Perceived barriers to optimal effectiveness of the South African School Administration and Management System (SA-SAMS): a case of selected township schools

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A B S T R A C T

The undeniable impact of implementing school management systems on the efficiency of school administration in the Global South is evident. Nevertheless, the implementation of school management systems can provide significant challenges, particularly in educational settings with limited resources, such as township schools. This qualitative study examined the impediments to the optimal efficiency of SA-SAMS in three township schools located in the Nkangala Education District, Mpumalanga Province, South Africa. The study was based on the people, processes, and technology framework (PPTF). A deliberate sampling technique was employed to choose a sample of five administrative clerks and three principals. The results indicated that administrative clerks identified several obstacles: 1) unreliable internet connectivity; 2) issues related to the delayed release of the assessment patch and changes to its structure during the school term; 3) glitches in learner admissions, leading to the deletion of profiles of learners admitted to schools in the middle of the year, exacerbated by the system's inability to smoothly process admissions of foreign learners; 4) lack of onsite technicians to provide technical support, necessitating schools to allocate funds designated for academic and operational programmes to hire private technicians. Meanwhile, principals identified two main issues: 5) limited acceptance among teachers and 6) the inadequacy of provincial SA-SAMS helpdesk workers, whose skills frequently failed to offer necessary technical assistance when system issues developed. The study suggested ensuring dependable internet access for schools with limited resources, promptly releasing the patch, maintaining clear and timely communication regarding patch format changes, providing training to teachers on SA-SAMS, offering on-site technical support to schools, and employing competent SA-SAMS provincial helpdesk personnel.

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Introduction

The fourth industrial revolution (4IR) has had a significant impact on organisational productivity, prompting public sector institutions to recognise information as a valuable asset that needs to be effectively utilised and organised inside the institutional memory using digital methods. In order to achieve success in this endeavour, it is imperative for such institutions to establish a knowledge management system (KMS), a term commonly employed in the commercial or corporate domain and, to a lesser degree, in the public sector. Given that the term KMS is not universally used across all professions, there exist several sector-specific alternative terms that express the same notion. In the context of elementary and secondary education, the word “school management system” (SMS) is employed at the school level, while the phrase “education management information system” (EMIS) is utilised at the national, provincial, and district administration levels. In their work, Van Wyk and Crouch (2020, p. 11) drew upon the definition of EMIS provided by the United Nations Educational, Scientific, and Cultural Organisation (UNESCO). According to UNESCO, EMIS is a...
comprehensive system that encompasses various aspects such as data and information collection, integration, processing, maintenance, and dissemination. Its primary purpose is to facilitate decision-making, policy analysis and formulation, planning, monitoring, and management across all levels of an education system. In recent decades, educational reforms in the Global South have pushed schools to widely implement EMIS, to the extent that even in schooling systems with limited resources, it has become an essential requirement. There is currently a widely accepted consensus that in order to enhance the delivery of high-quality public education to all individuals, it is imperative that the administrative procedures pertaining to education across all domains of operation are conducted within the midpoints of the Fourth Industrial Revolution (4IR). The UNESCO Institute for Statistics (UIS) urged schools to use digital data management tools to enhance the management, planning, monitoring, and evaluation processes of their education systems. This forward-thinking mindset was sparked by UNESCO's emphasis on the importance of quality data managed within efficient information systems for effective decision-making.

According to the UNESCO Institute for Statistics (2020), the successful implementation of EMIS enhances the likelihood of institutions attaining administrative efficiency while also adhering to the requirements of Sustainable Goal No. 4. According to Almuş (2010), the implementation of EMIS effectively addresses the issues of redundant functions and lack of accountability by establishing explicit parameters on the accessibility of system features to district-based staff against those that can be processed exclusively at the provincial level. Additional commendable aspects include the system's ability to efficiently store substantial amounts of data and knowledge assets within a physically condensed storage facility, as well as its facilitation of seamless information exchange between various operational ecologies at the school, district, provincial, and national levels. The EMIS, as described by Barnebaum and Moses (2011), serves as a knowledge management tool that facilitates the provision of appropriate information to individuals at the appropriate moment, enabling them to make optimal decisions, engage in effective planning, and monitor activities in the organization's best interest (Bhatti & Adnan, 2010, p. 1).

