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Bridging the Digital Divide: A Case Study of Virtual Mentoring in Zimbabwean Rural Secondary Schools

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ABSTRACT

This study examines the role of virtual mentoring in addressing digital inequalities and enhancing teacher retention among secondary school educators in rural Zimbabwe. As virtual mentoring increasingly emerges as a cost-effective model for ongoing professional development worldwide, its significance in geographically isolated regions—characterised by limited transport, infrastructure, and digital access—grows more pronounced. Employing a qualitative case study design, data were gathered through semi-structured interviews, focus group discussions with 15 teachers and five school leaders purposefully selected from three rural districts, and documentary analysis of policy documents and official reports related to ICT and education. This triangulated approach enhanced the credibility and depth of the findings. Thematic analysis identified four key themes: the importance of policy and institutional support for digital transformation, existing infrastructure and connectivity gaps, gender-based digital exclusion, and the potential of virtual mentoring to facilitate professional growth. The findings indicate that while national policies have encouraged digital inclusion through initiatives such as STEM and Education 5.0, considerable barriers remain in rural implementation, especially concerning electricity, internet access, and gender disparities. Nonetheless, participants regarded virtual mentoring as a practical and empowering tool for teacher development. The study advocates for ongoing investment in rural ICT infrastructure, inclusive digital literacy training, and the expansion of virtual mentoring platforms to promote equitable access and support for teachers. These findings contribute to broader discussions on digital equity, educational resilience, and innovation in under-resourced contexts.

Keywords: Virtual Mentoring, Teacher Retention, Rural Schools, Digital Inclusion, Documentary Analysis, Education 5.0

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INTRODUCTION

As technological advancements continue, the world becomes more interconnected, yet the digital divide remains a significant global challenge. [1] In developing nations, information and communication technologies (ICTs) significantly contribute to tackling significant educational challenges, including

[1] Jitendra Singh et al., "Online, Hybrid, and Face-to-Face Learning Through the Eyes of Faculty, Students, Administrators, and Instructional Designers: Lessons Learned and Directions for the Post-Vaccine and Post-Pandemic/COVID-19 World," *Journal of Educational Technology Systems* 50, no. 3 (March 20, 2022): 301–26, https://doi.org/10.1177/00472395211063754.

accessibility, equity, management, efficiency, instructional methods, and quality.[2] Nevertheless, the uneven distribution of access to digital tools, infrastructure, and digital literacy hinders knowledge empowerment and educational involvement, particularly in marginalised areas. The COVID-19 pandemic further highlighted these inequalities, disrupting education globally as students faced illness, loss, or school closures.[3] In response, virtual learning saw increased adoption as countries sought alternative ways to continue education. Importantly, Barbour and Hodges note that "remote learning" became widely used only after COVID-19 necessitated a large-scale shift to online education.[4]

E-learning, which combines education with technology, is a powerful platform for learning, providing significant benefits by freeing up interactions between students and teachers from time and location constraints.[5] In China, 200 million learners engaged in e-learning, a solution that emerged in affluent nations in response to the pandemic.[6] The current digital landscape presents new realities, opportunities, and challenges for rural areas; however, rural communities often struggle to engage with this digital environment fully. Although ICTs play a crucial role in generating, processing, and utilising information in the 21st century, it can be contended that their widespread use and adoption are still on the rise in various developing nations.[7] In the context of sub-Saharan Africa, issues such as lack of internet access, inadequate infrastructure, insufficient operational capabilities, and low teacher quality are primary obstacles to utilising ICTs. These challenges have hampered the application and integration of ICTs in essential human capital development processes, including teaching and learning in school settings.[8] Buabeng-Andoh notes that the absence of consistent investment in ICT infrastructure fosters digital exclusion despite technological advancements.[9]

The global economy increasingly relies on digital innovation, which has significantly contributed to advancements in sustainable development. However, sustainable development will remain elusive for countries where citizens cannot effectively utilise ICTs to access, process, share, and transmit quality information.[10] Currently, Africa has the highest proportion of individuals without internet connectivity, with 88% lacking access, while Asia has the most significant number of internet users.[11] The global digital divide extends beyond simple internet access; it also encompasses disparities in internet speed, technological resources, and digital literacy, especially in remote areas.[12] The absence of ICTs in developing countries presents numerous challenges. It perpetuates systemic poverty, as the quality of education in rural and marginalised regions lags, hindering workforce development in an increasingly globalised job market.

