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The Digital Divide: An Investigation of Native American Undergraduate Population in South Dakota

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ABSTRACT

The Native American population in South Dakota accounts for more than 8 percent of the state-wide population as per the 2000 U. S. Census. The primary purpose of this study was to survey a segment of this population base, and identify the percentage of South Dakota's Native Americans that do not own computers, or have access to the Internet and subsequently are classified as being affected by the digital divide.

Keywords

Digital divide, native American, technology access, computer, Internet

INTRODUCTION

Technological advancements have made significant gains in assisting schools and other public agencies with their goal of providing computer and Internet access to all, including the minorities and the poor (Roach, 2003a). Koss (2001) referred to the digital divide as "the gap between individuals, households, businesses, and geographic areas at different socio-economic levels and their opportunities to access information and communication technologies" (p. 77). The term "digital divide" entered the American lexicon in the mid-1990's to refer to unequal access to information technology (Light, 2001). According to Vigna, Fairchild, Bearnes, and Sherry (2003), the unequal access to technology comes from the aging of the rural population; it comes from the fact that the U.S. population has become more ethnically diverse; and it comes from the fact that web-based content on the Internet continues to be directed to white America, not addressing the interests of minorities.

This study is intended to apply the knowledge base of previous studies regarding the digital divide in order to provide an analysis of the Native American population in one state and to demonstrate the effects of the digital divide on the Native American population of South Dakota.

BACKGROUND OF THE STUDY

The impact of technology-driven deprivation in American Indian nations is an active debate; many American Indians on reservations live without electricity, indoor plumbing, telephone service, sewer systems, and roads. Along with these obstacles, Indians on reservations also encounter the digital divide, the chasm that discourages people of minority and low-income households from accessing technology tools, related learning opportunities, and high-quality online content. Although digital divide literature has described existing and likely scenarios ranging from other ethnic groups in the United States to racial groups in other countries, the American Indians are a statistically insignificant population and, consequently, the federal government excludes them in digital divide research (DeBell & Chapman, 2003).

In 1994, Native Americans from across the United States gathered in Denver, Colorado, to hold the first tribal communications forum. The president and founder of this group, LaDonna Harris, noted the following situations that existed at that time: (a) Indian America is a very special situation and should be treated very differently from other ethnic communities.(b) Tribal governments and Tribal peoples are totally excluded from current Information Highways, and (c) Indians active in information technology development are not given the opportunity to participate in national planning for telecommunications. (as cited in Baldwin, 1995, p. 151) The development for the rationale for this research takes an inquisitive view of what the decade that had passed, since this original forum, had delivered to the Native American population relative to access to the Internet by the Native American population.

Multiple theories exist regarding the social and political implications of the digital divide in the United States. Lenhart et al., (2003), First and Hart (2002), and DeBell and Chapman (2003), writing for the National Center for Educational Statistics of

the U.S. Department of Education, all agree that the most at-risk portion of the U.S. population are the elderly, the poor, the disabled, the minorities, and those Americans living in the rural areas of the nation.

Many public and private entities conducted investigations into the digital divide, its possible solutions and magnitude. These entities include the private sector, philanthropic organizations, the Department of Education, and the Federal Communications Commission, among many others, but perhaps, no private or public entity has done more investigation and research into the digital divide than the United States Department of Commerce through its National Telecommunications and Information Administration (NTIA).

The NTIA issued its first investigative report in 1995, *Falling Through the Net: A Survey of the Have Nots in Rural and Urban America* (U.S. Department of Commerce, 1995). The next contribution was a report in October 1997, a second publication, *Falling Through the Net II: New Data on the Digital Divide*. Implemented in 1999, the NTIA's use of the term "digital divide" when they published their third in a series of reports, *Falling Through the Net: Defining the Digital Divide*, and the presentation of the fourth in a series of publications titled, *Falling Through the Net, Toward Digital Inclusion*.

At the time the second report from the NTIA became public in 1998, the Native American population as a race/origin had disappeared (NTIA, 1998). No mention was made of this segment of the American population throughout the entire report. This omission of data for Native Americans has left a segment of the American population underserved, and according to Hacker and Mason (2003), "As a consequence of this situation, policy makers lack the valid and empirical grounds they need for making policy decisions about government support for new and necessary communication infrastructures" (p. 100).

DISCUSSION

The rationale for research comes from the fact that according to Sanoff (2001), "as computers and the Internet have become part of the fabric of daily life, those on the wrong side of the divide are at a growing disadvantage in everything from pursuing higher education to getting a new job" (p. 16). The identification of demographic characteristics (DeBell & Chapman, 2003) among the Native American population of this study being affected by the digital divide demonstrates the application of this rationale.