It is important to mention that the effectiveness of the EMIS relies on human involvement. Nevertheless, the interaction between humans and technology presents certain difficulties. The existing body of research on educational technology in various countries, including Hong Kong, South Africa, Ghana, Rwanda, Ethiopia, and Kenya, has highlighted the significance of human resource and policy-related factors in impeding the effective implementation of information systems and the achievement of Sustainable Development Goal 4 (SDG4) in educational institutions (Bedane, 2020; Gyaase et al., 2015; Kasimir et al., 2021; Kwan, 2006; Maremi et al., 2020; Mwandulo & Odoyo, 2020; Mokwena, 2011, 2014; Paul & Ng’umbi, 2019).

The choice to focus the investigation on these occupational categories aligns with Shah's (2014) recommendation that future research should emphasise the involvement of school administrators in implementing SMSs, and Demir's (2006) call for researchers to examine the abilities of school managers to lead the implementation of SMSs in public schools. In order to carry out the study, the authors conducted interviews with five administrative clerks and three principals from three schools in the Nkangala Education District in Mpumalanga Province, South Africa. These individuals provided insights into the obstacles that hinder the School Administration and Management System (SA-SAMS) from functioning at its highest level of effectiveness.

This study aims to examine the experiences of administrative clerks in selected schools within the Nkangala Education District regarding the hurdles to optimal efficacy of SA-SAMS. Moreover, this study also examines the elements that principals perceive as obstacles to the maximum efficacy of SA-SAMS in specific schools within the Nkangala Education District.

The literature review portion focuses solely on the utilisation of information systems in local and worldwide primary and secondary schooling systems, as outlined below, in order to emphasise the main idea, problem statement, objectives, and originality of the study.

**Literature Review**

**The benefits of effective application of school management systems**

The positive contribution that the introduction of school management systems (SMSs) has had on the productivity of the administration of schools in the developing world is evident. Moreover, in under-resourced public schools in Zambia, Uganda and Malawi where SMSs greatly improved the quality of data capturing, curriculum knowledge sharing processes, and knowledge management practices which were previously in a state that failed to promote the delivery of quality education (Barnebaum & Moses, 2011). Similarly, at selected elementary schools in Turkey, Demir (2006) ascertained that despite the scarcity of savvy technological infrastructure, primary school principals derived satisfaction from the ease with which SMS facilitated their human resources, communications and leadership functions. In Israel, Blau and Presser (2013) found that SMSs improved the principals’ delegation of duties and maximised their e-leadership capabilities and influence on the pedagogical efficacy of their schools. Meanwhile, in Lebanon, Khalil (2023) reported that teachers characterised their interface with SMS user friendly as beneficial to their curriculum management practices. Lee et al. (2010) conducted a study at several secondary schools in Taiwan, which found that SMSs (which they refer to as knowledge management systems) galvanised knowledge externalisation, combination and sharing processes as well as ongoing social interactions among stakeholders. In Kenya, Kasimir et al (2021) indicated that proactive deployment of SMSs enabled school administrators to resolve administrative errors caused by scarcity “of accurate, dependable, and timely information for decision-making” (p. 50).
Most public schools in South Africa use the South African School Administration and Management System [SA-SAMS] (Mokwena, 2014). SA-SAMS was created as a solution to create a new avenue for effective information and data management processes in a post-apartheid schooling system (Gxwati, 2011). According to Nkambule (2020), the system was touted as a strategic tool for ensuring equity across all spectrums of the country’s schools and a uniform systemic method of managing school administrative processes. SA-SAMS was piloted between 2005 and 2006 in schools that had more than one computer (Gxwati, 2011) before being rolled out on a massive scale to “public schools in 2008” (Kuriakose, 2014, p. 15), except for “rural schools” (Gxwati, 2011, p. 63) who were exempt from the process due to scarcity of resources. However, this exception was nullified in 2014, following the gazetting of a policy that made it mandatory for every school under the Department of Basic Education to utilise SA-SAMS (Republic of South Africa [RSA], 2014).

The policy contributed to the huge increase in the popularity of SA-SAMS among public schools, spreading across eight of the country’s nine provinces. In statistical terms, its user rate constitutes 90% of schools (Gustafsson, 2021; Zenex Foundation, 2018). Excluded in this figure are public schools in the Western Cape Province that use CEMIFS (Centralised Education Management Information System) (Human, 2021). Mokwena (2011) supported by Nkambule (2020) and South Africa (2007) postulate that much of its popularity stems from its cost-effective nature, integration into all three arms of education (namely district, provincial and national), and its all-encompassing capacity to record data concerning all areas of schools’ operations, as well as its easy to navigate features – implying that its users do not have to possess high impact computer/ICT skills. The greatest attribute of the system is its all-encompassing storage of “school information about learner data, parent data, class list information, fee information, school budget, curriculum, maps, and timetabling and human resource modules” (Mokwena, 2014, p. 77).