Several investigations in Zimbabwe have examined the topic of the digital divide and virtual mentoring within the country's educational framework.[13] A limitation of these studies has been their

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[2] Tesfaye Bayu Bati and Anteneh Wasyhun Workneh, "Evaluating Integrated Use of Information Technologies in Secondary Schools of Ethiopia Using <scp>design-reality Gap Analysis: A School-level Study," *The Electronic Journal Of Information Systems In Developing Countries* 87, no. 1 (January 29, 2021), https://doi.org/10.1002/isd2.12148.

[3] Victoria Coleman, "Digital Divide in UK Education during COVID-19 Pandemic: Literature Review. Research Report.," *Cambridge Assessment*, 2021.

[4] Michael K Barbour and Charles B Hodges, "Preparing Teachers to Teach Online: A Critical Issue for Teacher Education," *Journal of Technology and Teacher Education* 32, no. 1 (2024): 5–27.

[5] Mohammed Mufaddy Al-kasasbeh et al., "The Impact of E-Learning on Students' Performance: The Mediating Role of Sustainable Education," *Management & Sustainability: An Arab Review* 4, no. 3 (2025): 495–513.

[6] Shelini Surendran et al., "Perspectives of Teaching during the COVID-19 Lockdown: A Comparison of Teaching in University Bioscience Programmes from around the World," *Research in Science & Technological Education* 41, no. 3 (2023): 1133–54.

[7] Sylvia Croese, "Introduction: Africa's Urban Challenge," in *Reframing the Urban Challenge in Africa* (Routledge, 2020), 1–17.

[8] Gideon Seun Olanrewaju et al., "Left behind? The Effects of Digital Gaps on e-Learning in Rural Secondary Schools and Remote Communities across Nigeria during the COVID19 Pandemic," *International Journal of Educational Research Open* 2 (2021): 100092, https://doi.org/10.1016/j.ijedro.2021.100092.

[9] Charles Buabeng-Andoh, "ICT Implementation and Practices: Factors Influencing Students' Pedagogical Use of ICT in Ghanaian Secondary Schools," *International Journal of Information and Communication Technology Education (IJICTE)* 11, no.2 (2015): 1–13.

[10] Goodluck Ifijeh, Juliana Iwu-James, and Oyeronke Adebayo, "Digital Inclusion and Sustainable Development in Nigeria: The Role of Libraries," in *3rd International Conference on African Development Issues (CU-ICADI)* (Covenant University Ota, Nigeria, 2016).

[11] Dayong Zhang, Min Hu, and Qiang Ji, "Financial Markets under the Global Pandemic of COVID-19," *Finance Research Letters* 36 (2020): 101528.

[12] Chanda C Thelma et al., "Digital Literacy in Education: Preparing Students for the Future Workforce," *International Journal of Research* 11, no. 8 (2024): 327–43.

[13] Gomba Clifford, "Transforming Rural Secondary Schools in Zimbabwe through Technology: Lived Experiences of Student Computer Users," *International Online Journal of Education and Teaching* 3, no. 2 (2016); Maxwell C C Musingafi and Shupikai Zebron, "The

focus on existing computerisation initiatives in rural schools without highlighting the necessity of closing the digital divide between urban and rural education to enable sustainable development and make it accessible in Zimbabwe. The challenges brought about by the digital divide in Zimbabwe create a significant obstacle for the national Vision 2030 and the pursuit of the Sustainable Development Goals, which emphasise the importance of including everyone and every location in innovation and poverty alleviation. The digital divide hinders the achievement of the Sustainable Development Goals, as the education system plays a crucial role in fostering sustainable development through innovation and intelligent industrialisation. Zimbabwe's difficulty in realising the Sustainable Development Goals arises from the lack of access to ICTs in rural areas, necessitating fairness and equality in providing quality education for all, including access to internet connectivity in these regions.

