Pre-service teachers conceptions of the digital divide: A four-year study at a predominantly white institution

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Abstract

This four-year study (2004-2007) of 463 early childhood and secondary pre-service teachers in their first quarter of study at a predominantly white institution analyzed the responses to an open-ended questionnaire item that asked the participants to define the digital divide. Over half of the participants didn't answer the question or answered that they did not know the definition. The remaining responses were coded and distributed across the following categories: 1) access divide -(13%), age divide – (11%), use / embrace / motivation divide – (5.7 %), technology divide– (5 %) , school-related divide– (4.7%), social and cultural divide- (4.5%), complex phenomenon (4.1%), computer literacy divide – (2.6%), and idiosyncratic – (2.6%). In order to try to explain the high number of participants who did not know or chose not to answer the question, the results are contextualized within whiteness theory. Theories of whiteness identify an epistemology of ignorance in which whites don't understand the racist world that they created, while they benefit from resulting racial hierarchies, economics, and ontologies.

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INTRODUCTION

First coined by the National Telecommunications and Information Administration (NTIA) in 1995 (National Telecommunications and Information Administration, 1995), the term "digital divide" entered the public discourse when Bill Clinton and Al Gore first invoked it in a 1996 speech (Clinton & Gore, 1996). During the decade of its existence the phrase has been widely used to describe the unequal access to information and computer technologies (ICT), often characterized as the difference between the "haves and the have nots". In November 2007 searching for "digital divide" on Google resulted in over 2 million hits, leading the search engine to suggest the following subcategories to narrow the results, "global digital divide", "digital divide in the United States", "digital divide data", "bridging the digital divide", "digital divide in America", "digital divide in education".

While recent studies have shown the technology access divide has been decreasing in typically underrepresented homes and schools (Kaiser Family Foundation, 2004; National Telecommunications and Information Administration - U. S. Department of Commerce, 2002), there are still large disparities in terms of the amount and quality of access to ICTs (Eamon, 2004; Fox & Livingston, 2007) in addition to unequal access to ICT jobs that pay a living wage (Rodino-Colocino, 2006). From the outset the ways in which the digital divide has been defined has often highlighted inequitable access drawn along racial lines. For example, differences in access to technology based on race still exist even when controlling for poverty and other demographic factors like mother 's marital status and educational level (Warschauer, Knobel, & Stone, 2004). In addition the rate of the digital divide has

decreased more among low income whites compared to low-income African Americans (Lindsay, 2005).

A growing body of research and scholarship, often called second wave Digital Divide research, is showing that access to ICT does not depict the entire digital divide picture, concluding that no single divide exists (Damarin, 2000; Peter & Valkenburg, 2006; Van Dijk & Hacker, 2003; Warschauer et al., 2004). In fact, many scholars and policy makers have argued that the term, digital divide, is too limiting and have suggested different terms or an expanded definition of the digital divide (Light, 2001; Underwood, 2007; Warschauer, 2002). This research reveals an ongoing "digital differentiation" in which new technologies and the skills required to use those technologies to gain access to social, cultural, and economic capital create a cycle in which the poorest segments of society are consistently behind the technology curve.

An important aspect of the second wave digital divide research that looks beyond access is the conclusion that how computers are used teach, learn, and conduct personal and professional activities is as import as access to information and communications technologies (Attewell & Battle, 1999; Ching, Basham, & Jang, 2005). A decade of research shows the divides that currently exist are complex and less visible when compared to earlier matrixes by which the digital divide has been measured and assessed (Barzilai-Nahon, 2006). The digital divide is a dynamic phenomenon marked by social and spatial boundaries that are constantly changing in response to the latest ICT innovations and demands of high-end users (Crampton, 2003). While there are different definitions, arguments have been made that regular access to resources and culturally relevant rich curriculum and pedagogies can have an impact on social mobility and economic opportunity.

Teachers are central agents in helping K-12 students from economically fragile communities navigate the personal, social, and learning issues raised by the digital divide. Teachers who understand these complex issues are better able to help students overcome barriers due to access. Research shows that teachers can make a positive difference in bridging issues of access to technology and pedagogy (Chen & Price, 2007; Jin, 2005; Kim & Bagaka, 2005; Lee, 2006). Teachers who are motivated to facilitate educational opportunities for their students find ways to provide their students with access to the resources and pedagogies to put ICTs to productive uses to support learning. In order to do the most good, teachers need to understand the generational divide between themselves and their students and the resulting differences in languages, activities, and behaviors surrounding ICTs (Underwood, 2007) while also being able to help students from low income families navigate the disjunctions between home and school ICT use (Sutherland-Smith, Snyder, & Angus, 2003). As was previously noted, while the digital divide is not strictly a phenomena defined by race, it disproportionately affects people of color compared to those of European decent.