There is thus an indication that continuous efforts are being made to further enhance the integrity of the system. Determined to improve the 92% user satisfaction level (SA-SAMS, 2018), “the Department has invested heavily toward the enhancements of data structures to support schools and education officials at various levels” (Mwelwi cited in Nkambule, 2020, p.91). As of 2017, a combined amount of R 56 million had been set aside by the government and its private sector partners to overhaul the Learner Unit Record Information Tracking System (LURITZ) (Parliamentary Portfolio Committee on Basic Education [PPCBE], 2015; National Education Collaboration Trust [NECT], 2017). Evidence suggests that even presently there are ongoing collaborations between higher education institutions, the government (department of education) and non-governmental organisations aimed at calibrating the data analytical component of SA-SAMS, so that it provides easy access to personal and numerical profiles of learners’ movement across all the grades and phases of the schooling system. According to Van der Berg et al. (2019), such multisectoral collaborations/partnerships are envisaged to ensure that:

This underlying data storage feature also provides access to longitudinal data that enables schools to track individual learners through the education system on a year-to-year basis. It is essential for addressing questions pertinent to the quantity of learners who progressed through the school system without any repetition; and of learners currently in the school system after repeating grade(s), as well as the quantity of learners who dropped out of the school system (p. 2).

To ensure uniformity, the national education department sets generic guidelines that must be followed by provinces, districts and schools and solely takes care of the designing and upgrading processes of SA-SAMS. Meanwhile, the education districts under the directive of provincial education departments are entrusted with rolling out the implementation of strategy and maintenance of SA-SAMS in schools under their jurisdiction. According to the Free State Department of Education (FSDE, 2016), this translates to them having to: 1) ensure continuous training of principals, admin staff, SMT and teachers on EMIS related processes and systems; 2) manage connectivity at all schools that have connectivity signal; 3) support schools to set up SA-SAMS and connectivity in the schools; 4) provide network connection maintenance where required; 5) support schools in the maintenance of SA-SAMS by verifying SA-SAMS daily backups; 6) handle all school requests for new PC’s and/or stolen IT resources; 7) ensure monthly submissions by schools and follow-up on outstanding school’s data; 8) apply consequence management by the District Director for outstanding submissions; 9) verify that schools have adequate processes for data security and privacy protection, including access management; 10) ensure that schools amend data capturing mistakes and their submission thereof. As such, this arrangement enables schools to feed data into SA-SAMS’ Data Driven Districts (DDD) operational data repository that stores disaggregated data (Van der Berg et al., 2019) which is also interlinked with provincial and national data coordinates.

Administrative clerks’ association with SA-SAMS

Research explicates that the significance of the role of administrative clerks on the productivity of a school is rarely documented scientifically (Bayat, 2012, 2014; Bayat et al., 2015; Conley et al., 2010; Nkambule, 2020; Thomson et al., 2007). As such, it cannot be disputed that even in cases where schools achieve administrative excellence, the contributions of administrative clerks do not receive due recognition (Bayat & Fataar, 2018). In addition to that, evidence indicates that administrative clerks are likely to be mistreated by teachers and HoDs (Bayat, 2012; Bayat et al., 2015; Bayat & Fataar, 2018; Nkambule, 2020, 2022, 2023a, 2023b, 2023c; Nkambule & Ngubane, 2023). School leaders are somewhat oblivious to the fact that when administrative clerks are unfairly treated by teachers and HoDs (Bayat, 2012) their proficiency to share, apply and manage knowledge diminishes (Memisoglu, 2016). Despite working under tough conditions, they are still determined to influence the well-being of learners, proficiency of school administration and teaching and learning processes (Bayat & Fataar, 2018).
SA-SAMS manual places administrative clerks at the forefront of the operationalisation of the system and it clearly states that they must be fully supported by the school management team and the district to deploy the system maximally (SA-SAMS, 2018). Nkambule (2020) adds that administrative clerks utilise the system to ease the burden of manual data processing, storage and retrieval. They use the system, inter alia, to process and retrieve data on curricular and co-curricular programmes, learners’ behavioural records, term reports, parents’ contact details (Kuriakose, 2014), school fee payments, attendance registers, school budget, timetables (Mokwena, 2014), list of topic achiever per class and grade, mark sheets and overall statistical makeover of pass and failure rate in the school. Based on the lengthy list of the duties associated with their occupation, it is apparent that administrative clerks utilise the system way more than their colleagues in other ranks within their schools. Kasimiri et al (2021) argue that SMSs aid administrative clerks tremendously as they facilitate easy access to and acquisition of information, general record keeping and data consolidation. Meanwhile, Memisoglu (2016) underscores that administrative clerks deserve credit for their role which makes them a thread that holds the functionality of school operations together.