Delving deeper into this divide of haves vs. have-nots, Light (2001) made mention of the fact that technology has never entered U.S. society equitably. Disparities in access to innovations have always been prevalent, whether it was electricity, telephones, television, or the automobile.

Native Americans in South Dakota do, for the most part, live in the isolation of over 5 million acres of reservation land. The Native American population has gone unnoticed in the attempts to narrow the digital divide within their culture (First & Hart, 2002). The infrastructure in many poor and minority communities does not exist for accessing the Internet, regardless of whether a computer exists in the home. Many Native American households are without a cable television provider or telephone, the two most common mediums for providing Internet access. Lack of access affects the ability of "children to improve their learning with educational software, of adults to acquire valuable technology skills, and of families to benefit from online connections to important health and civic information" (Laudon & Tarver, 2004, p. 556).

Research conducted by the State of South Dakota Bureau of Information and Telecommunications (2004) demonstrated a lack of technology access and affirmed the position of First & Hart (2002). The majority of Native American reservation lands are located in the western half of South Dakota.

Population

The research conducted was a preliminary investigation into the digital divide among Native Americans college students in South Dakota. The research adds important new knowledge to the existing body of knowledge regarding the digital divide. There is much yet to be researched and learned in the attempt to gain a more thorough understanding of the impact of the digital divide on this segment of the U.S. population. The selection of students, who were attending a college, to participate in this study tests the premise that technological advancements have made significant gains in assisting schools with their goal of providing computer and Internet access (Roach, 2003a). Statistics from the South Dakota Board of Regents (BOR) office has recognized importance of colleges to this segment of the Native American population. The BOR reported that the Native American population as a percentage of total headcount at the six regental universities in South Dakota account for 571 of the 30,237 students, only 1.9 percent (South Dakota Board of Regents, 2004). These students have chosen to leave their respective reservations to further their education, and possibly to escape the isolation of the reservation setting.

RESEARCH QUESTIONS

This study will address three research questions. From a null hypotheses standpoint, the hypotheses include the following:

H01: The Native American population studied does not have a higher percentage of their population without computers and access to the Internet when compared with the study population of the National Center for Educational Statistics in 2001 (DeBell & Chapman, 2003).

H02: There is no statistically significant difference between head of household types and the digital divide within the study population.

H03: The factor of family income is the economic indicator most often cited by the population of this study relative to the lack of computer ownership and access to the Internet in the household.

To assist with the retaining or rejecting of the stated hypotheses, a mapping technique was employed that aligns the respective survey questions to the research questions and also to the hypotheses that the researcher has created. The mapping design is exhibited in Table 1.

Table 1: Mapping Survey Questions to Research Questions and to Hypotheses

Survey Questions	Hypotheses
1, 5, 6, 7, 8, 9, 10, 11, 12, 21, 24, 25, 26, 27	H01
3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 20, 24, 25, 27	H02
1, 13, 14, 16, 17, 18, 19, 21, 22, 23	H03

The selection of college students to participate in this study tests the premise that technological advancements have made significant gains in assisting schools with their goal of providing computer and Internet access (Roach, 2003a). Statistics from the South Dakota Board of Regents (BOR) office has recognized importance of colleges to this segment of the Native American population. The BOR reported that the Native American population as a percentage of total headcount at the six state universities in South Dakota account for 571 of the 30,237 students, only 1.9 percent (South Dakota Board of Regents, 2004).

The survey instrument used for this study was obtained from the National Center for Education Statistics (NCES) by way of personal email contact with the two researchers that authored the studies for NCES, Matthew DeBell and Chris Chapman. This instrument was used on two occasions by NCES, in 2001 for the report titled *Computer and Internet Use by Children and Adolescents in 2001*, (DeBell & Chapman, 2003), and also in late 2003 for a yet-to-be-released study relative to school enrollment / computer use supplemented by DeBell and Chapman.

DATA ANALYSIS

Upon completion of the data collection, the researcher explored the data collected with the use of the analytical software, PC/SAS. A mapping of hypotheses and research questions to the survey queries as outlined in Table 1 was completed. The purpose for this exercise was to recognize the sources of information relative to the retaining and rejecting of specific hypotheses by way of answering the research questions that had been developed as a tool for guiding the research

RESULTS

Table 2: Computer Ownership & Internet Access

	No.	Yes
Household Computer	14	51
Internet Access in Household	16	49

The study surveyed 65 Native American college students, asking 28 questions. Fourteen of the questions targeted demographic characteristics of the participants. Specifically, data that identified the following: (a) tribal affiliation, (b) age, (c) gender, (d) family head of household type, and (e) household income. In addition, the participants were queried regarding the availability of telephone service, cable television service, satellite television service, and if they had ever taken part in a survey regarding computers and the Internet. Table 2 displays the results from the survey.

