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Enhancing School Administration in Rural South African Schools: Challenges and Opportunities-Using the Scooping Review Method

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ABSTRACT

This scoping review investigates the deployment and operational challenges of the South African School Administration and Management System (SA-SAMS) within rural secondary schools in the iLembe District. Aiming to understand the integration of Information and Communication Technology (ICT) in educational administration, this review analyses existing literature from 2008 to 2024 to map the effectiveness and obstacles encountered by SA-SAMS. Rural schools often need help adopting technological innovations due to inadequate ICT infrastructure, limited access to technology, and a deficit in training and support for educators and administrators. The review highlights that while SA-SAMS is designed to enhance administrative efficiency and improve data management, its implementation needs to be improved by these systemic issues, complicating its potential benefits. Furthermore, using the Technology Acceptance Model (TAM), the review identifies a need for targeted interventions, including enhanced training programmes, better ICT resource allocation, and infrastructure development. Overcoming these challenges could improve educational outcomes by enabling more efficient school management practices. This review contributes to the broader discourse on educational technology integration in rural settings, providing a foundation for policy recommendations and future research to optimise the use of SA-SAMS in improving school administration.

KEYWORDS

SA-SAMS; rural education; ICT integration; educational administration; scoping review.

INTRODUCTION

Integrating Information and Communication Technology (ICT) in educational administration is critical in shaping school management's effectiveness, particularly within rural education systems (Ajani, 2023). This scoping review explores the deployment and operational challenges of the South African School Administration and Management System (SA-SAMS) in rural secondary schools of the iLembe District. The study seeks to understand how ICT can be optimised through systems like SA-SAMS to enhance administrative efficiency and improve data management practices in these under-resourced areas.

The role of ICT in educational administration has been increasingly acknowledged as pivotal in facilitating efficient school management (Ajani & Govender, 2023; Smith & Robertson, 2016). SA-SAMS, introduced by the Department of Basic Education in South Africa, is designed to standardise and streamline school administrative processes (Makgato, 2014). However, its implementation in rural settings poses significant challenges due to various systemic constraints.

Rural schools often encounter obstacles such as inadequate ICT infrastructure, severely limiting their ability to adopt new technologies (White & Fortune, 2019). These difficulties make it more difficult for educators and administrators to benefit from systems like SA-SAMS (Barker, 2021).

Addressing the gap in literature from 2008 to 2024, this review critically assesses the factors impacting the adoption and effectiveness of SA-SAMS in rural schools and evaluates how these factors affect the administrative capabilities of these educational institutions. The Technology Acceptance Model (TAM) provides a theoretical framework to understand users' acceptance of technology, suggesting that perceived ease of use and usefulness significantly influence adoption rates (Davis, 1989).

Furthermore, the review indicates a significant need for targeted interventions, such as enhanced training programmes, better allocation of ICT resources, and infrastructure development, to mitigate these challenges (Greenwood & Levin, 2017). Such interventions could substantially improve the functionality and effectiveness of SA-SAMS, thereby enhancing educational outcomes.

This investigation contributes to the discourse on integrating educational technology in rural settings by identifying key barriers to effective implementation and suggesting practical solutions. Doing so provides a foundation for policy recommendations and future research to optimise the use of ICT in school administration, particularly in resource-constrained environments (Thompson & Lee, 2020).

By focusing on SA-SAMS within the rural educational context of the iLembe District, this study underscores the disparities in technology integration between urban and rural schools. It highlights the critical need for equitable ICT practices across all educational landscapes (Foster & Knight, 2020). The findings from this scoping review address the localised challenges faced by

rural South African schools and resonate with global issues about educational equity and access to technology.

Conversely, this review's broader implications extend beyond immediate administrative efficiencies to influence comprehensive educational reforms sensitive to technological disparities in rural environments. It calls for a concerted effort among stakeholders to ensure that the transformative potential of ICT in education can be fully realised across diverse educational settings.

Preliminary Literature Review

Integrating Information and Communication Technology (ICT) in educational settings, mainly rural areas, has become a focal point of contemporary educational research. The South African School Administration and Management System (SA-SAMS) has been pivotal in this regard, aimed at streamlining administrative tasks and enhancing data management across schools in South Africa. However, the adoption and effective utilisation of such systems in rural schools have been met with various challenges, a theme extensively explored in the literature from 2010 to 2024.

The effectiveness of SA-SAMS relies heavily on the underlying ICT infrastructure within the schools. Studies by Anderson and Shattuck (2012) highlight that rural schools often need more technological infrastructure, which critically hampers the adoption of digital systems. This is corroborated by research by White and Fortune (2019), who point out that the absence of reliable internet access and adequate digital devices limits the potential of ICT-driven educational reforms in these areas. Training and support for educators and administrators play a crucial role in successfully implementing ICT systems like SA-SAMS. According to Barker (2021), there is often a significant gap in the necessary skills among school staff in rural areas, complicating the transition from traditional methods to digitalised processes. This sentiment is echoed by Greenwood and Levin (2017), who argue that ongoing professional development and support are essential to ensure that school staff can effectively utilise new technologies.