It is the intersection of race and pre-service teachers ideas about the digital divide that is the topic of this study. While the term, "digital divide" has been circulating in the public discourse for over a decade, it's not clear what incoming teachers know about the digital divide, particularly in programs at predominantly white institutions. While the majority of the research on pre-service teachers and technology focuses on their attitudes about technology and their technical knowledge (Bahr, Shaha, Farnsworth, Lewis, & Benson, 2004), there has been little research that examines pre-service teachers conceptions of the digital divide.

This study of 463 early childhood and secondary education preservice teachers took place between 2004 and 2007 and sought to understand how the students in a required technology integration course define the digital divide. The data for this study was taken from the answer to an open ended question about the digital divide on a survey that was given to students during their first lab in the course. While it was not expected that students would have a developed definition of digital equity, it was thought that most of the students would have some sense of the meaning of the term.

A central goal of this study is to understand one aspect of how the current and ongoing over-representation of white teachers in US public schools, might impact the ways that teachers approach digital divide issues. As Table 1 depicts, based on current statistics, whereas 83.2% of public school teachers are white only 57.2% of public school students are white (US Department of Education, 2007). This disparity will only grow if the projected rate of cultural diversification continues without corresponding shifts in the teacher population.

Table 1

Comparison of racial distribution between teachers and students in the US (2003-2005)

	White	Black	Hispanic	Asian	Pacific Island	American Indian/ Alaska Native	More than one race
Teachers (2003-2004)	83.2 %	7.8 %	6.2%	1.4%	.2%	.5%	.7%
Students (2005 data)	57.2 %	15.6%	19.7%	3.7%	.2%	.7%	2.5%

What then are the implications of the racial disparity in schools when teachers and students have developed a different cultural and racial identity? Research has found that

white pre-service teachers often have significantly lower expectations of students from schools with predominantly minority populations (Walker-Dalhouse & Dalhouse, 2006) and that unfavorable teacher perceptions of students can strongly undermine student academic performance (Hyland, 2005; Oates, 2003). More specifically, for the purposes of this study what are the consequences of these cultural and expectation differences for new teacher's capacity to address the digital divide?

BACKGROUND

The study took place within a M.Ed. teacher preparation program at a large public predominantly white Midwestern university. While the student diversity in 2007 at this university was distributed as follows: 6.7% African American, 4.9 Asian, 2.2% Hispanic, .4% Native American, and 85.2% White, the racial makeup of the pre-service teachers in both the early childhood and secondary education teacher program over the course of this study reflected even less diversity. Of all the participants at least 92% identified themselves as "white", 4% African American, 2% Hispanic, and 2% Asian. It is because of this statistic and the fact that over 50% of the participants did not or could not define the digital divide on a questionnaire that this study is being framed through theories of whiteness and white privilege.

Whiteness

Whiteness theory looks at how race, in particular whiteness, is constructed in binary opposition between white and "not white". It highlights how white privilege is maintained by constructing whiteness as an unmarked category against which other races are measured. As an unmarked category whites often do not maintain an explicit white racial identity, instead they impose racial labels on other groups that are judged in relation to unspoken

white norms in which members of non-white groups often come up short (Frankenberg, 2001). Since these norms are consistently framed as commonsensical they are often not interrogated or challenged. Whiteness studies acknowledges the reality of white privilege and its material effects on non-whites by helping to clarify how institutionalized privilege and an erroneous belief in meritocracy create racist consequences and attitudes in society. These beliefs are often created and supported by justifications that place the blame of social inequities on individuals or ethnic groups rather than deep seated social-structural issues (Thompson, 1999). Institutional privilege describes benefits that are enjoyed by whites at the expense of people of color where institutions like schools and systems of justice are often based on European values and cultural norms that benefit white Americans who are enculturated into these systems.