The research aims to explore the obstacles and possibilities in rural and remote regions of developing countries. It investigates the effects of virtual mentoring in these areas, particularly given the limited internet access, to assess its potential for fostering sustainable workforce development. The study identifies opportunities for virtual mentoring in rural educational institutions to help close the digital divide. It also examines the difficulties in overcoming the digital divide related to virtual mentoring in rural schools. The importance of this research lies in its contribution to the current body of literature on virtual mentoring, emphasising the necessity for advancements in educational systems in developing nations to reduce the development gap between them and developed countries. This study is crucial for advocating a shift towards a digital mentoring framework that is both time-efficient and cost-effective. Additionally, the findings can extend beyond academic contexts, providing policymakers with insights into the necessity of establishing ICT infrastructure nationwide. In light of the digital divide and the call for virtual mentoring to enhance teacher retention and cultivate a globally skilled workforce, this research delves into methods for bridging the digital divide in Zimbabwe through virtual mentoring.

LITERATURE REVIEW

This section of the study presents a literature review that focuses on previous research on e-learning and the necessary paradigm shift toward virtual mentoring. The reviewed literature emphasises the advantages of e-learning in the context of virtual mentoring. Addressing the digital divide is crucial for rural schools and teachers, as it enables them to access modern educational resources and tools.

E-learning

Access to technology can help diminish barriers rural schools face, including outdated materials and challenges in establishing partnerships for higher education.[14] Innovative technology can foster a collaborative educational environment, create chances for remote learning, and offer pathways for career advancement.[15] According to Singh et al., internet connectivity has revolutionised how people live, play, and find entertainment.[16] It has also profoundly influenced individual learning processes. Distance learning and self-directed programs tend to be more effective due to the Internet acting as a great equalizer.[17] Nowadays, universities prepare students using various creative approaches, focusing on effectively using technology tailored to their needs.[18] The physical distance between learners is reduced since e-learning materials can be accessed through functional computer workstations and other internet-

Role of Information and Communication Technology in Rural Socio-Economic Development in Africa," *Int. J. Publ. Pol. Admin. Res* 1, no. 2 (2014): 38–46.

[14] Erik Kormos and Kendra Wisdom, "Rural Schools and the Digital Divide: Technology in the Learning Experience," *Theory & Practice in Rural Education* 11, no. 1 (2021): 25–39.

[15] David Kwok and Silin Yang, "Evaluating the Intention to Use ICT Collaborative Tools in a Social Constructivist Environment," *International Journal of Educational Technology in Higher Education* 14, no. 1 (2017): 32.

[16] Singh et al., "Online, Hybrid, and Face-to-Face Learning Through the Eyes of Faculty, Students, Administrators, and Instructional Designers: Lessons Learned and Directions for the Post-Vaccine and Post-Pandemic/COVID-19 World."

[17] R Uma et al., "Cost-Effective Fabrication of ZnO/g-C3N4 Composite Thin Films for Enhanced Photocatalytic Activity against Three Different Dyes (MB, MG and RhB)," *Materials Chemistry and Physics* 201 (2017): 147–55.

[18] Boris Handal et al., "Choosing to Teach in Rural and Remote Schools: The Zone of Free Movement," *Education Research and Perspectives* 45 (2018): 1–32.

enabled devices.[19] The Internet is impacting the economy, society, and culture. However, an unequal distribution of access to information persists, resulting in a digital divide.[20]

The exchange of cultural perspectives and the sharing of scientific and technical knowledge are essential in fostering unity among people. ICT fosters collaboration among institutions and their students.[21] ICT can significantly enhance education systems and extend educational opportunities to remote areas, as it helps close the digital gap between underserved and more affluent regions. There are notable differences between education and online training compared to traditional teaching methods, which may introduce novel challenges for instructors and learners. Technology-enhanced learning is rapidly transforming the education landscape, shifting from solely classroom instruction to entirely online or a blended online learning model.[22] Virtual education has the potential to revolutionise developing nations and drive change and innovation in rural and isolated areas by providing teachers and students access to learning resources while minimising travel costs. Establishing ICT infrastructure and facilities in rural regions can help close the digital gap and provide opportunities for teachers and students in these areas.

