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EDUCATIONAL EQUALITY AND PEDAGOGICAL TECHNOLOGICAL TRANSFORMATION OF RURAL SOUTH AFRICAN SECONDARY SCHOOLS

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Abstract

The global COVID-19 pandemic has significantly impacted education systems worldwide, forcing institutions to adapt rapidly to ensure continuity of learning. In the context of South Africa, where educational disparities persist, the pandemic has exposed and exacerbated existing inequalities in access to quality education. This research critically examines the Educational Equality and Pedagogical Technological Transformation of Rural South African Secondary Schools. Recognizing the persistent educational disparities in resource allocation and quality of instruction between urban and rural settings, this study aims to investigate the potential of integrating technological advancements to bridge this gap. The research employs a mixed-methods approach, combining quantitative data collection and qualitative analysis to provide a comprehensive understanding of the challenges and opportunities inherent in education. Quantitative surveys were conducted to assess the current state of educational resources, infrastructure, and academic performance across a representative sample of rural schools. The case study research design was adopted. Concurrently, qualitative methods, such as interviews and focus group discussions, were employed to capture the nuanced experiences and perspectives of educators, students, and community stakeholders. The study investigated the utilization of pedagogical technologies within the sampled 3 rural purposively selected secondary schools, examining 60 teachers as participants on the extent to which digital tools, e-learning platforms, and interactive media were integrated into teaching practices. Data was analyzed manually, graphs and tables were utilized, and themes were drawn. The findings of this study revealed that Special attention needed to be given to the identified barriers to technology adoption, including infrastructural limitations, teacher training, and cultural considerations. Furthermore, the study the findings revealed that the impact of technological interventions on educational outcomes, evaluating factors such as student engagement, academic achievement, and the development of 21st-century skills was a necessary need in rural schools. The study recommended the efficacy of various pedagogical technologies, which would aim to provide evidence-based technological skills for the implementation of sustainable and contextually relevant solutions to enhance educational equality in rural South African schools. The findings hold the potential to inform policy decisions, guide educational practitioners, and contribute to the ongoing discourse surrounding global efforts to achieve inclusive and quality education for all. This study concluded that the Department of Education takes a relook into education by aligning with national educational goals and considering the unique challenges faced by rural communities to contribute to the formulation of policies that promote inclusive and technology-enabled education.

Keywords: *Educational, equality, pedagogy, technology, advancements.*

1. Introduction

Particularly in rural South African secondary schools, educational equality and pedagogical technologies are essential for improving the quality of education. Even with advancements, inequalities in education and resource allocation persist in rural regions due to structural issues (Smith, 2020). These problems should be resolved by combining technology advancement with educational equality. It is critical to modify educational systems for continuity and justice in the COVID-19 epidemic. This study uses a mixed-methods approach to investigate the function of infrastructure, pedagogical technology, and educational resources König, Jäger-Biela, & Glutsch (2020). It highlights obstacles to the implementation of technology, ranging from teacher preparation to infrastructure (Silva, Fernandes, Peres, Lima, & Silva, 2022). Policy choices for inclusive and high-quality education are influenced by the study's findings (Alfredo, Echeverria, Jin, Yan, Swiecki, Gašević, & Martinez-Maldonado, 2024).

2. Literature review

This section studied theoretical and empirical literature to fully comprehend educational equity and the pedagogical technological transformation of rural South African secondary schools.

