district and established a new Woodlawn local whose district lines coincided with the village lines. Prior to this action, many Lincoln Heights children attended Woodlawn schools, for the district overlapped into the incorporated village of Lincoln Heights. This was also true of the neighboring Lockland and Evandale districts. Technically, though Woodlawn redefined its district lines to exclude Lincoln Heights properties, Lincoln Heights should not have been designated as having a district coinciding with its corporation lines because of the remaining overlapping districts. This technicality did not however prevent the Board from doing just that. In 1950 the Hamilton County Board of Education, in addition to establishing a new Woodlawn district, created Lincoln Heights local school district. Evidence indicates that this was accomplished without input or even knowledge of Lincoln Heights' citizens and without employing the required procedures as outlined in the city code. Legal notice of the new Lincoln Heights school district appeared in the Cincinnati Post newspaper but "...failed to mention that a remonstrance petition filed by the qualified majority of electors in the district could prevent the action" (p. 12). In reference to the problem of overlapping city and district lines, "[t}he code required a map to be filed with the County Auditor as a part of the procedure in creating a school district. At the time of this writing ...this map could not be located in the Hamilton County Auditor's files" (p. 11). The Miami University research group concluded their analysis of the above stated events as follows:

> There are some who hold the belief that the birth of Lincoln Heights city school district was the result of pre-conceived effort to place the school district in this position to force independence,

> that this action was taken prematurely, and that this action was taken with no legal compulsion. Furthermore, too little consideration was given to the financial structure for future operation. (p. 13)

These irregular incidents did not escape the notice of Harris and Erickson (1951) in their study of school consolidation in Hamilton County. Their comments warrant the near complete inclusion in this paper.

> The petition to create two new districts, Woodlawn and Lincoln Heights, which was approved by the County Board, provided for the withdrawal of only 17% of the pupils into the new Woodlawn district, but left only 46% of the tax valuation to support the remaining 83% of the pupils. The withdrawing area now has a ration of $8,801 per child, while the remaining area has only the incredibly low ration of $1,544 per child. It is to be noted that it is this withdrawing area, with the high valuation, which is still a part of the county system, while the municipality of Lincoln Heights, with its low valuation, is the area which is expected to become a city school district and therefore no longer a concern of the county school board. The motives which this set of facts seems to impute to the county board are hardly very commendable. There is also the possibility of a racial question. The district before division was largely colored; after separation the new Woodlawn area was little less than half colored (in school enrollments) while Lincoln Heights was entirely colored. There are indications here that the white minority pulled out, taking with them the bulk of the wealth, in order to become a majority in the new Woodlawn district. For school purposes, the result of this division has been that a populous but impoverished area has been cut loose from the county system and left isolated to meet alone almost insuperable obstacles to financing an adequate educational system. This is the complete opposite of the basic principle of consolidation, which is to join small and financially insufficient areas so that better and more economical education can be achieved. (p. 66-67)

And so a district was created, a city established and a new high school built.

Epilogue

> The Ohio State Department of Education granted Lincoln Heights a High School Charter in April, 1958, and in September a 240-pupil, 4-year high school was opened. Some parents continued to send their children out of the district, on a tuition basis, bearing the cost themselves. (Miami University, 1961, p. 14)

At this point of my analysis, I heartily reject my original hypotheses concerning the cause of my 1959 educational predicament. Evidence to the contrary indicates that local leaders in Lincoln Heights neither sold out to the idea of constructing a high school within its boundaries nor were they talked into this notion. The events of 1950 and 1951 were controlled and directed by Cincinnati city planners and the Hamilton County Board of Education and the major subsequent effect of those events, the building of

Lincoln Heights High School, was forced upon the residents of the community. It seems that if the Black inhabitants of this unique community brought unfortunate circumstances upon themselves, it was in the same manner that the Black dwellers of the West End basin area created their living conditions. Had these inhabitants been able to afford to construct dwelling units in conformance with city standards and zoning requirements, perhaps they would have been deemed worthy of federal assistance like their Greenhills neighbors to the west. However, Lincoln Heights inhabitants were viewed as responsible for their surroundings and were expected to recreate their "natural habitat" even if rescued. Because of these prevailing attitudes, investments in this community were viewed as unwise and the best alternative was to contain the community. If surrounding locales could wrest themselves from associations with Lincoln Heights, barring ownership or free access to economic and educational resources, then containment would be complete. By establishing Lincoln Heights as a city, excluding valuable industrial property, and establishing the school district that coincided with the new boundaries, the mission was accomplished. Now a school district, Lincoln Heights needed a high school. The rest is my history.

Conclusions

> I have great faith in the power and influence of facts. It is seldom that anything is permanently gained by holding back a fact. (Booker T. Washington, 1901, p.32)

During the course of this research, I had many conversations with family members concerning the events described above and associated feelings and reactions to them. As the story unraveled, we were appalled, amazed, dismayed and yet somehow liberated by the glaring truth that stared from the pages of the research documents. Believing that education is the great equalizer and yet suspecting that access to quality education is not equally afforded are not conflicting notions. This research process has illuminated both notions and provided deeper understandings for me and those with whom I had frequent dialogues. Uncovering the truth, regardless of how repugnant, has simultaneously provided answers to nagging questions and healing to wounds of previously undetermined origins.

In a country where many espouse the ideas of individualism and self-empowerment, it is important to expose forces, often overwhelming, that are external to the adult and child. Hidden economic and political forces that gave rise to the school district serving Lincoln Heights children actually determined the paths and patterns of our lives. Compared to resources of the neighboring wealthier districts, most Lincoln Heights students were forced to struggle with far less in terms of textbooks, libraries, and seasoned teachers. Documentation of comparative tax valuations of the neighboring districts shortly after the opening of Lincoln Heights High School indicates the resources affordable to the schools within those districts. The Miami University (1961) researchers provide this information and point out its relevance by stating, "[t]he tax valuation of a school district constitutes an important index of ability to provide a good educational program....The relationship of the number of pupils to the total tax valuation is also significant. The smaller the number of enrolled pupils, the larger the amount of money per pupil available from tax revenues for educational purposes...." (p. 107). Lincoln Heights tax valuation per pupil is compared to other districts in the state and county.

> In 1960 the tax valuation per pupil was $7,667, a figure which compares very unfavorably with other districts in Ohio.... In 1960 the average per pupil wealth was $17,583 for all city school districts, $10,648 for all exempted village school districts, $11,406 for all local school districts in county systems, and $15,042... for all districts in the state. Lincoln Heights has only half the ability (50.7 per cent) to support an educational program through local taxes that the average district in Ohio has.... In Hamilton County itself, Lincoln Heights ranks, in tax valuation per pupil, lowest of the ten city school districts.... St. Bernard is first with $114, 963, and Lockland is second with $55, 632.... Lincoln Heights also has a lower valuation per pupil than any of the eight local school districts in Hamilton County..., or than any of the exempted villages in the county... (p. 109)

The struggle with less that Lincoln Heights students endured and the history of the emergence of the school district that brought about the struggle provide evidence of not only the existence of the reciprocal correlation between economic participation and educational opportunities but also make obvious the disenfranchisement this relationship has born to the Black child and adult. Though the Lincoln Heights schools can boast of many successful graduates that overcame, with the help of dedicated educators, the unlevel playing fields, one can only wonder how many more would be enjoying fuller adult lives had not their paths been determined by these external factors.

The implications for further study are numerous. Tracing the formation of other racially segregated communities and school districts using a multiple case study approach would help determine if the events that occurred in the greater Cincinnati area from the 1900s through the 1950s are representative of community and school district formation across the nation. Expanding such research into the 1990s may also uncover efforts to either reinforce or eradicate the effects of earlier decades. In addition, research aimed at quantifying the differences in educational resources and opportunities available to different racial and socio-economic groups may aid in determining the significance and the strength of the hypothesized reciprocal correlation between educational opportunity and economic participation. Tracking the strength of the correlation or the intensity of group differences in educational resources and opportunities throughout the decades could reveal the direction being taken on a national level toward equalizing access to education.

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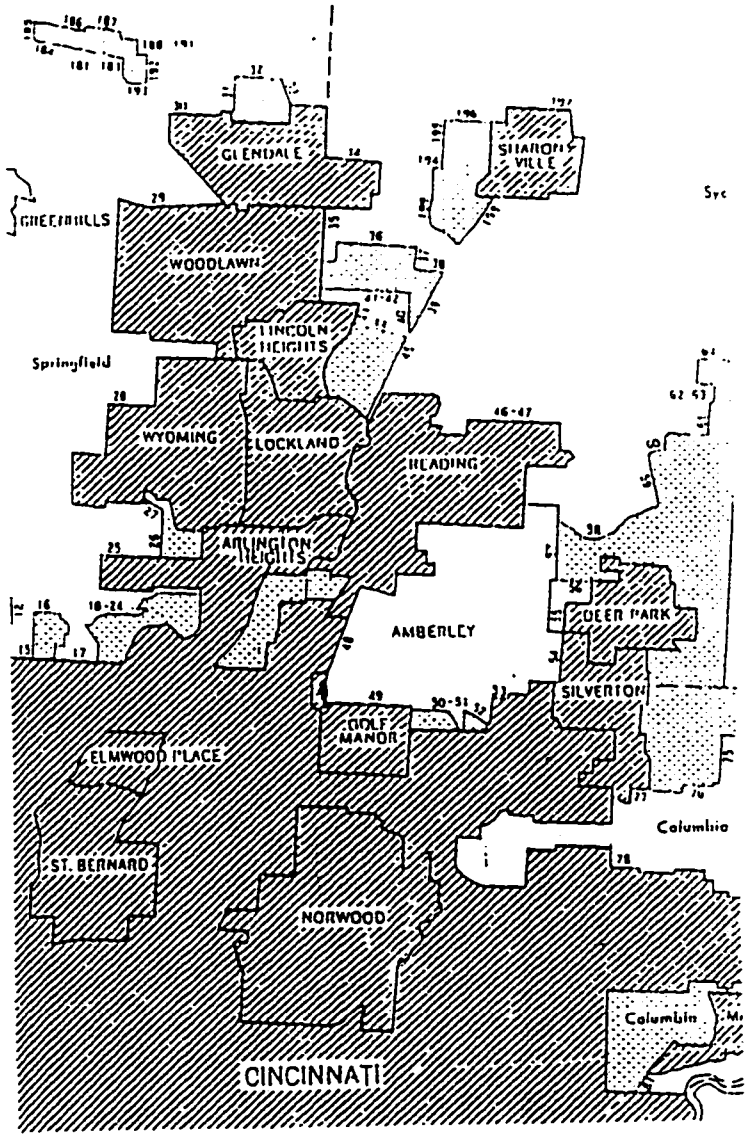