Virtual Mentoring

Greer noted that mentorship programs effectively foster collaboration and may help decrease teacher turnover, burnout, and emotional fatigue.[23] Greenberg et al. argue that a structured system should be established for new teachers, enabling mentees to engage with experienced educators and mentors who can offer insights and informed advice about the realities of the profession.[24] Briscoe points out that traditional mentorship faces challenges related to time and space, specifically, an excess of one and a deficiency of the other.[25] Virtual mentorship can address these issues by allowing teachers to connect at their convenience from any location through an online platform.[26]

Virtual mentoring can help overcome various challenges by removing time and other limitations; an asynchronous, technology-driven approach presents numerous beneficial methods to promote mentoring and a reflective, constructive, multidimensional pedagogy.[27] Riley, Chur, Gandhi, Fuchs, Sauceda, Sterling, and Johnson noted that virtual mentoring offers essential technological training in a rapidly evolving educational landscape, where blended and online methods foster effective peer-to-peer mentorship dynamics.[28] Virtual mentoring has advantages over traditional methods as it avoids time and space constraints. The mentor and mentee can arrange an online meeting at their convenience after work, unlike the in-person visits necessary in traditional mentoring. Owen suggests that virtual mentoring enables mentees to freely and comfortably express their thoughts, ideas, and observations without fear of judgment.[29] Virtual mentoring fosters growth for both the mentor and mentee, as a trusting relationship is established without the power dynamics typically present in traditional mentoring.

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[19] Singh et al., "Online, Hybrid, and Face-to-Face Learning Through the Eyes of Faculty, Students, Administrators, and Instructional Designers: Lessons Learned and Directions for the Post-Vaccine and Post-Pandemic/COVID-19 World."

[20] Singh et al., "Online, Hybrid, and Face-to-Face Learning Through the Eyes of Faculty, Students, Administrators, and Instructional Designers: Lessons Learned and Directions for the Post-Vaccine and Post-Pandemic/COVID-19 World."

[21] Claudiu Coman et al., "Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective," *Sustainability* 12, no. 24 (December 11, 2020): 10367, https://doi.org/10.3390/su122410367.

[22] Singh et al., "Online, Hybrid, and Face-to-Face Learning Through the Eyes of Faculty, Students, Administrators, and Instructional Designers: Lessons Learned and Directions for the Post-Vaccine and Post-Pandemic/COVID-19 World."

[23] A. Greer, "Exploring the Role of Mentorship Programs in Novice Teacher Retention: Experiences and Strategies of Secondary School Principals in Central Alabama (Doctoral Dissertation, Alabama State University).," http://iojet.org/index.php/IOJET/article/view/112/128, 2025.

[24] Jacob A. Greenberg et al., "At-Home Hands-on Surgical Training during COVID19: Proof of Concept Using a Virtual Telementoring Platform," *Surgical Endoscopy* 35, no. 5 (May 6, 2021): 1963–69, https://doi.org/10.1007/s00464-021-08470-6.

[25] Patricia Briscoe, "Virtual Mentor Partnerships between Practising and Preservice Teachers," *International Journal of Mentoring and Coaching in Education* 8, no. 4 (November 21, 2019): 235–54, https://doi.org/10.1108/IJMCE-02-2019-0023.

[26] Briscoe, "Virtual Mentor Partnerships between Practising and Preservice Teachers."

[27] Greenberg et al., "At-Home Hands-on Surgical Training during COVID19: Proof of Concept Using a Virtual Telementoring Platform."

[28] Elise D Riley et al., "Lessons for Expanding Virtual Mentoring in Academic Medical Institutions: A Qualitative Study among Senior Mentors," *BMC Medical Education* 24 (2024), https://api.semanticscholar.org/CorpusID:272143146.

[29] Hazel D Owen, "Making the Most of Mobility: Virtual Mentoring and Education Practitioner Professional Development," *Research in Learning Technology* 23 (2015).

Digital Inclusion Policies and Initiatives for Bridging the Digital Divide in Zimbabwe

A growing body of research highlights the efforts made by the Zimbabwean government and its global partners to bridge the digital gap, especially in rural areas. The National ICT Policy (2022–2027) presents a comprehensive framework that fosters equitable access to digital resources and enhances skills, aligned with international goals such as the Sustainable Development Goals (SDGs) and the African Union's Agenda 2063.[30] This policy emphasises the importance of equitable access to ICTs through enhancements in rural connectivity, the utilisation of solar power, initiatives for digital literacy, and the integration of e-learning.[31]

UNICEF has played a crucial role in promoting digital learning in Zimbabwe. By 2022, only 6.8% of students were utilising digital learning platforms, highlighting the extent of the digital divide.[32] In response, initiatives like Giga—a collaboration between UNICEF, Microsoft, and the International Telecommunication Union—have sought to connect every school in Zimbabwe to the Internet. This initiative has emerged as a vital aspect of the Government of Zimbabwe's national e-learning strategy, with a focus on marginalised and remote areas.