Principals’ association with SA-SAMS

Swanepoel (2008) points out that the role of principals has gone through significant changes in the last few years. The promise of 21st first century education has diversified their leadership functions to include knowledge management leadership (Kazak, 2021) which, inter alia, deals with overseeing the implementation of SA-SAMS. In addition to complex leadership functions, their administrative workload has also drastically increased (Swanepoel, 2008). Authors are of the view that the increased workload of principals has to do with heavy compliance and legislative environment and the politicisation of education. Presently principals use SA-SAMS to record human resource information, infrastructural information, and financial data transactions. This is a far cry from a few years prior, when they carried out minimal data management tasks and were not expected to operate a computer. To lessen the tediousness of “management and administration of the school” (Kuraikose, 2014, p. 77), SA-SAMS was created as an all-encompassing digital platform for them to perform all areas of their job description (Department of Basic Education [DBE], 2012) and enhance their knowledge management leadership capabilities (Kazak, 2021; Nkambule, 2023d). Based on their interpretation of related research, Kasimiri et al (2021) concluded that the introduction of SMSs professionalised principalship by ensuring that individuals entrusted with it acquired ICT skills and developed effective administration competencies.

Barriers to optimal effectiveness of SA-SAMS: A local perspective

Despite the transformative effect of SA-SAMS on the outlook of school administrative processes, particularly in historically disadvantaged schools (South Africa, 2007) and the 92% reported user satisfactory level (DBE, 2012), media reports and local research suggest that the implementation of SA-SAMS is marred by several barriers. Mokwena (2014) found that the adoption of SA-SAMS in the predominantly rural province of Limpopo was met with resistance by school personnel due to their negative perception of its ease of use and no provision of resources to implement it. In the Eastern Cape, Buttlér (2016) found that school principals were particularly discontented by the system’s inability to account for over 12000 learners owing to its inability to accurately acknowledge foreign identity numbers, which led to schools forfeiting a large portion of their annual subsidies and experiencing a reduction in the number of teachers allocated to them. Kuriakose (2014) found that since updates and amendments to the system can only occur at a particular time of the year, the system lacks data capturing flexibility and is not consistent with high quality data management standards. Maremi et al (2020) established that the system tends to delete the profile information of learners who are archived during the year. In the Free State Province, Murithi and Masinde (2016) ascertained that many schools do not have enough computers to enable all members of staff to actively involve themselves in the capturing of data on the system. In KwaZulu-Natal, Pillay (2020) found that teachers felt that a lack of training, resource allocation and technical support resulted in them not fully realising their goal of interfacing with SA-SAMS effectively – all of which, as argued by Khalil (2023), are a prerequisite for effective implementation of information systems in educational administration.

Barriers to optimal effectiveness of school management systems: A global perspective

As pointed out by Nemani (2010, p. 1), “computer technology” enables organisations to enhance their “knowledge generation and management” productivity. Unfortunately, owing to a range of factors, the adoption of SMSs does not always yield maximal outcomes. According to Barnabaum and Moses (2011, pp. 19-20), school leadership’s failure to give equal preference to the roles played by “people, practices and technology” constitutes one of the fundamental barriers to optimal effectiveness of SMSs. Similarly, Cong and Panya (2003) observed that technology leaders tend to think that the provision of technology will automatically translate into effective workmanship, user acceptance and compliance. A demonstration of this fallacy occurred in Hong Kong where in 1994, despite “investing 70 million US dollars in [a] five-year strategy to develop an integrated computer network linking the Education Department and all public sector primary and secondary schools” known as the School Administration and Management System (SAMS) (Visscher et al., 1999, p. 11), it was found that the uptake of this systems was met with resentment by school personnel, particularly principals and administrative clerks, who asserted that it did not significantly reduce administrative workloads attached to their occupations (ibid). Precisely eight years later, after a series of modifications had been done on the system and a subsequent amendment of its name from SAMS to WebSAMS (Web School Administration and Management System), Kwan’s (2006) study involving a sample of 119 WebSAMS users, established that despite notable improvements there were still some levels of dissatisfaction with the quality of the system, training and development initiatives as well as on-site technical support.
Bedane’s (2020) study established that the dearth of IT resources and contextually relevant training weakened the adoption of SMS in Ethiopia’s public schools. A similar finding unfolded in Ghana, drawn from Gyaase et al.’s (2015) study in which school administrators and teachers pointed to the frailty of ICT tools and unreliable web connectivity as barriers to the effectiveness of the SMS. In the Philippines, Cuetero and Role (2018) found that the financial module of the system was not user friendly to elementary school personnel who were not sufficiently trained to contend with it. Furthermore, in Kenya, Mwandulo and Odoyo (2020) problematised inequitable use of ICT in primary schools. They found that primary schools used ICT mainly in teaching and learning and much less in the management of programmes (ibid). In their investigation on the utilisation of SMS by selected schools in one education district in Rwanda, Paul and Ng’umbi (2019) pointed to poor internet connection as having a bearing on the achievement of effective administration of education. Much of what is discussed by the cited scholars indicates that contextual factors may affect the optimal effectiveness of SMSs.