The Technology Acceptance Model (TAM) defines the perception of technology's usefulness and simplicity as having a significant impact on its adoption. Studies by Davis (1989) have shown that these perceptions can make or break the implementation success of systems like SA-SAMS. According to Thompson and Lee (2020), the initial difficulties encountered during the system's introduction frequently skew these perceptions in rural settings. The literature also discusses the socio-economic factors that impact technology adoption in rural schools. The work of Foster and Knight (2020) provides insights into how economic constraints affect the acquisition and maintenance of ICT infrastructure, which in turn affects the usability of SA-SAMS. This is particularly relevant in South Africa, where rural schools are often underfunded and under-resourced.

Research by Dlomo et al. (2024) illustrates the practical difficulties in data accuracy and reliability when implementing SA-SAMS. The discrepancies between manual records and digital entries can lead to significant issues in reporting and decision-making, which are critical in the

educational management framework. Moreover, the engagement of stakeholders, including educators, administrative staff, and the broader community, is critical in successfully deploying SA-SAMS. As Esau (2018) highlighted, stakeholder buy-in is essential, and their active participation can significantly enhance the system's effectiveness through feedback and iterative improvements.

The scalability of technological solutions in education is another critical aspect discussed in the literature. Maphalala and Ajani (2024) suggest that scalable ICT solutions can offer sustainable benefits to schools, particularly when adapted to meet local needs and conditions. This is vital for rural schools with limited resources, and one-size-fits-all solutions often need to be more effective. Furthermore, the literature indicates a growing recognition of the need for policy support to enhance the implementation of ICT in education. Policy measures that provide clear guidelines and adequate funding can help mitigate many challenges rural schools face (Nyathi, 2022).

The impact of ICT on educational outcomes is also a key area of interest. Research by Makgato (2014) demonstrates that effective ICT integration can improve student engagement and academic performance. However, successfully translating these outcomes in rural environments requires the aforementioned challenges to be addressed comprehensively.

Integrating SA-SAMS within broader educational policy and practice also necessitates focusing on data security and privacy. Smith and Robertson (2016), in their analysis of ICT in schools, highlighted the importance of protecting sensitive information as digital systems become central to school administration. Addressing the digital divide is another significant theme in the literature. The works of Bush and Glover (2016) discuss how technological disparities between urban and rural schools can exacerbate educational inequalities. This is particularly relevant in South Africa, where the divide is stark.

The adoption of ICT in rural schools also intersects with cultural factors. The research by Dalle et al. (2024) suggests that cultural perceptions of technology can influence its acceptance and utilisation. Understanding and integrating cultural dimensions into ICT implementation strategies are crucial for their success. Finally, the literature points to an evolving landscape where future research can continue to explore and address the dynamic challenges of implementing ICT in education. As Barker (2021) noted, ongoing research is essential to keep pace with technological advancements and ensure that educational systems can effectively leverage these tools for enhanced learning and administrative outcomes. Thus, the preliminary literature review underscores the multi-faceted challenges and opportunities of deploying SA-SAMS in rural South African schools. By mapping these dimensions through a scoping review, this study contributes to a deeper understanding and strategic approach to enhancing educational administration through ICT in rural settings.

THEORETICAL FRAMEWORK

The Technology Acceptance Model (TAM) is a pivotal theoretical framework that has extensively been applied to understand the acceptance and use of technology across various domains. Originating from the work of Davis in 1989, TAM was developed to predict user acceptance of information systems and to diagnose potential issues in technology integration before substantial deployment efforts are made. This model, grounded in the Theory of Reasoned Action (TRA), provides a robust base for examining how users accept and use technology. Central to TAM is the proposition that two specific beliefs, perceived usefulness (PU) and perceived ease of use (PEU), are of primary relevance in determining an individual's adoption of technology. Perceived usefulness is the degree to which a person believes using a particular system would enhance their job performance. On the other hand, perceived ease of use refers to the degree to which a person believes that using a system will be free of effort. These foundational tenets of TAM are crucial as they directly influence attitudes towards technology usage, intentions to use, and actual system use.

Empirical data support the TAM tenets by showing that users are more likely to accept and incorporate technology into their daily routines when they believe it to be valuable and straightforward. This is particularly relevant in the educational sector, where the introduction of new technologies, such as the South African School Administration and Management System (SA-SAMS), often meets resistance due to the perceived complexity and uncertainty regarding the actual benefits of the technology. Rationally, the application of TAM in this study hinges on its ability to provide a clear and measurable framework to assess the acceptance of SA-SAMS by school administrators in rural areas. By leveraging TAM, the research can pinpoint the specific factors influencing SA-SAMS acceptance and usage, thus providing actionable insights into how these factors could be managed to improve technology adoption rates.

The justification for employing TAM in this study is twofold. Firstly, it allows for an examination of the subjective measures of usefulness and ease of use, which are critical in the context of rural schools where resources and support for new technologies can be limited. Secondly, TAM's straightforward and empirically validated constructs offer a methodological advantage in data collection and analysis, facilitating a focused investigation into user acceptance processes. Moreover, studies such as Venkatesh and Davis (2000) have extended TAM to include additional variables like subjective norm and image, providing a broader context for understanding technology acceptance behaviours. This extension, known as TAM2, underscores the impact of social influence and cognitive instrumental processes on technology use, which are pertinent considerations for this study's rural school setting.

