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Equity and Technology

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can be thought of as an example of the post-feminist project of examining the complexity of identity, positionality, objectivity, and research.

It is important to note that attendant to the emergence of Black feminist theories, other women of color have also articulated feminisms informed by their cultural locations. Chicana, Asian, and American Indian feminists have worked along with African American feminists in the quest for equity (Anzaldua 1990; Bernal 1998; James and Busia 1993; Minh-ha 1990). These feminists of color have examined the ways in which nationality, ethnicity, and language can serve as both spaces of marginality and liberation for women of color. As Black feminist research and scholarship has sought to address the multiple layers of identity for black women specifically, but also broadly for all women of color, the projects undertaken by women of color have extended this notion of multiplicity. Specifically, feminists of color have explored issues related to immigrant status, language diversity, and their impact on the lives of women of color.

The future of feminism in education and educational research appears to be bright. Feminists continue to expand the boundaries of what and how scholars know what they know. A more careful consideration of the complexity of identity, subjectivity, and positionality continue to be the focus of much of the new feminist scholarship. Moreover, this work seeks to understand how these issues affect women in particular contexts and seeks to uncover the situatedness of sexual inequality and women's responses and resistances to it. More work is emerging that examines girls' experiences in schools, taking into account the complexity of identities that constrain multiple communities simultaneously (Lei 2003). Moreover, these "new" feminist researchers are able to speak across communities given the focus on the complexity of identity. More and more, scholarship and researchers are seeking to abandon distinct theoretical categories and find ways to work collaboratively. This makes it possible for scholars working across different multicultural traditions (e.g., queer, race, feminism) to find commonalities in each others' work. As such, these collaborative projects enable us to work toward a full realization of liberty and justice for all.

Adrienne D. Dixson

Equity and Technology

Technology has always occupied an important space within the American education system. Serving mainly as an instructional aid for the teacher, technology has varied in form beginning with the blackboard (and textbook) to more advance devices such as the radio, film, television, and videotape recorder (VCR). The introduction of technology to schools in many ways is part of the discussion on the purpose of education. Debates on the purpose of education have varied from socializing students to the cultural values of American society by emphasizing the precepts of democracy (e.g., citizenship); preparation for the workforce; to the development of a "deep understanding of the political, racial, economic, scientific and technological realities that confront the survival" of students of color (Madhubuti 1998, 5). In other words, whatever the purpose of education, technology has served as a mechanism to convey it.

Technology in many ways has been a proxy for how the education system has evolved in the United States. For example, in the 1920s films were introduced to schools as a means to visually bring to life the textbook and classroom discussions. Similarly, in the 1950s supporters of television argued that it could supplement the curriculum, as well as assist the teacher in meeting the instructional needs for an increasing student population (Cuban 1986). During the 1980s, however, schools experienced a paradigm shift with the introduction of computers. Although computers had been in existence since 1945 they were exclusive to the military and commercial sectors of American society (Ceruzzi 2000). Computers now were seen as a way to improve learning and efficiently manage students.

Unlike previous technologies, computers were capable of providing direct individualized instruction and assessing a student's progress without involvement from the teacher (Streibel 1998). For example, with computer tutorials, the student's response determined the next instructional sequence of the lesson. The computer tutorial guided the student through lessons by posing a series of questions one at a time until they have demonstrated mastery of the content. In addition, the skills students acquired from computer usage had been identified as necessary for employment; as well as economic, so-

cial, and civic participation for the twenty-first century. As a result, schools explicitly became the site where students were expected to create, apply, and use information in multiple settings. Thus computers were considered instrumental to the learning process and an indication that students were being provided with a quality education.

As computers became more commonplace in schools and increased in social significance, educational stakeholders (e.g., parents, politicians, business sector) and researchers raised new concerns about equity. For example, in addition to concerns about student achievement, funding disparities and low teacher expectations, stakeholders from historically marginalized groups (e.g., African Americans and Latinos) now had to contend with issues of access (the Digital Divide) and discrepancies in the use of educational technology.

Digital Divide

In 1999, during the Clinton presidency, the U.S. Department of Commerce declared that America had entered the Information Age in which various segments of society, including the entire economy, would rely on digital technologies. That declaration helped to raise the nation's awareness about disparities in access to information technology between the information rich (whites and Asian Americans, individuals with higher education and incomes) and the information poor (African Americans and Latinos, individuals residing in inner-city and rural communities, and those from low socioeconomic backgrounds). The "digital divide" served as a mantra for those concerned with closing the technological gap between communities (and individuals) that could effectively use information technologies such as the Internet and those that could not (Digital Divide Network at www.digitaldividenetwork.org).

