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A Closer Look at West Virginia's Broadband Barriers and The Potential of Open Educational Resources: A Systematic Review

Taylor Miltenberger*

Blue Ridge Community and Technical College, Martinsburg, West Virginia, USA

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*Corresponding Author:

Taylor Miltenberger

tmiltenb@blueridgectc.edu

Abstract: West Virginia (WV) faces a unique convergence of socio-economic and geographic challenges, including persistent rural poverty, a declining extractive economy, and a severe opioid crisis (Alzarrad, 2024; Douglas & Walker, 2017; O'Leary et al., 2018; United States Census Bureau, 2024). These systemic barriers are rooted in the uneven geographical development produced by legacy Neoliberal frameworks, manifesting today as profound infrastructure deficiencies, most notably a digital divide that maintains the state's position at the nation's periphery regarding high-speed connectivity (Burdette, 2024; Bustillos, 2017; O'Leary et al., 2018; WV Office of Broadband, 2025). Such factors create inequities that hinder access to higher education, particularly within the community college system. Using a critical geography framework, this study employs a PRISMA-guided systematic review to examine the intersection of internet accessibility and Open Educational Resources (OER). The analysis seeks to answer how accessibility challenges impact rural community college students and whether OER initiatives can serve as a mechanism for social justice by mitigating these barriers. Results indicate that while OER offers a transformative pathway to decommodify learning materials and reduce the financial burden on students in an economically distressed region, its efficacy is currently throttled by physical and digital obstructions, ranging from the mountainous terrain and the National Radio Quiet Zone to the resource curse that diverts educational funding toward environmental and health remediation. The study concludes that while OER is a vital tool for advancing educational equity, its success in WV is inextricably linked to broader efforts to dismantle the systemic technological and socio-spatial barriers that marginalize rural learners.

Keywords: Open Educational Resources; Internet Access; Rural Education; West Virginia; Critical Geography; Neoliberalism

Introduction

West Virginia (WV) is characterized by a challenging socio-economic landscape, marked by extensive rurality, significant economic hardship (The Annie E. Casey Foundation, 2018; United States Census Bureau, 2024), and an entrenched opioid crisis (Alzarrad, 2024). These systemic factors create substantial barriers to equitable educational opportunities, particularly within the

state's higher education sector (Bennett et al., 2019; O'Leary et al., 2018). The present study critically examines how geographic isolation and socioeconomic disparities in rural WV shape access to Open Educational Resources (OER). Specifically, this research investigates whether these openly licensed materials can fulfill their promise of equity within a community college system constrained by the state's fragmented digital infrastructure.

This analysis situates itself within a broader

discussion of social justice and educational accessibility. In this study, educational accessibility is defined as the reliable, unimpeded access to current, high-quality learning materials. Because educational inequity is not geographically neutral, this article employs a critical geography framework to expose the socioeconomic and spatial processes that produce these disparities. Critical geography prioritizes issues of equity and social justice by asking which spaces are valued, who inhabits them, and whose needs remain marginalized (Ozias & Pasque, 2019). When applied to education, this lens highlights the interplay among space, place, power, and identity (Gilbert, 2010; Ozias & Pasque, 2019). Through this framework, OER initiatives are evaluated as potential mechanisms to mitigate the specific spatial inequities that restrict rural students' access to learning resources.

Guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Page et al., 2021), this study utilizes a systematic review to synthesize existing literature on accessibility challenges associated with OER implementation in WV, with a primary focus on the state's community and technical college system. The review addresses two guiding research questions: (1) What specific accessibility challenges are faced by rural West Virginia community college students? and (2) How might OER initiatives be structured to mitigate these challenges and advance equity in higher education?

By situating WV's educational landscape within its historical and socio-economic context, this analysis illuminates how systemic barriers intersect with emerging pedagogical innovations. The following section reviews the relevant literature on OER, critical geography, and educational accessibility, establishing the conceptual grounding for the subsequent synthesis of findings.

A Critical Geographical Analysis of WV

To contextualize the subsequent systematic review, this section provides a critical overview of the historical, political, and socio-economic factors that have shaped modern-day WV. Historically, the state has experienced extensive land exploitation, with an economy dominated by resource-extractive industries such as coal mining (Douglas & Walker, 2017). This reliance on extraction has fostered what scholars often term a resource curse, resulting in vulnerable populations, intersecting environmental

and health crises, and uneven infrastructure development across increasingly divergent rural and metropolitan areas (Love, 2024; Rickman et al., 2017; West Virginia House of Delegates, 2022). These factors have collectively strained educational opportunities and restricted upward mobility for many residents.

Understanding WV's contemporary economic challenges requires an examination of the legacy of neoliberalism. In the context of this study, neoliberalism is defined as a political and economic framework characterized by the prioritization of free-market competition, the deregulation of industry, and the reduction of state influence in the public sector (Harvey, 2005).

For WV, neoliberal policies have manifested as substantial budget reductions for social programs, including public higher education, and a shift toward the privatization of services (Gorby, 2023; Harvey, 2005). By emphasizing individual responsibility over state-funded support, these frameworks have often undermined labor unions and exacerbated the digital divide in regions where private providers find infrastructure investment less profitable. First coined in the mid-1990s (National Telecommunications and Information Administration, 1995), the digital divide refers to the widening gap between those with physical access to modern information technology and those without, a disparity that in rural WV is compounded by a second-level divide regarding the technical skills required to navigate digital systems (Hargittai, 2002). The following sections examine these effects in detail, beginning with a socioeconomic and geographic profile of the state.

WV's physical geography has profoundly shaped the state's socio-economic trajectory. The mountainous terrain necessitates winding infrastructure, while the scarcity of flat land has historically resulted in the development of small, scattered rural settlements (Hamilton, 2016). This geographic reality contributes to WV's status as the third-most forested state in the U.S., with 78% of its land area covered by forests (Hamilton, 2016; O'Leary et al., 2018). Consequently, the U.S. Census Bureau ranks WV as the third-most rural state, with 34 of its 55 counties meeting the federal criteria for rurality (O'Leary et al., 2018). The Office of Management and Budget defines these rural areas as regions outside of metropolitan centers with urban populations of 50,000 or more (O'Leary et al., 2018). Under this definition, the vast majority of the state

remains rural, except for a few metropolitan hubs such as Beckley, Charleston, Huntington, Morgantown, Parkersburg, Weirton, and Wheeling (O'Leary et al., 2018). These rural communities face compounding systemic challenges, including the opioid crisis and significant population decline (Bennett et al., 2019; Love, 2024).

Economic growth in WV is largely concentrated in these metropolitan areas, which drives out-migration as residents in outlying counties seek viable employment (O'Leary et al., 2018). This movement widens the disparity between rural and urban sectors, as wages and income levels remain consistently higher in metropolitan centers (O'Leary et al., 2018). The resulting uneven geographic distribution of the population leads to inequitable access to essential resources and professional opportunities (Canterbury, 2012).

Historically, several counties were classified as metropolitan during the height of industrialization, only to revert to rural status following factory or mine closures. Logan County serves as a poignant example: the coal industry industrialized the region and subsequently vacated the area once the coal was depleted (O'Leary et al., 2018). Such instances reflect neoliberal investment patterns that treat rural spaces primarily as sites for resource extraction. Once these resources are exhausted, the lack of diversified investment often leaves these communities without an envisioned economic future or sustainable infrastructure (Guenther, 2023). These socioeconomic conditions, characterized by persistent poverty and geographic isolation, directly contribute to the state's fragmented internet infrastructure, as discussed in the following section.

The Legacy of Natural Resources: Coal and Its Consequences in WV

WV has a long-standing historical connection to the coal industry; the state was once recognized as the coal bin of the world and remains the second-largest coal producer in the United States, with 53 of its 55 counties having a history of production (Hamilton, 2016). Currently, however, the industry is highly concentrated, with four counties in the southern coalfields accounting for 65% of all coal mining in the state (West Virginia Center on Budget & Policy, 2017). These four counties represent some of the most economically disadvantaged and health-vulnerable areas in the nation, as evidenced by high rates of birth defects,

cardiovascular diseases, respiratory illnesses, and cancer (Surber & Simonton, 2017).

While the coal industry remains a significant employer, the physical nature of mining presents substantial long-term health risks. For decades, the Coal Workers' Health Surveillance Program provided essential healthcare access to miners at high risk for Black Lung Disease. However, recent federal budgetary shifts in April 2025 resulted in a reduction of funding for this program (Noguchi, 2025; Radmacher, 2025). These fiscal changes also impacted mine safety infrastructure, leading to the closure of several Mine Safety and Health Administration offices responsible for safety inspections and the maintenance of dust monitors that alert miners to hazardous conditions (Radmacher, 2025). Within a critical geography framework, such budgetary retrenchments can be viewed as a spatial strategy that prioritizes industrial expansion and the unhindered flow of private capital over the maintenance of public health infrastructure (Brenner & Theodore, 2002; Harvey, 2001; Peck, 2012).

The chronic health impacts associated with the mining industry have significantly influenced the state's public health crisis. The high prevalence of work-related injuries and debilitating pain among miners is strongly associated with the rise of prescription opioid use in the region (Friedman et al., 2025). This intersection of physical labor, systemic health neglect, and the resulting drug epidemic illustrates how the resource curse, characterized by an over-reliance on a single extractive industry, can lead to a cycle of socioeconomic and physiological vulnerability.

Resource Curse

Regions rich in natural resources, such as WV, often experience what scholars describe as a resource curse, wherein a heavy reliance on extractive industries can paradoxically hinder long-term economic well-being (Douglas & Walker, 2017). This phenomenon often discourages sustained population growth due to volatile market prices, adverse exchange rates, and the systemic neglect of other economic sectors (Douglas & Warner, 2017; Gylfason, 2001; Sachs & Warner, 2001). Globally, the coal industry has seen a steady decline as power generation shifts toward natural gas and renewable sources, leading to widespread mine closures. These closures precipitate severe financial consequences

for local municipalities, including increased unemployment and rising property taxes to cover the environmental remediation costs of former mining sites (Surber & Simonton, 2017).

Significantly, the reliance on local property taxes to fund environmental cleanup and social safety nets represents a shift of corporate risk onto the public. Within a critical geography framework, this relationship, where the state subsidizes an industry's environmental and social externalities, systematically drains the fiscal resources essential for achieving educational equity (Bridge, 2004; Parenti, 2014). Such fiscal pressures reflect a spatial restructuring where public funds are diverted from social investments, like schools, to mitigate ecological crises left behind by private capital (Fraser, 2014; Moore, 2015). For example, Boone County has historically required emergency state aid to meet its educational budgetary requirements due to these shrinking local tax bases (Surber & Simonton, 2017).