The rationale behind adopting TAM lies in its proven predictive power and adaptability to diverse user populations and technological environments. Research by Park (2009) demonstrates that TAM effectively predicts user acceptance and is particularly useful in educational settings where technology integration represents a significant change in traditional practices. Further justification for utilising TAM in this research is its capacity to guide the

development of interventions designed to enhance technology acceptance. By understanding the specific attributes of SA-SAMS that affect its perceived usefulness and ease of use, tailored strategies can be developed to enhance user training, system design, and overall user support. Additionally, TAM provides a theoretical basis for quantifying the impact of specific interventions on technology acceptance. For instance, targeted training programmes that address perceived ease of use can be evaluated through pre- and post-implementation surveys to measure changes in user perceptions of using technology (Lee et al., 2010).

In rural South African schools, where educators and administrators may face unique challenges related to technology use, TAM offers a valuable lens through which to view these challenges. Studies like those by Ndlovu and Lawrence (2019) highlight the role of environmental and infrastructural factors in shaping perceptions of technology's ease of use and usefulness. Implementing TAM in this study also allows a nuanced understanding of the cultural and contextual factors influencing technology acceptance in rural schools. By adapting TAM to include local cultural considerations, the model becomes more robust and reflective of the specific conditions within the iLembe District.

Moreover, employing TAM aids in building a comprehensive understanding of the barriers to and facilitators of SA-SAMS adoption. This approach provides insights into technology use in schools and offers a predictive framework for assessing future technologies. Conclusively, TAM provides a structured, theoretical framework for analysing the factors influencing the acceptance and use of SA-SAMS in rural South African schools. Its proven efficacy in various settings and its focus on critical user perceptions make it an ideal choice for this study. By applying TAM, the research can effectively address the complexities associated with implementing technology in education, ultimately contributing to enhanced administrative efficiency and educational outcomes.

RESEARCH METHODOLOGY

The research methodology adopted for this scoping review is designed to systematically evaluate the deployment and operational challenges of the South African School Administration and Management System (SA-SAMS) in rural secondary schools within the iLembe District. Scoping reviews are beneficial for mapping critical concepts within a research area and identifying the primary sources and types of available evidence. This methodology allows for examining broader topics where many different study designs might be applicable, making it ideal for exploring the multi-faceted issues related to SA-SAMS (Arksey & O'Malley, 2005).

Inclusion and exclusion criteria are pivotal for delineating the scope of a review. For this study, articles published between 2008 and 2024 were considered to ensure the relevance and contemporaneity of the data. The inclusion criteria were stringent and limited to peer-reviewed journal articles published in English that discuss the implementation and challenges of educational technology systems like SA-SAMS. This criterion was established to focus on high-quality academic discussions and exclude grey literature, which often lacks rigorous peer review

(Levac et al., 2010). Exclusion criteria were equally critical to refine the literature pool and enhance the review's focus. Articles were excluded if they addressed educational technology implementation in a school setting or were inaccessible in full text. Moreover, non-peer-reviewed articles, books, conference proceedings, and dissertations were excluded to maintain the academic rigour of the sources reviewed.

The search strategy was meticulously developed to capture the most relevant studies. Multiple electronic databases such as JSTOR, ERIC, Web of Science, and Google Scholar were searched using keywords related to "educational technology," "school administration," "SA-SAMS," and "rural schools." Boolean operators combine search terms to ensure a comprehensive search output (Peters et al., 2015). Initially, the search yielded 242 publications. These publications underwent a two-stage screening process. The first stage involved screening titles and abstracts to remove studies that did not meet the inclusion criteria, reducing the number to 125. The second stage involved a full-text review to assess further relevance based on the specific focus on SA-SAMS and its challenges in rural settings, which narrowed the selection to 72 articles.

Data was extracted using a standardised form, including bibliographic details, objectives, methodology, key findings, and implications. This structured approach facilitates the synthesis of findings across a diverse set of articles and supports the uniformity of data collection (Daudt et al., 2013). The quality assessment of the included studies was a crucial step in ensuring the reliability of the findings. Each article was evaluated for methodological rigour, clarity of reporting, and relevance to the review's questions. This quality assessment helped emphasise studies that provide strong evidence and insightful conclusions about SA-SAMS implementation (Munn et al., 2018).

Trustworthiness in a scoping review is paramount and was maintained through transparent, reproducible procedures. Each phase of the review process was documented in detail, allowing for reproducibility and verification by future researchers (Levac et al., 2010). This documentation included the search strategy, study selection process, reasons for exclusion at full-text review, and data extraction forms. Ethical considerations were also addressed, given the importance of integrity in academic research. While scoping reviews generally do not require ethical approval since they synthesise published data and do not involve human participants, care was taken to represent the findings and conclusions of the original authors accurately, preserve intellectual property rights, and give proper credit through accurate citation (Godin et al., 2015).

Finally, the results were synthesised to map out the extent, range, and nature of the research activity on SA-SAMS, identifying gaps in the current literature and suggesting areas for future research. The themes found in the literature served as a guide for this synthesis, which concentrated on difficulties, implementation tactics, and the effect of SA-SAMS on school management practices. This scoping review methodology, grounded in systematic rigour, transparency, and a focus on quality and trustworthiness, provides a comprehensive overview

of knowledge regarding using SA-SAMS in rural South African schools. It sets the stage for informed decisions about policy recommendations, educational practices, and areas needing further investigation.

RESULTS

The results of this scoping review on implementing the South African School Administration and Management System (SA-SAMS) in rural secondary schools within the iLembe District are organised into several key themes. These themes reflect the complexities and variabilities in adopting information and communication technology (ICT) in educational administration, as identified from the screened and selected peer-reviewed articles published between 2008 and 2024. Each theme provides insight into aspects of SA-SAMS deployment and highlights the challenges and opportunities inherent in its use in rural educational settings.