2.1. Theoretical literature review

In academic debate, the quest for educational equity and pedagogical technology in rural South African secondary schools is a central theme. Firmansyah, Putri, Wicaksono, Putri, Widianto, & Palil (2021) draws attention to difficulties that impede equal results, such as inadequate infrastructure and teacher shortages. Advocating for transformational methods and confronting oppressive institutions, critical pedagogy (Silva, Fernandes, Peres, Lima, & Silva, 2022). Sociocultural theory stresses social interactions' function, calling for meaningful involvement (Alfredo, Echeverria, Jin, Yan, Swiecki, Gašević, & Martinez-Maldonado, 2024). According to Sabela (2023), integrating pedagogical technology has the potential for fairness, breaking down obstacles, and promoting individualized instruction. Nonetheless, Shwedeh, Salloum, Aburayya, Fatin, Elbadawi, Al Ghurabli, & Al Dabbagh, (2024) highlights the necessity of infrastructure, teacher preparation, and contextual factors for sustainable practices. Interventions are guided by theoretical frameworks, guaranteeing all students in rural South African secondary schools' fair access to high-quality education.

2.2. Empirical literature

In rural secondary schools in South Africa, empirical research offers important insights on educational equity and pedagogical technology integration. König, Jäger-Biela, & Glutsch (2020) draws attention to resource inequalities and emphasizes focused actions. Infrastructure and training are essential for equal access to technology, according to Gallegos-Rejas, Thomas, Kelly, & Smith, (2023). Contextual elements and community participation are key components of effective pedagogical technology, underline cultural impacts on schooling according to Silva, Fernandes, Peres, Lima, & Silva, 2022). Alfredo, Echeverria, Jin, Yan, Swiecki, Gašević, & Martinez-Maldonado, (2024). Sabela (2023) investigate methods for integrating technology. This empirical research supports inclusive education for all students in rural South African secondary schools by providing information for evidence-based practices and policy choices.

3. Research methodology

Methodological aspects presented in this section involve the research design, population and sampling, data, and analytic techniques.

3.1. Methodological design

Using a mixed-methods approach, the research provides a thorough grasp of the opportunities and problems inherent in education by integrating qualitative analysis with quantitative data collecting. A representative sample of rural schools' academic performance, infrastructure, and educational resources were evaluated using quantitative questionnaires. The research design for the case study was chosen. Concurrently, qualitative approaches, such as interviews and focus group discussions, were deployed to capture the diverse experiences and opinions of educators, students, and community stakeholders.

3.2. Population and sampling

The study examined how pedagogical technologies were used in three rural secondary schools that were purposefully chosen for the sample. It looked at the degree to which digital tools, e-learning platforms, and interactive media were incorporated into teaching practices, with 60 teachers serving as participants.

3.3. Data collection and data analysis

Qualitative techniques, like focus groups and interviews were used to record the complex viewpoints and experiences of teachers, students, and community members. Tables, graphs, and manual data analysis were used. Focus group discussions also promote discussion and offer enlightening data (Ramphabana, 2022). A large sample of instructors participated in quantitative questionnaires to evaluate the patterns and prevalence of participation across socioeconomic backgrounds (Gallegos-Rejas, Thomas, Kelly, & Smith, (2023).

3.4. Data collection procedure

In rural South African secondary schools, data collecting to analyze parental engagement in their children's education was carried out ethically and methodically, taking into account the goals of educational equity and the pedagogical technology revolution. After receiving clearance, a varied group of educators voluntarily participated in the research (Hongoro, Makoae, Alubafi, Ramoroka, Maphosa, Makitla, Maphosho, Nchabeleng, Mohlabane, & Nkosi, 2023). We carefully used qualitative techniques, such as focus groups and interviews, with participants' express permission to minimize interference with their daily lives (Gallegos-Rejas, Thomas, Kelly, & Smith, (2023). Furthermore, participants' anonymous data was gathered with interviews (Ramasamy & Vilakazi, 2022). Coding strategies and triangulation procedures were used to support the validity and reliability of the data that was gathered. With a focus on educational equity and pedagogical technology change in rural secondary schools, this methodical approach seeks to provide instructors with a thorough understanding of their perspectives on parental engagement in South African children's education Hongoro, Makoae, Alubafi, Ramoroka, Maphosa, Makitla, Maphosho, Nchabeleng, Mohlabane, & Nkosi (2023).