Furthermore, the impact of active mines continues to present challenges for the region. WV's coal mines have a long history of safety concerns, often leading to significant tension between labor and industry management (Hamilton, 2016; Douglas & Walker, 2017). Beyond the immediate physical dangers of mining, the environmental legacy of both active and abandoned sites contributes to pervasive pollution. Issues such as acid mine drainage (Zhou et al., 2023) and coal dust (Clay et al., 2024) directly degrade the health of surrounding communities. Notably, nine of the ten most unhealthy counties in WV are located in proximity to active mining operations, where residents experience higher rates of premature death and lower birth weights (Surber & Simonton, 2017). In these areas, the negative health effects of the resource curse persist across the lifespan, from birth to death.

Boom And Bust Cycles

Mirroring other economies centered on intensive resource extraction, such as the relationship between the Navajo Nation and uranium mining, coal mining in Appalachia follows the boom-and-bust cycles of the broader global economy (Lorinc, 2025). During financial booms, these industries attract significant labor; conversely, during economic downturns, widespread job losses often follow (Hamilton, 2016; Douglas & Walker, 2017). Over several decades, coal mining in WV has steadily

declined (Greenberg & Schneider, 2025), a trend that coincides with a global shift toward alternative energy sources (Appalachian Regional Commission, 2020). While peak demand during times of conflict has occasionally prolonged the industry's lifespan, current production levels are at a historical low (State Journal [WV], 2015). Furthermore, since the 1950s, the twin pressures of globalization, seeking lower labor costs overseas, and the automation of industrial processes have further eroded local livelihoods (Hamilton, 2016). Within a critical geography framework, these trends illustrate how a neoliberal economic regime, prioritized through free trade agreements and deregulation, often centers corporate mobility over the stability of local communities (Harvey, 2005; Peck & Tickell, 2002; Rodrik, 2011; Stiglitz, 2017).

These cyclical fluctuations contribute to slower regional economic growth and inconsistent levels of educational attainment. High poverty levels resulting from these cycles directly impact public sector stability, including educational budgets and infrastructure development (Douglas & Walker, 2017). Scholars have suggested that strengthening educational access is one strategy to mitigate the effects of the resource curse, as it can provide a skilled workforce capable of transitioning to alternative industries during bust phases (Douglas & Walker, 2017). However, the economic instability inherent in these cycles often creates a paradox: during downturns, fiscal resources are frequently redirected to immediate social relief, which may inadvertently divert long-term investment away from the very educational infrastructure needed to buffer against future volatility (Douglas & Walker, 2017). These lasting economic fluctuations have left a legacy of infrastructure deficiencies, particularly in the state's rural sectors (Myers, 2008).

Persistent Economic Hardship and Infrastructure Deficiencies

While WV possesses a rich cultural and industrial history, its residents have long endured significant economic disparities. Poverty levels in the state (16.7%) remain substantially higher than the national average in the United States (12.4%; United States Census Bureau, 2024). Historically, WV has ranked among the most economically disadvantaged states in the nation, recently placing 47th in overall economic well-being, a metric characterized by low wages, a scarcity of affordable housing, and

persistent poverty (The Annie E. Casey Foundation, 2018). Within this context, a poverty-stricken population often lacks the broad tax base necessary to fund social services adequately, thereby exacerbating the correlation between childhood poverty and lower educational attainment (O'Leary et al., 2018).

Rural areas are disproportionately impacted by these economic constraints. Nearly a quarter of all employment in WV consists of low-wage positions; this is particularly prevalent in rural regions where large-scale retail corporations serve as the primary employers (O'Leary et al., 2018). Given these pervasive levels of poverty, many communities find it difficult to secure the capital necessary to invest in essential modern infrastructure, most notably high-speed broadband internet.

Despite high-speed internet being a necessity for contemporary education and economic participation, only 75% of WV's population has reliable access, ranking the state 45th in the United States for connectivity (O'Leary et al., 2018). This lack of access is heavily concentrated in rural sectors, where 30% of the population lacks fixed high-speed wireless internet. In 11 specific counties, nearly half of the residents remain unconnected (O'Leary et al., 2018). Broadband expansion in these regions is often stagnant because the low population density makes it less profitable for private internet service providers to invest in infrastructure far from metropolitan hubs (see Figure 1; O'Leary et al., 2018). This market-driven approach to infrastructure, a hallmark of neoliberal deregulation, effectively isolates rural students from the digital resources essential for academic success. Specifically, the digital divide highlights how high-speed internet access varies significantly across different demographic and geographic groups, often leaving rural populations at a distinct disadvantage.

Scholars argue that the contemporary digital divide is a byproduct of neoliberal policies, particularly the privatization and deregulation of the telecommunications industry. These policy frameworks incentivized investment in high-density urban markets while discouraging infrastructure development in rural areas due to lower profit margins (Bustillos, 2017). This market-driven approach perpetuates spatial inequality, the unequal distribution of essential resources across geographical regions. Consequently, the resulting barriers to access are increasingly characterized as a

social justice issue, as they restrict the ability of rural residents to participate fully in the digital economy and modern educational systems (Pang et al., 2024).

Internet Access

The combination of a dispersed population and mountainous terrain creates a market environment where infrastructure development yields lower profitability, directly impacting access to online educational resources (Salemink et al., 2017). Due to these geographic challenges, 4G cellular coverage in WV is significantly lower than the national average in the United States, contributing to the state's status as one of the least connected regions in the country (WhistleOut, 2025; WV MetroNews, 2025). Consequently, a substantial portion of the population relies on cellular data as their primary means of internet access; in rural areas, the absence of wired broadband is the most frequently cited reason for lacking home internet service (TPMA, 2024).

For residents who do have access to home internet, cost remains a formidable barrier. Recent data indicate that the average monthly cost for internet service in WV is typically higher than the national average, while the connection speeds are often slower, resulting in a significantly lower value for the consumer (Beaudette, 2024). While the national average monthly cost is approximately \$74.17, the average cost in WV is \$86.17; furthermore, residents pay nearly double the national average price per megabit per second (Mbps) for their service (Beaudette, 2024). Although there have been recent government-led initiatives to address these disparities, changes in federal policy, specifically under the administration of President Trump, led to the reduction of grant programs previously designed to incentivize infrastructure development in rural regions (American Library Association, 2025).

The socioeconomic impacts of these inequities are complex and often disruptive. Scholars have identified that a lack of infrastructure disproportionately affects specific populations, including the elderly, the economically disadvantaged, individuals with disabilities, and rural inhabitants (American Library Association, 2025; Pang et al., 2024). To address these systemic gaps, Pang et al. (2024) proposed a multi-level framework centered on four mechanisms: empowerment, inclusion, accountability, and

transformation. This framework suggests that digital technologies can advance social justice only when these mechanisms are intentionally integrated into policy. As explored in the following section, certain areas of WV continue to lack even basic wireless access, further widening the state's digital divide.

Green Bank

The physical barriers to internet connectivity in WV are further complicated by specialized scientific infrastructure, most notably the Green Bank Observatory. This 2,700-acre facility houses the 100-meter Robert C. Byrd Green Bank Telescope, the world's largest fully steerable radio telescope. To protect the integrity of astronomical research, the facility is shielded from electromagnetic interference by two distinct regulatory layers: the National Radio Quiet Zone, which encompasses 13,000 square miles across WV and Virginia, and the West Virginia Radio Astronomy Zone, which establishes a strict 10-mile radio protection perimeter around the observatory (Green Bank Observatory, 2024).

Within these zones, the use of various electronic devices, including those that emit Wi-Fi and Bluetooth signals, is heavily restricted to prevent interference with the telescope's sensitive instruments (Green Bank Observatory, 2024). Although updated standards now permit residents to utilize Wi-Fi routers operating at the 2.4 GHz frequency, the regulatory environment still significantly limits high-speed connectivity (Green Bank Observatory, 2024). These radio protection zones serve as a unique example of a geographic and regulatory barrier to internet access. For the residents within these zones, the prioritization of scientific research results in a specialized digital divide, often hindering access to essential online resources and modern educational materials.

Opioid Crisis

In addition to economic hardship and infrastructure deficiencies, WV residents have been profoundly impacted by the opioid crisis. The state's high rate of disability is driven largely by high-injury industries such as mining and logging, as well as chronic health concerns that far exceed national averages in the United States (Surber & Simonton, 2017). These systemic health issues established a foundation for widespread prescription drug dependence, as individuals frequently sought treatment

for work-related injuries and chronic pain through opioid medications (O'Leary et al., 2018). Although WV ranks 39th in population size and 41st in total land area (A.C.S., 2021; Hamilton, 2016), it leads the nation in opioid-related overdose rates. Furthermore, the state is considered the most at-risk in the U.S. for HIV or Hepatitis C outbreaks linked to intravenous drug use and maintains the second-highest rate of opioid prescriptions nationally (O'Leary et al., 2018).

In 2023, overdose deaths in WV totaled 1,389 (Alzarrad, 2024). While the raw figure may appear lower than in more populous states, the impact is significant when controlled for WV's sparse population and rural density. Despite recent decreases, the opioid prescription rate remains exceptionally high; in 2023, providers wrote 46.4 prescriptions for every 100 persons, significantly exceeding the national average of 39.5 (Centers for Disease Control and Prevention, 2024).

The economic implications of this public health crisis are profound. In 2019, the crisis was estimated to cost WV \$11.3 billion, a staggering economic burden for an already financially challenged state (West Virginia Center on Budget & Policy, 2021). Within a critical geography framework, the financial burdens of the crisis act as a drain on social reproduction; resources are diverted away from education and infrastructure to manage the overwhelming costs of criminal justice and emergency healthcare (Roper-Miller & Speaker, 2019). Consequently, the economic instability stemming from the state's resource curse exacerbates this public health epidemic, resulting in limited social development and diminished financial well-being for citizens (Peck, 2021). This crisis necessitates educational interventions that are low-cost and highly flexible, such as OER, to accommodate students whose academic journeys may be interrupted by health and economic crises.