Figure 1. Cincinnati Upper Valley
U. S. Bureau of the Census, 1950

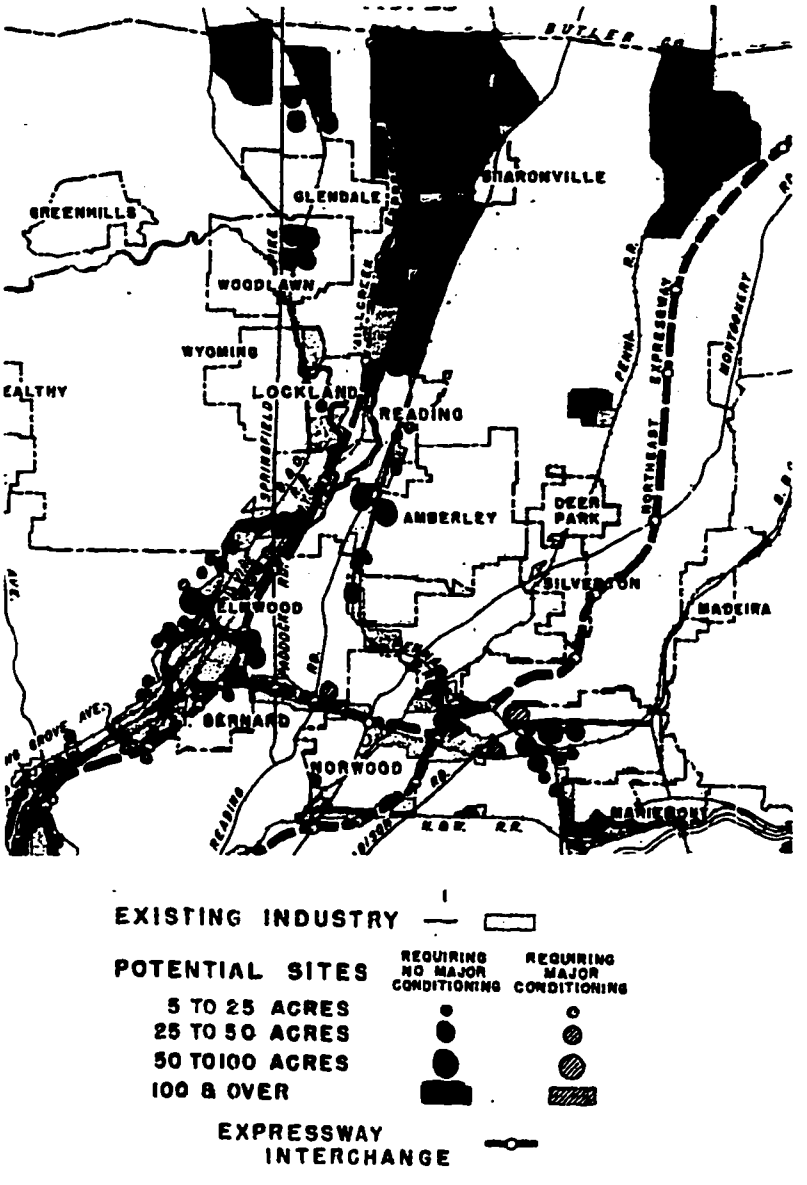

Figure 2. Existing Industrial Areas and Potential Sites (upper valley) Cincinnati Metropolitan Master Plan, 1948

ELECTRONIC CONNECTIONS AND EQUAL OPPORTUNITIES: AN ANALYSIS OF TECHNOLOGY DISTRIBUTION IN PUBLIC SCHOOLS

A paper to be submitted to the Educational Researcher

Patricia Randolph Leigh

Introduction

Equal Rights and Equal Tools

Tools for educating American children have taken on many forms since the origin of the U. S. public educational system, progressing from the simple writing slates and basic readers to electronic software and hardware. What has not changed is the fact that the level of access to these tools correlates to race membership or socio-economic status (Coleman, 1966; Becker & Sterling, 1987; Becker, 1992). Documentation of such a correlation received much attention following the banishment of 'separate but equal' laws and mentalities that upheld the notion that racial segregation in U. S. public schools was acceptable as long as all schools were equipped with equal resources. These 'separate but equal' ideas found support in the *Plessy v. Ferguson* decision of 1896 but "[i]n its desegregation decision of 1954, the Supreme Court held that separate schools for Negro and white children are inherently unequal" (Coleman, 1966, p. 3). This *Brown v. Board of Education* decision of 1954 was followed by the 1964 Civil Rights Act which had profound educational ramifications. By declaring that all citizens had the right to equal opportunities regardless of race, color, religion or national origin the implication was that all children should have equal access to the educational tools of the era whether in the form of slates, textbooks or electronic computer programs and equipment. Studies followed to determine if the racially segregated and separate schools in America were upholding this 1964 act by providing equal educational opportunities.

The Equality of Educational Opportunity report (Coleman, 1966) represents seminal, in-depth analyses of these issues that no study to date has matched in terms of the detail and scope in which

equality, especially pertaining to race, is examined. Though similar research questions resurfaced in the 1980s, the associated investigations did not include all aspects of the Equality of Educational Opportunity (EEO) report. In addition, and more importantly, the studies that followed approached the research from divergent perspectives or viewed the data through dissimilar lenses. Sutton (1991) gives some insight to the educational research perspective that sprung forth during the eighth decade. In surveying the literature, she found that the growing presence of computer technology in schools and the expense associated with new educational tools raised concerns of equality of access for students of varying socio-economic status or racial identities (p. 476). Regarding 1980s research, Sutton states, "[d]uring this period, the rationale for the attention to equity issues in school computer use typically focused on economic and global competitiveness concerns arising from several current but distinct beliefs. First, a plethora of reports during the 1980s documented the inferior state of education in the U.S.A..... Second, ...if the U.S.A. is to maintain a competitive place in the world economy, it must educate female and minority children because they are needed as future workers" (p. 476).

Sutton's statements indicate that the well-being of the American society was the central focus of research efforts of the 1980s and concerns for individual rights were secondary to and viewed in light of how affording such rights benefited society or at least preserved and protected the lifestyle of the majority of citizens. Sutton goes on to explain, "...for the country to remain competitive and retain the quality of life enjoyed by the predominately White middle class, the education system had to be reformed, and this reform had to focus on technological skills for all students. Thus, for reasons of self-interest, attention had to be paid to the school computer use of poor, minority, and female students" (p. 476).

The implication here is not that studies following the pivotal work of 1966 yielded no useful or valuable information. Evidence to the contrary is exemplified in the efforts of Becker and Sterling (1987). Using survey data from a stratified sample of 2,331 public and nonpublic elementary and secondary schools, these researchers verified inequalities in computer use and access both by race and socio-economic status. They conclude, "Black elementary school students in 1985 were less likely to attend schools with computers, and blacks of all ages attend schools with fewer computer-using teachers than do

whites. Socio-economic status and achievement differences between schools account for other differences in access and use of computers by students" (p.310). However, what this and other studies of the era do not provide is a framework for interpreting the data in terms of individual rights in a democratic society. If Sutton's assessment is correct, the reason such a framework was missing was due to the emphasis or focus on creating a work force that would stand up to international competition. Her assessment was upheld in light of the research concerns and concluding remarks of Becker and Sterling. These authors brought attention to problems related to how computers were used in schools and the possible benefits such use might bring to individuals entering the work force at some future time. While considerations regarding success in the marketplace and in modern society were shared by those investigating equality of opportunities in the 1960s, these considerations were aspects of the larger issue under study and did not take precedence over this greater concern for equality. Equality was not the primary research concern of Becker and Sterling (1987) and perhaps this fact is most clearly illustrated in their concluding remarks. "Before testifying to the inequity of some youngsters getting little or no exposure to computers in school, we should learn whether computer instruction produces the desired results to warrant diverting resources from other school programs.... The case for broadening access to school computers now rests on untested assumptions about benefits such as future job opportunities" (p. 310).

Using survey data collected four years later, Becker (1992) again offers valuable information concerning the status of equality of computer access and use in public schools. He finds that "...U.S. schools in poor districts or schools with a majority-black student enrollment have 10 to 12 percent fewer computers than other schools.... Even more significantly, perhaps, a 1989 Center for Social Organization of Schools survey of school computer coordinators found that only half as many elementary teachers in poor district/majority-black schools were judged to be 'expert in using instructional software' as in other elementary schools" (p. 17). These inequalities notwithstanding, Becker's primary concern was how computer and information technology was used by students and teachers and the overall lack of a critical mass of technology in schools to support learning and teaching. While he calls for an of examination computer uses in varying school populations, his focus in this 1992 writing was the failure of schools to

seamlessly integrate technology into classroom teaching and learning activities and the failure of teachers overall to display computer using skills. Concerning the issue of the unequal number of 'exemplary' teachers found in predominately Black compared to predominately White school populations versus the issue of the overall low percentages of 'exemplary' teachers found system wide, he questions, "[i]sn't it more important to be concerned that the overall percentages are so low?" (p. 18). Becker ends this short position paper on equity by calling for more research on the benefits of using technology in teaching and learning. Along those lines, "Equity and the Big Picture" concludes with the statement, "...the most important issue confronting the technology advocacy community is to demonstrate--with the kind of strong evidence that would convince a skeptical audience--that these exciting media do have important consequences for student competencies when they are intelligently used in schools" (p. 18).

In contrast, concerns for individual rights, prompted by the Civil Rights Act, underscored the EEO study. While this study looked at how the individual student would fit in and contribute to modern society, the focus was on well-being of the individual or group of individuals. This research perspective is articulated in the introductory statements concerning the EEO survey. "In view of the fundamental significance of education opportunity to many important social issues today, Congress requested the survey of educational opportunity reported in this document. The survey is, of course, only one small part of extensive and varied activities which numerous institutions and persons are pursuing in an effort to understand the critical factors relating to the education of minority children and hence to build a sound basis for recommendations for improving their education" (Coleman, 1966, p. 1). EEO researchers operated from the premise that textbooks, laboratories, libraries and other resources of the decade had important consequences for learning and therefore equal distribution of resources was the paramount researchable issue. Such a difference in perspective and motivation is enough to explain why the research of the 1980s fails to present similar data in the same analytical framework as that of the 1960s. A different dialogue takes place when speaking of individual empowerment versus betterment of the society at large.