3.5. Data treatment and analysis

To investigate educational equity and pedagogical technological change in rural South African secondary schools, data handling and analysis are essential. To guarantee correctness, dependability, and relevance to the study goals, the data were subjected to a methodical processing process once they were collected. Data cleansing was one of the first phases when missing numbers, outliers, and inconsistencies were found and fixed (Sabela, 2023). After that, the data was arranged and coded to make analysis easier. The coding schemes were created to identify important themes and variables on educational equity and the integration of pedagogical technology (Silva, Fernandes, Peres, Lima, & Silva, 2022). Surveys and evaluations were used to collect quantitative data, which was then statistically analyzed to identify trends, correlations, and links between educational results and technology use (Ramasamy & Vilakazi, 2022). Researchers can confirm findings and reach strong conclusions by using a triangulation of data sources and methodologies, which improves the validity and dependability of findings (Alfredo, Echeverria, Jin, Yan, Swiecki, Gašević, & Martinez-Maldonado, 2024). Additionally, the data analysis process was iterative, with researchers going back and adjusting their findings to meet the intricacies present in education and get a deeper knowledge (Sabela, 2023).

4. Findings and discussions

The results show persistent gaps in secondary education that must be addressed to facilitate the successful integration of technology in rural South African secondary schools (Ramphabana, 2022). Communities, parents, teachers, and students must work together on collaborative efforts (Alfredo, Echeverria, Jin, Yan, Swiecki, Gašević, & Martinez-Maldonado, 2024). For pedagogical skills and digital literacy, teacher training programs are essential (Ramasamy & Vilakazi, 2022; Sabela, 2023). These observations guide the development of evidence-based interventions and policy choices that support inclusive, high-quality education in rural secondary schools in South Africa.

4.1. Infrastructure needs to be improved

Figure 1. The infrastructure required for educational fairness in rural schools.

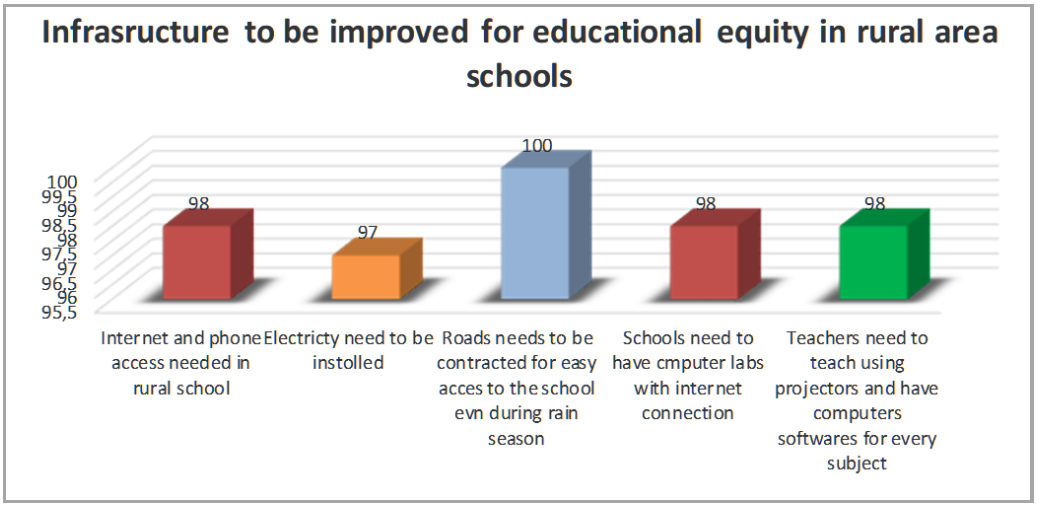
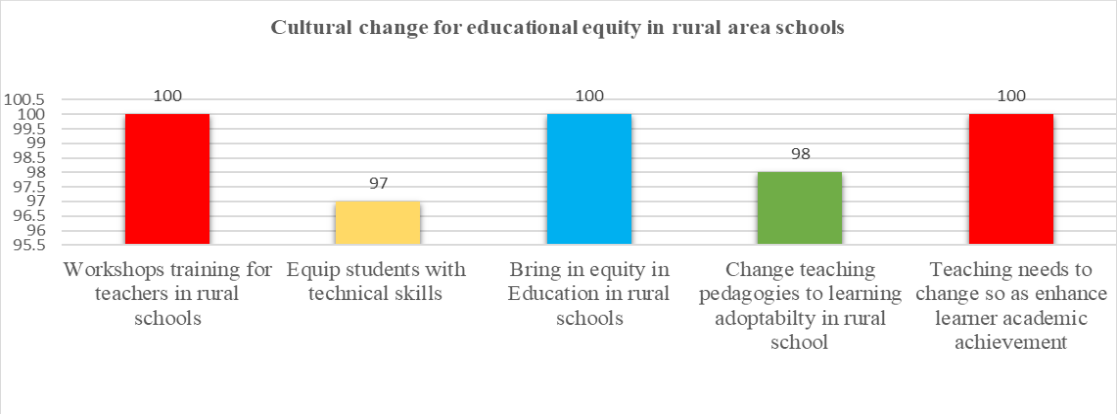