Rural Education

Education remains a avenue for addressing the structural difficulties facing WV; however, the state's rural geography presents complex challenges that complicate this potential (Donehower et al., 2007; Tieken, 2014). Rural schools are often characterized by geographical isolation, inconsistent access to social services, and resource deficits, factors that contribute to higher rates of teacher attrition (Mazzuki, 2025). Despite rural areas encompassing half of the school districts in the United States and one-third of its public

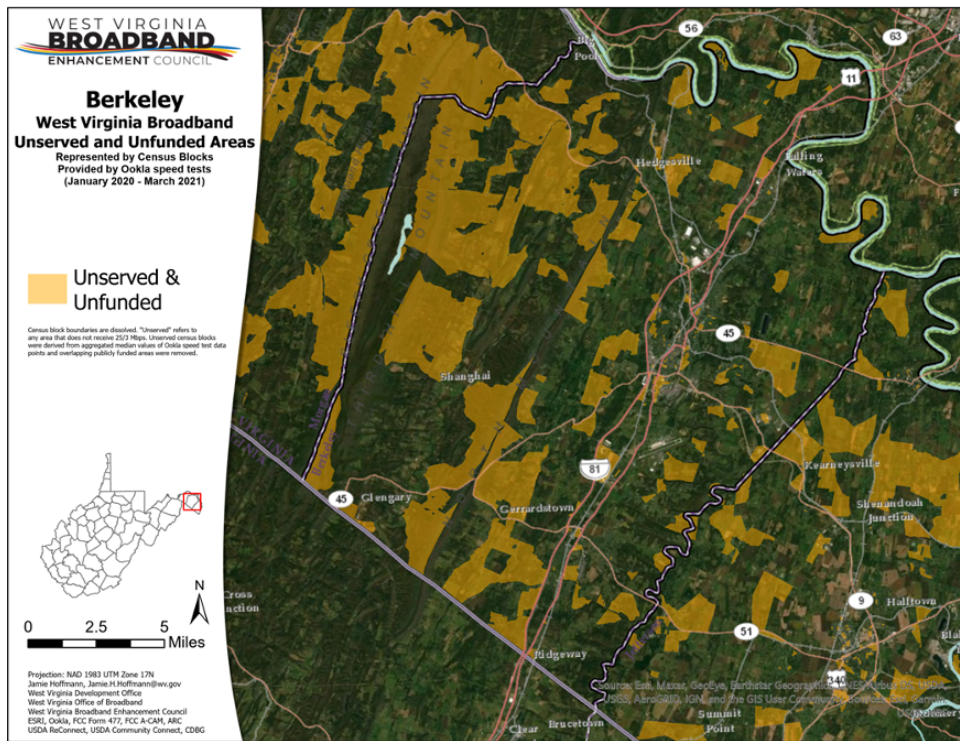


Figure 1. Unserved and Unfunded Broadband Access Areas in Berkeley County, WV (Hoffmann, 2021). Note. This figure illustrates the unserved and unfunded broadband areas in one WV county, highlighting the significant number of residents still lacking internet access.



Figure 2. Map of the Green Bank Telescope and the National Radio Quiet Zone (Alchetrn, 2024).

schools, research on rural education remains comparatively limited when contrasted with urban education (Aud & Wilkinson-Flicker, 2013; Ticken & Montgomery, 2021). Nationally, approximately one in seven students attends a rural public school (Showalter et al., 2019). This proportion is considerably higher in WV, where 43% of the public-school population attends rural institutions (Center for American Progress, 2025). Consequently, the state's academic landscape is intrinsically tied to the unique hurdles inherent in rural education.

These rural institutions play a crucial role in sustaining community development, yet they consistently struggle with teacher recruitment and retention (Guenther & Cuervo, 2025). Shortages of educators in these regions are influenced by disparate salary scales, state-level funding policies, and broader political climates that affect the attractiveness of rural teaching positions (Ruppar et al., 2025). Scholars suggest that improving funding models specifically tailored for rural contexts is essential for promoting long-term regional development (Tang & Lan, 2025).

The K-12 experiences of rural students can often fall short of preparing them for the rigors of higher education, frequently due to limited access to modern technology and specialized academic resources (McNamee et al., 2025). Nationwide, rural learners exhibit the lowest enrollment and completion rates in higher education (McNamee et al., 2025). This disparity is evident in WV, where only 23% of rural residents have completed a bachelor's degree, compared to the national average of 34% in the United States (United States Census Bureau, 2024). Furthermore, a lack of institutional engagement with rural communities, specifically regarding transportation and targeted funding, continues to limit residents' access to the state's colleges and universities (McNamee et al., 2025). This systemic disconnect underscores the necessity for interventions like OER, which aim to reduce the physical and financial barriers to entry.

Current Challenges in West Virginia's Educational System

A robust educational foundation, culminating in advanced learning, provides the skills and perspectives necessary to address systemic inequalities (Piketty, 2020) and retain a skilled workforce. The state's academic system is currently characterized by

significant barriers to access, limited resources, and declining enrollment in higher education (Ferris & Vesely, 2021). In 2024, the college-going rate among recent public high school graduates fell to 47.4% (West Virginia Higher Education Policy Commission, 2025). This decline, coupled with a chronic teacher shortage (West Virginia Department of Education, 2024), disproportionately impacts rural districts. In these areas, geographic isolation and lower wages relative to neighboring states create a spatial trap for educational recruitment (Lochmiller et al., 2016; Saunders, 2021).

Furthermore, this vacancy crisis is exacerbated by a geographical brain drain. Highly educated residents frequently migrate to metropolitan hubs with robust digital and physical infrastructures, often leaving rural classrooms dependent on uncertified substitute teachers (Showalter et al., 2019). OER may serve as a strategic intervention to mitigate this drain by reducing the cost of entry for local students, allowing them to pursue higher education while remaining within their communities. These academic challenges persist alongside widespread economic hardship; 48% of WV households live either below the federal poverty line or are unable to afford basic costs of living (United For ALICE, 2024).

Since 2008, funding for all levels of public education has decreased, with post-secondary institutions experiencing the most dramatic reductions (O'Leary et al., 2018). Because educational budgets are largely dependent on local property tax revenues, school districts experience significant budgetary disparities (Hughes, 1992). These financial constraints also result in WV's public employees being compensated significantly less than those in neighboring states (O'Leary et al., 2018). In 2018, WV K-12 teacher pay ranked 50th in the nation; although a 2019 increase brought the average salary to \$50,000, it remained nearly 17% below the national average of \$60,000 (Ferris & Vesely, 2021). Within a critical geography framework, this lack of competitive compensation is tied to a socialization of industrial risk. Local property taxes, which serve as the primary engine for school funding, are frequently diverted to cover the immense costs of environmental remediation and social services necessitated by the legacy of the extractive industry (Bridge, 2004; Parenti, 2014). By prioritizing these industrial externalities over educational investment, the state reinforces a cycle of poverty that makes it difficult to attract qualified educators to rural communities.

Community colleges nationwide also face lower student enrollment, which may be influenced by public perceptions regarding student demographics and academic preparation (Elmotri et al., 2024). These institutions also struggle with a perceived lack of success when graduates encounter a job market that does not align with their training (Elmotri et al., 2024). Such perceptions, however, often overlook the spatial mismatch between the modern skill sets provided by community colleges and the shifting industrial landscapes of WV.

Brain Drain

The cumulative impact of underinvestment in education and infrastructure contributes to a phenomenon known as brain drain. Brain drain serves as a primary indicator of limited opportunities for a region's educated populace, often resulting from a combination of inadequate housing, stagnant wages, and insufficient support for advanced education (Vazzana & Rudi-Poloshka, 2019). These systemic factors collectively compel skilled individuals to seek professional prospects in metropolitan areas with more robust social and digital infrastructures (Vazzana & Rudi-Poloshka, 2019).

The consequences of brain drain extend beyond economic metrics; this migration significantly exacerbates social inequalities by reducing the density of role models, mentors, and community leaders within rural districts (Vazzana & Rudi-Poloshka, 2019). This loss of human capital weakens community bonds and further destabilizes the social reproduction of the region. Scholars suggest that enhancing educational access is a strategy for addressing social justice issues related to persistent poverty (De Sousa et al., 2001) and brain drain (Vazzana & Rudi-Poloshka, 2019). By equipping residents with relevant skills and reducing the financial barriers to degree completion, educational interventions can help break the cycle of economic dependence and foster more sustainable local development.

Population Decline

WV is currently one of only three states in the U.S. to experience a consistent population decline, with a 1.3% decrease recorded since 2020 (USAFacts, 2024; PolitiFact, 2025). This demographic shift exacerbates existing inequalities between rural and metropolitan areas. As residents depart, the resulting economic contraction often leads to tax forfeitures and a reduction

in the public services and professional opportunities available to those who remain (Vazzana & Rudi-Poloshka, 2019).

In WV's coal-producing regions, out-migration rates are significantly higher. This trend is driven by several factors, including the environmental degradation and documented health concerns associated with living in proximity to active mining operations (Douglas & Walker, 2017). While individual agency plays a role in these migration patterns, broader systemic and economic drivers are equally influential (Guenther, 2023). Within a critical geography framework, the decision to leave a rural community is often less a choice and more a consequence of institutional underfunding and a diminished quality of life (Sherman & Sage, 2011).

Open Education Resources

OER represents a strategic pedagogical intervention that could address many of the challenges facing WV's educational system. First coined at a UNESCO conference in 2002, OER was initially defined as the open provision of educational resources, enabled by information and communication technologies, for consultation and adaptation by a community of users for non-commercial purposes (Hylen, 2006). This definition has since evolved to encompass digitized materials offered openly for educators and students to utilize for teaching, learning, and research (Mitchell & Chu, 2014; Smith, 2013). These resources, which include openly licensed syllabi, adaptable presentations, and shareable assignments, are designed to be freely accessible and editable by users.

In the context of WV, OER has the potential to mitigate the loss of intellectual capital driven by brain drain. As the density of educated individuals in rural areas declines, the localized knowledge they possess is frequently lost to the community (Sherman & Sage, 2011). OER can help bridge this gap by providing underserved communities with direct access to high-quality information and expertise (Naim, 2025). Furthermore, in an environment of substantial economic hardship, the cost-saving potential of OER is particularly salient (Palmer, 2024). By eliminating the cost of traditional textbooks, OER reduces the financial burden on students, thereby fostering more equitable learning opportunities (Hilton III, 2019).

Critically, OER also serves to counteract entrenched neoliberal tendencies in higher education by

decommodifying learning materials and promoting open access over proprietary, profit-driven systems (Almeida, 2017). While OER effectively removes the financial barrier of textbook costs, the digital divide, characterized by high-cost, low-speed internet and unreliable cellular service, undermines the promise of accessibility (Colvard et al., 2018; Lane, 2012). For students who are smartphone-dependent due to a lack of wired broadband, the necessity of downloading large digital files can strain limited mobile data plans, effectively creating a new financial and technical barrier to access (Overby & Narasimhan, 2024).

The Present Study

OER offers academic materials that are free at the point of access, providing a potential mechanism to mitigate the effects of persistent poverty and regional brain drain in WV. However, the state's digital divide and unique geographic constraints, such as the radio protection zones surrounding the Green Bank Observatory, frequently obstruct access to these digital materials. Without adequate internet infrastructure, the primary promise of OER's accessibility remains unfulfilled for many rural learners.