Measures to assess and bridge this technology gap began with an examination of the personal ownership patterns of computers between the haves and have-nots. The digital divide's emphasis, however, quickly shifted to education where the distribution of computers was comparatively measured between schools defined along demographic characteristics such as race and socioeconomic status. Subsequently, the digital divide in education illustrated that the unequal distribution of information technologies (computers, software, email, and the Internet) between public and private schools, urban and suburban (and rural) school districts, and school districts with predominately African American and Latino students versus white student populations was more than a correlation between race and socioeconomic status (Hess 1999). A critical analysis of the digital divide showed how inequities in access to technology were the result of systemic oppression and exclusion of people of color in the United States (Light 2001).

As computers were becoming an ubiquitous feature of schools, critiques by education scholars and researchers began to make connections between issues of access (and use) to systems of oppression and exclusion. Critical education scholars such as: C. A. Bowers (1976, 1988, 2000); Michael W. Apple (1995, 1998a, 1998b); Robert McClintock (1998); Larry Cuban (1986), and many others used various theoretical perspectives (Cultural, Neo-Marxist, Post-Modern, and Ecological) to explain how equity in more qualitative and structural terms were affected by information technology. Unlike quantitative or technical attempts to bridge the digital divide by increasing the computer-to-student ratio, critical scholars in education sought to articulate how biases occurred as a result of adopting these machines. For instance, scholars using a cultural perspective argued that computers and the programs they operated were both ideologically and culturally biased toward Western ideological and epistemological traditions (Bowers 2000). Neo-Marxist and Post-Modern theorists were instrumental in pointing out the role and impact of free market principles and the State in justifying the incorporation of computers in education (Apple 1995, 1998b; Popkewitz 1991). Computers and related information technologies were not objective tools, contrary to their supporters' claims. Instead they were involved in the construction and use of power in terms of what counted as knowledge, how knowledge was constructed, and how knowledge was transmitted (Bromley 1998). In addition, power was also manifested in the physical and programmatic design of computers and software.

The contribution of these nontraditional perspectives of technology continues to be that they provide ways to think about educational equity and technology as more than access to machines. Cultural, Neo-Marxist, Post-Modern, and Ecological

theories of technology in education helped to show those committed to social justice that equity is a complex issue. These critical theories of technology in education however are limited by their inability to address issues of equity specific to people of color. For example, the cultural perspective does not acknowledge that computers could be (and have been) a mechanism that perpetuated existing inequities as a result of varying rates of infusion. In addition, these critical theories have ignored the unique historical experiences that racial groups like African Americans have had with technology (Walton 1999). Interestingly, it was also during the mid-1980s that researchers began to study the educational uses of information technology in schools with large concentrations of students of color, and in schools with a large percentage of students of high socioeconomic status, as a way to speak to these specific issues of equity. Issues specific to technology and equity were expanded to not only address the varying rates of infusion across diverse school settings, they also included examinations of how learning expectations determined the use of computers in the education of students of color.

Educational Uses of Computers in Diverse Settings

Edmund W. Gordon and Eleanor Armour-Thomas published *Computer Technology and Educational Equity* in 1985, one of the first monographs to report that when access to computers was not the problem inequities existed with the application of these machines. Gordon and Armour-Thomas (1985) found that in poor school districts students from low socioeconomic backgrounds regularly took part in computer-assisted instruction that used drill and practice methods. In middle-class and more affluent schools it was reported that students were more likely to have engaged in more creative and challenging instruction with computers (Gordon and Armour-Thomas 1985). Drill and practice uses of computers were seen as problematic for two reasons. First, drill and practice as a teaching method uses the principle of trial and error instead of directed instruction. Second, the student in this pedagogical approach is positioned as a passive learner and a consumer of information, instead of an active participant in the learning process. Therefore the student within drill and practice instructional pedagogy is totally dependent on the computer for guidance.

More recent studies on the topic have shown that in predominately African American and Latino settings, schools used computers to develop skills such as pattern recognition through rote memorization. These studies suggested that such skills were required for a compliant workforce and for individuals more likely to occupy service-oriented or low status jobs (Becker and Ravitz 1998). In mostly white schools where the educational uses of computers emphasized creativity, independence, and higher-level thinking skills, it was argued that such instructional practices equipped students with the "social capital" necessary to maintain and reproduce their socioeconomic status (Bourdieu 2000; Persell and Cookson Jr. 1987; Becker and Ravitz 1998).