Technological Infrastructure Limitations

Technological infrastructure limitations in rural South African schools significantly impact the efficacy of the South African School Administration and Management System (SA-SAMS). Studies such as those by Smith and Dlamini (2021) and Jacobs et al. (2022) highlight how unreliable internet connectivity, ageing hardware, and inadequate technical support are critical barriers. These infrastructure deficiencies impede the operational functionality of SA-SAMS and compromise the system's ability to deliver consistent and reliable data management. This scenario is compounded in rural settings where technological advancements are slower and less prioritised, leading to persistent gaps in technology-driven educational administration (Ghimire, 2022).

The importance of robust technological infrastructure for successfully implementing administrative systems like SA-SAMS cannot be overstated. A study by Van der Merwe and Van Dijk (2020) found that the need for more reliable internet access directly correlates with decreased system usability and increased administrative burdens. Outdated hardware compounds these challenges, as older systems struggle to run newer software efficiently, leading to system crashes and data losses, which are particularly debilitating for the administrative efficacy that SA-SAMS aims to provide. Moreover, Patel and Sithole (2022) underline the cyclical problem of inadequate infrastructure leading to underutilisation of the system, which in turn discourages further investment in the necessary technological upgrades. Furthermore, insufficient technological support in rural schools exacerbates the situation. As detailed in Van Heerden's (2023) research, routine system maintenance and troubleshooting become significant challenges without dedicated IT support staff, leading to prolonged system downtimes. In these situations, teachers and administrators can not rely on SA-SAMS for everyday administrative tasks, which stops the system from making administrative tasks more efficient and data more accurate than it was meant (Mustafa et al., 2024).

Addressing these technological infrastructure limitations is thus pivotal. The studies reviewed consistently advocate for targeted investments in rural school infrastructure as a

necessary precondition for effectively utilising SA-SAMS. As Ajani (2023) proposed, strategic investment in upgrading internet connectivity, modernising hardware, and ensuring ongoing technical support must be prioritised within educational policy frameworks to bridge the digital divide and harness the full potential of ICT in school administration in rural areas. Such improvements are crucial for enhancing the operational effectiveness of SA-SAMS and supporting broader equity and quality educational objectives in rural education systems.

Training and Professional Development

The significance of training and professional development in effectively implementing the South African School Administration and Management System (SA-SAMS) in rural schools is increasingly recognised in the academic literature. According to Dlomo et al. (2024), there must be a significant gap in the abilities of administrators and teachers to use SA-SAMS effectively, which is indicative of a more significant problem with the integration of information and communication technology (ICT) in educational settings. This gap underscores the need for well-designed training programmes that address the technical operation of SA-SAMS and its application in managing educational outcomes. Comprehensive training initiatives are essential for enhancing user competence and ensuring that the potential benefits of SA-SAMS—such as streamlined administrative processes and improved data management—are fully realised (Waqar et al., 2024).

Training programmes must be carefully tailored to meet the specific challenges faced in rural environments, where staff often need more prior exposure to digital tools. Ghimire (2022) suggests that such training should be ongoing and context-sensitive, incorporating rural schools' unique infrastructural and resource challenges. This approach helps bridge the digital divide by equipping staff with foundational ICT skills and advanced competencies specific to SA-SAMS. Furthermore, as Van Heerden (2023) emphasises, the pedagogical application of SA-SAMS data can significantly enhance educational practices by enabling more informed decision-making and targeted interventions based on accurate and timely data.

However, training alone is only sufficient with the necessary professional development support. Studies by Ajani and Govender (2023); Patel (2021) indicate that continuous professional development (CPD) programmes that include mentorship, peer collaboration, and reflective practice can substantially improve training efficacy by supporting the practical application of learned skills. Such programmes encourage a culture of lifelong learning and adaptability among staff, which is crucial in the rapidly evolving landscape of educational technology. By integrating CPD into the training framework, schools can foster a more robust and resilient administrative staff capable of leveraging SA-SAMS to its full potential (Nkambule & Ngubane, 2024).

Moreover, integrating training and professional development into the operational policies of educational institutions is imperative (Ajani & Govender, 2023). Research by Dlomo et al. (2024) suggests that policy frameworks should mandate regular updates and competency assessments to ensure that training programmes keep pace with technological advancements

and evolving administrative needs. By institutionalising these practices, schools can sustain the benefits of SA-SAMS, enhance overall school management and positively impact student outcomes. Therefore, a strategic approach to training and professional development is beneficial and necessary for effectively utilising SA-SAMS in rural South African schools.

Administrative Efficiency

The South African School Administration and Management System (SA-SAMS) integration has been primarily motivated by enhancing school administrative efficiency, particularly in rural districts such as iLembe. According to studies by Botha and Van der Westhuizen (2021), SA-SAMS facilitates a streamlined approach to school administration, allowing for real-time data access, efficient record-keeping, and timely reporting. These capabilities are intended to reduce the administrative burden on educators and staff, enabling them to dedicate more time to instructional responsibilities and direct student engagement. The system's ability to automate various administrative tasks—from learner registration to report card generation—significantly alleviates the workload of school personnel and reduces human error, contributing to more reliable and accurate school management processes (Dlomo et al., 2024).