While OER has been utilized globally for over two decades, there is currently a lack of systematic reviews that compile and analyze research specifically focused on OER implementation within rural community college systems, particularly in the WV context. While this review draws on broader trends in WV higher education, it specifically prioritizes the community and technical college system as the primary site of OER implementation for socioeconomically vulnerable populations. The present study addresses this gap by synthesizing existing literature to examine the intersection of digital infrastructure and open pedagogy. To guide this analysis, the study addresses the following research questions:

1. What specific accessibility challenges are faced by students enrolled in rural West Virginia community and technical colleges?
2. How might OER initiatives be structured to mitigate these challenges and advance educational equity within the state's fragmented digital landscape?

Materials and Methods

This systematic review was conducted in accordance with the updated Preferred Reporting

Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). To ensure transparency and minimize bias in study identification and selection, the research process adhered to the comprehensive 27-item PRISMA checklist. Inclusion and exclusion criteria were established prior to ensure that the final synthesis directly addressed the study's focus on rural higher education in community colleges and social justice.

The review specifically targeted peer-reviewed articles that examined accessibility and social justice challenges associated with OER within the context of rural community and technical colleges. The temporal scope was limited to literature published between January 1, 2019, and June 17, 2025. This six-year window ensures the inclusion of contemporary insights and specifically captures research published following the passage of West Virginia House Bill 2853 in 2019, which established the state's formal OER program (Higginbotham et al., 2019). Exclusion criteria were applied to articles not published in English, those lacking accessible full-text versions, and studies that focused exclusively on K-12 settings without a clear application to the higher education transition.

Selection of Studies

To identify relevant literature, a systematic search was conducted on June 17, 2025, across several academic databases through the EBSCOhost platform, including Academic Search Complete, ERIC, and PsycINFO. The search strategy utilized Boolean operators to align results with the primary research questions. To maintain a focused and manageable scope, the search terms were iteratively refined; for example, broad terms such as internet access were excluded due to an excessive volume of results unrelated to higher education. The final search string used across all databases was:

(Internet infrastructure OR OER adoption)
AND (West Virginia OR rural community OR
community college) AND (higher education OR
rural education).

The systematic selection process followed the PRISMA multi-stage flow (see Figure 3). The initial search yielded 174 records. Following the identification and removal of 20 duplicate articles, a sample of 154 sources remained for the first phase of screening. During the title screening phase, 36

articles were excluded for lack of topical relevance, leaving 118 sources for abstract review.

All remaining abstracts were evaluated against the predefined inclusion and exclusion criteria. This phase resulted in the removal of 35 articles that did not meet the study's specific focus on rural higher education or social justice frameworks. The remaining 83 articles underwent a rigorous full-text review. Following this final assessment, 31 articles were found to meet all inclusion criteria and were selected for the final synthesis (see Appendix A).

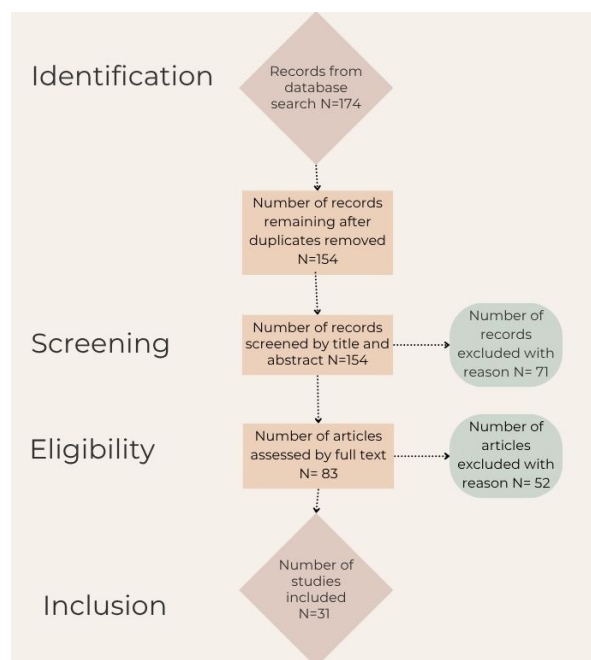


Figure 3. PRISMA Flow Diagram of the Systematic Review Process.

Article Coding

Following the establishment of the final sample, data were extracted from each article into a standardized matrix. This process captured key information, including institutional context, OER implementation strategies, and reported findings regarding accessibility and social equity. To analyze this data, the study employed a hybrid thematic analysis approach, combining deductive and inductive coding (Braun & Clarke, 2006).

The deductive phase utilized the software Dedoose to identify themes established prior, such as geographic barriers, financial constraints, and the impact of neoliberal policy on infrastructure. Specifically, this phase documented how spatial and

economic frameworks influence the disparities observed in WV. Simultaneously, an inductive phase allowed for the emergence of new themes directly from the literature that were not captured by the initial theoretical framework.

The analysis followed the six-phase process outlined by Braun and Clarke (2006) (see Table 1), moving from data familiarization and initial code generation to the final synthesis of overarching themes. This method was selected for its flexibility in identifying complex patterns across qualitative data, enabling a robust description of the intersection between digital infrastructure and educational equity. The identified themes were subsequently synthesized to provide a comprehensive overview of current literature, highlighting common challenges, effective practices, and existing gaps in the regional understanding of OER.

Table 1. Phases of the Thematic Analysis.

Phase of Thematic Analysis	Description of Process
1. Familiarization	Read articles and began highlighting information relevant to the research question.
2. Generate initial codes.	Systematically coded interesting ideas.
3. Search for themes.	Organized initial codes into themes.
4. Review themes.	Generated a thematic map of analysis.
5. Define and name themes.	Refined the specifics of each theme.

Results

The primary objective of this systematic review was to identify the current accessibility challenges confronting rural WV community college students and to evaluate the potential of OER to advance educational equity within the state. A synthesis of the 31 included articles reveals two primary, intersecting barriers: the systemic difficulties inherent in rural geography and the rising costs of higher education in the United States (see Figure 4). Beyond these foundational challenges, the literature provides a specialized focus on OER implementation within the community college sector, the nascent state of OER adoption in WV, and the specific pedagogical strategies required to ensure accessibility (see Figure 5). The following sections synthesize these findings to demonstrate how regional infrastructure and

socioeconomic conditions determine the efficacy of open learning initiatives.

Accessibility Challenges Faced by Students Enrolled in Rural WV Community Colleges

A predominant theme across the reviewed literature is the prevalence of information poverty within rural educational ecosystems. This condition is defined not merely by a lack of available data, but by the systemic inability of residents to access and utilize information essential for socioeconomic mobility (Mojapelo, 2020). In rural environments, this poverty is a byproduct of a spatial mismatch where the lack of physical internet infrastructure intersects with prohibitive access costs (Muflihin & Warsito, 2024). While digital platforms are often framed as a solution to educational deserts, the efficacy of online learning is fundamentally tethered to the quality of regional connectivity (Stone & Milman, 2020). In WV, where mountainous topography and low population density discourage private investment, students frequently inhabit digital deserts characterized by subpar broadband speeds and unreliable service (Mojapelo, 2020; Stone & Milman, 2020). This lack of infrastructure does more than hinder coursework; it accelerates brain drain by forcing those seeking professional or academic advancement to migrate to metropolitan hubs with robust connectivity (Stone & Milman, 2020).

The divergence in internet access between rural and metropolitan sectors is framed in the literature as a failure of equitable resource distribution. Under neoliberal market models, internet service providers prioritize infrastructure development in high-density urban centers where economic activity and profitability are maximized (Muflihin & Warsito, 2024). Consequently, rural regions experience a slower adoption of technology, which effectively stalls local socioeconomic development and reinforces existing cycles of poverty (Mojapelo, 2020; Muflihin & Warsito, 2024). For the rural WV student, high-speed internet has transitioned from a technological luxury to a fundamental educational right, a prerequisite for participation in a modern degree program (Stone & Milman, 2020). Without this utility, the shift toward digital-first curricula serves as a mechanism of exclusion rather than inclusion.

The transition to digital learning has also introduced new forms of financial gatekeeping. Modern

academic publishing models, specifically the use of single-use access codes, effectively eliminate the used-book market and tie a student's learning potential directly to their purchasing power (Jenkins et al., 2020). This model creates a recurring financial barrier that is particularly acute for low-income households in WV. When these high content costs are coupled with the hidden costs of rural connectivity, such as expensive satellite internet or limited mobile data plans, the result is an inferior educational experience. This synthesis suggests that for rural community college students, the promise of digitized education is often undermined by an infrastructure that remains financially and geographically out of reach (Jenkins et al., 2020; Stone & Milman, 2020).

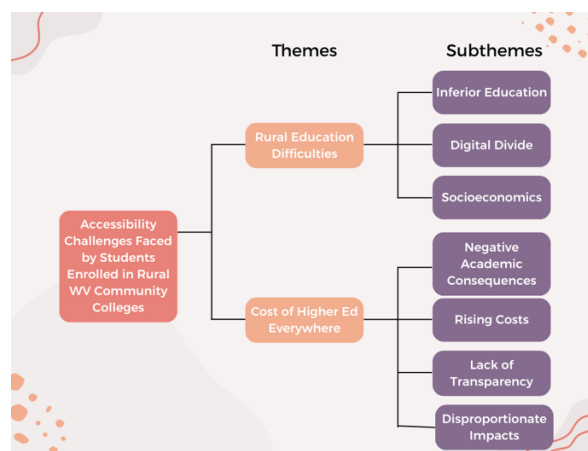


Figure 4. Thematic Analysis Map.

Costs of Higher Education Everywhere

The literature identifies a consistent upward trajectory in the cost of higher education throughout the United States, driven largely by a decades-long shift in fiscal responsibility from the state to the individual. This transition is rooted in neoliberal policy frameworks that have seen a significant reduction in federal and state academic funding over the last 20 years (Bol et al., 2022; Herrine, 2025). Even where funding levels have remained static, the purchasing power of grants and scholarships has been severely eroded by inflation (National Association of Student Financial Aid Administrators, 2026). Consequently, tuition and textbook expenses have become a primary source of financial strain, creating a pay-to-play environment that complicates academic entry for many families (Sanchez et al., 2022).

The financial burden of purchasing learning

materials leads to tangible, negative academic behaviors. Synthesis of the reviewed data indicates that approximately 65% of students across the United States actively avoid purchasing required materials due to cost (Bol et al., 2022). These cost-avoidance strategies, such as sharing textbooks, utilizing outdated editions, or attempting to complete courses without the primary text, directly correlate with lower overall grades and higher withdrawal rates (Grimaldi et al., 2019; Kimmel et al., 2024; Ren, 2019). Furthermore, the high cost of materials acts as a barrier to degree completion; an estimated 12% of students nationally reduce their course loads or withdraw entirely from higher education due to these expenses, contributing to a broader crisis of non-completion (Clinton-Lisell, 2023; Katz, 2019).