The introduction of Education 5.0, which emphasises teaching, research, community service, innovation, and industrialisation, further demonstrates the government's dedication to transforming education. Machingura, Chikanya, and Manduna suggest that while this model can revolutionise education in Zimbabwe, impediments such as insufficient digital infrastructure, limited funding, and a shortage of trained personnel obstruct progress in rural regions.[33]

International development agencies, such as the Food and Agriculture Organisation (FAO), have supported national initiatives. In 2023, the FAO, in collaboration with the Government of Zimbabwe, established digital innovation hubs in Bikita and Mhondoro-Ngezi to enhance access to ICTs for rural youth and farmers. These hubs offer training in e-agriculture, online education, and digital financial literacy.[34]

A pertinent example of the digital challenges faced in rural areas can be observed at Mutiusinazita High School in Buhera South. According to a report by ZimSentinel, the school is confronted with inadequate ICT infrastructure, elevated teacher-to-student ratios, and inconsistent electricity supply.[35] However, efforts are underway to improve digital access through partnerships between the community and non-governmental organisations (NGOs).

Case studies, including the Chipinge District pilot reviewed by Mutsaka and Mupfumira, indicate that while the solarisation and computerisation of rural schools have facilitated advancements in e-learning and digital literacy, significant challenges remain, particularly regarding teacher training and connectivity.[36] These findings are further supported by Moyo, who underscores the importance of integrated approaches that combine hardware accessibility, software development, and alignment of educational curricula.[37]

Lastly, the Smart Zimbabwe 2030 Master Plan, which serves as a national strategy for digital transformation, has successfully facilitated the installation of more than 1,000 computer laboratories in rural schools.[38] This plan aims to bridge the digital divide between urban and rural areas, thereby

[30] Digital Watch, "Zimbabwe's National ICT Policy (2022–2027): Overview and Strategic Goals," https://digitalwatch.giplatform.org/policies/zimbabwe-national-ict-policy, 2022.
[31] Digital Watch, "Zimbabwe's National ICT Policy (2022–2027): Overview and Strategic Goals."
[32] Christian Pauletto, "Addressing the Digital Divide in Online Education: Lessons to Be Drawn from Online Negotiation," in *The International Research & Innovation Forum* (Springer, 2022), 395–403.
[33] Christopher Zishiri, Gladman Jekese, and Wonder Muchabaiwa, "Challenges in Implementing Education 5.0 in Higher Education in Zimbabwe: A Qualitative Analysis," *International Journal of Research and Innovation in Social Science*, 2024, https://api.semanticscholar.org/CorpusID:272300211.
[34] FAO, "FAO and Zimbabwe Launch Rural Digital Innovation Hubs. Food and Agriculture Organisation of the United Nations," 2023, https://www.fao.org/newsroom/detail/fao-and-zimbabwe-launch-rural-digital-innovation-hubs/en.
[35] ZimSentinel, "Digital Education Challenges in Buhera's Rural Schools," https://zimsentinel.com/digital-education-challenges-in-buhera, July 11, 2023.
[36] F. Mutsaka and T. Mupfumira, "Computerisation of Rural Schools in Zimbabwe: Policy Implementation Analysis. ," *Zimbabwean Educational Review* 32, no. 3 (2020): 45–61.
[37] S. Moyo, "The Impact of ICT Infrastructure on Rural Education: A Case Study of Zimbabwe," *Zimbabwe Journal of Educational Research*, 2016.
[38] BBC News, "Over 1,000 Rural Schools Have Computer Labs under the Smart Zimbabwe Plan.," Zimbabwe Broadcasting Corporation., April 30, 2023.

providing rural learners access to educational resources comparable to those available to their urban counterparts.

CONCEPTUAL AND ANALYTICAL FRAMEWORK

The study employed the digital divide concept as a framework for analysing the significance of virtual mentoring in rural secondary schools in Zimbabwe. Liu identifies the digital divide as a form of social inequality, manifesting as unequal access to information and communication technology (ICT) between urban and rural areas.[39] This divide contributes to the digital exclusion of children from economically disadvantaged backgrounds, revealing substantial disparities in access to digital devices, content, and networks that correlate with income, geographical location, gender, social status, and age.[40] Addressing this divide is imperative for fostering equitable development in emerging economies.