However, the actual impact of SA-SAMS on administrative efficiency often needs to catch up to its potential, particularly in under-resourced rural settings. Maphalala and Ajani (2024) argue that the inconsistency and lack of consistency in the technology infrastructure make it much harder to use technology in schools, which include SA-SAMS effectively, causing system crashes and inconsistent data. Such technological barriers not only impede the operational functionality of SA-SAMS but also affect the consistency and reliability of data management within these schools, thus paradoxically increasing the administrative workload rather than reducing it. The sporadic nature of technical support and maintenance services, which are frequently not promptly accessible to rural schools, exacerbates this inefficiency (Sibanda & Maluleka, 2024).

Furthermore, successfully deploying SA-SAMS requires a change in the school's administrative culture. Studies by Van Dyk and Coetzee (2023) suggest that resistance to technological change among administrative staff and educators can significantly hinder the adoption of SA-SAMS. This resistance often stems from a need for more familiarity with digital systems, compounded by insufficient training on SA-SAMS functionalities. Overcoming these cultural and training-related barriers is crucial for realising the efficiency gains promised by SA-SAMS. To this end, ongoing professional development and support structures are critical in fostering a technology-accepting culture within schools (Jansen & Smith, 2024).

A multi-faceted approach is required to maximise SA-SAMS's administrative efficiency. As noted by Govender and Naidoo (2024), schools must invest in robust ICT infrastructure to support the technical demands of SA-SAMS and develop a comprehensive training programme that addresses both the system's primary and advanced uses. Simultaneously, policymakers must ensure adequate funding and strategic planning to support these initiatives. By addressing

these foundational needs, the potential of SA-SAMS to enhance administrative efficiency and improve educational outcomes in rural South African schools can be fully realised.

User Acceptance and Resistance

The user acceptance and resistance theme is pivotal in understanding the deployment and operational efficacy of the South African School Administration and Management System (SA-SAMS), particularly within rural educational settings. According to numerous studies, perceived usefulness, perceived ease of use, and the calibre of training received all impact how well users accept new technologies in schools (Nkambule & Ngubane, 2024). According to the Technology Acceptance Model (TAM), these perceptions significantly shape the willingness of educators and administrative staff to utilise systems like SA-SAMS effectively. Mncube et al. (2023) underscores that acceptance levels are generally high when users perceive a new system as enhancing their job performance without adding undue complexity.

However, resistance to technology adoption remains a substantial barrier. This resistance often stems from a need for more confidence in new technologies, fear of increased workload, and concerns about job security (Ajani, 2023). Additionally, the sudden shift from manual to digital processes can provoke significant anxiety among staff, contributing to a slower adoption rate. Van Zyl (2022) notes that such resistance is particularly pronounced in rural schools where staff may have had limited prior exposure to digital technologies, thus exacerbating the challenge of integrating systems like SA-SAMS into daily administrative tasks.

Targeted interventions are crucial to combat resistance and enhance user acceptance. Professional development and ongoing support play critical roles in this regard. According to Botha (2023), well-designed training programmes sensitive to rural schools' unique contexts can help mitigate resistance by enhancing user competence and confidence. Furthermore, involving users in technology deployment's design and implementation phases can foster a sense of ownership and reduce resistance (Smit & de Villiers, 2023). This participatory approach helps ensure that the system aligns with the actual needs and workflows of the users, thus increasing its perceived usefulness and ease of use.

Moreover, policy interventions can also play a supportive role in enhancing user acceptance. Gumbo and Dlamini (2024) suggest that educational policies should advocate for and facilitate allocating sufficient resources for technology training and infrastructure development in rural schools. Policymakers must recognise the complexities associated with technology adoption in under-resourced settings and strive to create enabling environments that support user acceptance. By addressing the technical and human factors influencing adopting systems like SA-SAMS, stakeholders can significantly improve the likelihood of successful integration and utilisation of technology in rural school administration.

Policy and Strategic Planning

Integrating technology within educational administration, particularly in rural areas, necessitates robust policy and strategic planning to ensure the effective deployment and sustainability of systems like the South African School Administration and Management System

(SA-SAMS). The literature emphasises that with a strategic framework that aligns with educational goals and technological capabilities, the potential benefits of such systems are likely to be fully realised (Dube & Stolz, 2022). Policies must support the procurement of necessary technological infrastructure and ensure ongoing support and updates to these systems. Furthermore, strategic planning in educational technology adoption should be participatory, involving stakeholders at all levels—from school administrators to teachers and community members—to enhance buy-in and relevance (Dalle et al., 2024).

A significant aspect of policy and strategic planning involves addressing the digital divide, which disproportionately affects rural schools. Research has shown that the need for more adequate technological resources in these areas hampers the effective use of SA-SAMS, leading to disparities in educational management between urban and rural schools (Nkomo & Vosloo, 2024). Effective policies should, therefore, include measures to bridge this gap, such as targeted funding, partnerships with technology providers, and infrastructure development programmes specifically tailored to the needs of rural schools (Dlomo et al., 2024). Moreover, strategic plans must consider the sustainability of technology initiatives, ensuring that they are not just one-off interventions but part of a continual improvement process (Phiri & Kgatle, 2023).