The Equality of Opportunity Report and the Current Research

Research Perspective

The research studies of Becker and Sterling (1987) and Becker (1992) discussed above are among the few available in which national survey data is used to look at issues of equality of educational technology resources. As pointed out, the research and writings are significantly different from the 1966 work in which equality is indeed the central focus and the important concern and individual rights to equalities are compelling considerations. Similarly, the current research operates from the premise that computer and information technologies contribute to teaching and learning and the important issue is the equal distribution of these resources. Moreover, in a time when decisions are being made nationally concerning electronic communications access, it is important to assess the situation to make educated recommendations to decision and policy makers.

Consequently, though the Equality of Educational Opportunity report is now dated, much can be learned by examining its contents. The EEO report summarizes the results of the EEO survey and addresses many of the same issues that continue to plague educators today. Indeed, the educational tools have changed but the question of whether equal educational opportunity is afforded all American children remains with us. Perhaps this question remains more than three decades hence because many fear the answer remains unchanged. A brief analysis of how researchers in the 1960s tackled such a complex issue and reached their conclusions informs the current research.

Criteria

In determining equal educational opportunity, researchers must outline the criteria used to measure this elusive construct. Typically, various aspects of school characteristics are used. For example, in the Equality of Educational Opportunity study of 1966 characteristics "such as numbers of laboratories, textbooks, libraries...curriculums offered...academic practices...characteristics of teachers..." were used to compare schools (Coleman, 1966, p. iii). Student characteristics such as socio-economic backgrounds,

educational background of parents, and student attitudes and motivation also are used as criteria as well as student achievement as measured by some type of standardized test.

Current surveys concerned with assessing the availability of resources in American schools, also collect similar information which can be used to determine equality of educational opportunity. The Advanced Telecommunications in US Public Elementary and Secondary Schools, 1995 survey (National Center for Education Statistics, 1996) "... requested information regarding the types of advanced telecommunications equipment and services that are currently available in public schools and the specific locations of the equipment; current computer networking capabilities in public schools; the number of schools that have plans to connect to wide area networks; the formal role groups have in developing telecommunications plans; and the various barriers that limit schools' acquisition or use of advanced telecommunications" (p. 1). Information regarding the size of enrollment, metropolitan status, geographic region, percent minority enrollment and percent receiving reduced or free lunches was also obtained. Such information can be used to determine the parity of electronic educational resources and thus the equality of educational opportunities across US schools in the 21st century.

Instructional Materials, Laboratories and Microworlds

The 1966 researchers found that Black students often had equal or better access to some educational resources or facilities. What they found, however, was that when equality or advantage occurred it was related to resources having little to do with learning or educational achievement. For example, Black students typically had better access to cafeterias in the 1960s. EEO researchers reported, "...minorities are not at a disadvantage in every item listed--but that there are nevertheless some definite and systematic directions of differences. Nationally, Negro pupils have fewer of some of the facilities that seem most related to academic achievement: They have less access to physics, chemistry, and language laboratories; there are fewer books per pupil in their libraries; their textbooks are less often in sufficient supply" (Coleman, 1966, p. 9).

Because Internet access provides connections to informational servers covering a vast array of subject areas, it is just as important to determine the equality of this access in the 1990s as it was to ascertain the level of textbook supplies in the 1960s. Furthermore, educators believe the use of electronic tools enhances learning. Honey and Henriquez (1993) surveyed elementary and secondary teachers experienced in the use of telecommunications technologies. Their respondents indicated that "...one of the most important benefits of using this technology for instructional purposes is its impact on their students' higher order thinking skills, suggesting that inquiry-based analytical skills like critical thinking, data analysis, problem solving, and independent thinking--develop when students use technology that supports research, communication and analysis" (p. 20). Rudenstine (1997), president of Harvard University, views the Internet as technology capable of enhancing learning using various pedagogies and instructional methodologies. He states, "...the Internet holds the potential to be an exceptionally fine tool for creating densely woven, unusually engaging, and highly demanding new course materials. Such materials are rooted in traditional forms of pedagogy, yet are enhanced by the new technologies" (p. A48). Concerning student-centered teaching methodologies, he states, "[t]he Internet dovetails with this vision of learning. It calls upon the user to be active and engaged--following leads, distinguishing the substantial from the trivial, synthesizing insights drawn from different sources" (p. A48).

The level of Internet access is also of significance. Modem access allows for transmission of a great deal of information but generally only in text or ASCII format if not augmented by SLIP/PPP or ISDN connections. In addition, the speed of the modem determines the speed of information transmission. Such restrictions could conceivably affect the level of student interest, motivation and productivity. SLIP/PPP access, on the other hand, allows for transmission of information in a variety of forms including text, graphics, and motion. Resources in these formats are available and accessible on World Wide Web (WWW) Internet servers. It is then possible to deliver simulated complex scientific processes to the student's desktop or create virtual laboratories with the appropriate software, hardware and communications networking (Owston, 1997; Dede, 1995).

Owston (1997) observed that "[a]n inviting, graphical screen layout, interactive multimedia learning materials, simplified access to and searching of databases, exponential growth of new resources around the world, and open technical standards that allow any modern computer access the Web are some of the advantages institutions see in the Web to make learning more accessible" (p.17). More directly related to improved learning, Owston outlines advantages of using WWW materials in elementary and secondary school learning environments. Whereas the medium or technology does not inherently spawn academic gains, Owston contends that this computer telecommunications-based tool has the advantage of appeal and flexibility.

Distributing virtual or synthetic environments to multi-users using wide-area computer networking is of particular interest to futuristic educators. Concerning the consequences for student competencies, Dede (1995) states, "[t]he key capabilities that distributed synthetic environments for learning add to current educational media are: --telepresence via avatars (perceived simultaneous presence in a virtual environment by geographically separated learners and --immersion (the subjective impression that a user is participating in a 'world' comprehensive and realistic enough to induce the willing suspension of disbelief)" (p. 49). He contends that telepresence and immersion simultaneously aid in learning by presenting new possibilities for collaborative, cooperative learning and by presenting difficult concepts for which students hold misconceptions or have no real life experiences in which to relate the concepts. Summing up these advantages, Dede states, "[t]hrough distributed simulation approaches, we can support shared interaction in a distributed virtual reality--even across merely moderate-bandwidth networks, such as the Internet--thus enabling telepresence and collaboration among learners' avatars" (p. 51). Because of the educational potentials and advantages offered by the Internet and the World Wide Web, the equality of electronic and telecommunications technology distribution is relevant to educational opportunities.

Teacher Preparation

Teacher preparation, certification, and other criteria used to determine capability were examined in efforts to ascertain equality of educational opportunity in the 1960s. The EEO report revealed that "[t]he average Negro pupil attends a school where a greater percentage of the teachers appears to be somewhat less able ...than those in the schools attended by the average white student" (p.12).

Teacher preparation and certification takes a different slant as computer technology is increasingly present in the classroom and used in learning and teaching a variety of subjects--from math and science to reading and language arts. The ability of a teacher to function in a technology-rich classroom and instructional environment depends to a large extent on his or her ability to model technology use in learning. In many cases, the presence of computer technologies in classrooms has served to support student-centered learning and altered the dynamics of the environment. The Apple Classrooms of Tomorrow (ACOT) are examples of such altered environments. "The teacher isn't merely a gatekeeper; he or she is an orchestrator of activity and will greatly influence how technology fits into the classroom" (Reilly, 1996, p. 207).

The importance of inservice teachers having skills related to technology use and technology integration into instruction is reflected in today's national standards guiding preservice teacher programs. Both the International Society for Technology in Education (ISTE) and the National Council for Accreditation of Teacher Education (NCATE) have been active and center stage in setting such standards and guidelines for directing "...the inclusion of needed technology experiences within teacher education programs" (Handler, 1997 p. 16). Furthermore, in order to assure that inservice K-12 teachers receive the needed experiences during their preservice education, all faculty in teacher education programs must possess technology skills and be able to model its use. The program at Iowa State University described by Thompson, Schmidt and Hadjiyianni (1995) is an example of one that attempts "...to address the need for faculty integration of technology into teaching..." and the need to create "...models for educating faculty and successfully infusing technology throughout the curriculum..." (p. 14). Thompson et al., outlined the labor-intensive, technology infusion activities that took place over a three year period with the

administrative support of the Department of Curriculum and Instruction and the College of Education. Consequently, the efforts of respected organizations such as ISTE and NCATE as well as those of esteemed educational institutions across the country lead one to conclude that professional educators believe technology can enhance learning and the use of technology in teaching is at least one measure of the teacher's ability.

The telecommunications data used in the current study allow for analysis of an aspect of teacher preparation or ability. The percentage of teachers that actually use the available Internet access within the schools may reflect a measure of their experience and technology-related skills. Administrative use of available Internet access may be an indirect indication of teachers' ability in that Becker (1994) observed that exemplary computer-using teachers were often found in schools where there was strong administrative support of technology use in education.

Success in Society

The EEO report points out that achievement tests measure a student's potential for success in society and not intelligence or character attributes. The fact that the tests are culturally biased is believed to contribute to their ability to predict success in certain cultures. EEO researchers found that the Black child fell further and further behind the White child in achievement test performance as they advanced through the school grades. This indicates that Blacks became increasingly less able to assume productive roles in the greater society as they moved through the public educational system. The report states, "...the deficiency of achievement is progressively greater for the minority pupils at progressively higher grade levels. For most minority groups, then, and most particularly, the Negro, schools provide little opportunity for them to overcome this initial deficiency; in fact they fall farther behind the white majority in the development of several skills which are critical to making a living and participating fully in modern society" (Coleman, 1966, p. 21).

