The COVID-19 pandemic raised greater awareness to ways in which societies have become dependent upon technology and the Internet. The shift to remote-only education, in particular, fostered the recognition of compounded problems faced by economically and educationally disadvantaged families with school-age children. Millions of children, particularly students of color, faced diminished and imperiled progress because of limited or no access to the Internet at home. This exploration concentrates particularly on residents of rural and tribal communities, whose insufficient efforts have been made to increase technological advances and access levels to reflect current standards. This article focuses on digital inclusivity in rural and tribal areas of two Great Plains states through a wide-ranging survey and analysis of the challenges and successes of technological leadership, information literacy and public policy development and administration.

**Introduction**

The world has overcome a third year of life-shattering political, economic, medical and social challenges caused by the pandemic. The COVID-19 pandemic has restructured our individual and collective lives in ways that are still not fully recognized. Yet, almost immediately apparent in this restructuring was the central role of the Internet in making sense of the evolving pandemic as it reshaped all aspects of our daily lives, ranging from work to recreation. Consequently, a politically divisive debate about our K-12 education systems followed.

The Internet has been a major player in communicating coronavirus and health-related information, and its infrastructures have facilitated the continued work of those employed and, as education from pre-K through graduate school. In many regards, continuation of education and employment has been among the greatest challenges, and has highlighted problems that existed long before the COVID-19 pandemic. In 2020, a report issued by a coalition that includes the Alliance for Excellent Education, National Indian Education Association, National Urban League, and United Negro College Fund, among others, warned that minority students of color will be left behind because of limited access to the Internet and technological infrastructure.

While the technology divide continues to affect societies in many ways yet to be seen, a silver lining, if compared to surveys for one, is that if a high-speed Internet access to the technological skills in most households may lack, factors permitting digital literacy are measured to any given geographical area, from neighborhood location, existing public access to digital literacy and access to digital literacy defines how the Internet is used.

**Historical framework**

The digital divide is an ongoing dilemma, international in scope. At the national level of the U.S., there has been an acknowledgment of the divide, and the various issues related to it, for at least three decades, as evidenced by a 1999 article penned by ALA (then diglib in 2006): “The combined effect of [the Digital Divide] is an increasingly fragmented information base — large components of which are directly available to people with money and education and not necessarily available to those who lack them.” Consequently, insufficient efforts have been made to increase technological advances and access levels to reflect current standards. This paper seeks to set the light and explore the reasons for this divide in rural and tribal areas through a wide-ranging survey and analysis of the technological infrastructure, information literacy and public policy development and administration.

**Methodology**

The framework of this investigation is an examination of policies of educational systems, library and information science (LIS) institutions, state government policies and actions, tribal government policies and actions, and media coverage. This analysis compares Kansas and Oklahoma, two neighboring rural states within the Great Plains region with similar demographic and physical geographic features, highlighting significant issues and dynamics that create differences in approach and policy development. One of the states has significant tribal populations; one does not. Comparisons will draw data from counties with and without substantial tribal populations.

**Geographic factors**

The physical geographies of Kansas and Oklahoma are similar. Both states feature steep hills and forests in the east giving way to rolling hills, escarpment, and flat plains in the west, although the Ozark plateau extends much farther into eastern Oklahoma than eastern Kansas. It is also worth noting that the development of infrastructure is Greater Plains cities has been historically interconnected and interdependent.

**Broadband comparison**

Kansas and Oklahoma differ greatly in terms of broadband connectivity. Kansas has 87.1 percent terrestrial broadband coverage (BroadbandNow, 2023) while Oklahoma only has 85.3 percent coverage (BroadbandNow, 2023). Kansas’ broadband infrastructure reflects a state that has tried to keep up with national levels of connectivity. The difference in broadband between these two neighboring states can be attributed to several factors:
Broadband in both states was notably expanded in 2018, through the Federal Communications Commission’s (FCC) Inaugural Universal Service Support program as well as through the 2018 USDA ReConnect Program. The USAC support program generated much support from Kansas lawmakers and Internet service providers across the entire state (Moran, 2018). Within the FCC’s 2018 Connect America Fund Fact Sheet pertaining to the support program (U.S. Federal Communications Commission, 2018), the Commission stated:

According to the Federal Communications Commission’s (FCC or Commission) most recently available data, about 30 percent of rural Americans lack access to fixed, terrestrial high-speed Internet of at least 25 Mbps download/3 Mbps upload (25/3 Mbps), the Commission’s current speed benchmark, which reflects consumer demand for high-speed broadband services. In urban areas, that number is two percent. The gap between broadband access in rural and urban areas is unacceptable. We must do better. (U.S. Federal Communications Commission, 2018).