The most prevalent demographic factor relative to lack of computer ownership or technology access was gender. More than 67% of the participants were female, and the research shows that 15.9% of the female population did not own a computer. The same trends were present when the researcher examined access to the Internet. More than 38% of the male respondents

reported that they did not have access to the Internet in their respective homes, as compared to slightly more than 20% of the female population.

Table 3: Household Types with Computer and Internet Access

Household Type	2001 Study%	Current Study%
Computer in Home (two parent)	73.3	87.5
Computer in Home (single female parent)	53.8	64.7
Computer in Home (single male parent)	44.1	100.0
Computer in Home (other arrangement)	51.1	66.7
Internet in Home (two parent)	51.6	85.0
Internet in Home (single female parent)	37.8	47.1
Internet in Home (single male parent)	29.7	100.0
Internet in Home (other arrangement)	36.3	66.7

There are three hypotheses to be tested.

Hypothesis 1: H_{01} : The Native American population studied does not have a higher percentage of their population without computers and access to the Internet when compared with the study population of the National Center for Educational Statistics in 2001 (DeBell & Chapman, 2003).

Based on the data collected and analyzed in this research study, the action of retaining Hypothesis 1 is in order. The population of Native Americans studied has a higher percentage of its population with computers and access to the Internet in their respective home environments. The statistical outcomes of the frequency distributions supported the retention of H_{01} .

Research findings illustrate 78.5% of the Native Americans own a computer in the home, and 75.38% have access to the Internet from home. The DeBell and Chapman (2003) study reported an overall percentage of homes with computers to be 65.2%, and Native American homes reported 54.0% of computer ownership. Access to the Internet was lower than computer ownership in the DeBell and Chapman study. The Internet access in the home was 45.6% of the respondents, and specifically 31.7% the Native American population stated that they had Internet access.

Hypothesis 2: H_{02} : There is no statistically significant difference between head of household types and the digital divide within the study population.

Based on the data collected and analyzed in this research study, the action of rejecting Hypothesis 2 is in order. Data collected in this study show a significant difference between head of household types and the digital divide within the participants. The households with a single female parent were more unlikely to have a computer or access to the Internet in their respective homes. The performance of a Chi-square test on the four categories of household type demonstrated a statistical significance between household type and the digital divide with a degree of freedom of 3, and a Type 1 error rate of 0.05.

Overall, 78.46% of the current study participants reported owning a computer in the home, but the percentage dropped to 64.71% for single female parent households. Overall, 75.38% of the current study participants reported having access to the Internet in the home, but the percentage dropped to 47.06% for single female parent households.

Hypothesis 3: H_{03} : The factor of family income is the economic indicator most often cited by the population of this study relative to the lack of computer ownership and access to the Internet in the household.

Based on the data collected and analyzed in this research study, the action of retaining Hypothesis 3 is in order. The cost of computers and Internet access was the factor most often selected by the study participants that did not have computers or Internet access in their respective homes. The performance of a Chi-square test on the categories selected by the participants regarding lack of computer ownership and Internet access demonstrated a statistical significance between computer ownership, access to the Internet, and the digital divide with a degree of freedom of 5, and a Type 1 error rate of 0.05.

Findings from the current research that demonstrate a support for Hypothesis 3 include the following, (a) 61.1% of homes with a family income of under \$20,000 own a computer, and (b) 38.9% of homes with a family income of under \$20,000 have Internet access at home. (c) In addition, 71.4% of the participants that do not have a computer at home cited the cost of

computers as the main reason, and (d) 75% of the respondents that do not have Internet access at home cited cost of this access as the main reason for lack thereof.

CONCLUSIONS

The completed research study at only one college does not demonstrate the measurement of the digital divide on all Native American reservations in South Dakota. The study is replicable on reservations as well as other educational institutions. Previous research (Natriello, 2001), (Dickard, 2002), and (DeBell & Chapman, 2003), demonstrates that further quantitative studies regarding the digital divide and the Native American population are warranted.

The research conducted could not effectively measure the extent that isolationism affects the ability to own computers or have access to the Internet and the research conducted is not representative of the entire Native American population in South Dakota.

This research filled a void regarding digital divide awareness among Native Americans in South Dakota. There is considerable research previously conducted relative to other minorities in the United States, but the Native American population has gone unstudied due to the small national population base. The data collected during this study will assist in the quantitative measurement of the effectiveness of programs and projects implemented to decrease the digital divide among Native American groups. The completed research study at one college does not demonstrate the measurement of the digital divide on all Native American reservations in South Dakota. The study is replicable on reservations as well as other educational institutions. Since the publication of the dissertation in 2005 the study has been replicated with a Hispanic population in Michigan and a Native American population in New Mexico. The researchers plan to conduct similar research within the Native American population on the South Dakota reservations.

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