Many aspects of American society, including education and the workplace, have taken on a global nature resulting from the advent and influence of emerging computer, information, and

telecommunications technologies. Of these advancements, Fisher et al. (1996) state, "[o]ver a remarkably short period of time, digital technologies and all that they have spawned--a transformation of the workplace, introduction of multimedia to offices and homes, a veritable revolution in local and global communications--are inexorably changing our perceptions of time, place, and knowledge itself" (p. xv). Therefore providing equal or unequal access to these technologies could arguably affect the level and quality of participation in the general society by the student. Schools with Internet access have the ability to communicate and share information and resources with students, teachers and administrators regardless of geographical location. These same technologies are mirrored in the workplace as industries use them to facilitate the expansion of markets and exchange information and resources with collaborating teams of employees or partners. A student having experienced global learning environments as well as leading technologies should find smooth transitions into a similar workplace using familiar tools. More importantly, because new technologies have the potential of altering the ways in which students learn and view themselves in the learning process, exposure to these technologies can prepare students for life long learning and personal fulfillment in an information-based society supported by these technologies.

Reflecting on the impact computers had upon students in the Apple Classrooms of Tomorrow Project, Tierney (1996) states, "...technology has become woven into the fabric of who they were and what they do both individually and within their classrooms, schools, and wider communities. Technology has played an important role in how these students view themselves, the roles they assume in their various communities, and the cultural practices they have come to value" (p. 169). Today's researcher can use variables related to computer use and access in making predictions regarding success in society that were previously forecast from achievement measures. Analyses of differences, by race and socio-economic status, in the number of instructional rooms connected to the Internet as well as the percentages of students using available Internet access have promise for making such predictions.

Purpose of the Current Study

Those concerned about equality of educational opportunities can no longer wait for more proof that technology access and use have benefits related to learning, from a cognitive standpoint, as well as benefits for assuming roles in the greater society. While waiting on consensus among educators based upon irrefutable research evidence, our constituents are at risk of getting further behind those who have greater access to the technologies and the unfair advantage both in school and later in the marketplace. We must infer from the extensive efforts of ISTE and NCATE and the intervention actions of respected teacher education institutions that professional educators believe technology use in education is indeed beneficial to teaching and learning. If we accept the views of esteemed educators (e.g., Dede, 1995, Rudenstine, 1997) that computer and telecommunications technology tools support education in positive ways, we then are deeply concerned about the unequal access that continues to exist in U.S. public schools.

The aim of the current study is to analyze telecommunications data in the framework of individual rights to equal educational opportunities, therefore, much is drawn from the Equality of Educational Opportunity report of 1966, the most recent model for such analysis. With this in mind, 1995 telecommunications data collected by the National Center of Education Statistics is examined to determine if there are significant differences in access and use of electronic network access between schools based upon racial or socio-economic student enrollments. It is hoped that such an analysis will provide a 'snapshot' picture of the equality of available educational opportunities as measured by access to technologies important to this age.

Research Questions, Hypotheses, Expected Outcomes

As stated earlier, the current research is informed by the findings of 1966 and therefore the research questions and hypotheses are framed according to and influenced by the earlier findings. Though expected outcomes are typically implied in the hypotheses and the directions of the applied statistical tests, they are made explicit here. In the current research, the data does not lend itself to directional tests and

the variables studied lack the long research history that makes expected outcomes obvious to the reader. It seems particularly necessary when examining variables associated with type of Internet access to point out which types of access are expected, for example, in schools with predominately White enrollments or student bodies of high socio-economic status. These expected outcomes are based upon the preferred type of access and the findings of the EEO study concerning preferred educational resources of that era.

Presence and Absence of Internet Access.

The first variable examined relates to the existence of a connection to a specific wide-area network, the Internet, within the schools in the sample. The Internet is defined by the NCES as "...a network of networks all running the TCP/IP protocols, sharing the same underlying network address space as well as the same domain name space, and interconnected into a network of information" (National Center for Education Statistics, 1995, p. 47).

Questions Does school minority enrollment level relate to the presence or absence of Internet access within the school? Does the percentage of the school student body that is eligible for free or reduced lunches relate to the presence or absence of Internet access within the school?

Hypotheses The presence and absence of school Internet access is dependent on school minority enrollment percentage. The presence and absence of Internet access within the school is dependent on the percent of the student body that is eligible for free or reduced lunches.

Expected Outcomes It is expected that schools with low levels of minority enrollment will have access to the Internet whereas schools with high levels of minority enrollment will not have Internet access. It is also expected that schools with low percentages of student body eligibility for reduced or free lunches will have Internet access but schools with high eligibility will have no Internet access.

Type of Internet Access.

Only schools reporting current Internet access were used to analyze this variable, type of Internet access. Respondents indicated whether the school's Internet access included modem, SLIP/PPP, 56Kb, T1

and ISDN. NCES defines modem as "...a device which connects between a computer and a phone line to translate between the digital signal of the computer and the analog signal required for telephone transmission"; SLIP as "...(Serial Line Internet Protocol)...a protocol that allows a computer to use TCP/IP (Internet) protocol using serial lines such as dial up telephone lines"; PPP as "...(Point to Point Protocol)...a protocol that allows a computer to use TCP/IP (Internet) protocols (and become a full-fledged Internet member) with a standard telephone line and a high speed modem"; 56Kb as "...a digital transmission speed of 56 Kilo (thousand) bits per second"; T1 rate as "...a digital transmission speed of 1.544 Mega (million) bits per second; ISDN as "...(Integrated Services Digital Network)...data communication that integrates voice and data" (National Center for Education Statistics, 1995, p. 47-48).

Questions For schools having Internet access, does minority enrollment relate to the type of access that is present? Does minority enrollment relate to the presence of fast/slow and high/low levels of Internet access? For schools having Internet access, does percentage of free or reduced lunch eligibility relate to the type of access that is present? Does free or reduced lunch eligibility relate to the presence of fast/slow and high/low levels of Internet access?

Hypotheses In schools with Internet access, the presence and absence of modem, SLIP/PPP, 56Kb, T1, and ISDN Internet access are each dependent on school minority enrollment levels. In schools with Internet access, the presence and absence of modem, SLIP/PPP, 56Kb, T1, and ISDN Internet access are each dependent on free or reduced lunch eligibility levels.

Expected Outcomes It is expected that schools with low levels of minority enrollments will have faster and higher level types of access (SLIP/PPP, T1, 56Kb and ISDN) whereas the schools with high levels of minority enrollments will have slower and lower level types of access (modem). Along the same lines, it is expected that schools with low levels of free or reduced lunch eligibility within the student body will have faster and higher level types of access whereas schools with high eligibility levels will have slower and lower level access.

Number of School Computers with Internet Access.

Only school computers with Internet connections and access are counted for analysis of this variable. Respondents estimated the number of computers present by indicating a range of numbers (e.g., 2-5 or 6-9).

Questions For schools with Internet access, do school minority enrollment levels relate to the number of computers within the schools that have Internet connections? For schools with Internet access, do reduced or free lunch eligibility levels relate to the number of computers within the schools that have Internet connections?

Hypotheses In schools with Internet access, the number of computers with Internet connections is dependent on the levels of minority enrollments in the schools. In schools with Internet access, the number of computers with Internet connections is dependent on the level of student body eligibility for free or reduced lunches.

Expected Outcomes It is expected that schools with low levels of minority enrollments will have larger numbers of computers connected to the Internet whereas schools with high minority enrollments will have smaller numbers. It is also expected that schools with low student body eligibility for reduced or free lunches will have larger numbers of computers connected to the Internet whereas schools with high eligibility levels will have smaller numbers of Internet connected computers.

Number of Instructional Rooms with Internet Access.

Only instructional rooms with Internet-connected computers are considered in the analysis of this variable. NCES define instructional rooms as "...rooms in the school building used for any instructional purposes (includes classrooms, labs, media centers, art rooms, rooms used for vocational or special education, etc.)" (National Center for Education Statistics, 1995, p. 47).

Questions For schools with Internet access, does percent of minority enrollment relate to the number of instructional rooms within the schools that have Internet connections? For schools with

Internet access, does percent of student body eligibility for reduced or free lunches relate to the number of instructional rooms within the schools that have Internet connections?

Hypotheses In schools with Internet access, the number of instructional rooms having computers with Internet connections is dependent on the level minority enrollment. In schools with Internet access, the number of instructional rooms having computers with Internet connections is dependent on the level of student body eligibility for free or reduced lunches.

Expected Outcomes It is expected that schools with low minority enrollment levels will have large numbers of instructional rooms with Internet connections while schools with high minority enrollments will have small numbers of Internet connected instructional rooms. Similarly, it is expected that schools with low student body reduced or free lunch eligibility levels will have large numbers of instructional rooms with Internet connections while those with low eligibility levels will have small numbers of Internet connected instructional rooms.

School Community Use of the Internet.

School community use of the Internet actually includes three separate variables; administrative, teacher and student use of the Internet. Respondents reported either no use, use to a small extent or use to a moderate or large extent.

Questions For schools with Internet access, does percent of minority enrollment relate to administrative, teacher and student use of the access? For schools with Internet access, does percent of student body eligibility for reduced or free lunches relate to administrative, teacher and/or student use of the access?

Hypotheses In schools with Internet access, the degree of administrative, teacher and student use of the Internet access are each dependent on the percent of school minority enrollment. In schools with Internet access, the degree of administrative, teacher and student use of the Internet access are each dependent on the percent of student body eligibility for reduced or free lunches.

Expected Outcomes It is expected that schools with low minority enrollment levels will have high degrees of administrative, teacher and student use of the Internet while those with high percentages of minority enrollment will have low degrees of administrative, teacher and student Internet use. By the same token, it is expected that schools with low reduced or free lunch eligibility will have high administrative, teacher and student Internet use whereas schools with high eligibility will have reduced use of the available Internet access

Plans for Internet Access.

Only schools that reported having no current Internet access were used to analyze this variable. Respondents indicated whether these schools had plans for securing Internet access in the future.

Questions For schools without Internet access, does the level of minority enrollment relate to the presence or absence of plans for obtaining access? For schools without Internet access, does the level of student body eligibility for free or reduced lunches relate to the presence or absence of plans for obtaining access?

Hypotheses In schools without Internet access, presence and absence of plans for obtaining access is dependent on the level of minority enrollment. In schools without Internet access, presence and absence of plans for obtaining access is dependent on the level of student body eligibility for free or reduced lunches.

Expected Outcomes It is expected that schools with low levels of minority enrollments and no current access will have plans for obtaining access whereas schools with high levels of minority enrollment will have no plans. It is also expected that schools with low student body percentages of eligibility for free or reduced lunches and no Internet access will have plans for securing access while schools with high eligibility will have no plans for obtaining access.