In 2019 and 2020, the U.S. Department of Agriculture’s (USDA) ReConnect program has offered US$1,508,129,456 in grants and loans to telecommunications firms, rural electric cooperatives, Internet service providers, and municipalities in connect rural areas with “affordable broadband service” (USDA, 2021). This program has an evaluation criteria focused upon “connecting agricultural producers and marketing, e-Commerce, health care and education facilities” (USDA, 2018). The program was based on the efforts of a 2017 Intrastate Task Force or Agriculture and Rural Prosperity which discovered that improving broadband infrastructure correlated into rural development (Perdue, 2017, USDA, 2018). Since the commencement of this research, the USDA has released its “October 25, 2021 Funding Opportunity Announcement,” designed to focus broadband infrastructure development in remote rural and tribal communities (USDA, 2021).

In Kansas, the ReConnect program was dispersed throughout the state, to approximately 1,390 households, 16 businesses, and 27 farms (USDA, 2019a). These awards appear to be disseminated more or less equally across the state. In Oklahoma, 4.2 million were allocated, for 312 households and 20 farms (USDA, 2019b). Those awards appear to have been mostly allocated to a telecom servicing the western part of the state (USDA, 2021).

In an official report to the Kansas Statewide Broadband Expansion Planning Task Force, Legg (2019) asserts validating the available broadband data is an essential role state and tribal governments must take on to have successful broadband campaigns (Kansas Legislative Research Department, 2020). At the commencement of writing this paper, Oklahoma’s Broadband Initiative appeared to be little more than a shell organization (Oklahoma Broadband Initiative, n.d.). Recently, Oklahoma’s Broadband Office has recently announced the hire of its first director, Mike Sanders (OkBurden and Stroage, 2023). Launched in October of 2019, the former state broadband initiative offered a map representing available broadband connectivity in Oklahoma (Oklahoma Broadband Initiative, n.d.). Another map, created by Brian Whitacre at Oklahoma State University based upon 2019 ACS Census Data (2019a), provides more detail, featuring types of Internet connectivity.

Figure 1: Percentage of Oklahoma households with no Internet, by school district. Source: Whitsers, n.d. and U.S. Census ACS 2014-2018 Table S2801 (https://data.census.gov/cedsci/s?tid=ACSD1P.S2801).

A comparison of Oklahoma broadband maps to a map of tribal jurisdictions in Oklahoma (2021) demonstrates that rural counties not within tribal jurisdictions tend to have better broadband connectivity rates than counties which do not within tribal jurisdictions (Whitsers, 2021; Oklahoma Department of Transportation, 2010). Of the available broadband coverage on both the state’s broadband map and in data from BroadbandNow (2023b), Oklahoma’s infrastructure is composed of wired and wireless (satellite), with wireless comprising most Internet access in rural areas. Nonetheless, wireless rural Internet is more expensive, offering access cost prohibitive to many in rural areas. In a state known for capricious and violent weather, with many areas lacking cell phone service, satellite Internet is also not as reliable as cable Internet.
Educational systems

In Kansas, about 46 percent of school districts are considered rural (Scott, 2019). Free and reduced lunch (FRL) statistics, the numbers used to calculate E-rate for schools and libraries, indicate fairly uniform conditions across all Kansas schools. Nearly all of Kansas counties are within the same range of FRL numbers: approximately 50 percent (Kansas Association of School Boards, 2016). With a handful of exceptions, Kansas does not have county boundaries that overlap with tribal lands. Areas without Internet service exist fairly uniformly across the state (Gates, 2021). Connected Nation and the Information Network of Kansas (2019) suggests that recent federal broadband initiatives have either assisted Kansas, or state leadership was more proactive in addressing Internet connectivity issues and securing broadband access than neighboring states. Certainly, Kansas has made strides in broadband connectivity and the state’s FRL numbers are much lower than its neighbor to the south, inspiring a deeper investigation of differences.