A significant secondary theme is the lack of transparency regarding course-related expenses. Students often enroll in courses without prior knowledge of the additional costs associated with third-party homework systems or proprietary digital platforms (Leonard, 2022; LeMire, 2024). These hidden fees represent a social justice issue, as they disproportionately impact students from lower socioeconomic backgrounds and first-generation learners, populations that are already statistically less likely to obtain a degree (Lantrip & Ray, 2021). Because traditional financial aid often prioritizes tuition coverage, it frequently leaves students with insufficient resources for the essential materials required to succeed in the classroom (Beile, 2020; Kruger & Abramovich, 2019). For the rural WV community college student, these national cost trends intersect with local economic hardship to create a formidable barrier to higher education that tuition assistance alone cannot solve.

OER

The literature evaluates the implementation of OER specifically within the community college sector, including nascent initiatives within WV. These studies transition from analyzing the barriers of cost and geography to examining the pedagogical and socioeconomic outcomes of open-access materials. By prioritizing the 5Rs, the ability to retain, reuse, revise, remix, and redistribute content, OER is framed not merely as a cost-saving measure, but as a mechanism for institutional transformation (Wiley & Hilton, 2018). The following sections synthesize research regarding student performance,

faculty considerations, and the specific strategic frameworks necessary to deploy OER effectively within the Appalachian educational landscape.

OER in Community Colleges

The literature highlights community colleges as critical sites for OER implementation due to their unique mission of serving high-need populations. Because these institutions are frequently selected by students specifically for their lower tuition rates, additional expenses such as textbooks constitute a disproportionately large share of the total cost of attendance (Griswold, 2022; Lantrip & Ray, 2021). For low-income and first-generation learners, populations that are statistically more prevalent in community college systems, these secondary financial pressures function as a primary barrier to academic persistence and institutional retention (Bol et al., 2022; Hill et al., 2024).

The shift toward OER within two-year institutions directly addresses these vulnerabilities. Synthesis of the reviewed studies suggests that the adoption of open-access materials enables students to reallocate restricted financial aid toward additional credits, thereby accelerating degree completion (LeMire, 2024). Furthermore, community college curricula, which rely heavily on high-enrollment introductory courses, are particularly well-suited for OER integration. Unlike specialized upper-level content, introductory materials remain relatively stable over time and are readily available for adaptation, making them a strategic entry point for institution-wide OER initiatives (Lantrip & Ray, 2021). By reducing the reliance on proprietary textbooks, community colleges can better fulfill their mandate of providing equitable educational access to historically marginalized students (Griswold, 2022).

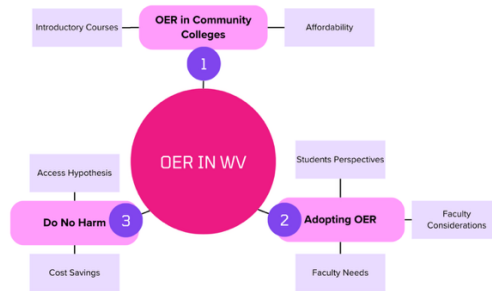


Figure 5. Thematic Analysis Map.

Adopting OER

The literature identifies a significant shift in faculty perception regarding the efficacy of OER. Central to the decision to adopt OER is the concept of academic autonomy, as instructors value the ability to curate and customize course content to meet the specific needs of their students (Lantrip & Ray, 2021). Contrary to the you get what you pay for fallacy, multiple studies indicate that OER materials are perceived as equal or superior in quality to traditional textbooks by both faculty and students (da Silva & White, 2021; Lantrip & Ray, 2021). Critically, the transition to open materials yields no significant decline in student grades, suggesting that OER provides a high-quality, equivalent alternative to commercial products while simultaneously removing the day one access barriers that often hinder student performance (da Silva & White, 2021; Ren, 2019).

From the student perspective, OER is viewed as a primary facilitator of academic retention and success. Students frequently cite day one availability, having full access to materials on the first day of class, as a transformative factor in their ability to engage with course content (Ren, 2019). The elimination of textbook costs allows students to enroll in more credit hours per semester, directly impacting their time-to-degree and reducing the likelihood of withdrawal due to financial strain (Dempsey, 2021; Ren, 2019). Furthermore, students report higher levels of engagement with OER that has been specifically curated by their professors, as this customized content often feels more relevant than the standardized, one-size-fits-all approach of commercial publishers (Hill et al., 2024; Sanchez et al., 2022).

Despite the pedagogical benefits, the widespread adoption of OER is obstructed by significant institutional and systemic hurdles. Faculty cite time poverty as the primary deterrent, as the initial labor required to locate, evaluate, and design an OER-based course is substantial (Allen, 2023; Lantrip & Ray, 2021). Without institutional support in the form of professional development, administrative recognition, or direct compensation for this labor, the burden of adoption remains on individual instructors (Hill et al., 2024).

These local challenges are exacerbated by a broader market monopoly within the academic publishing industry. In the United States, five major publishers dominate the landscape, creating a system

where the consumer (the student) has no choice but to pay the price set for a required text selected by the instructor (White, 2025). This market structure, combined with the lack of robust ancillary materials, such as test banks and automated homework platforms, often discourages faculty from moving away from proprietary systems (LeMire, 2024). Consequently, the adoption of OER requires more than individual faculty interest; it necessitates a structural shift in institutional policy and state-level support to counteract the entrenched economic power of commercial publishers (Bol et al., 2022; Wilfong et al., 2024).

Do No Harm

A critical finding emerging from the literature is the validation of the Do No Harm principle, which asserts that OER implementation provides significant socioeconomic benefits without compromising pedagogical integrity (Bol et al., 2022). Across diverse institutional contexts, researchers found no adverse effects on learning outcomes when commercial textbooks were replaced with open materials; students performed at levels equivalent to or exceeding those of their peers using proprietary texts (da Silva & White, 2021; Hill et al., 2024). Significantly, for at-risk populations, including part-time students and Pell Grant recipients, the adoption of OER is associated with higher final grades and a marked decrease in withdrawal rates (Wilfong et al., 2024). This suggests that OER does more than do no harm; it actively serves as an equalizer for students whose academic persistence is most threatened by financial instability.

The financial relief provided by OER is substantial, with full-time undergraduate students saving an estimated \$1,000 to \$1,350 annually (Contrada, 2021; Ikahihifo et al., 2017). On a granular level, this translates to a savings of approximately \$116 per course, a figure that represents a significant percentage of the total cost of attendance at a community college (Contrada, 2021; Sergiadis et al., 2024).

While the highest cumulative savings are found in high-enrollment introductory courses, such as Psychology, Biology, and English, where commercial texts average \$90 to \$140, the most profound individual impact occurs in STEM and business programs (Fischer et al., 2015). In these specialized fields, commercial textbooks frequently exceed \$300 and possess a limited resale market, making the transition to OER a high-impact intervention for upper-division students (Fischer

et al., 2015; Pina & Moran, 2017). Consequently, OER provides a strategic pathway for mitigating the resource gap in both general education and technical specializations, ensuring that financial capacity does not dictate academic success.

Results Summary

The synthesis of 31 peer-reviewed articles underscores a complex intersection of geographic marginalization and economic exclusion facing rural WV community college students. The findings indicate that these learners are situated within a web of obstacles defined by information poverty, underdeveloped digital literacy (Curtis et al., 2021), and a persistent brain drain where academic success often necessitates regional out-migration (Lamb, 2024). These spatial inequities are exacerbated by a lack of fundamental internet infrastructure (Ratledge, 2020), creating an environment where geographic location effectively erodes the protective benefits typically associated with educational attainment (Assari et al., 2025).

Nationally, these regional challenges are compounded by the escalating cost of higher education, which has created a profound equity gap. This financial strain disproportionately burdens students from lower socioeconomic backgrounds, leading to systemic academic setbacks such as delayed graduation or institutional withdrawal (McGuire, 2020). Within this context, OER emerged as a transformative mechanism for social justice. By decoupling learning potential from purchasing power, OER provides a strategic pathway to mitigate both financial and geographic barriers through the provision of free, adaptable materials (LeMire, 2024; Tlili et al., 2023).

Finally, this review identifies a significant void in the current scholarly landscape. Despite the critical need for regional interventions, there is a stark deficiency of empirical research focused specifically on rural WV (Ratledge, 2020; Darrah et al., 2014). This lack of data represents a barrier to informed policymaking and highlights the urgent necessity for the present study to bridge the gap between OER theory and rural Appalachian reality. By facilitating the creation of OER that reflects local Appalachian ecology or history (Place-Based Pedagogy), faculty can increase the perceived relevance of local degrees, encouraging students to apply their expertise within their home counties rather than migrating for resource-rich curriculum elsewhere.

Discussion

The findings of this systematic review illuminate the structural and geographic factors that define the educational experience for rural WV community college students. By addressing the primary research questions regarding accessibility challenges and the mitigating potential of OER, this study situates OER not merely as a financial convenience but as a disruptive intervention against long-standing systemic inequities. The results suggest that while OER provides a strategic mechanism to decouple learning potential from purchasing power, its efficacy is fundamentally constrained by the spatial mismatch of regional infrastructure. Consequently, the discussion that follows interprets these findings through the lens of Critical Geography and Neoliberal critique, exploring how OER can challenge entrenched barriers while acknowledging the infrastructure-dependency that remains a persistent hurdle for rural learners.

Accessibility Challenges Faced by Students Enrolled in Rural West Virginia Community Colleges

Information Poverty

The accessibility challenges identified in this review indicate that information poverty in rural WV is an active production of space rather than a passive geographic accident. By viewing internet infrastructure through the lens of Critical Geography, the lack of connectivity is revealed as a deliberate spatial fix (Harvey, 2001). Under a Neoliberal regime, private corporations prioritize infrastructure in high-density urban corridors to maximize capital accumulation; conversely, the rugged topography and low population density of rural WV are viewed as low-return investments (Piazza & Graber, 2023). As Smith (2008) observed, this uneven geographical development is a structural requirement of the market, which devalues rural regions to maintain the mobility and profitability of capital elsewhere.

This systemic devaluation creates a form of accumulation by dispossession (Harvey, 2005), wherein the state's withdrawal from public utility funding in favor of market-led solutions effectively marginalizes rural populations. For the community college student, this manifests as a prohibitive access

tax, where the few available service options are often too expensive to be sustainable. Consequently, the information poverty experienced by these students is a foundational social justice issue. It suggests that until internet access is decoupled from the requirement of corporate profitability and treated as a public right, rural learners will remain structurally excluded from the digital-first trajectory of modern higher education.