Through the privilege of whiteness social and economic opportunity is seen as an inalienable right much like the right to own property. The right to opportunity is maintained by the American mythology that social barriers can be overcome with hard work. This, in turn, frames a lack of resources as a choice based on the actions of individuals rather than the historical discrimination of a group. By making opportunity and access an individual issue rather than a group (e.g., racial) issue, the notion of race is at once negated, as it is subversively supported. When confronted with the anger and outrage of racism a common tactic is fall back on a position that negates race. A race-neutral or colorblind orientation by whites is seen as a way to eliminate racism, however, it is merely a way to maintain the unacknowledged privilege of whiteness in the face of racial tension (Chubbuck, 2004). By saying that race doesn't exist hides racial privilege while maintaining the inequitable social and institutional factors. This color blind fallacy has often lead to white teachers thinking of

themselves as white saviors, able to confer the material benefits of whiteness if students follow the rules and norms that they are given.

Recent scholarship about white privilege has examined how white understandings of race are often framed through an "epistemology of ignorance" (Sullivan & Tuana, 2007). Mills (1997) argued that there is racial contract between whites and non-whites that maintains white social position at the expense of nonwhite persons. This contract is maintained through an epistemology of ignorance in which whites don't understand the racist world they created, while they benefit from resulting racial hierarchies, economics, and ontologies (Frye, 1983). From this perspective, ignorance is not a passive state but consists of many acts and negligences (Outlaw Jr., 2007). An important component of a social epistemology is that social structures and institutions, like schools, act as sites for the transmission and learning of white ignorance of other races. This is based on the notion that there is a collective amnesia coupled with a vested interest in maintaining the racial status quo. Notions of whiteness and epistemologies of ignorance will be utilized to theorize how the participants responded to a survey question about the digital divide.

METHODOLOGY

The data being reported here was collected between 2004 and 2007 and represents the answers of four separate pre-service teacher cohorts, 463 students, to a web-based survey administered during the first lab session of a required technology integration course. The course is taken during participants first or second quarter as part of a 5-quarter post-baccalaureate teacher education program. The course is divided into two sections, one for early childhood pre-service teachers and one for secondary pre-service teachers in English Education, Foreign and Second Language Education, and Social Studies Education (see

Table 2 below for a distribution of responses). Most of the students in these programs typically have just completed their bachelor's degree. Admissions into all the programs are competitive. For example, the early childhood program regularly turns down applicants with a 3.8 undergraduate grade point average.

Table 2

Distribution of responses

	Early Childhood Education	Secondary Education	**Total**
2004	64	43	**107**
2005	100	79	**179**
2006	59	30	**89**
2007	53	35	**88**
Total	**276**	**187**	**463**

This manuscript will focus on the way that students answered one question, "How would you define the digital divide?". The question is part of a questionnaire that asks participants about their knowledge and comfort with computers (e.g., hardware and software), electronic technologies (e.g., digital cameras, video cameras, game consoles) and educational processes (e.g., lesson plan development, assessing learning). The question comes near the end of the questionnaire and appears in the context of a series of open ended questions about how the participants see technology playing a part in their teaching and how would they define computer, information, and media literacy. The question is asked for several reasons including the need to provide a sense of their knowledge to gauge how the topic will be addressed in the course.

In order to make sense of the open-ended responses to the question about the digital divide, codes were inductively generated from the responses. The codes were selected based on three criteria: 1) Every post had to be assigned to a code, therefore if a code didn't exist

to describe an answer, a new code was generated, 2) Codes had to be mutually exclusive allowing only minimal overlap between categories, 3) Each code had to provide some insight into how the respondent constructed the digital divide. Based on these three criteria one or more of the following alphabetically listed codes were assigned to each response:

Access –The digital divide as differential access to ICTs.

Age- All or part of the digital divide as a difference in age between those on each side of the digital divide. Most typically this was characterized as a generational divide in which one younger generation has facility in using ICTs and the other older generation does not.

Computer literacy / Skills - The digital divide is a computer literacy or skills divide. Responses mentioned specific skills or utilized the phrase "computer literacy".

Didn't Answer – Participant skipped question.

Don't Know – Participant stated that they did not know the answer to the question.

Idiosyncratic – Answers that diverged from any currently accepted definitions of the digital divide

Insightful – Answers that went beyond simple definitions to describe the implications of the digital divide on individuals and groups. Included with this category are responses that discussed the digital divide as both a domestic and a global phenomenon.

School Related – The digital divide as a phenomenon that impacts schools. In some way the answer talked about an access, knowledge, or skills divide that had implications for teaching.