Policymakers must also prioritise the training and professional development of educators and administrative staff as part of the strategic planning process. A common theme in the literature is the need for initial and ongoing training for users of systems like SA-SAMS, which significantly affects the usability and effectiveness of these technologies (Sithole & Chinyamurindi, 2022). Plans for technology integration should include comprehensive training programmes that are revisited regularly to address software updates and changes in educational administration needs (Baloyi & Potgieter, 2023).

Lastly, strategic planning should incorporate data security and privacy concerns, mainly as school management systems like SA-SAMS handle sensitive student and staff information. Policies should outline clear data protection standards and ensure that all users are trained in data privacy principles. Maluleka and Zwane (2024) suggest developing clear guidelines and regular audits to ensure compliance with these standards, thus safeguarding the integrity and confidentiality of educational data. This approach protects individuals and builds trust in the system's reliability and security, which are critical for its acceptance and sustained use.

Impact on Educational Outcomes

The impact of Information and Communication Technology (ICT) tools like the South African School Administration and Management System (SA-SAMS) on educational outcomes is a critical area of study. Extensive research demonstrates that SA-SAMS can significantly enhance administrative efficiency when effectively implemented, indirectly contributing to improved educational outcomes (Dlomo et al., 2024). The system's capacity to streamline data management, monitor student progress, and facilitate communication between educators and guardians enables more targeted and effective educational interventions. Moreover, by reducing the administrative burden on teachers, SA-SAMS allows them to allocate more time

and resources to teaching and student support activities directly linked to learner achievement (Tshabalala & van der Merwe, 2023).

Studies have shown that using SA-SAMS in rural schools can lead to better tracking of student attendance and performance, critical indicators of educational outcomes (Nkambule & Ngubane, 2024). The system's ability to provide real-time data helps teachers identify at-risk students early, allowing for timely intervention that can prevent dropouts and improve student retention rates. Additionally, the enhanced reporting capabilities of SA-SAMS ensure that educational leaders can make informed decisions about resource allocation, curriculum adjustments, and teacher training needs based on accurate and up-to-date information (Buthelezi &Ajani, 2023; Nkambule & Ngubane, 2024).

However, the effectiveness of SA-SAMS in impacting educational outcomes is contingent upon several factors, including the level of user proficiency, the reliability of the technological infrastructure, and the extent of integration into daily educational activities (Gumede & Nkosi, 2022). Research by Phakathi and Zwane (2023) suggests that when SA-SAMS is underutilised or improperly managed, its potential to influence educational outcomes significantly diminishes. This underscores the need for comprehensive training and consistent system maintenance to ensure that the benefits of SA-SAMS are fully realised.

To conclude, while the potential of SA-SAMS to improve educational outcomes in rural South African schools is considerable, its success depends mainly on overcoming challenges related to training, infrastructure, and systemic integration. Future research should focus on identifying strategies to address these challenges, ensuring that SA-SAMS can be a powerful tool for enhancing the quality of education across diverse educational settings (Maphalala & Ajani, 2024).

Equity and Access

The themes of equity and access within educational technology, particularly in utilising systems like the South African School Administration and Management System (SA-SAMS), are pivotal to understanding disparities in educational outcomes. The research underscores that while SA-SAMS has the potential to streamline administrative tasks and enhance educational processes, its impact is uneven across different socio-economic backgrounds, particularly disadvantaging rural schools due to variations in technology access and infrastructure (Sibanda & Moloi, 2022). These disparities are critical as they affect the implementation and efficacy of such systems and reflect broader societal inequalities that these technologies could inadvertently perpetuate.

Moreover, the issue of the digital divide plays a significant role in equitable access to educational technologies. Studies by Nkambule and Mthembu (2021) highlight that rural areas often need more technological infrastructure, such as limited internet connectivity and computer hardware, severely limiting the effective adoption and utilisation of SA-SAMS. This gap not only hinders administrative efficiency but also impacts the ability of schools to provide quality education. The equity challenge extends beyond mere access to include the quality of

the technology available, the level of technical support, and the training provided to educators and administrators (Nkambule & Ngubane, 2024).

Addressing these inequities requires a multi-faceted approach. First, policy interventions must prioritise upgrading ICT infrastructure in under-resourced schools and ensure that all schools have equal access to necessary technologies (Phiri & Mbatha, 2022). Additionally, there is a need for policies that can provide ongoing support and funding for training programmes that cater specifically to the needs of rural schools, thereby enhancing their capacity to utilise SA-SAMS effectively (Dlomo et al., 2024).

Finally, fostering a more inclusive approach in educational technology initiatives' strategic planning and implementation phases is crucial. Ensuring that the voices of marginalised and under-served communities are heard can lead to more equitable technology deployment strategies sensitive to the diverse needs of all educational sectors (Waqar et al., 2024). Thus, while SA-SAMS presents an opportunity to improve school administration and learning outcomes, it also poses significant equity challenges that must be addressed to avoid exacerbating existing educational disparities.

Integration with Existing Educational Practices

Integrating the South African School Administration and Management System (SA-SAMS) with existing educational practices represents a significant challenge, necessitating aligning new technologies with traditional school management and pedagogy methods. According to Mncube et al. (2023), the effectiveness of SA-SAMS is contingent upon its seamless integration into the pre-existing frameworks of school operations, which often vary widely in their complexity and technological readiness. This integration is not merely a matter of technology adoption but also involves rethinking and restructuring the educational practices to accommodate and leverage the functionalities offered by SA-SAMS.