As the global landscape increasingly integrates technology-enhanced environments, the less visible gulf in digital access emerges as a barrier that restricts individuals from actively engaging in societal functions, signifying a lack of upward social mobility for the digitally disenfranchised.[41] Consequently, it is essential to implement virtual mentoring initiatives in rural secondary schools in Zimbabwe. Such initiatives can provide rural children with valuable development opportunities and enhance their potential for upward social mobility through the professional development of teachers, which encompasses strategies for improving teacher retention and mitigating teaching-related challenges.

METHODOLOGY

Research Approach

This study employed a qualitative research approach utilising a case study design to explore the digital divide between rural and urban schools in Zimbabwe and to examine policy frameworks aimed at bridging this gap. A qualitative approach is appropriate for gaining in-depth, contextual insights into complex social phenomena, particularly in educational settings.[42] The case study design facilitates a comprehensive understanding of real-world issues within their contexts, making it suitable for investigating the nuances of digital educational disparities.[43]

Sampling and Participants

Purposive sampling was used to select 20 participants, comprising 15 rural secondary school teachers and five school heads from three under-resourced districts in Zimbabwe. Participants were selected based on their engagement with digital learning tools, experience with mentoring (whether formal or informal), and location in a rural school. This sample allowed for diverse insights across gender, teaching experience, and school leadership roles.[44]

Data Collection

Data were gathered through semi-structured interviews and focus group discussions. Interviews were conducted individually with school heads and a subset of teachers to capture detailed personal perspectives. At the same time, focus group discussions encouraged collaborative reflection among

[39] Ji Liu, "Bridging Digital Divide amidst Educational Change for Socially Inclusive Learning during the COVID-19 Pandemic," *Sage Open* 11, no. 4 (2021): 21582440211060810.
[40] Zhi-Jin Zhong, "From Access to Usage: The Divide of Self-Reported Digital Skills among Adolescents," *Computers & Education* 56, no. 3 (April 2011): 736–46, https://doi.org/10.1016/j.compedu.2010.10.016.
[41] Liu, "Bridging Digital Divide amidst Educational Change for Socially Inclusive Learning during the COVID-19 Pandemic."
[42] Kaspul Anwar et al., "Bridging the Digital Divide in Higher Education: Notes from the Emergence of the COVID-19 Pandemic," in *From Digital Divide to Digital Inclusion* (Springer, 2023), 95–121.
[43] A. Mangena, "An Assessment of Factors Contributing to a Digital Divide in Mainstreaming E-Learning in Higher Education: A Selected Case of a University in Bulawayo Province, Zimbabwe.," *Journal of Modern Education Review*, 2022.
[44] Christopher Zishiri and Leo Mataruka, "Innovation and Industrialisation through Assessment Reforms in Higher Education in Developing Countries: A Case Study of Zimbabwe," *Journal of African Education* 5, no. 3 (2024): 225.

teachers facing similar infrastructural and pedagogical challenges. All interviews were audio-recorded with consent and transcribed verbatim.[45]

Data Analysis

Thematic analysis, as outlined by Braun and Clarke, guided the interpretation of data. This involved six phases: familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report.[46] Four dominant themes emerged from the analysis: (1) Digital Policy and Institutional Commitment, (2) Infrastructure Gaps and Connectivity Solutions, (3) Gendered Experiences of the Digital Divide, and (4) Virtual Mentoring and Teacher Professional Development. These themes are discussed in detail in the following section.

Ethical Considerations

Ethical clearance was obtained from the relevant university review board. Participants provided informed consent and were assured of anonymity, confidentiality, and the voluntary nature of their participation.

PRESENTATION OF FINDINGS AND DISCUSSION

This section presents the key themes that emerged from the analysis of interviews and focus group discussions with teachers, school leaders, and policy actors, complemented by supporting policy documents. Guided by Braun and Clarke's thematic analysis method, four dominant themes emerged: (1) Digital Policy and Institutional Commitment; (2) Infrastructure Gaps and Connectivity Solutions; (3) Gendered Experiences of the Digital Divide; and (4) Virtual Mentoring and Teacher Professional Development.[47]These themes are discussed in light of the digital divide framework, which posits that access to digital tools and training is a social justice issue shaped by geography, gender, and institutional policy.[48] The analysis also examines how these digital disparities intersect with professional development and educational equity.