In Oklahoma, about 90 percent of school districts are considered rural and some estimate at least one in four Oklahoma students lack adequate Internet connectivity at home (Denwalt, 2021). Denwalt highlights the connectivity dilemma succinctly in an interview with Erika Buzzard Wright of the Oklahoma Rural Schools Coalition:

“A lot of our rural kids don’t have the resources they need to learn outside of the classroom,” Wright said. “This inhibits their learning and exploration opportunities when you compare that to what their peers have at the same level in urban and suburban settings.” (Denwalt, 2021)

Much of the state’s eastern rural counties also have the highest percentage of free and reduced lunch programs. These county boundaries often overlap with tribal jurisdiction boundaries. In the case of the eastern counties with high FRL levels that overlap with tribal jurisdictions, many report low broadband access.
Tribal and rural digital inclusivity: An examination of broadband access in two neighboring Great Plains states

There are 1,740 library employees in the state of Oklahoma (Oklahoma Department of Libraries, 2017); therefore, less than 27 percent of certified public librarians in Oklahoma have an ALA-accredited Master’s degree; 666, or about 29 percent, of certified public librarians in Oklahoma have an ALA-accredited Master’s degree (Oklahoma Department of Libraries, 2017). It is not easy for such librarians to determine how many ALA-accredited librarians are working in public libraries within each county. It is not easy for such librarians to determine how many ALA-accredited librarians are working in public libraries within each county. Only 271, or about 29 percent, of certified public librarians in Oklahoma have an ALA-accredited Master’s degree; 666, or about 29 percent, of certified public librarians in Oklahoma have an ALA-accredited Master’s degree (Oklahoma Department of Libraries, 2017).

Citizens of Oklahoma are primarily served by rural libraries. Some of these libraries are members of larger library systems, while others are independent entities. Oklahoma’s libraries are a mix of public and academic libraries. As noted earlier, broadband initiatives, such as those by the FCC and USDOE, appear to be focused on innovative areas with less need for assistance. Meanwhile, rural areas continue to be left behind.

Access and technology: literacy

Another factor often overlooked in digital inclusion is the lack of technology and information literacy (TIL). Digital skills learned while using technology are not knowledge skills, or skills learned by doing. In Oklahoma, K-12 public school systems, these skills are most often learned under the guidance of a school library media specialist. Typically, and with regard to this, a district will only have at least one certified library media specialist per district. In large districts, urban and otherwise, one library media specialist (LMS) typically serves per school. Nationally, the population of school library media specialists has declined 26 percent (Year 2020, Sports and Health, 2010).

Rural districts, as well as those with English language learners, and majority-low-income districts, are those least likely to have school librarians (Engstrom, 2012; Lance and Kachel, 2012). National data may be too broad to be specific to be applicable at a local level. As Lance and Kachel pointed out, comparing complicated spreadsheet on the National Center for Education Statistics (NCES) Website, “a certain district and state data is arbitrary and ad hoc” (Kachel, 2012). NCES data indicates that only 271, or about 29 percent, of certified public librarians in Oklahoma have an ALA-accredited Master’s degree; 666, or about 29 percent, of certified public librarians in Oklahoma have an ALA-accredited Master’s degree (Oklahoma Department of Libraries, 2017). Access and technology: literacy

While available data is sparse and non-specific, some of library media specialists are listed as only having a bachelor’s degree. Notwithstanding, many employers look at library/media specialists as having a master’s degree. However, confirming that some library media specialists also serve in other roles in a school (Oklahoma State Department of Education, 2018). Caught in a conundrum of repeated waves of budget cuts and a state-mandated teacher pay increase, some rural schools in Oklahoma do not have certified LMS, a sole library aide will carry out all the library-related responsibilities. In small rural districts, the person serving this librarians role will sometimes serve double duty: as school counselor, teacher, or even district network administrator. In some small rural districts, this person may lack relevant qualifications, though most schools aim for persons with appropriate competencies. Some districts, although by no means ideal, lack any librarian at all. When there is no LMS in the school, the person serving this role will carry out all library-related responsibilities. In small rural districts, this person may lack relevant qualifications, though most schools aim for persons with appropriate competencies. Some districts, although by no means ideal, lack any librarian at all. Lance and Kachel are attempting this feat in their SLIDE project, fostered by a grant from the Institute of Museum and Library Services (Antioch University, n.d.).