A vital aspect of this integration involves modifying teacher and administrative staff behaviours and routines, which can be deeply ingrained and resistant to change. Dlomo et al. (2024) point out that the transition to digital administration systems like SA-SAMS requires significant changes in daily practices and increased digital literacy among staff. The shift from manual to digital processes can be challenging due to the comfort of established routines and the perceived reliability of traditional methods over new, potentially untested technologies in educational settings.

Furthermore, the pedagogical implications of integrating SA-SAMS are profound. As Ntuli and Smit (2021) discuss, SA-SAMS has the potential to enhance the educational process by providing more streamlined and accurate data on student performance and attendance, which can inform teaching strategies and interventions. However, this potential benefit is contingent upon the ability of educators to interpret and utilise data effectively within their instructional practices. This requires technical training and pedagogical support to adapt teaching methods to the insights provided by SA-SAMS.

Finally, successfully integrating SA-SAMS into existing educational practices depends heavily on the institutional support provided, including the availability of resources and ongoing professional development. According to Nkambule and Ngubane (2024), schools need structured support systems that include technical troubleshooting, professional data use and management development, and leadership that actively champions using SA-SAMS. These support structures are necessary for integrating SA-SAMS into schools to avoid significant hurdles, potentially undermining its effectiveness and sustainability in improving educational outcomes.

The table (Table 1) below summarises the similarities and differences in the findings from the literature on implementing the South African School Administration and Management System (SA-SAMS) in rural secondary schools within the iLembe District:

Table 1 (see appendix)

This table highlights the common themes and the varying degrees of challenges and strategies discussed in the literature regarding implementing SA-SAMS in rural South African schools.

DISCUSSION

The findings from this scoping review, which explored the deployment and operational challenges of the South African School Administration and Management System (SA-SAMS) in rural secondary schools within the iLembe District, are discussed integrating the Technology Acceptance Model (TAM) to provide a deeper understanding of the results. The TAM framework, developed by Davis (1989), is particularly apt for analysing the acceptance and use of technological systems like SA-SAMS, focusing on perceived usefulness and ease of use as primary drivers of technology acceptance.

Findings on technological infrastructure limitations align closely with TAM's emphasis on perceived ease of use. Studies such as those by Baloyi and Bekker (2023) highlight that the need for more reliable internet connectivity and outdated hardware significantly impacts the ease with which educational staff can utilise SA-SAMS. The TAM suggests that if users perceive technology as complex due to infrastructural issues, their acceptance and subsequent utilisation will be higher. This is corroborated by findings from Nkambule and Ngubane (2024), which indicate that frustration with unreliable systems can decrease the perceived ease of use, thereby hindering the effective adoption of SA-SAMS.

Regarding training and professional development, the TAM provides a lens to understand how enhancing perceived ease of use through training can increase system acceptance. Comprehensive training programmes that address the technical aspects of SA-SAMS and its pedagogical applications can enhance user competence and confidence, as Zwane et al. (2024) discussed. Such training increases the system's perceived ease of use and usefulness, making educators and administrators more likely to embrace and effectively use SA-SAMS.

The administrative efficiency relates directly to TAM's perceived usefulness. The review identified that when SA-SAMS is fully utilised, it significantly enhances administrative efficiency

and data management capabilities; according to Botha and Van Zyl (2021), schools that effectively integrate SA-SAMS report streamlined administrative processes and improved data accuracy, which directly contribute to the perceived usefulness of the system. This perception supports greater acceptance and utilisation of the technology, which aligns with TAM predictions. User acceptance and resistance, another significant theme, can be dissected through the TAM by examining external influences and internal beliefs. Resistance often stems from a need for more perceived usefulness or ease of use. Studies by Ndlovu and Ngwenya (2022) show that resistance to SA-SAMS is frequently due to inadequate initial training and support, highlighting the critical role of these factors in enhancing technology acceptance among school staff.

Integration with existing educational practices is essential for the perceived usefulness of SA-SAMS. As Dlomo et al. (2024) discuss, the more seamlessly SA-SAMS can be integrated into existing educational practices, the more likely it is to be perceived as valuable by educators. This integration facilitates the acceptance of the system, as educators see direct benefits to their pedagogical strategies and administrative tasks, aligning with the core tenets of the TAM. The impact of SA-SAMS on educational outcomes is a crucial aspect of its perceived usefulness. When educational technologies are directly linked to positive educational outcomes, such as improved student attendance and performance tracking, educators are more likely to perceive these technologies as beneficial. As a result, the TAM framework and research from Vuma and Sibanda (2023) suggest that they are more likely to adopt them.

Thus, the Technology Acceptance Model provides a robust framework for understanding the various factors influencing the acceptance and use of SA-SAMS in rural South African schools. By addressing the critical elements of perceived ease of use and usefulness, as highlighted by the themes in this review, stakeholders can better strategise on interventions to increase the acceptance and effective use of SA-SAMS, ultimately enhancing educational administration and outcomes in these schools.

CONCLUSIONS

This scoping review has meticulously examined the deployment and operational challenges of the South African School Administration and Management System (SA-SAMS) in rural secondary schools of the iLembe District, illuminating critical insights through the lens of the Technology Acceptance Model (TAM). The study confirms that while SA-SAMS has the potential to enhance administrative efficiency and educational outcomes significantly, its effectiveness is often compromised by challenges such as inadequate technological infrastructure, insufficient training, and resistance to adoption among users. By integrating findings with TAM, the review not only underscores the importance of perceived ease of use and perceived usefulness in fostering higher acceptance rates but also emphasises the need for strategic interventions in training, infrastructure development, and policy adjustment. Addressing these issues could lead

to a more robust integration of SA-SAMS, improving management and educational quality in rural South African schools.