Social and Culture – (e.g., SES) – Answers that included some mention of the digital divide as social and cultural phenomenon. In other words, responses defined the

digital divide as the result of both economic and cultural differences (and the interactions between the two).

Technology - The digital divide described strictly in terms of technology. For example, this could be the digital divide is the difference between "high tech" and "low tech" or the difference between "old" and "new" technologies.

Use / Embrace / **Motivation –** Responses coded win this category defined the digital divide as the difference between those who use, embrace, or are motivated to engage with technology and those who don't use, embrace, or are motivated to utilize technology.

It should be noted that while the categories were developed as much as possible so that each response would receive only one code, there were approximately 20 responses (4.3%) that were assigned two codes. For example, when someone responded that they didn't have a definition for the digital divide and then went on to offer a description that fit into one of the existing codes, the response was coded as "Don't' Know" and as the category in which their definition attempt best fit.

RESULTS

As has been previously mentioned, the most noteworthy result of the study is that of all 463 participants 54% either did not answer the question or explicitly said that they could not offer a definition of the digital divide. One possible explanation for the large number of students who didn't respond is that they were not forced by the online questionnaire to answer the question. Therefore because this was a voluntary, anonymous questionnaire and any question could be left blank there were no consequences to even guess at an answer. The data, however, did not support this explanation. None of the other open-ended questions had such a low response rate. In fact throughout the four years in which the study was

conducted, the other open-ended questions had a response rate of over 90%. Over the course of the study the proportion of students who didn't know or didn't respond did not decrease, and in fact increased during the final two years (see Table 3).

Table 3

Distribution of "Don't Know" or "Didn't Answer" responses during the study

	Don't Know	Didn't Answer	Total Proportion
2004	29/107	26/107	55/107 (51%)
2005	39/179	38/179	77/179 (43%)
2006	28/89	30/89	58/89 (65%)
2007	51/88	1/88	52/88 (59%)

The approximately 10% increase in 2007-2008 in students who didn't know or didn't respond to the question occurred at the same time as the shift in the administration of the questionnaire through a custom generated web page to a questionnaire build into the university course management system (CMS). The question remained the same throughout the study. Another explanation for this increase may have had to do with the decreased attention given to the digital divide in the public discourses on education which have increasingly focused on the equity issues raised by high stakes testing brought about by NCLB.

Of the students who attempted to answer the survey question about the digital divide, the two most common response categories included definitions of the digital divide as an access divide and an age divide. In the following sections each code will be listed in descending order based on the number of responses given.

Access - (60 responses / 13%) - The must fundamental way to define the digital divide would be to mention same aspect of access to technology. A typical answer in this category included, "The digital divide is the division among those who have access to

technological resources and those who do not.”. Within these answers must responses constructed “digital” as access to either a general notion of “technology”, “high tech” or “digital media” or they mentioned specific technologies including computers, the internet, cell phones, ipods, or digital cameras.

Age Divide – (51 responses / 11%) **-** The second most common explanation given defined the digital divide as the difference between “young” people who have access, knowledge and comfort with technology and “older” people who do not. A typical answer in this category included, “I assume the digital divide refers to those older individuals who are less attuned to the use and the changing technologies while youth has been submerged in it and uses technology almost naturally”. Whereas those who gave an access-related definition mentioned a tangible technology like computers, cell phones, and the Internet those who mentioned age focused on non-hardware factors including knowledge, skill, familiarity, experience, understanding and comfort differences. These answers were often personalized as the difference between the respondent (or the respondent’s generation) and an older family member like a parent or grandparent (or their generation). The difference was frequently characterized as a generational difference, sometimes naming a generation (e.g., baby boomers, gen x, y, millennial). Often they described the formative nature of technology, as in a generation who grew up with technology.

Use / Embrace / Motivation – (27 responses / 5.7 %) Many of the answers in this category dealt with the regularity with which someone uses technology. Use is a noteworthy contrast to access because most of the participants who described the digital divide as a gap between those who use technology and those who don’t did not mention issues of access. Many of these answers implied that lack of use was a choice made by someone. Examples

include, “I think that the digital divide is the dichotomy that exists in society between the amount of digital technology available and the amount of people who are willing/interested in using it.” And “I am not sure what this term means, but if it refers to the divide between people who are willing to use technology in their classroom as opposed to those who are not, I would say that it is mostly a mental issue.” A few of the answers given this code referred to the ability to use specific technologies including ICTs like email, digital cameras, etc. Those who defined the digital divide as the difference between individuals who do and don’t embrace technology made issues of technology access and knowledge a choice made by individuals in society. As one responded answered “I would guess that it is a divide among people who love technology and use it every chance they can, and those who appreciate technology but do not care to use it to the full extent.”.