Similarly, in Oklahoma’s rural districts lacking a certified LMS, a sole library aide will carry out all the library-related responsibilities. In small rural districts, the person serving this librarians role will sometimes serve double duty: as school counselor, teacher, or even district network administrator. In some small rural districts, this person may lack relevant qualifications, though most schools aim for persons with appropriate competencies. Some districts, although by no means ideal, lack any librarian at all. Alonso and Linetz pointed out, comparing complicated spreadsheet on the National Center for Education Statistics (NCES) Website, “a certain district and state data is arbitrary and ad hoc” (Kachel, 2012). NCES data indicates that only 271, or about 29 percent, of certified public librarians in Oklahoma have an ALA-accredited Master’s degree; 666, or about 29 percent, of certified public librarians in Oklahoma have an ALA-accredited Master’s degree (Oklahoma Department of Libraries, 2017). Access and technology: literacy

Sometimes, in Oklahoma’s rural districts lacking a certified LMS, a sole library aide will carry out all the library-related responsibilities. In small rural districts, the person serving this librarians role will sometimes serve double duty: as school counselor, teacher, or even district network administrator. In some small rural districts, this person may lack relevant qualifications, though most schools aim for persons with appropriate competencies. Some districts, although by no means ideal, lack any librarian at all. Alonso and Linetz pointed out, comparing complicated spreadsheet on the National Center for Education Statistics (NCES) Website, “a certain district and state data is arbitrary and ad hoc” (Kachel, 2012). NCES data indicates that only 271, or about 29 percent, of certified public librarians in Oklahoma have an ALA-accredited Master’s degree; 666, or about 29 percent, of certified public librarians in Oklahoma have an ALA-accredited Master’s degree (Oklahoma Department of Libraries, 2017). Access and technology: literacy

Access and technology: literacy

Another element worth examining is the notion that because of a lack of professionally trained staff, some rural schools must rely on volunteers to carry out all library-related responsibilities. Recent examples are the FCC’s Emergency Connectivity Fund (ECF) for public K-12 schools and libraries as well as the FCC’s Affordable Connectivity Program (ACP) for low-income families. While some U.S. states anticipated ECF and ACP and were assertive in spreading the word, some rural states, like Oklahoma, were notably slower in disseminating information about these programs.

Access and technology: literacy

Access and technology: literacy

Within Oklahoma’s higher education systems, remedial computer courses continued to be offered to undergraduate college students. Well into the 2010s, these courses were mandatory at some colleges. Some within the state’s colleges and universities have taken the lead and nullified the divide through writing, policies, and practices. At Oklahoma State University, Brian Whitacre has been a long-time advocate of school library programs. He has written about these, assisted in partnerships to implement real-world policies and initiatives. Leads the Oklahoma Education Office’s Rural Library Education Lending Program, and was appointed by the state’s Senator to serve on the Oklahoma Rural Broadband Expansion Council (Brus, 2021). Whitacre’s work has determined that only 48 percent of rural residents have access to broadband and compared to 74 percent nationally (Whitacre, n.d.). In an interview, Whitacre mentioned on the current state of the divide in Oklahoma: "Part of our work was at a significant economic disadvantage compared with the rest of the country and the falling further behind. We’re still in 2021. The COVID 19 pandemic forced people to stay home. It became obvious that job completion and student progress was often down to who has reliable Internet access — every missed connection ripples into cultural and economic losses." (Brus, 2021).
unlikely that a disproportionate amount of libraries with an ALA-accredited Master’s degree work in urban and suburban libraries where 3G is significantly higher and job descriptions are more likely to require at least a bachelor’s degree, not a Master’s degree. This is apparent in practice: the Oklahoma Department of Libraries’ Public Library Division’s Council is composed of a majority of members who work in cities and have a Master’s degree in the field. Localized director’s groups are composed of members who work in smaller, more rural communities, and mostly lack these degrees.