Theoretical Framework

The study was hinged on people, processes and technology framework (PPTF), which holds that for the organisation to achieve productivity, all these elements must be applied in unison and in a complementary manner rather than on a competing basis. The cornerstones of PPTF are akin to views projected by Barnabaaum and Moses (2011) and Cong and Pandya (2003) who assert that while technology has transformed the workplace like no other invention ever has, people are equally indispensable because they breathe life into the usefulness of technology, whereas processes, when properly applied, cannot be done without, owing to their propensity to set a tone for the manner in which people (i.e., administrative clerks and principals) react towards technological applications (i.e., school management systems). Therefore, the framework advocates for a process based organisational climate, anchored in 1) continuous consultative engagements with all actors (people) in the user web of the school management system; 2) clear-cut legislative guidelines to regulate the level of effectiveness of the system; 3) logistical protocols that facilitate regular maintenance and innovation of technological systems; as well as, 4) continuous development of people’s capacity to acclimatise to the system. Authors adopted the PPTF on the notion that it is in tune with the primary objectives of the study, namely, to understand experiences of administrative clerks and principals regarding barriers to optimal effectiveness of SA-SAMS in their respective schools.

Research and Methodology

Research Design

Set to investigate barriers to optimal effectiveness of SA-SAMS at selected township schools, the study adopted a qualitative case study research design. Naturally, because they are interested in understanding the problems affecting the social context of participants, qualitative researchers locate their investigation within an interpretivist paradigm (Thanh & Thanh, 2015). More than enhancing researchers’ portrayal of “a world in which reality is socially constructed, complex and ever changing” (Thomas, 2003, p. 6), the intersection between qualitative research and interpretivism meant that they were also able to understand the root of the research problem from participants’ subjective perspectives in a location of their convenience. Furthermore, Chiliza et al., (2022, p. 134) find the researchers’ decision to use qualitative research apt, stating that it is appropriate in instances where researchers aim to understand “staff perceptions and human behavior.”

Sampling

Based on a sample size of five administrative clerks and three principals (altogether eight participants), the research was actioned in three public schools in the Nkangala Education District, Mpumalanga Province. Both convenience and purposive sampling procedures were applied in the study. The reasonability of the distance travelled by researchers to schools to conduct research was of convenience to their research time management processes. Participants were purposefully sampled owing to their in-depth understanding of the challenges presented by the application of SA-SAMS as well as their schools’ classification within the category of resource-scarce or quintile 3 schools. Due to the low socio-economic status of the area they are situated in, such schools are operating on a no fee-paying or low fee-paying basis and are largely dependent on government subsidy to sustain their daily operations throughout the academic year (Mampane, 2023).

Table 1: Participants and schools

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Participants’ Designated Code</th>
<th>Gender</th>
<th>Experience</th>
<th>Schools’ Designated Code</th>
<th>Quintile</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative Clerk 1</td>
<td>AC1</td>
<td>Female</td>
<td>10 years</td>
<td>A</td>
<td>2</td>
<td>Combined School (Grade 1-9)</td>
</tr>
<tr>
<td>Administrative Clerk 2</td>
<td>AC2</td>
<td>Female</td>
<td>17 years</td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principal 1</td>
<td>P1</td>
<td>Male</td>
<td>27 years</td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative Clerk 3</td>
<td>AC3</td>
<td>Female</td>
<td>8 years</td>
<td>B</td>
<td>3</td>
<td>Primary School (Grade 1-7)</td>
</tr>
<tr>
<td>Administrative Clerk 4</td>
<td>AC4</td>
<td>Female</td>
<td>5 years</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principal 2</td>
<td>P2</td>
<td>Male</td>
<td>19 years</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative Clerk 5</td>
<td>AC5</td>
<td>Male</td>
<td>12 years</td>
<td>C</td>
<td>3</td>
<td>Secondary School (Grade 10-12)</td>
</tr>
<tr>
<td>Principal 3</td>
<td>P3</td>
<td>Male</td>
<td>24 years</td>
<td>C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Data Collection and Analysis