Methodology

Survey Instrument, Sample, and Data

The data used in this current study were collected for the National Center for Education Statistics (NCES) and published in the form of E.D. TAB, "...a collection of tables whose sole purpose is to make data or tables available to the general and research public quickly." (National Center for Education Statistics, 1996, p. 1). The survey instrument is published as an appendix to this E.D. TAB publication (p. 61-67). "The data were gathered from a nationally representative sample of 917 public elementary and secondary schools in fall 1995" (p. 5).

The current research used only the data reported for minority enrollments and percent eligibility for reduced or free lunches. The assumption is that minority enrollment percentages indicate the racial makeup of the schools in the sample. Those with low minority enrollments are presumed to have predominately White students. Similarly, the percentages of student body eligibility for reduced or free lunches are assumed to give an indication of the socio-economic make-up of the schools. Schools with low eligibility percentages are assumed to represent high socio-economic student bodies.

The stratified sample was derived from a large database of public school information maintained by the National Center for Education Statistics. The fact that the data were available to the researcher in summarized tabular form in some ways limited analysis. For example, there were no means of determining which schools with high 'minority' enrollments also have students predominantly of low-socio-economic status. Using regression analysis to determine which variables were better predictors of presence, absence and types of access was prevented because of the lack of easy access to the raw data. The researcher also assumes that 'minority' includes races or ethnic identities other than the White race. Such a clumping of data could be responsible for some of the unexpected outcomes. If one thinks of 'minority' as historically underserved impoverished races, such as Black Americans, it is difficult to explain why results for schools with predominantly low socio-economic student enrollments would not be the same as results for schools with high minority enrollments. The data used in the 1966 Equality of

Educational Opportunity Report did not have this limitation because statistics were available for several races.

Analysis

Percentage to Frequency Count Conversion

The NCES survey results were summarized and reported in tabular form primarily in terms of percentages. For example, this NCES publication shows that 48% of schools with less than 6% minority enrollment have no form of Internet access. In order to perform the chi-square test of independence for the current study, the percentage was converted into a frequency count. Since 266 schools with less than 6% minority enrollment responded to the survey, the frequency count of schools in this category reporting the absence of Internet access converts to 128 (48% of 266). In this particular instance, the percentage of schools with some form of Internet access was not explicitly stated. In such a case, the frequency count for the presence of access was simply calculated by subtracting the count for no access from the total sample number in that category (266 - 128 = 138).

Mutual Exclusiveness

In cases where percentages across the NCES tables sum to 100 percent for schools with a particular characteristic (i.e. less than 6% minority enrollment) the implication is that a chi-square statistic can test for independence of the variables represented by the table cells. In such cases, the table cells are mutually exclusive--an underlying assumption of the chi-square test. Table 6 in the NCES document reports the number of instructional rooms with Internet connections within those schools reporting access and is an example of mutually exclusive cells. The percentage reported for '0 rooms' with access is not included in the percentage reported for '1 room' or '2-3 rooms' and so on. Because the assumption of exclusiveness is not violated, one chi-square test was conducted to test independence of these variables and presented in Table 4a of the current research.

On the other hand, when percentages across individual NCES tables do not sum to 100 percent for schools with a particular characteristic, the variables represented by the table cells cannot be tested against each other without violating the assumption of exclusiveness for the chi-square statistic. For example, the NCES Table 10 reports the type of access available to those schools with current Internet connections. In this table, schools reporting modem access may also report SLIP/PPP access. For this reason chi-square tests were conducted against each type of access rather than testing independence of all types of access in one test. For instance, in the case of schools with less than 6% minority enrollment, 75% reported having modem access therefore the implication is that 25% had no modem access. For the current research, conversions for frequency counts were made and a chi-square test conducted for each type of access (modem, SLIP/PPP, 56Kb, T1, and ISDN) by school characteristics (minority enrollment and free or reduced lunch eligibility levels).

Results

Presence and Absence of Internet Access.

Minority Enrollment Chi-square tests of independence upheld the research hypothesis and verified that school computer access to the Internet is dependent on the minority enrollment percentage within the school. The number of schools represented in each level of minority enrollment is shown in Table 1 and the statistical outcomes are in Table 1a. The total chi-square value for minority enrollment and Internet access is significant at $p < .05$. Further analysis indicates that schools with fifty percent or greater levels of minority enrollment contributed to a large extent to the total chi-square. The standardized residuals (O-E/sqrt(E)) for this level of minority enrollment and access versus no access are 2.16 and 2.22 respectively. Residuals greater than 2.00 indicate major contributions to the chi-square value from the categories in question (Hinkle et al., 1994). Examining the observed frequency and expected value tables reveals that observed access to the Internet was less than expected for schools with fifty percent or greater

minority enrollment. The reverse is true for absence of access for this group of schools, whereby observed absence was greater than expected.

Reduced/Free Lunch Eligibility Chi-square tests of independence verified that school computer access to the Internet is dependent on the percentage of student body eligibility for reduced or free lunches. The number of schools represented in each level of eligibility is shown in Table 1 and the statistical outcomes related to Internet access are in Table 1b. The total chi-square value for eligibility and access is well above the critical value thus yielding significance at $p < .05$. The cells for the lowest and highest percentages level of eligibility, for access as well as no access, are the major contributors to this chi-square. The largest standardized residuals are for seventy-one percent or more level with 3.4 for access and 3.47 for no access. The observed frequency and expected value tables reveal that for schools with seventy-one percent or more of the student body eligible for reduced or free lunches, the observed access to the Internet is less than expected whereas the observed absence of access is more than expected. The residuals for schools with less than eleven percent eligibility are 2.01 for access to the Internet and 2.05 for absence of access. The observed and expected values have the reverse relationship than found in the seventy-one percent or greater level. Here the observed access to the Internet is more than expected and the observed absence of access is less than expected.

Type of Internet Access.

Minority Enrollment Of the schools having access to the Internet, it was determined that, for the most part, the type of access is independent of the percentage of minority enrollment. The one exception is that of modem access dependence upon minority enrollment levels. The standardized residual of 2.08, in this case, points to the '21-49% / no modem' as the major contributing cell. Table $2a_1$ shows that absence of modem access is less than expected for schools with twenty-one to forty-nine percent enrollments. Chi-square values for SLIP/PPP, 56Kb, and T1 types of access were not significant at $p < .05$ (see Tables $2a_2$, $2a_3$, and $2a_4$). In the case of ISDN type of access, the expected frequencies for more than 20% of the cells are below 5, indicating a significant lack of continuity in the chi-square distribution. In

such cases the chi-square test is not recommended (Hinkle et al., 1994, p. 550) but the observed and expected frequencies are shown in Table $2a_5$.

Reduced/Free Lunch Eligibility Chi-square tests concerning type of access to the Internet, for schools currently connected, determined that modem, SLIPP/PPP, and 56Kb access are dependent on the percentage of reduced or free lunch eligibility. These access types show significance at $p < .05$ and the results are presented in Table $2b_1$ (modem), Table $2b_2$ (SLIP/PPP), and Table $2b_3$ (56Kb). In the case of modem access, the cell contributing most to the significant chi-square value is '31-70%'/no modem' with a residual of 2.67. For schools with 31-70% of their student bodies eligible for reduced or free lunches, the observed absence of modem access was less than expected.

The standardized residuals for SLIP/PPP access were all below 2.00 so no specific cells are identified as major contributors to chi-square significance. Examination of the observed frequency and expected value tables reveal that schools with low eligibility percentages had greater SLIP/PPP access than expected whereas as schools with high eligibility percentages had less SLIP/PPP access than expected. The reverse is true for absence of SLIP/PPP access wherein low eligibility schools had less absence of SLIP/PPP access than expected and high eligibility schools had more than expected.

The residual for '< 11%/56kp' cell is 2.35 indicating that it is the major contributor in verifying the dependence of 56Kb access and percentage of reduced or free lunch eligibility. In schools with less than eleven percent eligibility, 56Kb access was greater than expected.

The chi-square test demonstrated, however, that T1 type of access is independent of eligibility percentage (see Table $2b_4$). For ISDN type of access, low expected frequencies indicated a significant lack of continuity in the chi-square distribution, therefore, the chi-square test was not conducted (Hinkle et al., 1994, p. 550). The observed and expected frequencies for ISDN access are shown in Table $2b_5$.

Number of School Computers and Number of Instructional Rooms with Internet Access.

Minority Enrollment Table 3a shows chi-square results demonstrating that percent of minority enrollment is independent of the number of computers connected to the Internet within the schools.

However, the chi square value for percent of minority enrollment and the number of instructional rooms with Internet access shows significance at $p < .05$. The results of this 4 X 5 test of independence are presented in Table 4a. Further analysis reveals the '<6% / zero rooms' cell, with a standardized residual of 2.33, as contributing to the verification of dependence between enrollment and classroom Internet access. The observed number of schools with six percent or less minority enrollment and no instructional classrooms with Internet access was greater than expected.

Reduced/Free Lunch Eligibility Results presented in Table 3b demonstrates that reduced or free lunch eligibility is independent of the number of computers connected to the Internet within the schools. Likewise, Table 4b demonstrates that reduced or free lunch eligibility is independent of the number of instructional rooms with Internet access.

School Community Use of the Internet.

Minority Enrollment Results of independence between administrative, teacher, and student use of computer Internet access and percent of minority enrollment are reported in Tables $5a_1$, Table $5a_2$ and Table $5a_3$ respectively. Again, only schools with current access were considered. Chi-square tests failed to verify dependence of either administrative or student use of access and enrollment. On the other hand, the total chi-square value for teacher use of Internet access and percent of minority enrollment is significant at $p < .05$. Examination of Table $5a_2$ shows that the largest contributor to this significance is the '< 6%/none' cell with a residual of 3.58. More schools with six percent or less minority enrollment reported that teachers have no use of Internet access than was statistically expected. Cells '6-20%/none' and '21-49%/none' were also major contributors to the significant chi-square value with residuals of 2.02 and 2.14. In these two instances, fewer schools than expected reported teachers with no use of available Internet access.

Reduced/Free Lunch Eligibility Results of independence between administrative, teacher, and student use of computer Internet access and percent of reduced or free lunch eligibility are reported in Tables $5b_1$, Table $5b_2$ and Table $5b_3$ respectively. Again, only schools with current access were considered.