In many rural libraries, patrons serving as librarians often have no state Library certification; their institutions often require levels of education no higher than a high school diploma. This is not to suggest that librarians without higher degrees necessarily lack the skills needed to serve their patrons; rather, they may lack the advanced study and mastery of ALA competencies that a strong reading of information and technology and information literacy. Just such sensibilities and sensibilities are new a part of a larger diversity, equity, and inclusion (DEI) measures in LIS programs long advanced by the library science field. Digital inclusivity is part of these measures. Missing the requirements for a Master’s degree in library science, from an ALA-accredited institution, or one that meets the “Standards for Accreditation of Programs in Library and Information Studies” (American Library Association, 2021) maintains: (for an individual), a great understanding of DEI issues and how to address them, (San Jose State University of Information).

As such, many rural libraries may not have been fully aware of the FCC’s Emergency Broadband Fund for low-income families, NTIA’s Tribal Broadband Connectivity Program [4], or FCC’s Emergency Connectivity Fund for schools and libraries. For instance, in communications with colleagues, a director had only just learned about the ECF via a-mail from the Oklahoma Department of Libraries (months after the program had begun). However, the director did not understand what it was and why it was important, and therefore had disregarded it. This Director had served her community for nearly 20 years; yet, had she pursued higher certification within the Oklahoma Department of Libraries for over a decade. Another rural director within an MLS explained that her library did not even know how to apply for the ECF, and were told that her library’s policy was to not help people with technology, merely to offer to apply for it.

Disparities in disseminating information about the ECF and EBBF or NTDA’s Tribal Broadband Connectivity Program also exist between the states’ library associations. Kansas Library Association’s Web site does not display a designated news site, sections and communities of practice pertaining to civic engagement, information literacy, and technology, as well as a list of librarian, Oklahoma Library Association’s Web site also does not feature these titles. The other libraries do contain contact information for those wanting to participate in any of these three divisions, four committees, and 12 communities, as well as a list and talk to talk about previous conferences. After a review of the Oklahoma Libraries Association’s Web site, it appears that the organization did not address digital inclusion, at least as it pertains to internet access in rural communities, until recently. Currently, the Kansas Library Association addressed that issue in 2016 in an annual conference (Peary, 2016). Considering that ALA has increased its focus for thirty years, OLA’s policy of lack of action is alarming, illustrating another element of digital inclusivity issues in the state.

Like any other organization, these state library associations communicate important information via various methods: phone, e-mail, and social media. Yet, this may still pose a problem, since some rural libraries are not well connected to these communication chains, or understand what may be at stake by missing certain information. Those who could benefit from such communication may be failing to receive the message that help is available. Furthermore, there is a lack of accountability, or deficiencies in existing systems to calculate how well this information is being disseminated into rural areas.

Governmental policy and action

On a national scale, governmental leadership has admitted a lack of detailed knowledge about information and communication technologies, but this institutional weakness has evolved rapidly (Hahn, et al., 2015). As early as 2011, Kansas has led the way with numerous broadband initiatives, urban and rural, across its own, and continues to expand connectivity to the state (Kansas Department of Commerce, 2021, Mears, 2019).

In contrast, Oklahoma Governor Kevin Stitt has historically stuck down major legislation to improve broadband measures and initiatives (Sergeo, 2020). There is some information on technological solutions on the Web site for the Oklahoma Broadband, as well as a recent review in December 2022 on NTDA connectivity solutions for tribal nations[3].

Deficiencies on the federal level continue to be criticized for their macroscopic approach. “Even with Influenza Investment and Jobs Act (IIA) funds, the federal government will once again fail to address digital disparities without a clear definition of the problems being solved and a lack of substantive feedback from local stakeholders who understand the conditions of their communities” (Lee, 2021). The FCC has admitted its own need to improve communication and effectiveness in the deployment of broadband for tribal areas (U.S. Federal Communications Commission, Preemption Task Force). In a recent study, the U.S. Government Accountability Office (GAO) demonstrated that the issue is presently negligible at federal levels.