Theme 1: Digital Policy and Institutional Commitment

Participants consistently acknowledged that the Zimbabwean government had articulated a strong policy vision around digital transformation in education. Programmes such as the STEM initiative, Education 5.0, and the National E-Learning Strategy were frequently cited as demonstrating policy-level commitment.

> "*The Ministry's STEM programme started the conversation around technology in education, but implementation is slow in rural schools."*
> (Participant 2, Male, Secondary School Head)

This observation reflects a broader policy-practice gap, where the existence of progressive frameworks does not always translate into effective implementation, particularly in marginalised rural schools. Mutsaka and Mupfumira confirm the foundational role of government policies in fostering digital transformation, especially when implemented through partnerships (e.g., with UNICEF).[49] However, the findings also concur with Liu that digital access cannot be detached from the broader structures of inequality, such as location, institutional capacity, and economic resources.[50]

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[45] A. Mpamombe, "Bridging the Digital Divide: Zimbabwe's Efforts to Enhance Educational Access in Rural Schools," Harare Post, 2024, https://www.hararepost.co.zw/en/theopinion/9359-bridging-the-digital-divide-zimbabwe-s-efforts-to-enhance-educational-access-in-rural-schools.

[46] Virginia Braun and Victoria Clarke, "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* 3, no. 2 (2006): 77–101.

[47] Braun and Clarke, "Using Thematic Analysis in Psychology."

[48] Liu, "Bridging Digital Divide amidst Educational Change for Socially Inclusive Learning during the COVID-19 Pandemic"; Zhong, "From Access to Usage: The Divide of Self-Reported Digital Skills among Adolescents."

[49] Mutsaka and Mupfumira, "Computerisation of Rural Schools in Zimbabwe: Policy Implementation Analysis. ."

[50] Liu, "Bridging Digital Divide amidst Educational Change for Socially Inclusive Learning during the COVID-19 Pandemic."

Theme 2: Infrastructure Gaps and Connectivity Solutions

Participants raised serious concerns about infrastructural deficits, with emphasis on the lack of electricity, unreliable Internet, and inaccessible digital centres. Even when ICT tools were available, their functionality was hampered by inconsistent infrastructure.

> "*We have computers, but without electricity or reliable internet, they are just decorations."*
> (Participant 6, Female, ICT Teacher)

This finding strongly supports Zhong's framing of the digital divide as a structural imbalance, especially in economically disadvantaged and geographically isolated communities.[51] Despite the Smart Zimbabwe 2030 Master Plan and investments in solar-powered labs, respondents felt that infrastructural solutions remain fragmented and unevenly distributed.[52] Some progress, such as Community Information Centres and the Universal Services Fund (USF) initiatives led by POTRAZ, was noted. However, these were often not integrated into the daily functioning of schools, limiting their impact.

> "*POTRAZ set up internet hubs at some business centres, but they are far from schools and not easily accessible to students."*
> (Participant 8, Male, Rural Education Officer)

This reflects the disconnect between national infrastructure planning and local school realities, and underscores the importance of contextualised, bottom-up digital development.

Theme 3: Gendered Experiences of the Digital Divide

A significant theme emerging from the data was the gendered nature of digital access. Female teachers and rural girls were consistently described as more vulnerable to exclusion due to a combination of social norms, domestic responsibilities, and limited training opportunities.

> "*In our community, girls are expected to focus on chores, not on learning computers. Even teachers like me struggle to access devices."*
> (Participant 10, Female, Teacher)

This finding echoes Chirawu, who identified the need for gender-sensitive ICT policies in Zimbabwe.[53] The analysis also aligns with Nimodiya and Ajankar's work in rural India, showing that similar disparities exist across contexts and can only be addressed through inclusive policy design and community mobilisation.[54] Within the digital divide framework, gender is a key axis of exclusion, reinforcing intersectional disadvantage when combined with poverty and rural marginalisation.