Technology – (23 responses / 5 %) – The answer coded “Technology” focused primarily on divides centered on technology. Some of the divisions described by responses coded “technology” included the divide between high tech and low tech, between old and new technology, and between virtual and real technology-based experiences, between geographic areas that have differential access to technology (e.g., urban vs. rural), and between high and low use of technology. Those who described the digital divide as a technology divide of some sort were firmly entrenched in a technological determinist view in which technology is seen as the driving force behind social change. In other words technologies on the right side were new, up-to-date, abundant, highly integrated in daily living and frequently used while technologies on the wrong side were older, out of date, scarce, peripheral to day-to-day living and infrequently used. This combination of technological determinism and positive view of technology can be observed in this

response, “The digital divide is the increased division between the world highly influenced by technology and the world where there are trace amounts. Technology is being incorporated into every facet of every day life.”

School Related – (22 responses / 4.7%) - Access to computers in schools is often made synonymous with access to social opportunities in these answers. “I think the digital divide is a battle between those who have regular access to technology and those who do not have regular access to technology. Perhaps schools that have several computer labs, software, and the education to use it versus schools who do not have such resources and whose students are not familiar with these processes." Answers that related the digital divide to schools mostly discussed issues of access, however, a few participants, specifically address the implication of differential access to computer on classroom teaching including the expectations of computer use outside the class. Also some answers compared students’ abilities and comfort with those of parents and teachers and the differences in desire of teachers to use technology to teach.

Social & Cultural - (21 responses / 4.5%) – In these responses the participant identified either a cultural or social factor as the cause of the digital divide. Some of these answers specifically used the acronym SES or the phrase socio-economic facts. For examples, as one participant responded, “The digital divide can explain the gap between technological knowledge across social groups and the access to technology and technology education across similar socioeconomic barriers.” In many of the answers coded using this descriptor the responses mentions some social or cultural implication of not having access to ICTs and ICT-related skills. These implications include specific factors like literacy, access

to information, modes of communication, economic resources and social mobility in addition to responses that spoke of more general social advantages and inclusions.

Insightful (11 responses / 4.1%) Responses coded as insightful typically mentioned more than one factor contributing to the digital divide. For example, these answers were described as a socioeconomic divide that results in an access divide or answers that would offer more detail about the nature of the access divide. Some of the answers coded as insightful were not necessarily long, but sharp, such as "It is a superficial movement created by capitalism to make money by continuing to mandate that people buy new products." A subset of the students whose responses were coded as insightful mentioned the digital divide as a global phenomenon. Those who described the digital divide as a global phenomenon characterized the divide along typical measures like access and knowledge but described these phenomenon occurring in a larger context, (e.g., "The digital divide is the idea that, as technology advances in highly-developed countries, the tech gap between those countries and undeveloped countries becomes wider."

Computer literacy – (12 responses / 2.6%) – Of those participants who mentioned computer literacy about half defined the digital divide strictly as a computer literacy divide (e.g., "With one part of the population being computer/technology literate and the other portion not being so".) while the other half integrated computer literacy divide with another type of divide including an access divide or an age divide (e.g., "A divide between [someone] who is literate in technological information and [someone] who isn't, on one hand and [someone] who does and does not have access to it on the other.").

Idiosyncratic – (12 responses / 2.6%) **–** The answer that were coded as idiosyncratic ranged from the plausible (e.g., "The two arguments for and against the use of technology in

the classroom.”) to the absurd (e.g., digits flow west on one side and to the east on the other). Four of the responses discussed divides between those who support the use of technology in schools (or in society at large) and those who don’t support the use of the technology, some even offered their opinion about this guessed at divide (e.g., ,"I find myself somewhere in the middle”). Some of the responses coded as idiosyncratic described technical operations like dividing digital graphics in half or the area one needs to scroll to on a web page.