Rural Communities Lag Behind in Infrastructure and Technology

The systemic failure to invest in rural internet infrastructure is more than a logistical oversight; it is a profound form of spatial injustice (Kitchin & Dodge, 2011). By distinguishing between geographic location, which is a fixed physical point, and spatial configuration, it becomes clear that digital infrastructures are not neutral utilities. Instead, they are active configurations that produce disparate educational realities. While urban students occupy a space of hyper-connectivity and immediate resource access, rural WV community college students are systematically excluded from these digital geographies (Kitchin & Dodge, 2011). This spatial exclusion ensures that even when a student's physical location remains unchanged, the digital environment fails to provide the same educational space afforded to their urban counterparts.

This digital divide creates a recursive barrier to educational equity. It not only restricts students from accessing necessary course materials but also serves as a systemic impediment to faculty engagement with open practices (Seaman & Seaman, 2018). In WV, where the mountainous topography often serves as a pretext for corporate underinvestment, this divide effectively stalls the adoption of OER by creating a connectivity threshold that many students cannot meet (Auxier & Anderson, 2020). Consequently, these findings suggest that OER policy cannot be viewed in isolation from infrastructure policy. For OER to fulfill its social justice mandate, the state must move beyond market-led solutions and treat internet infrastructure as a prerequisite for equitable participation in higher education.

Underdeveloped Technology Skills

The disparity in educational outcomes is further exacerbated by a second-level digital divide, wherein the mere provision of hardware and connectivity fails to equate to equitable educational engagement (Hargittai, 2002). Even as broadband initiatives begin to penetrate rural WV, students often demonstrate lower levels of digital literacy and technical self-efficacy than their urban counterparts (Hampton et al., 2020). This gap suggests that technological access is not a panacea; without the foundational skills to navigate, evaluate, and synthesize information within complex digital systems, rural learners remain structurally marginalized (Malecki, 2003).

Critically, the literature warns that introducing digital tools, including OER, without concurrent, localized pedagogical support may inadvertently widen existing inequality gaps (Warschauer, 2023). For the rural WV community college student, digital literacy is not just a technical skill set but a prerequisite for socioeconomic mobility. To avoid technological determinism, the false belief that tools alone solve social problems, institutions must integrate OER adoption with robust digital literacy frameworks. This ensures that students are not only provided with free materials but are also empowered with the cognitive and technical agency required to leverage these tools in an increasingly digitized global economy.

Brain Drain

The accessibility challenges confronting rural WV community college students are inextricably linked to a historical legacy of resource extraction, which has rendered the region uniquely vulnerable to Neoliberal economic volatility (Billings & Blee, 2000). As regional wealth is depleted and local economies are abandoned by transient capital, the resulting brain drain manifests within the higher education system as a dual crisis of instruction and preparation (Eller, 2008). This intellectual exodus creates a systemic reliance on underqualified adjunct faculty or staff teaching outside their primary specializations, thereby diluting the rigor of the collegiate experience (Ardoin, 2017).

Consequently, instructors are frequently forced to focus on closing fundamental knowledge gaps rather than facilitating high-level collegiate discourse, effectively stalling the socioeconomic mobility that higher education is intended to provide (Hlinka, 2015). However, a critical synthesis of the findings suggests that OER and robust digital access could serve as a counter-extractive force. By connecting rural learners to specialized academic resources and global intellectual networks while allowing them to remain in their home communities, these digital interventions offer a potential mechanism to stabilize the local intellectual landscape and mitigate the cyclical nature of brain drain (Stone & Milman, 2020).

Socioeconomics Are an Indicator of Educational Quality

The transition of higher education from a public good to a private commodity has fundamentally linked educational quality to a student's purchasing power (Marginson, 2016). For rural WV community college students, this shift manifests as a stratified educational experience where lower-income learners are frequently tracked into under-resourced vocational programs that prioritize immediate workforce readiness over comprehensive academic enrichment (Goldrick-Rab, 2016; Urban et al., 2019). This neoliberal emphasis on credentialism over holistic inquiry effectively limits the long-term career flexibility and social mobility of rural populations, as curricula are increasingly narrowed to meet the transient needs of industry rather than the enduring needs of the community (Beach, 2011).

In the WV context, this commodification is devastating. The state's socioeconomic climate intensifies the financial pressures of attendance, creating an environment where the lack of institutional funding is directly offset by individual student debt (WV Center on Budget & Policy, 2024). Consequently, community colleges, as the primary access points for first-generation and low-income learners, become the sites of a high-stakes financial gamble. This vulnerability is compounded by the vocational trap, where a single financial setback or a requirement for extensive developmental coursework can lead to permanent withdrawal (Hlinka, 2017). This synthesis indicates that until the

financial and pedagogical models of higher education are decoupled from the market, rural community colleges will struggle to break the cycles of poverty they are tasked with alleviating.

Learning Potential Is Limited by Purchasing Power

The findings suggest that for rural WV students, the cost of attendance is a multi-layered financial burden that extends far beyond tuition. In the Appalachian context, the price of a degree includes a geographic tax consisting of high connectivity costs, transportation hurdles in mountainous terrain, and the elimination of the used-book market through digital access codes (RAND, 2025; Shapiro et al., 2019). This economic stratification is mandated by Neoliberal frameworks that view higher education through the lens of Human Capital Theory, which justifies rising costs by framing the student as an individual investor who will eventually reap market-driven rewards (Becker, 1964; Küçük, 2020). From this perspective, the financial hurdles identified in the literature are not seen as failures, but as efficient market filters that allocate capital to those most able to invest in their own productivity (Berman, 2012).

However, applying this individualized investment model to rural WV ignores the structural realities of generational poverty and the systemic underfunding of rural infrastructure (Morrison, 2016). By treating access to learning materials as a commodity, the current system risks codifying a socioeconomic caste system that masks structural exclusion as a personal failure of merit (Apple, 2001). Critics argue that this individualized strategy fails to account for the public-good benefits of an educated rural workforce, such as regional stability and civic engagement, which are lost when students are forced to withdraw due to unsustainable debt (Lynch, 2006). This synthesis suggests that a shift toward a public-good model, facilitated by OER, is necessary to ensure that regional geography ceases to function as a determinant of intellectual and economic potential (Helfenbein, 2021).

How OER Initiatives Mitigate These Challenges and Advance Equity and Accessibility in Higher Education

Mitigating Information Poverty through Offline Access

The adoption of OER functions as a critical redistributive intervention that actively disrupts the spatial injustice produced by market-driven infrastructure (Hodgkinson-Williams & Trotter, 2018). In the context of rural WV, OER effectively decouples educational opportunity from geographic profitability by providing materials that can be downloaded at centralized hubs, such as community colleges or local libraries, and subsequently utilized in internet deserts. This offline portability transforms the digital divide from an absolute barrier into a navigable hurdle, allowing students to bypass the prohibitive costs and unreliable connectivity of private internet service providers.

Furthermore, this shift aligns with the principles of recognitive justice, which demands that the unique identities and material constraints of marginalized populations be explicitly addressed within educational policy (Honneth, 1995). By transitioning from a proprietary, access-code model to a localized knowledge common, OER challenges the neoliberal gatekeeping that treats information as a market-gated luxury. In doing so, OER reclaims the intellectual space of the Appalachian learner, transforming it from a site of extraction and exclusion into one of empowerment and equitable participation (Hodgkinson-Williams & Trotter, 2018).

Rural Communities Lag Behind in Infrastructure and Technology

The findings of this review suggest that while OER is an essential redistributive tool, its efficacy in WV is subject to a significant technological trade-off. Because most OER initiatives are designed as digital-first solutions, they inadvertently mirror the neoliberal assumption of universal connectivity, an assumption that fails in the market-driven neglect of rural Appalachia (Ozdemir & Hendricks, 2017). Consequently, a tension arises: the very students who would benefit most from the elimination of textbook costs are often those least able to access the high-speed networks required to download large digital files (West Virginia Higher Education Policy Commission, 2025). This

infrastructure gap limits the promise of OER, transforming it from a universal solution into a conditional one that depends on a student's proximity to a reliable signal.

To resolve this tension, OER implementation in rural contexts must move beyond the online-only model toward a geographic intervention that utilizes offline-compatible formats. By prioritizing OER's capacity to be distributed via USB drives, institutions can bypass the physical infrastructure gaps inherent in mountainous landscapes (Tlili et al., 2019). This strategic pivot redefines digital equity not as constant connectivity, but as resource portability. Providing students with the ability to engage with high-quality materials regardless of their real-time internet access ensures that OER functions as a robust public good rather than a digital luxury tethered to geographic location (Jaya et al., 2020).

Underdeveloped Technology Skills

The second-level digital divide suggests that rural WV students face a cumulative disadvantage; they must navigate the financial burdens of degree attainment while simultaneously surmounting a technological learning curve that urban peers have already bypassed (Dube, 2020). OER initiatives mitigate this double burden by providing a low-stakes environment for digital skill acquisition. Unlike proprietary platforms or digital textbooks that utilize exploding licenses that expire after a single semester, OER offers perpetual access (Colvard et al., 2018). This permanence grants students the time and autonomy to engage with digital materials at their own pace, effectively decoupling technical mastery from the pressure of a financial deadline.

Furthermore, the transition from OER adoption to Open Pedagogy represents a fundamental shift in the power dynamics of the classroom. When faculty involve students in the collaborative creation or revision of open materials, students transition from passive consumers of a private commodity to active digital creators (DeRosa & Robison, 2017). This pedagogical shift directly challenges the Neoliberal model of workforce readiness, which often tracks rural students into specialized vocational roles with limited agency. By fostering technological self-efficacy through open practices, institutions

empower marginalized learners with the digital agency required to resist the economic extraction and social marginalization their communities face.

Brain Drain

In WV, brain drain is not a natural demographic shift but a socio-spatial manifestation of Neoliberal economic policy (Smith, 2015). When higher education is framed as a private commodity with an escalating entry price, rural students are subjected to a mobility mandate a structural coercion that forces a choice between remaining in their resource-depleted home communities or migrating to urban hubs to access the gated space of the university (Donehower et al., 2007). This mandate effectively dictates that academic advancement requires geographic displacement, ensuring that the intellectual capacity of the youth is extracted from the region along with its physical resources.

This systemic exodus creates a self-perpetuating cycle of abandonment and neglect, where the removal of human capital further justifies the withdrawal of state and private investment (Carr & Kefalas, 2009). However, by utilizing OER to lower the financial threshold of entry and leveraging digital platforms to deliver specialized instruction, institutions can begin to challenge this displacement. If educational materials and high-level discourse are decoupled from the physical urban center and redistributed to the rural periphery, the mobility mandate is weakened. By facilitating access to academic resources, OER may serve as a strategic tool for regional stability, potentially challenging the mobility mandate often required by Neoliberal frameworks.