Figure 1 reveals that 98% of participants said that internet and phone access might be required in rural schools, 97% said that electricity installation was necessary, 100% said that a road should be built for convenient access to the school, 98% said that computer labs with internet connections were necessary in schools, and 98% said that teachers should use projectors and have computers for every subject. The results are corroborated by Hongoro, Makoae, Alubafi, Ramoroka, Maphosa, Makitla, Maphosho, Nchabeleng, Mohlabane, & Nkosi (2023) who claimed that inequalities in education in rural South African secondary schools must be addressed to prevent ineffective technology integration.

4.2. Cultural change for educational equity

Figure 2. Cultural shift is necessary for educational fairness in rural schools.



According to Figure 2, 100 % of the participants needed workshop training in technology for teachers in rural schools; 97% said that students needed to be equipped with technical skills to achieve better academic achievements; 100% said that the department of Education needed to implement equitable education in rural schools; 98% said that they needed a change in teaching pedagogies to be implemented in rural schools; and 100% said that teaching needed to change to improve learner academic achievement. The results are corroborated by studies by Ramasamy & Vilakazi (2022) and Sabela (2023), which found that teacher preparation programs are essential for pedagogical skills and digital literacy. However, there is potential for pedagogical technology interventions to solve issues (Silva, Fernandes, Peres, Lima, & Silva, 2022). Furthermore, community engagement may help to enhance teaching and learning of the children teachers meet in the classroom.

5. Conclusion

In rural South African secondary schools, pedagogical technology change and educational equity are goals that require a diversified approach. Even while there are still gaps, integrating technology has the potential to close them and improve student results. Targeted teacher preparation, cultural sensitivity, and community participation show to be essential components in promoting long-lasting transformation. Through the promotion of cooperative endeavours and well-informed policy determinations, interested parties may progress inclusive and high-quality education for every student, regardless of their location or financial status. Embracing these ideals, South Africa may begin on a path towards egalitarian and technologically enabled educational institutions, assuring a brighter future for generations to come.

6. Recommendations

It was recommended that educational policymakers prioritize investments in infrastructure and teacher training to facilitate the effective integration of pedagogical technologies in rural South African secondary schools. Additionally, fostering partnerships between schools, communities, and technology providers may need to enhance access to resources and promote culturally relevant educational experiences. Embracing a holistic approach that addresses socioeconomic disparities and emphasizes community engagement might be essential in achieving sustainable educational equality. Moreover, ongoing research and evaluation of technological interventions could inform evidence-based practices and guide continuous improvement efforts, ensuring that all students have equitable access to quality education in rural areas.

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