Chi-square tests failed to verify dependence of either administrative or teacher use of access and eligibility however the total chi-square value for student use of Internet access and percent of eligibility is significant at $p < .05$. Examination of Table $5b_3$ shows that the largest contributor to this significance is the '< 31-70%/none' cell with a residual of 2.11. More schools with eligibility percentages between thirty-one and seventy reported that students have no use of Internet access than was statistically expected.

Plans for Internet Access.

Minority Enrollment Having plans to attain Internet access, for those schools where it is currently absent, is shown to be independent of percent of minority enrollment (Table 6a). Since the chi-square value for enrollment and planned access was not significant at $p < .05$, no further tests concerning the type of access planned were made.

Reduced/Free Lunch Eligibility Having plans to attain Internet access, for those schools where it is currently absent, is shown to be independent of percent of reduced or free lunch eligibility (Table 6b). Since the chi-square value for eligibility and planned access was not significant at $p < .05$, no further tests concerning the type of access planned were made.

Discussion

The results of this study strongly suggest that access to educational technologies are unequally distributed among schools of differing racial or socio-economic make-ups. Schools with predominately White students are more likely to have Internet access than schools with large numbers of students of other ethnic backgrounds. Along the same lines, students of high socio-economic status are more likely to have Internet access at their schools than students of low socio-economic status. These results are consistent with the findings of the Equality of Educational Opportunity study in that most Black students were also of low socio-economic status if measured by the percent of pupils eligible for free lunch programs (Coleman, 1966, p. 10-11). If access to the Internet is simply equated to the availability of

textbooks, this consistency in results is clearly demonstrated. "Availability of textbooks does show differences by race. At the elementary level, all of the minority groups attend schools with a greater lack of texts than whites in the same county. Only 84 percent of the Negro elementary pupils attend schools having enough texts, compared to 94 percent of the white pupils in the same counties" (p. 76).

Differences in the type of access available is more pronounced for socio-economic status than for racial identity. Results indicate that, for the most part, the higher the socio-economic status of the student body, the more likely the school will have higher levels and faster types of Internet access. Students of low socio-economic status are likely to have low-level, slow types of access that allow for transmission of textual information only. Such a discrepancy in access is viewed as unequal educational opportunity. The important implication is that, given the appropriate hardware and software, students of high socio-economic status can access graphics, simulations, motion picture and virtual reality environments that support learning via the Internet. These advanced technology learning environments can be equated to traditional school laboratories present in the 1960s. Using this analogy and still maintaining that most Black students were of low socio-economic status, the results from the current study are consistent with those of the EEO study. Just in terms of science facilities, "[t]he greatest difference, nationwide, exists for physics laboratories. Eighty percent of secondary school Negro students have physics laboratories as compared with 94 percent of white students" (p. 69). Furthermore, the findings of the current research regarding presence of Internet access and type of access are congruent with EEO claims that when facilities are related to learning then Black students are at a disadvantage when compared to White students. What the current study does not explain is why the results for schools with high 'minority' enrollments are not the same as for schools with student bodies of low socio-economic status when analyzing type of Internet access available.

Considering schools with current Internet access, the results suggest that schools of varying percentages of White students versus students of other ethnic and racial backgrounds have equal numbers of computers connected to the Internet. The same is true for schools with varying percentages of students of high versus low socio-economic status.

Equality is also suggested for schools that differ according to the socio-economic status of the student body when considering the number of Internet-connected instructional rooms available in the schools. The same can not be said for schools that differ according to the percentage of White students enrolled, however the direction of the inequality is not as expected or predicted. The schools in the sample with current Internet access and the highest percentages of White student enrollments were more likely to have no instructional rooms with Internet connections. The educational implication is that students attending predominately White schools will probably not have leading communications and informational technologies integrated into their daily studies or classroom work. This situation is also viewed as unequal educational opportunity. Using the same premise derived from the EEO report that White students have greater access to facilities associated with learning, this result was unexpected.

The results of the study indicate that equality exists, in most cases, concerning school community use of the Internet when considering percentage of White student enrollment or level of socio-economic status. There are two exceptions, however. Inequality is suggested for teacher use of the Internet and the percentage of White student enrollment versus students of other racial or ethnic backgrounds. Again the direction of the inequality is not as predicted. Teachers in schools with current Internet access and the highest percentages of White student enrollments were more likely to report no use of the access. The other exception to suggested equality in school community use of the Internet concerns student use and the socio-economic status of the student body. Here the inequality is in the direction predicted whereby students of lower socio-economic status are more likely to report no use or little use of the Internet access in their schools.

In the current study, Internet use is a measure of an aspect of teacher capability, certainly not capturing all facets of ability. Using this variable is validated by the emphasis placed upon technology infusion into teacher preparation programs by organizations such as NCATE and ISTE. The criteria used to gauge teacher ability in the EEO study also relate to certification and preparation requirements and guidelines of the era. Teacher characteristics used by EEO researchers included verbal score, highest

degree earned, years of experience, and salary. In addition, there appears to be no characteristic measured in the EEO study that reflects style of delivery, pedagogy or methodology (Coleman, 1966, p. 16).

There are several educational implications of the results related to school community use of Internet access. Teachers reporting no or little use of the Internet will unlikely facilitate students' use of information and communication technologies. Furthermore, the implication of teachers reporting little or no use of the Internet is that they are not using or integrating technology tools in the classroom nor are they incorporating related textual, graphical or simulated learning materials available on Internet servers into their lessons or learning environments. In terms of teacher ability, as indicated by use of Internet access in school, students attending predominately White schools have less able teachers. Such a result is contrary to what was reported in the 1966 EEO report in which White students are more likely to have able teachers (Coleman, 1966, p. 12, 16). It should be pointed out that Honey and Henriquez (1993) used a nation wide sample of educators who used telecommunications technologies in their teaching and the resulting data "...suggest that educators who are active users of telecommunications technology are also educators who are likely to integrate general tool based and multimedia applications into their teaching practices rather than relying on tutorial or drill and practice programs" (p. 23). However, slightly less than half of these teachers reported no access to the Internet and those with access seldom used it for student learning activities (p. 30). Since these were educators who actively used telecommunications technology in their teaching they obviously used networks outside the Internet and therefore obtained the more complex multimedia software from non-Internet servers. In the current study, if the teachers of the White students who reported no use of Internet access have at their disposal, like the teachers in the Honey and Henriquez study, the same level of telecommunication activities and computer resources as found on the Internet and incorporate them in their instruction then they are not necessarily less able teachers.

The educational implication of students reporting little or no use of the Internet is that they are not availing themselves of the informational and instructional Internet materials. In addition, these students are not using the technological tools that could make for smooth transitions from school into the

workplace and society in general. Students of low socio-economic status are disadvantaged in terms of use of technological tools and resources that enhance learning and/or prepares for future work in a modern society. Again assuming the Black student of the 1960s was also of low socio-economic status, this finding is consistent with the EEO report claiming that Black students fall behind their White counterparts "...in the development of several skills which are critical to making a living and participating fully in modern society" (Coleman, 1966, p. 21).

Conclusions

This study clearly demonstrates that, when measured by telecommunications distribution and use, inequalities in educational opportunities exist and most markedly among schools varying in the socio-economic status of the student bodies. As national initiatives focus upon providing every school in the United States with Internet access, as stated in the 1997 presidential inaugural address, it is important to understand where inequalities already exist and which types of schools need special attention. If the goal is to have every twelve-year old student logging on to the Internet by the year 2000, also stated in the same address, it is imperative to know which students are currently lagging behind concerning available Internet access and use of that access. This study is one step in making those determinations.

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Table 1. Responding Public Schools in Study Sample

	Number
Percent minority Enrollment	
Less than 6 percent	266
6 to 20 percent	219
21 to 49 percent	192
50 percent or more	194
Percent of students eligible for free or reduced-price school lunch	
Less than 11 percent	176
11 to 30 percent	184
31 to 70 percent	311
71 percent or more	143

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996. Statistic Tables by author.

Table 1a. Chi-Square Statistical Test

X: Minority Enrollment Y: Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	14.149

Observed Frequency Table

	access	no access	Totals
< 6%	138	128	266
6-20%	127	92	219
21-49%	104	88	192
50%+	78	116	194
Totals	447	424	871

Expected Values

	access	no access	Totals
< 6%	136.51	129.49	266
6-20%	112.39	106.61	219
21-49%	98.54	93.46	192
50%+	99.56	94.44	194
Totals	447	424	871

Residuals

	access	no access
< 6%	0.13	0.13
6-20%	1.38	1.41
21-49%	0.55	0.56
50%+	2.16	2.22

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table 1b. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y: Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	41.441

Observed Frequency Table

	access	no access	Totals
< 11%	109	67	176
11-30%	168	116	284
31-70%	146	165	311
71%+	44	99	143
Totals	467	447	914

Expected Values

	access	no access	Totals
< 11%	89.93	86.07	176
11-30%	145.11	138.89	284
31-70%	158.9	152.1	311
71%+	73.06	69.94	143
Totals	467	447	914

Residuals

	access	no access
< 11%	2.01	2.05
11-30%	1.9	1.94
31-70%	1.02	1.05
71%+	3.4	3.47

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table $2a_1$. Chi-Square Statistical Test

X: Minority Enrollment Y: Modem Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	8.877

Observed Frequency Table

	modem	no modem	Totals
< 6%	103.5	34.5	138
6-20%	101.6	25.4	127
21-49%	93.6	10.4	104
50%+	63.96	14.04	78
Totals	362.66	84.34	447

Expected Values

	modem	no modem	Totals
< 6%	111.96	26.04	138
6-20%	103.04	23.96	127
21-49%	84.38	19.62	104
50%+	63.28	14.72	78
Totals	362.66	84.34	447

Residuals

	modem	no modem
< 6%	0.8	1.66
6-20%	0.14	0.29
21-49%	1	2.08
50%+	0.08	0.18

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996. Statistic Tables by author.

Table $2a_2$. Chi-Square Statistical Test

X: Minority Enrollment Y: Slip/PPP Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	5.234

Observed Frequency Table

	slip/ppp	no slip/ppp	Totals
< 6%	38.64	99.36	138
6-20%	26.67	100.33	127
21-49%	21.84	82.16	104
50%+	11.7	66.3	78
Totals	98.85	348.15	447

Expected Values

	slip	no slip/ppp	Totals
< 6%	30.52	107.48	138
6-20%	28.08	98.92	127
21-49%	23	81	104
50%+	17.25	60.75	78
Totals	98.85	348.15	447

Residuals

	slip	no slip/ppp
< 6%	1.47	0.78
6-20%	0.27	0.14
21-49%	0.24	0.13
50%+	1.34	0.71

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996. Statistic Tables by author.