Socioeconomics Are an Indicator of Educational Quality

While the literature confirms that OER serves as a critical intervention for socioeconomically vulnerable populations, their impact must be understood through the lens of the Access Hypothesis (Griswold, 2022). This framework suggests that the measurability of OER's success is often obscured by conventional research strategies that prioritize standardized outcomes over equitable access. If a student is excluded from engaging with course materials due to a price barrier,

their learning potential is stalled before it begins. Consequently, OER does not merely offer a cost-saving benefit; it provides the foundational pedagogical parity required for any meaningful academic engagement to occur (Colvard et al., 2018).

This distinction is particularly relevant for WV's community college sector, where the access gap is most acute. The divergence in the literature regarding student performance outcomes (Grimaldi et al., 2019) can be explained by the specific demographic impact of OER: while affluent students may show negligible performance gains because they would have purchased commercial texts regardless, the impact on low-income students is transformative. For these learners, OER moves the textbook from an optional luxury to a day-one utility. Therefore, the Access Hypothesis suggests that educational policy should prioritize the removal of financial hurdles as a prerequisite for social justice, rather than solely evaluating OER through the narrow Neoliberal metric of universal grade improvement (Hilton, 2016; da Silva & White, 2021). By decoupling financial capacity from the right to access information, OER fulfills a primary mandate of recognitive justice for WV's underserved populations.

OER Implementation

The successful implementation of OER in WV requires a strategic rejection of the Neoliberal austerity models that have historically characterized the state's retreat from public funding (Mitchell et al., 2019). Rather than serving as a justification for further institutional budget cuts, OER must be positioned as a redistributive mechanism that reclaims pedagogical agency for faculty and socioeconomic agency for students (Lambert, 2024; Wiley & Hilton, 2018). The findings suggest that while faculty are uniquely positioned to champion these initiatives, the time poverty associated with OER adoption represents a significant systemic hurdle (Almeida, 2017). Without robust administrative and financial support, the labor of OER integration risks becoming an unfunded mandate that exploits faculty commitment to student success.

Furthermore, the implementation of OER in Appalachia serves as a critical countermeasure to

geographic neglect. By leveraging OER's offline capabilities, institutions can ensure that the absence of private-market broadband does not result in a total blackout of educational opportunity (West Virginia Higher Education Policy Commission, 2025). This approach transforms OER from a passive repository into an active tool for social and spatial justice. For WV to realize the exponential benefits of open learning, state policy and institutional leadership must transition from a model of passive allowance to one of active investment, providing the professional development and infrastructure necessary to sustain a truly accessible educational commons (Kimmel et al., 2024; Lantrip & Ray, 2021).

Learning Potential Is Limited by Purchasing Power

The findings suggest that OER operates on a logic fundamentally opposed to the Neoliberal redefinition of the degree as a private commodity (Venugopal, 2015). By removing the price barrier, OER functions as a redistributive tool that shifts higher education back toward its status as a public good. This intervention does more than alleviate financial strain; it actively resists the marketization of the classroom, ensuring that a student's individual purchasing power no longer serves as the primary determinant of information access (DeRosa & Robison, 2017). By decoupling educational opportunity from geographic profitability, OER creates a digital common that exists outside the physical and economic constraints of market-driven publishing models (Almeida, 2017).

Central to this disruption is the Do No Harm principle, which serves as a powerful ethical counter-argument to the commodification of learning materials (Griswold, 2022). The literature consistently demonstrates that OER maintains pedagogical parity, yielding learning outcomes equivalent to or exceeding those of commercial texts (Hilton, 2016). This neutral-to-positive impact effectively shifts the burden of proof onto proponents of proprietary materials; if free resources do no harm, then the continued use of expensive commercial textbooks must be justified by a measurable and superior impact on student success, a standard they frequently fail to meet. Consequently, requiring costly materials in an environment where comparable free alternatives exist is revealed as a

punitive form of exclusion that disproportionately marginalizes the very students who require the most support (Colvard et al., 2018).

OER as a Counter-Hegemonic Tool

While Neoliberal policies recast higher education as a competitive marketplace that reinforces class hierarchies through student purchasing power, OER emerge as a potent counter-hegemonic intervention (Apple, 2014; Giroux, 2014). By re-establishing learning as a public common, OER functions as a redistributive force that directly mitigates the information poverty produced by market-driven spatial fixes (Harvey, 2001; DeRosa & Robison, 2017). In rural WV, where internet service providers have historically bypassed low-density populations in favor of capital accumulation, OER serves to reclaim the intellectual space of the marginalized learner (Smith, 2008).

Furthermore, this intervention extends beyond financial relief; it fosters a place-based pedagogy that validates local knowledge over the standardized workforce training typical of global-market models. By improving retention among Pell-eligible and at-risk students, OER disrupts the cycle of intellectual displacement (Colvard et al., 2018). Ultimately, by decoupling academic success from the requirement of geographic mobility, OER resists the Neoliberal university model and transforms rural WV from a site of systemic resource extraction into one of sustainable, localized intellectual growth.

Lack of Research on OER

The scarcity of literature identified in this systematic review aligns with broader observations that rural education remains a blind spot in academic inquiry (Aud & Wilkinson-Flicker, 2013; Tieken & Montgomery, 2021). This academic neglect is a manifestation of uneven geographical development, where research funding and policy attention are disproportionately allocated to urban centers, leaving rural landscapes marginalized within the scholarly record (Harvey, 2007). In the context of WV, this omission is particularly stark; the finding of only a single peer-reviewed article (Kirschner et al., 2023) addressing OER within the state underscores a profound geographic and institutional neglect.

This lack of published research is not merely a scholarly oversight; it is a failure to interrogate the mechanisms that determine whether higher education remains a viable pathway for rural, financially vulnerable populations. Community colleges serve as the primary access points for these demographics, yet they are frequently excluded from the high-level discourse surrounding educational innovation (Lantrip & Ray, 2021). By ignoring the intersection of the digital divide and OER adoption in Appalachia, the current research landscape fails to account for how spatial neglect influences faculty awareness and student success. Consequently, there is an urgent need for a research agenda that centers the rural community college experience, investigating how localized OER initiatives might counter the geographic tax on learning and provide a sustainable model for educational equity in regions characterized by inconsistent infrastructure and generational poverty.

Implications for Research

The findings of this systematic review illuminate a significant research gap that is, in itself, a reflection of geographic bias within the academic industrial complex. To dismantle this spatial neglect, future scholarship must move beyond general OER efficacy studies and engage deeply with the critical geography of rural regions like WV. There is an urgent need for empirical, qualitative research that examines how faculty in resource-desert contexts navigate entrenched Neoliberal austerity while adopting open practices. Such studies should prioritize bottom-up, localized methodologies that elicit the lived experiences of rural community college students, specifically exploring how OER's offline capabilities serve as a critical intervention against infrastructural neglect.

Furthermore, future research should evaluate OER through the lens of Place-Based Pedagogy, investigating its potential to resist the mobility mandate and the resulting brain drain affecting the Appalachian region. Rather than viewing OER merely as a financial stopgap, researchers should develop frameworks that position open education as a mechanism for regional resilience. This involves examining how OER can validate local knowledge and support sustainable intellectual growth in situ, thereby challenging the

market-driven migration patterns mandated by traditional higher education models. By focusing on these intersections of space, cost, and agency, future scholarship can provide the evidence-based foundation necessary to transform OER from a temporary fix into a permanent pillar of rural social justice.

Implications for Education

The findings of this review suggest that WV's higher education institutions must transition from viewing OER as a voluntary, grassroots faculty endeavor to a core pillar of institutional accessibility. To mitigate the time poverty and burnout inherent in under-resourced settings (Lantrip & Ray, 2021), institutional leadership should formalize OER creation and adoption as a recognized component of faculty workloads. By embedding these efforts into promotion, tenure, and merit guidelines, rather than relegating them to extracurricular labor, colleges can establish a sustainable infrastructure for Open Pedagogy (DeRosa & Robison, 2017). This professionalization of open practices ensures that the labor of educational equity is not borne solely by individual instructors operating under Neoliberal austerity.

Furthermore, to address the systemic lack of transparency that disproportionately affects low-income learners (Leonard, 2022), institutions must implement mandatory course marking on all registration portals. Utilizing digital identifiers such as Zero-Textbook-Cost (ZTC) or OER-Enabled labels serves as a critical mechanism of recognitive justice; it allows students to make informed financial decisions at the point of enrollment, thereby preventing the sticker shock of prohibitive costs after the semester has commenced. Finally, as community colleges serve as the primary access points for the state's most vulnerable populations, they should prioritize OER-first curricula that decouple learning potential from individual purchasing power. By treating OER as a default rather than a secondary option, institutions can fulfill their mandate to provide a high-quality, barrier-free pathway to social and economic mobility for the Appalachian learner.

Implications for Policy

At the structural level, state and institutional

policies must evolve to address the spatial neglect and uneven development inherent in rural Appalachia. Because rural students are frequently marginalized within digital deserts characterized by subpar internet infrastructure (Stone & Milman, 2020), policy mandates must prioritize the development of OER formats that support offline accessibility. This requirement should be accompanied by dedicated state funding and professional development to ensure that digital-first initiatives do not inadvertently exclude those without high-speed access. By prioritizing downloadable, hardware-agnostic formats, policymakers can effectively decouple intellectual opportunity from geographic profitability, directly addressing the connectivity gaps that define the rural WV experience.

At the state government level, OER should be positioned as a strategic tool for socioeconomic stabilization and the mitigation of brain drain. By expanding state-funded grants targeted specifically at the creation of open ancillary materials in high-cost STEM and business disciplines (LeMire, 2024), WV can lower the financial threshold of degree attainment for its most marginalized populations (McGuire, 2020). Most importantly, state-level broadband expansion efforts must be explicitly synchronized with OER initiatives. Integrating physical infrastructure with educational content ensures that the digital commons is not merely a theoretical construct but a physically reachable utility for residents in the state's most remote regions. Ultimately, these policy shifts transition the burden of accessibility from the individual student to the state, transforming OER into a proactive mechanism for social justice and long-term regional resilience.

Limitations of this Study

Several limitations within this systematic review warrant consideration. First, the temporal scope was restricted to literature published between 2019 and 2025. While this timeframe was strategically selected to align with the current legislative and technological climate in WV, it inherently excludes longitudinal data that might track the evolution of rural digital inequities across several decades. Consequently, the review prioritizes contemporary relevance over historical context,

focusing on the immediate impact of current OER policy windows rather than long-term evolutionary trends.