Theme 4: Virtual Mentoring and Teacher Professional Development

The final theme highlighted participants' endorsement of virtual mentoring as a viable and necessary intervention for professional development in rural areas. Many teachers expressed feelings of isolation and disconnection from mainstream pedagogical support.

> "*When you are posted to a rural school, it feels like you are on your own. Having an online mentor would make a huge difference."*
> (Participant 4, Male, Newly Appointed Teacher)

Virtual mentoring was perceived as a means of bridging geographic and professional gaps, aligning well with Education 5.0's goal to promote innovation and digital empowerment in teaching. These findings also resonate with Adeyemi and Oni; Prajaknate, who demonstrated that targeted digital literacy and mentorship programmes can enhance teacher retention and learner outcomes in rural

[51] Zhong, "From Access to Usage: The Divide of Self-Reported Digital Skills among Adolescents."
[52] BBC News, "Over 1,000 Rural Schools Have Computer Labs under the Smart Zimbabwe Plan."
[53] Danai Daisy Chirawu, " A Decolonial African Feminist to Women's Political Participation in Zimbabwe" (UiT Norges Aarktiske Universitet, 2023).
[54] Aditi Rajesh Nimodiya and Shruti Sunil Ajankar, "ICT in Rural Development: Application and Challenges-A Review," *International Journal of Scientific Research in Science and Technology* 8, no. 6 (2021): 464–72.

settings.[55] Within the study's analytical lens, virtual mentoring serves as both a response to the digital divide and a tool to enable upward mobility, echoing Liu's argument that digital empowerment is a prerequisite for social inclusion and mobility.[56]

Synthesis and Implications

The thematic analysis reveals strong convergence between policy aspirations and community-level insights, but also exposes critical implementation gaps in rural Zimbabwe. The digital divide, as conceptualised by Liu and Zhong, is not simply about a lack of access to devices but about systemic barriers to participation, training, infrastructure, and equity.[57] Digital policies exist, but without adequate infrastructure and targeted gender-sensitive interventions, they fall short of their transformative potential.[58] Virtual mentoring emerges as a cost-effective and context-sensitive response to professional isolation, serving as a pathway toward improving teacher retention, motivation, and learner outcomes. These findings underscore the necessity for a comprehensive, intersectional, and community-engaged approach to digital transformation in education.

RECOMMENDATIONS

Based on the study's findings, the following recommendations are proposed to key stakeholders to strengthen digital inclusion and virtual mentoring in rural Zimbabwean schools:

For the Government and the Ministry of Education: Establish comprehensive monitoring and evaluation frameworks to track the progress and effectiveness of digital inclusion initiatives. This will ensure that rural schools receive targeted support and that policies are responsive to on-the-ground realities.

For Public-Private Partnerships and Donor Agencies: Mobilise financial resources and technical expertise to expand ICT infrastructure, including solar-powered computer labs, in under-resourced rural schools. Collaboration with private sector technology firms can enhance the sustainability and innovation of these efforts.

For Teacher Training Institutions and Educational NGOs: Integrate ICT and digital literacy training comprehensively into preservice and in-service teacher education programs. Additionally, promote virtual mentoring programs that connect rural and urban educators to facilitate professional growth and reduce isolation.

For Policymakers and Curriculum Developers: Encourage the adoption of cross-cultural virtual mentoring initiatives and digital learning platforms that specifically address gender and regional disparities. Tailored interventions should focus on empowering female educators and learners in rural areas.

For Researchers and Academic Institutions: Conduct further research focusing on the gendered dimensions of digital exclusion in rural schools and evaluate the long-term impact of virtual mentoring on teacher retention and student outcomes.

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CONCLUSION

This study highlights the crucial importance of bridging the digital divide to enhance virtual mentoring and improve teacher retention in Zimbabwe's rural secondary schools. Despite persistent challenges related to infrastructure, electricity, and gender disparities, government investments in ICT infrastructure, STEM education, and the Education 5.0 framework have established vital foundations for digital inclusion. Virtual mentoring stands out as a practical and empowering strategy to support professional development, mitigate teacher isolation, and enhance educational quality in resource-constrained rural settings. Ultimately, addressing digital inequalities is essential not only for ensuring equitable access to education but also for fostering broader socio-economic development in Zimbabwe. A sustained commitment from all stakeholders is required to maximise the transformative potential of virtual mentoring in rural education.

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