Using a semi-structured interview guide, one-on-one interviews of between 20-35 minutes took place in participants’ schools. Having noted the lack of privacy in the administrative clerk participants’ office, principals extended the courtesy of availing their offices as a conducive space for interview processes. Subsequently, audio recorded interviews were transcribed and stored in a computer. In keeping with Braun and Clarke (2023), researchers conducted a thematic analysis, which involved going through the interview transcripts to acquaint themselves with the content to identify recurring patterns and formulate interim themes. The next phase entailed comparing the research questions and eliminating excessive content from the interim themes before finally adopting the refined version of themes to be used to curate the findings (Braun & Clarke, 2023).

Research Ethics

Gallegos-Erazo et al (2021) emphasise the need for research involving human subjects to have ethical integrity. Therefore, prior to conducting fieldwork, ethical clearance was applied for and given by the Research Ethics Committee of the College of Education of the university where authors work. Not only were the participants informed about their rights and the expected contribution of their involvement in the study, but were also guaranteed anonymity. Anonymity meant that coding of names was done so that none of the participants’ names nor those of their schools would be used to curate the findings, as demonstrated in Table 1.

Results and Discussion

After an iterative exercise of analysing the relevance of the themes with the objectives of the study, outcomes of a thematic analysis yielded six themes, namely a) unreliable internet connectivity; b) patch related problems; c) learner admission glitches; d) no on-site technical support; e) low teacher user acceptance of SA-SAMS; and f) incompetent provincial SA-SAMS helpdesk personnel. The following discussion dissects the cornerstones of the above-mentioned themes.

Theme 1: Unreliable internet connectivity

Although to a certain extent, SA-SAMS hosts offline transactions, internet connectivity is an enabler of most of its features. To demonstrate their discontentment with unreliable internet connectivity, AC3 said, *Sometimes, when one opens the system, it does not want to open. It keeps on buffering for a long time, until you become impatient.*

AC5 added, *During exam time when there are many users who capture data on the system, it gets slow. Opening it in the morning takes a bit of time.*

This finding is similar to that of previous studies proving that unreliable internet connectivity is a problem that also affects the optimal effectiveness of SMSs in Ghana (Gyaase et al., 2015), Ethiopia (Bedane, 2020) and Rwanda (Paul and Ng’umbi, 2019).

Theme 2: Patch related problems

The patch is usually released for download during the first week or two of the first term, and comes pre-programmed with mark allocations and weightings for each assessment (Human, 2021). Every school term, principals are alerted by the district on when they can download amendments to the patch online (Maremi et al, 2021). Participants raised three concerns about the patch. AC1 said, *The department likes to change the patch late in the term when I have already given it to teachers and some of them have already written a test and recorded a mark based on the layout of the patch.*

AC5 revealed that, *Since I started working in the school in 2013, the patch must have come on time once or twice. Whoever is responsible for arranging and distributing patches never learns from the mistakes they make every term, all year round.*

From a point of view of school leadership, P2 added that, *The issue of the patch worries me every term because it comes very late in the term, and on top of that they would just change some parts of it right in the middle of the term when half of the tasks are already recorded on the system.*

The problems that participants alluded to about the patch is not new. In her investigation, Human (2021) found that public schools in KwaZulu-Natal Province once spent the whole term [of the 2021 school calendar] without the patch, and experienced delays with the finalising of marks, learner performance statistics and report cards. The finding showed that the arrival or the release of the patch often exceeded that of the initial communicated estimated time of arrival. Another aspect of the finding is that late or improperly communicated changes to the system in the middle of the term affects the mark weightings for each assessment already done.

Theme 3: Learner admissions glitches

The system is said to be inflicting strain on administrative clerks’ and principals’ jobs. More concerning to AC2 was that,
Learners who are transferred to our school after say April or May, the system would wipe out their profile in the archives, which causes a headache, when reports are being finalised.