Furthermore, the search was primarily conducted via EBSCOhost, a constraint that reflects the broader theme of resource poverty within institutional research environments. The exclusion of secondary databases such as ProQuest or JSTOR may have introduced a disciplinary bias, limiting the synthesis to those fields most heavily indexed within the primary search engine. Additionally, by filtering for peer-reviewed scholarly journals, this study prioritized academic rigor and replicability over gray literature, such as internal reports from the West Virginia Department of Education or the Appalachian Regional Commission (ARC). While this focus ensures a standardized metric for synthesis, it may overlook real-time, non-traditional data that captures the granular complexities of the OER rollout in Appalachia. Finally, the reliance on specific keyword indexing means that research utilizing adjacent frameworks, such as digital equity or open scholarship, may have been excluded if not explicitly categorized under OER implementation. These limitations suggest that while the findings provide a robust snapshot of the current landscape, they should be viewed as a foundational step toward more expansive, multi-database investigations of rural educational space.

Conclusion

This systematic review has investigated the multifaceted accessibility challenges confronting rural WV community college students, evaluating the capacity of OER to mitigate deep-seated systemic barriers. The findings reveal that accessibility is far more than a technical hurdle; it is a profound manifestation of uneven geographical development. Through the lens of Harvey's (2007) framework, the digital marginalization of rural Appalachia is revealed as a structural byproduct of Neoliberal economic policies that systematically prioritize high-growth urban centers. In this context, the region's infrastructural deficits are not geographic accidents but the result of capital being intentionally diverted from rural landscapes toward more profitable digital geographies. While this market-driven neglect threatens the core tenets of educational equity, OER provides a robust strategy to dismantle the

commodification of the classroom.

In direct opposition to Neoliberal mandates that frame the degree as a private commodity gated by purchasing power, OER offers a transformative pathway to reclaim higher education as a public common. By prioritizing free, hardware-agnostic, and offline-accessible materials, OER directly disrupts the information poverty and spatial injustices that have long defined the rural student experience. These findings underscore those strategic investments in open initiatives, when synchronized with broadband expansion, are not merely technological upgrades; they are essential social justice interventions required to reverse the systemic abandonment of rural communities (Salemink et al., 2017). Ultimately, a collaborative, state-level model for OER implementation in WV offers a counter-hegemonic framework for regional resilience. By decoupling intellectual potential from geographic and economic status, OER ensures that the right to academic success is no longer a privilege of the affluent or the urban, but a guaranteed public good for the Appalachian learner.

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Appendix A

Thirty-One Articles Included in the Systematic Review

Authors	Article Title	Location	Study Size	Methods
Allen, T (2023)	Awareness and Future Use of Open Educational Resources by Music Faculty	The study was conducted with music faculty in the United States.	<i>N</i> = 409 participants	The study employed a cross-sectional survey method.
Beile, P., de Noyelles, A., & Raible, J. (2020)	Analysis of an open textbook adoption in an American history course: Impact on student academic outcomes and behaviors.	University of Central Florida	<i>N</i> = 278 students.	mixed-methods design
Bol, L., Esqueda, M. C., Ryan, D., & Kimmel, S. C. (2022)	A comparison of academic outcomes in courses taught with open educational resources and publisher content.	United States	<i>N</i> =215 community college students.	Quantitative (Used a randomized assignment, quasi-experimental design to compare academic outcomes).
Clinton-Lisell, V. (2023)	How does OER efficacy vary based on student age and course modality? A multi-institutional analysis.	A Multi-institutional analysis across seven public postsecondary institutions.	<i>A dataset of 8,033 students.</i>	Quantitative (Used multilevel modeling to analyze existing student data).
Dempsey, M. (2021)	The impact of free and open educational resource adoption on community college student achievement.	A mid-sized community college in central New Jersey.	<i>1,209 students across seven courses.</i>	Quantitative (Quasi-experimental design analyzing grades and withdrawal rates).
Fischer, L.,	The Interaction of	A community college.	<i>Data from 35 different</i>	Quantitative (Quasi-

Hilton III, J., Clinton-Lisell, V., Xiong, Y., Wiley, D., & Williams, L. (2021)	Open Educational Resources (OER) Use and Course Difficulty on Student Course Grades in a Community College.			<i>courses were analyzed (total student (N) not specified).</i>	experimental design using statistical analysis on course grades).
Fischer, L., Hilton III, J., Clinton-Lisell, V., Xiong, Y., Wiley, D., & Williams, L. (2021)	The Interaction of Open Educational Resources (OER) Use and Course Difficulty on Student Course Grades in a Community College.	A community college.		<i>Data from 35 different courses were analyzed (total student (N) not specified).</i>	Quantitative (Quasi-experimental design using statistical analysis on course grades).
Griffiths, R., Mislevy, J., & Wang, S. (2022)	Encouraging impacts of an open education resource degree initiative on college students' progress to degree.	11 US community colleges (Multi-institutional study).		<i>Approx. 60,245 students.</i>	Quantitative (Quasi-experimental impact studies and meta-analysis of GPA and credit accumulation).
Grimaldi, P. J., Basu Mallick, D., Waters, A. E., & Baraniuk, R. G. (2019)	Do Open Educational Resources Improve Student Learning? Implications of the access hypothesis.	N/A (Theoretical/Methodological paper).		<i>N/A (Used simulation analysis, not human participants).</i>	Quantitative/Theoretical (Simulation analysis to test the "access hypothesis").
Griswold, R. H. (2022)	Access Is Not Enough: An Examination of OER Textbook Usage by English Composition Students at One Community College.	One Community College.		<i>English Composition students (exact N not specified in abstract).</i>	Quantitative (Analysis of Learning Management System data for page views, activity, and grades).
Hill, D. L., Hartsell, T.,	Implementing Open Educational Resources in	Global		<i>NA</i>	Qualitative Literature Review.

Workman, J. L., & Smith, A. (2024)	Colleges and Universities: A Literature Review.				
Jenkins, J. J., Sánchez, L. A., Schraedley, M. A., Hannans, J., Navick, N., & Young, J. (2020)	Textbook broke: Textbook affordability as a social justice issue.	Southern California, USA.		<i>Over 700 undergraduate students.</i>	Quantitative Research. Survey
Katz, S. (2019)	Leveraging library expertise in support of institutional goals: A case study of an open educational resources initiative.	Lehman College, CUNY, Bronx, NY, USA.		<i>N/A (Focus on Institutional Initiative).</i>	Qualitative Case Study.
Kimmel, S., Bol, L., Ryan, D., & Esqueda, M. (2024)	The experiences of community college faculty using open educational resources versus publisher textbooks.	Virginia Community College System (VCCS).		<i>4 Community College Faculty Members.</i>	Qualitative Interviews.
Kirschner, J., Monnin, J., & Andresen, C. (2023)	Gaining Ground: OER at Three Health Sciences Institutions.	Three Health Sciences Institutions.		<i>Qualitative/Case Study.</i>	Case Study.
Kruger, J. S., & Abramovich, S. (2019)	Open educational resources: the new frontier.	NA		<i>NA</i>	Viewpoint/Opinion/Conceptual.
Krueger, S. G., & Ward, L. (2020)	Assessing textbook costs at a small college.	A Small College.		<i>Financial/Data Analysis.</i>	Assessment/Data Analysis.
Lantrip, J., & Ray, J. (2021)	Faculty perceptions and usage of OER at Oregon community colleges.	Oregon Community Colleges, USA.		<i>Faculty (Number not specified, but surveyed/interviewed).</i>	Survey/Qualitative.
LeMire, S. (2024)	Adult learning and open educational	NA		<i>NA</i>	Conceptual/Theoretical.

resources.

LeMire, S., Anders, K. C., & Pantuso, T. (2025)	Exploring first-generation student experiences with OER textbooks.	NA		<i>First-Generation Students</i>	Qualitative/Survey.
Leonard, C. (2022)	Inclusive access and OER are increasing affordability of textbooks in higher education.	NA		<i>NA</i>	Literature Review/Policy Analysis.
Mojapelo, S. M. (2020)	The internet access and use in public libraries in Limpopo Province, South Africa.	Limpopo Province, South Africa.	South	<i>Public Libraries/Users/Staff.</i>	Survey/Case Study.
Morgan, T., Childs, E., Hendricks, C., Harrison, M., DeVries, I., & Jhangjani, R. (2021)	How are we doing with open education practice initiatives? Applying an institutional self-assessment tool in five higher education institutions.	Five higher education institutions in British Columbia (BC), Canada.		<i>The study involved a collaborative self-study among the researchers who were also the practitioners at their respective home institutions.</i>	Self-study methodology.
Muflihini, M. H., & Warsito, C. (2024)	Independent learning policy for quality strategic educational management using IT skills: A case of Merdeka Campus (MBKM) program in Indonesia.	Merdeka Campus (MBKM) program in Indonesia.		<i>Library search/literature review.</i>	Data collection through library searches.
Nagashima, T., & Harch, S. (2021)	Motivating factors among university faculty for adopting Open Educational	University System of Georgia (United States).	77	<i>respondents (university faculty).</i>	Case study survey.

	Resources: incentives matter.				
Reed, J. B., & Jahre, B. (2019)	Reviewing the current state of library support for open educational resources.	United States.	NA		Review of the current state of Open Educational Resources (OER).
Ren, X. (2019)	The undefined figure: Instructional designers in the open educational resource (OER) movement in higher education.	NA	NA		Conceptual.
Riehman-Murphy, C., Raish, V., Mross, E., Pritt, A., & Nelson, E. (2020)	Bridges to affordability: Adopting a university OAER mandate with local implementation.	Penn State University Libraries and its many campuses.	223	<i>undergraduate students.</i>	Case Study.
Sanchez, S., Carter, D. E., Morey, T., & Fedorek, B. (2022)	Student perceptions of an open educational resource for an introduction to criminal justice course.	A criminal justice course at a higher education institution.	<i>N = 144 students.</i>		Qualitative study.
Stone, A., & Milman, N. B. (2020)	Discovering a digital oasis: Rural education students and online education.	Rural education students.	NA		Exploratory discussion or descriptive paper.
White, K. (2021)	Development and use of open educational resources in research methods for psychology.	A psychology department at a higher education institution.	<i>Two separate semesters of a research methods course.</i>		Quasi-experimental comparison study.
Wilfong, K.,	Academic Libraries	Maine colleges and	<i>94% of respondents.</i>		Commentary/Advocacy

Hill, N.,
Smith, D.,
Wing, K.,
Spinney,
A., &
Koons, C.
J. (2024)

and Open
Educational
Resources:
Addressing
Student
Textbook
Affordability.

universities.

Piece and Descriptive
Review.