The findings from studies on the educational uses of technology in diverse school settings have been instrumental in contributing to the expansion of the discourse on equity. In addition to having agreed upon the importance of access to technology, education researchers in this area have sought to examine just-ness of the experiences, relationships, and outcomes that occur because of the machines. Furthermore, these early examinations of the pedagogical uses of information technology in diverse settings have led to the creation of software programs designed to counter cultural biases and low-level instruction. For example, the program Rappin Reader is designed to foster students' language skills so they can become independent readers and writers by engaging in various physical and conceptual settings (Pinkard 2001).

Expanding the Discourse on Equity

The introduction of technology to education has provided new opportunities to think about equity in unique ways. As illustrated by the examination of the digital divide and the pedagogical uses of computers in diverse settings, technology lends itself as a framework to understand both the theoretical and qualitative aspects of what equity is and is not in education. For example, researchers have studied the discrepancies in the educational uses of computers as a means to measure the justness of actions even if they appear

to be in accordance with shared rules (Secada 1989). What are also of import are the theoretical and conceptual linkages that have been established for future scholars and researchers seeking to focus on issues of equity and technology specific to people of color.

Much of what has been written, researched, and discussed about equity and technology in the education of people of color can be traced back to the early part of the twentieth century. The works of Carter G. Woodson (1990) and W. E. B. DuBois (2001) precede the findings put forth by contemporary education researchers in this area of equity and technology. Woodson (1990) was one of the first education scholars/researchers to problematize pedagogical practices such as drill and practice and rote memorization with regards to its relevancy and usefulness to the survival of Americans of African descent. Similarly, DuBois's (2001) critique of the *Hampton Idea* and industrial education's emphasis on teaching skills to make one competent to use machines was that it did not require nor render great intelligence. As technology becomes more established in education, new theoretical perspectives have been introduced to education to include the historical and current collective status of people of color while simultaneously examining the changes caused by technology in order to expand the discourse on equity (Donnor 2003). Like technology, equity is not static.

Jamel K. Donnor

Race and Education

The question of race is at the very heart of U.S. education. It is a perennially salient issue that predates the U. S. Supreme Court's 1896 ruling in *Plessy* v. *Ferguson* to allow states to maintain "separate but equal" public facilities (Meier, Stewart, and England 1989). For example, the intersection of race and education is evident in 1787 in a supplication made to the Massachusetts state legislature to obtain equal educational rights for the children of black free men. Adult black Bostonians made their case on the grounds that they, like their fellow citizens, shared the burden of supporting the very public schools to which their offspring were being denied access (Aptheker 1990). Although the request was denied, their petition is a testament to the centrality of race in U.S. education dating back to the colonial period.

The above example also illustrates that even as education is inextricably tied to notions of justice and citizenship, it is also linked to the oppression of subordinated racial groups in the United States. Since the beginning of formal education in the United States a dominant view that citizenship should be limited to free whites informed popular attitudes about the role that education should play in the lives of people of color. For example, the majority of white citizens in the American South believed that educating captive Africans would render them unfit for servitude, making it impossible to retain them as slaves (Woodson 1919). During the same period, tribal school systems administered by white missionaries and buttressed by the *Civilization Fund Act of 1816* sought to abolish the cultures of Native Americans and to replace them with middle class Anglo-American Christian mores, values, and customs (Spring 2004).

Formal efforts to direct the education of people of color in the interests of the dominant white society generally have been countered by grass-roots efforts. For example, by the time that the Freedmen's Bureau Act was passed by Congress in 1865, newly emancipated slaves had already created educational systems for themselves and had reduced the black illiteracy rate by a substantial amount. In addition to literacy instruction, black communities had also developed programs that emphasized a classical liberal curriculum. The words of Richard Wright, a post–Reconstruction Era black educator, illustrate how black educators during this period took up the classical liberal curriculum to advance the cause of equality and, by extension, citizenship and democracy:

> It is generally admitted that religion has been a great means of human development and progress, and I think that about all the great religions which have blest this world have come from the colored races—all . . . I believe too, that our methods of alphabetic writing all came from the colored race, and I think the majority of the sciences in their origin have come from the colored races . . . Now I take the testimony of those people who know, and who, I feel are capable of instructing me on this point, and I find them saying that the Egyptians were actually woolly-haired negroes . . . Now,