We identify gaps in digital information and reporting, including a lack of transparency and accountability of spending. We recommended that FCC analyze how it uses its high-speed projects funding and make that analysis available at least annually. FCC has taken action to implement our recommendations to address the lack of transparency and accountability of spending. Yet, we reviewed data that FCC collected from providers to describe the locations of receiving broadband infrastructure and helped to fund projects directly served and underserved areas to target federal funding. We found that these data over-read broadband access, especially in tribal lands, and recommended that FCC take action to improve these data. FCC concurred with the recommendations and has begun taking action, but the agency has not yet fully implemented any of the report’s three recommendations (GOA, 2020).

Despite the vacuum of responsibility and action at various levels, some Indigenous Nations in Oklahoma and elsewhere have worked directly with the U.S. government to initiate broadband programs. In Oklahoma, the Cherokan, Chatco, Medicine (Creek), and Sac & Fox nations, among others, have formulated sovereign relations directly with the FCC and NTDA after the 2019 FCC decision (Rogers-Taylor, 2019; Nore, 2020; BroadbandUSA, n.d.; Cherokee Nation, 2020; Thomas, 2021; Taylor, 2021).

Media coverage/Information dissemination about programs

Kansas news and media outlets tended to exemplify moderate to good coverage about broadband initiatives. Those stories sometimes provide a program’s or initiative’s launch. In Kansas City, recent media coverage on anything pertaining to broadband and digital inclusion was released from all major urban news outlets, before and during the FCC’s Emergency Broadband Benefit’s (EBB) release (Arbel, 2021; Schneid, 2021).

In comparison, Oklahoma news and media outlets tended to exemplify poor to moderate coverage about broadband initiatives. While university-sponsored media outlets published news stories that either postponed or coincided with a program’s or initiative’s launch, the state’s mainstream media outlets were less likely to provide such news coverage. In a survey of all major Oklahoma and Jackson county media Web sites, the only coverage found was a brief article about the FCC’s Emergency Broadband Benefit. The article, posted by an OK media outlet, was released shortly before the program’s bank (Bank, 2021). Notwithstanding, as a brief mention on a newly created OKO “FYI Newswire” page, the broadcast and subsequent information probably did not reach those rural citizens. The broadcast was seen only by metropolitan viewers and those fringe-rural viewers in the viewing area (Onstot, 2021).

Conclusion

Despite having better rural broadband than his Eastern tribal counterparts, U.S. Representative Frank Lucas, representing the eastern half of the state (Washington County, and Sac & Fox, representing the western half of the state), candidly acknowledged continued existence of the digital divide in a 2021 news interview:

"In the country, I get about half the same bandwidth I would get... So the difference between Roger Mills County and (Washington) D.C. is a factor of four, five, more — maybe almost 10 times," Lucas said. He then asked, "Isn’t it important that all people have access to these same resources? Do we want a two-tier society where urban areas are prosperous and better educated and have more economic opportunity?" (Onstot, 2021)

Funding decisions pertaining to Internet infrastructure, connectivity, and access are made at federal and state levels, and tribal and rural areas continue to be left on the wrong side of the digital divide. One factor in the lack of representation in decision-making positions by those most affected by policies and processes. Tribal nations and rural areas should have adequate representation at the federal and state level in all arenas. Currently, not to have adequate representation is not inclusive, ethical, or effective. The time is overdue to ensure how governments are allocating and earmarking these funds, what transparency, and accountability measures are in place to report on the allocation and use of these funds, and how effective both federal and state government agencies are at ensuring such funds are used in rural and tribal areas. From faulty data to a historic lack of accountability, issues pertaining to digital inclusivity remain as relevant 30 years after ALA sounded the first alarms on the subject.

Notes

1. E-rate is a common name for the Schools and Libraries Program of the Universal Service Fund, a federal program assisting public schools and libraries in order to cover costs associated with Internet access.

2. https://www.fcc.gov/about/ericc/ericc.html

3. E-mail: maurice [dot] wheeler [at] unt [dot] edu

4. Maurice B. Wheeler

5. Antioch University, n.d. “About SLIDE (The School Librarian Investigation—Decline or Evolution?),” at http://libslide.org/about/
Tribal and rural digital inclusivity: An examination of broadband access in two neighboring Great Plains states


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