Table $2a_3$. Chi-Square Statistical Test

X: Minority Enrollment Y: 56Kb Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	3.849

Observed Frequency Table

	56Kb	no 56Kb	Totals
< 6%	19.32	118.68	138
6-20%	11.43	115.57	127
21-49%	8.32	95.68	104
50%+	5.46	72.54	78
Totals	44.53	402.47	447

Expected Values

	56Kb	no 56Kb	Totals
< 6%	13.75	124.25	138
6-20%	12.65	114.35	127
21-49%	10.36	93.64	104
50%+	7.77	70.23	78
Totals	44.53	402.47	447

Residuals

	56Kb	no 56Kb
< 6%	1.5	0.5
6-20%	0.34	0.11
21-49%	0.63	0.21
50%+	0.83	0.27

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996. Statistic Tables by author.

Table $2a_4$. Chi-Square Statistical Test

X: Minority Enrollment Y: T1 Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	1.01

Observed Frequency Table

	T1	no T1	Totals
< 6%	6.9	131.1	138
6-20%	10.16	116.84	127
21-49%	7.28	96.72	104
50%+	5.46	72.54	78
Totals	29.8	417.2	447

Expected Values

	T1	no T1	Totals
< 6%	9.2	128.8	138
6-20%	8.47	118.53	127
21-49%	6.93	97.07	104
50%+	5.2	72.8	78
Totals	29.8	417.2	447

Residuals

	T1	no T1
< 6%	0.76	0.2
6-20%	0.58	0.15
21-49%	0.13	0.03
50%+	0.11	0.03

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table $2a_5$. Observed and Expected Values

X: Minority Enrollment Y: ISDN Access to the Internet

Observed Frequency Table

	ISDN	no ISDN	Totals
< 6%	4.14	133.86	138
6-20%	1.27	125.73	127
21-49%	4.16	99.84	104
50%+	3.12	74.88	78
Totals	12.69	434.31	447

Expected Values

	ISDN	no ISDN	Totals
< 6%	3.92	134.08	138
6-20%	3.61	123.39	127
21-49%	2.95	101.05	104
50%+	2.21	75.79	78
Totals	12.69	434.31	447

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Tables by author.

Table $2b_1$. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y: Modem Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	13.527

Observed Frequency Table

	modem	no modem	Totals
< 11%	81.75	27.25	109
11-30%	126	42	168
31-70%	131.4	14.6	146
71%+	35.2	8.8	44
Totals	374.35	92.65	467

Expected Values

	modem	no modem	Totals
< 11%	87.37	21.63	109
11-30%	134.67	33.33	168
31-70%	117.03	28.97	146
71%+	35.27	8.73	44
Totals	374.34	92.66	467

Residuals

	modem	no modem
< 11%	0.6	1.21
11-30%	0.75	1.5
31-70%	1.33	2.67
71%+	0.01	0.02

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table $2b_2$. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y:Slip/PPP Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	9.57

Observed Frequency Table

	slip/ppp	no slip/ppp	Totals
< 11%	29.43	79.57	109
11-30%	48.72	119.28	168
31-70%	23.36	122.64	146
71%+	7.04	36.96	44
Totals	108.55	358.45	467

Expected Values

	slip	no slip/ppp	Totals
< 11%	25.34	83.66	109
11-30%	39.05	128.95	168
31-70%	33.94	112.06	146
71%+	10.23	33.77	44
Totals	108.56	358.44	467

Residuals

	slip	no slip/ppp
< 11%	0.81	0.45
11-30%	1.55	0.85
31-70%	1.81	0.1
71%+	0.1	0.55

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996. Statistic Tables by author.

Table $2b_3$. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y: 56Kb Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	8.925

Observed Frequency Table

	56Kb	no 56Kb	Totals
< 11%	19.62	89.38	109
11-30%	16.8	151.2	168
31-70%	10.22	135.78	146
71%+	3.08	40.92	44
Totals	49.72	417.28	467

Expected Values

	56Kb	no 56Kb	Totals
< 11%	11.61	97.39	109
11-30%	17.89	150.11	168
31-70%	15.54	130.46	146
71%+	4.68	39.32	44
Totals	49.72	417.28	467

Residuals

	56Kb	no 56Kb
< 11%	2.35	0.81
11-30%	0.26	0.09
31-70%	1.35	0.47
71%+	0.74	0.25

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table $2b_4$. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y: T1 Access to the Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	3.563

Observed Frequency Table

	T1	no T1	Totals
< 11%	6.54	102.46	109
11-30%	15.12	152.88	168
31-70%	5.84	140.16	146
71%+	3.96	40.04	44
Totals	31.46	435.54	467

Expected Values

	T1	no T1	Totals
< 11%	7.34	101.66	109
11-30%	11.32	156.68	168
31-70%	9.83	136.17	146
71%+	2.96	41.04	44
Totals	31.45	435.55	467

Residuals

	T1	no T1
< 11%	0.3	0.08
11-30%	1.13	0.3
31-70%	1.27	0.34
71%+	0.58	0.15

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table $2b_5$. Observed and Expected Values

X: Reduced/Free Lunch Eligibility Y: ISDN Access to the Internet

Observed Frequency Table

	ISDN	no ISDN	Totals
11-30%	1.68	166.32	168
31-70%	4.38	141.62	146
71%+	4.4	39.6	44
Totals	10.46	347.54	358

Expected Values

	ISDN	no ISDN	Totals
11-30%	4.91	163.09	168
31-70%	4.27	141.73	146
71%+	1.29	42.71	44
Totals	10.47	347.53	358

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Tables by author.

Table 3a. Chi-Square Statistical Test

X: Minority Enrollment Y: Number of Internet Connections

Summary Statistics

DF:	9
Critical Value .05:	16.919
Total Chi-Square:	15.733

Observed Frequency Table

	one	two-five	six-nine	ten+	Totals
< 6%	62.1	40.02	8.28	27.6	138
6-20%	31.75	53.34	8.89	33.02	127
21-49%	33.28	41.6	5.2	23.92	104
50%+	24.96	34.32	6.24	12.48	78
Totals	152.09	169.28	28.61	97.02	447

Expected Values

	one	two-five	six-nine	ten+	Totals
< 6%	46.95	52.26	8.83	29.96	138
6-20%	43.21	48.1	8.13	27.56	127
21-49%	35.39	39.38	6.66	22.57	104
50%+	26.54	29.54	4.99	16.93	78
Totals	152.09	169.28	28.61	97.02	447

Residuals

	one	two-five	six-nine	ten+
< 6%	2.21	1.69	0.19	0.43
6-20%	1.74	0.76	0.27	1.04
21-49%	0.35	0.35	0.56	0.28
50%+	0.31	0.88	0.56	1.08

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table 3b. Chi-Square Statistical Test

X:Reduced/Free Lunch Eligibility Y: Number of Internet Connections

Summary Statistics

DF:	9
Critical Value .05:	16.919
Total Chi-Square:	9.825

Observed Frequency Table

	one	two-five	six-nine	ten+	Totals
< 11%	31.61	41.42	6.54	29.43	109
11-30%	58.8	55.44	11.76	42	168
31-70%	58.4	58.4	7.3	21.9	146
71%+	14.08	18.92	1.76	9.24	44
Totals	162.89	174.18	27.36	102.57	467

Expected Values

	one	two-five	six-nine	ten+	Totals
< 11%	38.02	40.65	6.39	23.94	109
11-30%	58.6	62.66	9.84	36.9	168
31-70%	50.93	54.45	8.55	32.07	146
71%+	15.35	16.41	2.58	9.66	44
Totals	162.9	174.17	27.36	102.57	467

Residuals

	one	two-five	six-nine	ten+
< 11%	1.04	0.12	0.06	1.22
11-30%	0.03	0.91	0.61	0.84
31-70%	1.05	0.53	0.43	1.79
71%+	0.32	0.62	0.51	0.14

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table 4a. Chi-Square Statistical Test

X: Minority Enrollment Y: Number of Access Rooms

Summary Statistics

DF:	12
Critical Value .05:	21.026
Total Chi-Square:	21.155

Observed Frequency Table

	zero	one	two-three	four	five+	Totals
< 6%	16.56	59.34	34.5	4.14	24.84	139.38
6-20%	6.35	55.88	25.4	6.35	31.75	125.73
21-49%	2.08	49.92	24.96	6.24	20.8	104
50%+	5.46	39.78	23.4	0.78	8.58	78
Totals	30.45	204.92	108.26	17.51	85.97	416.66

Expected Values

	zero	one	two-three	four	five+	Totals
< 6%	9.4	63.26	33.42	5.41	26.54	128.63
6-20%	8.65	58.22	30.76	4.96	24.42	118.36
21-49%	7.08	47.68	25.19	4.07	20	96.94
50%+	5.31	35.76	18.89	3.05	15	72.7
Totals	30.44	204.92	108.26	17.49	85.96	416.63

Residuals

	zero	one	two-three	four	five+
< 6%	2.33	0.49	0.19	0.54	0.33
6-20%	0.78	0.31	0.96	0.61	1.48
21-49%	1.88	0.32	0.04	1.07	0.18
50%+	0.06	0.67	1.04	1.3	1.66

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996. Statistic Tables by author.