The concern raised by AC2 about the system’s deficiency, which leads it to delete learners’ information bears testimony to a similar finding as documented in a study by Maremi et al (2020).

Furthermore, participants problematised SA-SAMS’s processing of foreign learners’ information. C5 pointed out that,

"It makes it extremely hard to deal with the admission of learners who were not born in the country. There are challenges with their documentation, even if they have all the necessary particulars, the system can issue a disclaimer that something is missing."

AC1 explained that,

"It takes a long process to get foreign learners admitted because their passport numbers most of the time do not have thirteen numbers like ID’s. When the system rejects them, you have to find more documents to support the enrolment before the system takes it."

AC1 effectively divulged what was already illuminated by Buttler (2016), whose investigation found that school principals in the Eastern Cape were particularly discontented by the system’s inability to account for numerous learners from other countries in their schools.

**Theme 4: Non availability of onsite technical support**

Khalil (2023) argues that technical support goes a long way towards improving the use of ICT in the management and administration of educational processes in schools. As one of the barriers to optimal effectiveness of SA-SAMSs in their schools, participants pointed to non-availability of technical support.

AC2 said:

*We have no technicians employed by the department to receive call outs to offer technical support to schools whenever they have challenges with the system. Instead, we end up paying private technicians to fix our system, which is very expensive as an under-resourced school.*

According to AC4, due to nonavailability of technical support “whenever the system gives problems, I have to wait sometimes up to two days until the [private] technician comes to have a look.”

When asked to describe the length at which the district provided technical support, C1, C2, and C5 indicated that there were three office-based SA-SAMS representatives designated to each of the three nearby education circuits (i.e., satellite offices of the district) who mainly helped with patch related queries and were not trained to solve other problems beyond that scope. The issue of nonavailability of on-site technical support is also lucidly documented by Bedane (2020) and Pillay (2021) as having adverse consequences on optimal deployment of SMSs in schools.

**Theme 5: Low teacher user acceptance of SA-SAMS**

There are three critical role-players who input SA-SAMS data at school level (National Education Collaboration Trust [NECT], 2016). These are educators, school administrative clerks, and the school management teams (SMT) (ibid). Not only do information and communication technologies have a positive impact on the quality of education, using them also capacitates users with new skills that richly benefit their self-efficacy and professionalism (Pholotho & Mtsweni, 2016). Despite SA-SAMS manual encouraging teachers to utilise the system to perform curricular-related transactions on the system (Mokwena, 2011, 2014), administrative clerks from school A and B namely AC1, AC3, and AC4 divulged that teachers lack the motivation to learn to use SA-SAMS due to the principals’ ignorance of the situation. When asked to share their thoughts on what they considered as factors contributing to low teacher user acceptance of SA-SAMS; they opined that because most teachers were not computer literate, they generally had apprehension towards ICT oriented applications including SA-SAMS. Following their analysis of the participants’ views on this matter, the researchers deduced that no efforts were made by school management teams (SMTs) to encourage teachers to learn to use SA-SAMS.

The only exception applied to school C under the leadership of P3, whose school management team (SMT) made it mandatory for teachers to use the system and worked as a unit to convince teachers to embrace the system by outlining the importance of its role in their profession. To give context to this, P3 said, “it took time to be where we are today. When we first started, educators, especially older ones, did not like the idea. But now they see the value of the system.”

Based on the tone of the responses given by P1 and P2, who are in charge of schools A and B respectively, it was clear that in their schools, no attempts were made to motivate teachers to explore SA-SAMS, let alone train them how to use it. Both cited different reasons for not insisting on teachers to use SA-SAMS. Commenting on the perspective of his school, P2 said “Teachers have too much work. Adding SA-SAMS would drown them”.

While fully aware about SA-SAMS’s policy insistence on training teachers to use the system, P1 believed that “it is the duty of the department to train teachers to use the application.”
Lower SA-SAMS user acceptance among teachers due to the absence of motivation and training initiatives (Pillay, 2021), implies that they lose out on the benefit of using the system to record marks, retrieve lesson plans, notes and learning material, keep track of learner attendance, acquire easy access to analytical reports, and share best practices and expertise knowledge with colleagues (Awadallah, 2016). This finding is contrary to that of Khalil (2023), whose study concluded that Lebanese teachers’ SMS skills and levels of motivation to use it were generally above average. Also, because the SMT is vital in coming up with a turnaround strategy to minimise the negative impact of information systems (Ng’ayo, 2023), in not working alongside their respective SMTs to come up with internal initiatives to motivate and train teachers to use the system, P1 and P2 exemplified what Kazak (2021) and Nkambule & Ngubane (2023c) refer to as “ineffective knowledge management leadership skills”.