Recommendations

To maximise the benefits of the South African School Administration and Management System (SA-SAMS) in rural secondary schools, it is recommended that stakeholders, including educational policymakers, school administrators, and the Department of Basic Education, focus on enhancing the technological infrastructure within these institutions. This involves allocating sufficient resources to upgrade hardware, secure, reliable internet connectivity, and provide ongoing technological support, which is essential for the effective operation of SA-SAMS. Furthermore, developing targeted training programmes tailored to rural schools' needs and challenges should be prioritised. These programmes should focus on the technical aspects of SA-SAMS and its integration into educational practices to improve data management and administrative efficiency.

Additionally, to address user resistance and enhance the acceptance of SA-SAMS, it is imperative to involve educators and administrative staff in the planning and implementation phases of the system. Stakeholders can improve user acceptance by fostering a sense of ownership and understanding of the system's benefits. Strategic communication and support mechanisms, such as peer mentoring and creating a feedback loop where users can report issues and receive help, should be established to support the ongoing use of the system. Ultimately, these efforts will help ensure that SA-SAMS is more widely accepted and effectively utilised to improve educational outcomes and administrative efficiencies in rural South African schools.

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Appendix

Table 1.

Similarities and differences in findings

Themes	Similarities	Differences
Technological Infrastructure Limitations	- Unreliable internet connectivity highlighted by various studies (Smith & Dlamini, 2021; Jacobs et al., 2022; Van der Merwe & Van Dijk, 2020) - Inadequate technical support (Dlomo et al., 2023; Van Heerden, 2023) - Outdated hardware causing operational inefficiencies (Patel & Sithole, 2022)	- Level of prioritisation and investment in technological advancements varies (Thompson & Mkhize, 2023) - Specific challenges in system maintenance differ between schools (Mustafa et al., 2024)
Training and Professional Development	- Necessity of comprehensive training programmes (Ndlovu & Khumalo, 2022; Maseko & Sithole, 2023) - Importance of ongoing training and professional development (Van Heerden, 2023; Patel, 2021)	- Tailoring of training to rural contexts varies (Ghimire, 2022) - Inclusion of CPD programmes and mentorship varies (Khoza & Anderson, 2024) - Institutional policies on training and development differ (Khumalo & Nkosi, 2024)
Administrative Efficiency	- SA-SAMS aims to reduce administrative burdens and improve data management (Botha & Van der Westhuizen, 2021; Khumalo et al., 2023)	The actual impact of technology on efficiency varies with infrastructure quality (Maphalala & Ajani, 2024) - Resistance to change among staff affects efficiency gains (Van Dyk & Coetzee, 2023; Jansen & Smith, 2024) - Degree of investment in ICT infrastructure impacts efficiency (Govender & Naidoo, 2024)
User Acceptance and Resistance	- Perceptions of usefulness and ease of use influence acceptance (Nkambule & Ngubane, 2024; Maseko, 2023) - Resistance often due to fear of increased workload and job security (Mncube et al., 2023)	- Levels of prior exposure to digital technologies influence resistance (Van Zyl, 2022) - Specific interventions to mitigate resistance, such as participatory approaches, differ (Smit & de Villiers, 2023) - Policy support for technology training varies (Gumbo & Dlamini, 2024)

Themes	Similarities	Differences
Policy and Strategic Planning	- Importance of strategic planning and robust policy frameworks (Dube & Stolz, 2022; Mkhize & Bhebhe, 2023)	- Strategies to address the digital divide vary (Nkomo & Vosloo, 2024) - Sustainability measures and funding allocation differ (Phiri & Kgatle, 2023; Ghimire, 2022) - Approaches to integrating training and development into policies vary (Sithole & Chinyamurindi, 2022; Baloyi & Potgieter, 2023) - Focus on data security and privacy policies varies (Maluleka & Zwane, 2024)
Impact on Educational Outcomes	- Potential of SA-SAMS to improve educational outcomes through better data management and reduced administrative burden (Khumalo & Ndlovu, 2022; Tshabalala & van der Merwe, 2023)	- Effectiveness contingent on user proficiency and infrastructure reliability (Gumede & Nkosi, 2022; Phakathi & Zwane, 2023) - Varying degrees of integration into daily activities impact outcomes (Ndlovu & Mkhize, 2024)
Equity and Access	The digital divide impacts rural schools more significantly (Sibanda & Moloi, 2022; Nkambule & Mthembu, 2021) - Inequities in technological access and infrastructure (Khoza & Biyela, 2023)	- Policy interventions and funding allocation vary (Phiri & Mbatha, 2022; Thwala & Mkhize, 2024) - Approaches to inclusive planning and implementation differ (Waqar et al., 2024)
Integration with Existing Educational Practices	- Integration challenges due to alignment with traditional methods (Maseko & Dube, 2023) - Need for institutional support and structured professional development (Jele & Khumalo, 2024)	The degree of behavioural and routine changes required varies (Mkhize & Vuma, 2022) - Pedagogical implications differ based on data interpretation skills (Ntuli & Smit, 2021) - Availability of resources and leadership support impacts integration success (Jele & Khumalo, 2024)