Table 4b. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y: Number of Access Rooms

Summary Statistics

DF:	12
Critical Value .05:	21.026
Total Chi-Square:	15.503

Observed Frequency Table

	zero	one	two-three	four	five+	Totals
< 11%	3.27	50.14	23.98	4.36	27.25	109
11-30%	8.4	75.6	40.32	6.72	36.96	168
31-70%	13.14	67.16	35.04	8.76	20.44	144.54
71%+	3.96	24.64	11	0.44	3.52	43.56
Totals	28.77	217.54	110.34	20.28	88.17	436.33

Expected Values

	zero	one	two-three	four	five+	Totals
< 11%	6.72	50.77	25.75	4.73	20.58	101.83
11-30%	10.35	78.26	39.69	7.3	31.72	156.97
31-70%	8.99	68.01	34.5	6.34	27.56	136.41
71%+	2.71	20.5	10.4	1.91	8.31	41.12
Totals	28.77	217.54	110.34	20.28	88.17	436.33

Residuals

	zero	one	two-three	four	five+
< 11%	1.33	0.09	0.35	0.17	1.47
11-30%	0.6	0.3	0.1	0.21	0.93
31-70%	1.38	0.1	0.09	0.96	1.36
71%+	0.76	0.91	0.19	1.06	1.66

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table $5a_1$. Chi-Square Statistical Test

X: Minority Enrollment Y: Administative Use of Access

Summary Statistics

DF:	6
Critical Value .05:	12.592
Total Chi-Square:	5.097

Observed Frequency Table

	none	small	large	Totals
< 6%	35.88	74.52	27.6	138
6-20%	30.48	68.58	27.94	127
21-49%	32.24	58.24	13.52	104
50%+	20.28	46.8	10.92	78
Totals	118.88	248.14	79.98	447

Expected Values

	none	small	large	Totals
< 6%	36.7	76.61	24.69	138
6-20%	33.78	70.5	22.72	127
21-49%	27.66	57.73	18.61	104
50%+	20.74	43.3	13.96	78
Totals	118.88	248.14	79.98	447

Residuals

	none	small	large
< 6%	0.13	0.24	0.58
6-20%	0.57	0.23	1.09
21-49%	0.87	0.07	1.18
50%+	0.1	0.53	0.81

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996. Statistic Tables by author.

Table $5a_2$. Chi-Square Statistical Test

X: Minority Enrollment Y: Teacher Use of Access

Summary Statistics

DF:	6
Critical Value .05:	12.592
Total Chi-Square:	29.012

Observed Frequency Table

	none	small	large	Totals
< 6%	28.98	73.14	35.88	138
6-20%	6.35	78.74	41.91	127
21-49%	4.16	76.96	22.88	104
50%+	9.36	44.46	24.18	78
Totals	48.85	273.3	124.85	447

Expected Values

	none	small	large	Totals
< 6%	15.08	84.37	38.55	138
6-20%	13.88	77.65	35.47	127
21-49%	11.37	63.59	29.04	104
50%+	8.52	47.69	21.79	78
Totals	48.85	273.3	124.85	447

Residuals

	none	small	large
< 6%	3.58	1.22	0.43
6-20%	2.02	0.12	1.08
21-49%	2.14	1.68	1.14
50%+	0.29	0.47	0.51

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table $5a_3$. Chi-Square Statistical Test

X: Minority Enrollment Y: Student Use of Access

Summary Statistics

DF:	6
Critical Value .05:	12.592
Total Chi-Square:	5.849

Observed Frequency Table

	none	small	large	Totals
< 6%	49.68	62.1	26.22	138
6-20%	31.75	63.5	31.75	127
21-49%	32.24	47.84	23.92	104
50%+	28.08	38.22	12.48	78.78
Totals	141.75	211.66	94.37	447.78

Expected Values

	none	small	large	Totals
< 6%	43.76	65.34	29.13	138.23
6-20%	40.27	60.14	26.81	127.22
21-49%	32.98	49.24	21.96	104.18
50%+	24.73	36.93	16.47	78.13
Totals	141.74	211.65	94.37	447.76

Residuals

	none	small	large
< 6%	0.89	0.4	0.54
6-20%	1.34	0.43	0.95
21-49%	0.13	0.2	0.42
50%+	0.67	0.21	0.98

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996. Statistic Tables by author.

Table $5b_1$. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y: Administative Use of Access

Summary Statistics

DF:	6
Critical Value .05:	12.592
Total Chi-Square:	9.526

Observed Frequency Table

	none	small	large	Totals
< 11%	27.25	62.13	19.62	109
11-30%	42	84	40.32	166.32
31-70%	43.8	86.14	16.06	146
71%+	11.44	24.64	7.92	44
Totals	124.49	256.91	83.92	465.32

Expected Values

	none	small	large	Totals
< 11%	29.06	59.96	19.59	108.61
11-30%	44.78	92.42	30.19	167.39
31-70%	38.92	80.32	26.24	145.48
71%+	11.73	24.21	7.9	43.84
Totals	124.49	256.91	83.92	465.32

Residuals

	none	small	large
< 11%	0.33	0.28	0
11-30%	0.42	0.88	1.84
31-70%	0.78	0.65	1.99
71%+	0.08	0.09	0

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table $5b_2$. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y: Teacher Use of Access

Summary Statistics

DF:	6
Critical Value .05:	12.592
Total Chi-Square:	7.006

Observed Frequency Table

	none	small	large	Totals
< 11%	10.9	62.13	35.97	109
11-30%	13.44	105.84	48.72	168
31-70%	23.36	87.6	35.04	146
71%+	4.4	27.28	12.32	44
Totals	52.1	282.85	132.05	467

Expected Values

	none	small	large	Totals
< 11%	12.16	66.02	30.82	109
11-30%	18.74	101.75	47.5	167.99
31-70%	16.29	88.43	41.28	146
71%+	4.91	26.65	12.44	44
Totals	52.1	282.85	132.04	466.99

Residuals

	none	small	large
< 11%	0.36	0.48	0.93
11-30%	1.22	0.4	0.18
31-70%	1.75	0.09	0.97
71%+	0.23	0.12	0.03

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table $5b_3$. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y: Student Use of Access

Summary Statistics

DF:	6
Critical Value .05:	12.592
Total Chi-Square:	15.529

Observed Frequency Table

	none	small	large	Totals
< 11%	26.16	51.23	32.7	110.09
11-30%	45.36	82.32	40.32	168
31-70%	59.86	65.7	20.44	146
71%+	14.52	21.12	8.36	44
Totals	145.9	220.37	101.82	468.09

Expected Values

	none	small	large	Totals
< 11%	34.05	51.44	23.76	109.25
11-30%	52.49	79.28	36.63	168.4
31-70%	45.61	68.89	31.83	146.33
71%+	13.75	20.76	9.59	44.1
Totals	145.9	220.37	101.81	468.08

Residuals

	none	small	large
< 11%	1.35	0.03	1.83
11-30%	0.98	0.34	0.61
31-70%	2.11	0.38	2.02
71%+	0.21	0.08	0.4

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996. Statistic Tables by author.

Table 6a. Chi-Square Statistical Test

X: Minority Enrollment Y: Plans for Access to Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	2.33

Observed Frequency Table

	plans	no plans	Totals
< 6%	94.72	33.28	128
6-20%	66.24	25.76	92
21-49%	67.76	20.24	88
50%+	78.88	37.12	116
Totals	307.6	116.4	424

Expected Values

	plans	no plans	Totals
< 6%	92.86	35.14	128
6-20%	66.74	25.26	92
21-49%	63.84	24.16	88
50%+	84.15	31.85	116
Totals	307.59	116.41	424

Residuals

	plans	no plans
< 6%	0.19	0.31
6-20%	0.06	0.1
21-49%	0.49	0.8
50%+	0.57	0.93

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

Table 6b. Chi-Square Statistical Test

X: Reduced/Free Lunch Eligibility Y: Plans for Access to Internet

Summary Statistics

DF:	3
Critical Value .05:	7.815
Total Chi-Square:	2.556

Observed Frequency Table

	plans	no plans	Totals
< 11%	45.56	21.44	67
11-30%	90.48	25.52	116
31-70%	118.8	46.2	165
71%+	74.25	24.75	99
Totals	329.09	117.91	447

Expected Values

	plans	no plans	Totals
< 11%	49.33	17.67	67
11-30%	85.4	30.6	116
31-70%	121.48	43.52	165
71%+	72.89	26.11	99
Totals	329.1	117.9	447

Residuals

	plans	no plans
< 11%	0.54	0.89
11-30%	0.55	0.92
31-70%	0.24	0.4
71%+	0.16	0.27

Data Source: U.S. Department of Education, National Center for Education Statistics, 1996.
Statistic Tables by author.

GENERAL CONCLUSIONS

Reflections

The issues central to this research were examined using varying methodologies and data types and the results were likewise presented in varying formats. The first paper contained a review of the research literature as well as an examination of national and state survey data presented descriptively using bar and line charts. The research methodology of the second paper utilized primary and secondary historical data to chronicle events relevant to the case study and the issues examined. In the third paper, data from a national survey sample were analyzed using non-parametric statistical tests and the results reported in light of statistical significance. While each research approach has its strengths and weaknesses, together they provide a balanced and credible interpretation of the issues under study. The general conclusions drawn from the work in this volume are as follows:

- there is a relationship between economics and education in the U. S.
- economic participation can predict educational opportunities
- racial and class discriminatory practices limit economic participation and thus educational opportunities
- inequalities in access to educational opportunities by race and class have existed since the beginnings of American systems until now
- in general, there is a need for more research but the implications for further study are specific to the methodology used

While the connection between economics and education is made clear, the implication is not that money and finance are the sole determinants of quality education. However, the connnection does indicate that a minimum level or threshold of economic provision is required to support educational institutions as well as a minimum level of individual participation in the economic system is necessary to afford quality education. Historically, the ability to reach this threshold level has been lacking for educational institutions serving Black Americans. In addition, Black Americans have participated to significantly

lesser degrees in the economic system than White Americans, arguably below the minimum levels necessary to afford quality education.

A Call to Action

While it is true this dissertation volume was written in partial completion of the requirements for a doctoral degree, this was never an end in itself. Since committing to this research endeavor, my aim has been to honor and remain true to the literature, people and data studied and represented in the papers within this volume. My hope now is that my humble efforts will call myself and others to action for the research has a power and strength of its own, owing very little to the investigator. The action called for may be as simple as refusing to dismiss inequalities as something to be remedied totally by sensitivity, good will or good intentions. Those willing to be involved more overtly are encouraged to learn from history and physics concerning altering the paths of powerful forces. To will it so does not make it so. The political, sociological and economic factors that created and wove inequalities in our American systems have force and momentum that should not be taken lightly. Changing the manner in which educational resources are distributed along racial or socio-economic lines means contending with these powerful forces. The fact that significant differences exist today between the computer communications access available to American students of differing racial or ethnic identities or economic backgrounds indicates that these forces have the advantage of velocity, direction and a well-traveled course. National, regional, state and local decision and policy makers aiming to provide equitable resource distribution need to closely examine the particular dynamics at play in the areas of their responsibility in order to provide appropriate and effective interventions.