Answers from non-white participants – Since only about five percent (23 responses) of the answers were from students who identified themselves as African American, Asian, or Hispanic the response cannot be compared to the answers from white students. Nevertheless, a few observations about the answers from non-white are illuminating. Of these 23 responses, about 90 percent answered the question and articulated one of the generally accepted definitions of the digital divide including access (75%), insightful (10 %), age (10%), and use / embrace / motivation (5%).

DISCUSSION

In framing the results of the study it is important to note that while the use of the term, digital divide, has in many social discourses become generic, that as an educational policy issue it has received less attention in education in recent year because it has been overshadowed by No Child Left Behind. NCLB has made teachers less likely to integrate technology into their teaching because they are often singularly focused on getting students to score well on state standardized tests (Davis, 2007). Nevertheless, the first issue that needs to be confronted when discussing the results is that given the wide circulation of the term “digital divide” in public discourses over the past ten years, how can over 50% of pre-

service teachers in a highly selective graduate level pre-service teacher programs not be willing or able to venture a definition? According to a whiteness studies perspective this can be explained by the notion that white students don't need to know about the digital divide in order to maintain a white identity. In fact, according to an epistemologies of ignorance perspective it is more difficult to maintain a white identity in the face of data that shows the structured racism that exists in American society. Many of these pre-service teachers have been raised in social circles and were enculturated in contexts where the digital divide was not a part of their experience or the experience of their peers. This would, however, be a simple class explanation, not a racial issue.

Of the participants who did offer a definition none defined the digital divide as a racial issue. The most common answers were categorized as Access, Age, School-Related, and Use/ Embrace /Motivation. Each of these categories of responses is consistent with a whiteness theory framing of the results because they are able to address social differences without mentioning race. Instead theses explanations focus on issues of economics, age, and individual choice.

Answering that the digital divide is an issue of access to technology is the most commonly accepted definition of the digital divide. It is perhaps the most culturally neutral answer because it does not consider the digital divide as a cultural divide or a literacy divide – instead it can be framed as a more culturally neutral economic divide. While it is true that digital divide research based on national surveys have looked at race from the beginning, much of this research has documented a decreasing digital divide when looking at race (Corporation for Public Broadcasting, 2003). But even the research that notes a decrease in the digital divide finds discrepancies related to race and ethnicity (Fox & Livingston, 2007).

Studies of this nature are quick to point out that the digital divide is more of an economic issue then a race or ethnicity issue. These studies are often based on limited definitions of access that do not take into consideration the differences that exist when someone has access to a computer and the internet, but the computer is out-of-date, unable to run a current operating systems or software, or the internet connection is slow, or the person must share a computer with a number of individuals, or the individual doesn't have the ability to solve technical problems or have the social network to help solve technical problems.

Age is a form of difference that is consistent with theories of whiteness because it can be examined within one's own race. Ageism is perhaps easier to justify than racism. It is a more socially sanctioned form of discrimination that does not carry the same charge and stigma as racism. Students who mentioned an age difference often invoked their parents as examples of individuals who were on the other side of the digital divide from them. A popularized form of this ageism has come about as a result of the digital natives/digital immigrants dichotomy (Prensky, 2001) which has gained traction in public discourses. While this dichotomy has a great deal of face validity (i.e., it makes sense that generation differences would cause different technology literacies), it oversimplifies the generational differences that exist around literacies and comfort with technology.

The participants who addressed school-related definitions mostly focused on issues of access in the schools. By situating the digital divide in schools, it places the problem and the solution to the problem within the realm of a social institution. Institutional solutions allow individuals an element of distance between themselves, problems, and solutions. This distance facilitates a disavowal of certain social inequities that cannot be traced to the actions and prejudices of individuals. The same institutions that are seen as the center of the

digital divide are also the places where institutional racism including inequitable student tracking that is biased against students of color, culturally unresponsive standardized tests and assessments, and low expectations of minority students, allow educators off the hook for supporting racist practices hidden in institutional practices (rather than individual actions). This in turn, frees the educator to focus on solving social ills through other means in their classroom.

A critical observation of whiteness studies notes the ability of whites to perceive themselves as saviors of non-whites. The white savior teacher mythologized in films like "Dangerous Minds " (Simpson & Bruckheimer, 1995) and "Freedom Writers" (DeVito, Shamberg, & Sher, 2007) able to save the brown underprivileged children is a common myth among pre-service teachers (Grant, 2002; Trier, 2005). The myths and metaphors that frame the relationships between teachers and students, teachers and technology, and students and technology provide the context with which new and working teachers address issues of equity like those raised by the digital divide. When white teachers do not acknowledge the institutional dynamics that marginalize their students, they are often left with their own value systems as the basis on which to guide how they address issues like the digital divide. When these value systems are based in a belief that teachers are lifting students out of their flawed social and cultural circumstances, teachers subtly and overtly create a dynamic where there are clear right and wrong values, dispositions, behaviors, attitudes toward learning and technology.