Theme 6: Incompetent provincial SA-SAMS helpdesk personnel

According to Pretorius (2014), school effectiveness reflects the support extended to them by the district, provincial and national based structures and officials. Disgruntled with the level of SA-SAMS related technical support, P1 said,

*The province is a letdown. I wonder if those people are qualified to do the job or are just political appointments. You can tell even when you liaise with them that they do not know much about the job. Bayabhadalwa mahala for ukuhlala bangenzl lutho [A Zulu language text loosely translated as ‘they are getting paid for sitting and doing nothing’].*

P2 said:

Technical support by provincial education department EMIS staff is not always helpful and is often ill-equipped to give SA-SAMS technical advice. That is why we have to dig deep into our pockets and pay private technicians which costs an arm and a leg … very expensive I can tell you.

P3 said:

*After inviting the department [of education] to come and workshop teachers on how to use SA-SAMS to no avail, we conducted internal training of teachers on how to use the system to capture their marks on it and download LTSM [i.e. learning and teaching support material]. We did this to do away with the trend of shifting blame on [administrative] clerks when marks are not correctly captured on the system teachers.*

Evidently, all three participants cited incompetency of district-based SA-SAMS helpdesk personnel as having a bearing on optimal effectiveness of SA-SAMS. This finding dovetails with a point made by Pretorius (2014) stating that the level of efficiency of operational processes of a school is proportionate to the official support they receive above.

Conclusions

The study aimed to examine the obstacles that hinder the maximum efficiency of SA-SAMS, as perceived by administrative clerks and principals in specific schools within the Nkangala Education District in Mpumalanga Province. The research findings indicated that administrative clerks identified several obstacles that hindered the ideal efficacy of SA-SAMS. The system frequently experienced unreliable internet connectivity, leading to slow system opening and functioning. Additionally, there were issues with the delayed release of patches for downloading, particularly when some assessments had already been completed. Furthermore, the inconvenience of making changes to the patch structure after marks had already been recorded on the system further exacerbated the problem. Furthermore, learner admission glitches occurred, resulting in the deletion of profiles of learners who were admitted to schools in the middle of the year. Furthermore, the admission process for foreign learners was lengthy and tedious due to the system's inability to process admissions of foreign learners promptly and smoothly. Lastly, the absence of one-site technical support technicians led schools to incur significant costs for private services. Principals expressed greater concern with the limited acceptability of teachers, attributing this issue to the district's failure to address their need for teacher training and the perceived inadequacy of provincial SA-SAMS helpdesk workers. The participants expressed apprehension regarding the help desk's inability to deliver essential technical assistance during instances of system malfunctions. The findings lead to the following recommendations:

i. The Department of Basic Education (DBE) should contemplate the identification of a service provider capable of providing dependable internet connectivity to all educational institutions.

ii. DBE should closely oversee the distribution procedures of the patch to prevent its delayed delivery to schools, unwarranted modifications to the patch during the school term, and the introduction of viruses into the system.

iii. It is imperative to enhance the learner admission module in order to address issues related to the unjust deletion of learner information during the mid-academic year, as well as the perceived inadequacy in admitting foreign learners.

iv. The education district should contemplate hiring competent mobile technicians to visit schools and offer technical assistance for SA-SAMS.

v. Policymakers are required to incorporate a provision into the SA-SAMS policy that imposes an obligation on instructors to using the system. Nevertheless, this must be accomplished in conjunction with the delivery of training.

vi. The hiring of appropriately qualified and competent staff by the provincial office is necessary in order to provide clear guidance to principals when they experience issues with the system.
Study limitations and implications for future research

The study was subject to methodological and contextual limitations. First and foremost, qualitative research restricts the incorporation of a wide range of viewpoints. Employing mixed-methods research would have guaranteed the inclusion of a more extensive sample size of participants and schools. Furthermore, because to widespread public alarm regarding the outbreak of COVID-19, two volunteers decided to withdraw from the study. The presence of both of these factors implies that the results obtained may not accurately reflect the various dynamics that influence the most effective implementation of SA-SAMS in township schools within the Nkangala Education District. Hence, it is imperative for future researchers to investigate the phenomena through alternative research methodologies that have the potential to attract a larger number of participants and schools.

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