Related to school-related responses are answers that focused on a computer literacy divide in the definition. Defining the digital divide as a literacy issue associates the digital divide with simplistic notions of (textual reading/writing) literacy as a set of

decontextualized skills that can be assessed through standardized tests, rather than a multi-literacies approach (New London Group, 1996) that situates technology literacy within broader contextual notions of literacy that are defined by a student's ability to engage in multiple social, cultural, economic, technological, and creative contexts. Strictly language-based constructs of literacy again support the euro-centric status quo. Framing computer literacy as a neutral skill that someone either possess or doesn't possess again communicates a literacy divide as a an element of choice, much like those who defined the digital divide as the difference between those who choose to use technology and those who don't chose to use technology.

Framing the digital divide as an issue of use or motivation communicates that one can decide on which side of the digital divide one wishes to reside. Someone has access and chooses not to use the technology or someone does not take the initiative to create access. Meritocratic justifications are often used to maintain a white identity in the face of blatant social inequities. Relying on the notion that hard work is the solution to bridging the digital divide plays into a fundamental component of white identity, the very disavowal of the notion of race itself. The colorblind argument often offered by white teachers as a preemptive defense against accusations of racism, serves to minimize the impact of race on social opportunities. If whiteness is defined by what it is not, then there must be an active negation of the other.

CONCLUSIONS

While the results of this survey cannot be generalized beyond the population of the program in which this study was conducted, the following suggestions based on the findings and relevant literature may provide insights to other teacher preparation programs with pre-

service teachers who are predominantly white, who are training teachers to work with culturally diverse students:

1) Because preservice teachers construct their ideas about teaching largely from their own experiences (Buchmann & Schwille, 1983; Hollingsworth, 1989), it is important for teacher education programs to understand the cultural literacies that new teachers will bring into their classroom. As has been shown in this and other studies, teachers response to cultural difference is informed by both what they understand about their biases and backgrounds and by what they do not know (ignorances). These ignorances are often based on the systematic silences brought about by internalized values that are advocated as common sense and institutional practices that distances teachers from their students. In the process of developing this understandings teacher educators should understand that white ignorance is not monolithic and that it is inflected by class, gender, nationality, religion, region, ability, and sexuality (Mills, 2007). While specific discourses about difference and equity may permeate the professional and academic experiences of teacher educators, pre-service teachers may not even have a basic conception of their own biases and how these biases relate to their future teaching practices.

2) The cultural blinders that pre-service teachers may bring to their teacher training programs can permeate every aspect of how a new teacher approaches their future students. If new teachers are to be able to address the digital divides with all of their complexities and social and cultural interconnections then addressing the epistemologies of ignorance inherent in white racial identity is necessary. For example, it was revealed in this study that many of the white students who were able to define the digital framed their understandings within the socio-economic frameworks that they developed in their communities of origin.

Thus they could understand it as an economic or age divide, but rarely discussed it as a cultural divide or literacy divide. As will be discussed in the final suggestion, helping pre-service teachers construct the complex and nuanced characteristics of their own identities will help them develop the tools to teach students from different backgrounds than their own.

3) In helping teachers to understand their cultural biases, there is the potential for them to feel threatened as very deeply held beliefs are brought into relief against the backdrop of their emerging teacher identities. One way to both challenge and work with these beliefs is in the use of metaphor to explore teacher identities. Saban (2006) discusses using metaphor as a way to bridge the familiar with the unfamiliar by providing a way to help preservice teachers develop a reflective practice that connects their own social and cultural experiences with those of students who may have different cultural frames. Helping teachers to understand curriculum and teaching around issues of the digital divide through metaphors of teacher identity (e.g., savior, caregiver, guide, firestarter), curriculum (e.g., a set route, a map, an unexplored landscape), and technology (e.g., tool, teacher, babysitter, communication medium, representation device) can all contribute to how teachers simultaneously see themselves addressing the digital divide in addition while interrogating their own racial identities and racial ignorances.

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