RESEARCH ARTICLE:

A Conceptual Framework for Safety Challenges in South African Schools

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Abstract

The purpose of this research study was to propose the implementation of a conceptual framework related to safety challenges in South African schools. One such challenge is asbestos-containing material (ACM), banned in South Africa in 2008. Nevertheless, the National Institute for Occupational Health (NIOH) in South Africa has indicated that one in every eight schools contains asbestos, thereby exposing persons to potential asbestos-related diseases. The research question is: How can a school conceptual framework be managed to overcome safety challenges? An extensive literature review was conducted to structure a conceptual framework to identify key building blocks, that are connected and interdependent, to address the safety challenges in South African schools. The study offers important insights, in terms of which this framework clarifies a solid plan for school stakeholders who need to know about school safety challenges. This research provides a solid foundation for future research related to asbestos safety hazards in South African schools.

Keywords*: hazards; building blocks; safety challenges; schools; Department of Basic Education (DBE)*

Introduction

Although asbestos has been banned in South Africa since 2008, 12 years later – in 2020 – studies reported that asbestos is still a primary concern due to the large number of schools containing asbestos in South Africa. Any structure built before 2000 can contain asbestos (HSE, 2011). There are approximately 30 000 schools across South Africa (Grant and Otter, 2017a; 2017b), and research by the Department of Labour (DoL) has indicated that the largest asbestos-containing province in South Africa, is Mpumalanga, with 429 samples, at 31.7%. Gauteng was calculated at 21.7%, with the Western Cape at the next highest level of 16.4%, KwaZulu-Natal with 14.2%. Limpopo, North West, the Eastern Cape, and the Free State contributed less than 8.5% of all the asbestos samples received. There is thus exposure to unrehabilitated and uncontrolled asbestos-containing school buildings, accounting for more than 240 schools in the province of Gauteng alone, thus creating unsafe conditions for all school stakeholders (GDE, 2014; Good and Note, 2009; Fihlani, 2018). As a result, various authors, including Xaba (2014) and Masitsa (2011), have pointed out that thousands of learners and hundreds of educators and support staff, as well as the surrounding community, are exposed to potential asbestos-related diseases in South Africa.

There is a growing need on an operational level within schools to have a structured methodology platform to manage school infrastructure within building compliance regulations and to meet school infrastructure norms and standards, ensuring safety and health conditions for educators, learners, and all other stakeholders (Fary, 2012; Louton, 2015; Management and WHS, 2017). Schools must ensure social responsibility towards all stakeholders, such as educators, learners, and other administrative and maintenance staff involved in the school. To shape safe compliance with poor school infrastructure and its impact on learners due to safety challenges such as asbestos-containing classrooms. Schools must conform and contribute by supporting the DBE, uplifting school responsibilities towards existing safety hazards that need to be improved, and ensuring good social standards that meet and exceed all stakeholder expectations, including those of the DBE (Ndlovu and Murray, 2013; Roberts, 2018; Xaba, 2014). Asbestos is a silent killer, and knowledge of asbestos-containing substances and their

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management is crucial (NIOH, 2018; Murray and Nelson, 2008). The severe impact of asbestos and its effect on health requires a framework for management by stakeholders to ensure that it is integrated with all other safety challenges. The implementation and compliance with the Occupational Health and Safety Act (OHS Act) NO. 85 of 1993, and building regulations based on the premise of South African laws are legislated in all South African businesses by the Occupational Health and Safety Act No. 85 of 1993. (Eberlein, 2009; HSE, 2017). Since compliance with this Act and the regulations is complex, a simple conceptual framework is needed to support and manage safety challenges and ensure stakeholder conformance regarding service delivery (Milne *et al*., 2013; HSE, 2017; NIOH, 2018).

A large and growing body of literature by Hart (1998) shows that South African schools should use their internal procedures and instructions to manage safety hazards and fulfill all the needs of stakeholders. To manage safety hazards, such as asbestos, there is a vital need for a framework to guide stakeholders toward managing safer facilities. There is abundant literature on asbestos problems worldwide. Still, this literature does not capture and include a value framework at school management level because the asbestos challenges are unique and vary from school to school (DBE, 2014; Equal Education, 2016; Mail and Guardian, 2018). Past research has concentrated only on schools exposed to asbestos, and there has been no active framework for school stakeholders to effectively manage safety challenges such as asbestos (Good and Note, 2009). Considering the issue of asbestos exposure is easy, but the literature is silent on the details of stages within schools.

Consequently, there is an incomplete picture of how asbestos challenges are managed. As support structures and systems become more technologically advanced, there is an increasing concern to find a balanced approach between observing legislative guidelines and managing infrastructure that causes asbestos exposure (Godfrey, 2018). Asbestos exposure is still too high in South Africa, so stakeholders must manage a new framework efficiently to eliminate or reduce the risks involved (Foster, 2015). Against this background, this research aimed to answer the question: How can a conceptual framework within schools be managed to overcome asbestos challenges? To answer the research question, the researchers had two objectives:

- To develop a conceptual framework with generic building blocks for managing safety challenges such as asbestos.
- To explore the stages necessary to implement the conceptual framework ensuring sustainable results.

In this research paper, the researchers attempt to identify key building blocks from literature to manage safety challenges, such as asbestos, and to identify the key stages involved in implementing a conceptual framework, thus ensuring stakeholder satisfaction within schools. Essentially, this research responds to the call for a new way of managing safety challenges. It draws inspiration from Fixsen *et al*. (2013), Foster (2015), Oschman (2019), and Sivakumar (2013), who have stressed the need for creating frameworks that will enable any institution or industry to provide sustained solutions through a progression process. Significantly, this research is limited to those schools exposed to asbestos. The research findings are expected to assist stakeholders in developing a successful conceptual framework to create full awareness of the need for effective collaboration with potential stakeholders while managing safety challenges. The conceptual framework outlined in this article is intended to act as a bridge between the Department of Basic Education (DBE) and schools, thereby giving schools the mandate – through the framework – to comply with stable and sustained safety improvement practices. Not much has been written on the management of asbestos in schools, and few studies have been conducted on the impact of a conceptual framework for schools, so this paper explores and proposes a conceptual framework based on a significant literature review intending to contribute to the area of safety management.

Methodology

In this study, the researchers adopted an in-depth holistic qualitative review of previous literature, related documentation, and data as evidence of safety challenges within South African schools. These researched materials were structured and combined in an integrated manner to establish key/critical components/pillars as generic building blocks for an integrated conceptual framework. The framework guides the research analysis to address the hazard challenges of asbestos in South African schools and to help overcome the safety risks involved. A vast number of school asbestos-related documents were reviewed to gather information on the nature of asbestos problems (Busby, 2018; Fihlani, 2018; HSE, 2017; Gerbode, Sun *et al*., 2019; Grant and Otter, 2017c; Pessl *et al*., 2017; Roberts, 2018; Schools4sa, n.d.; Turner, 2017; NIOH, 2017). Various Acts with guidelines were

reviewed and studied to gather historical information, including international and national documents. These research methods included benchmarking through an extensive academic library search. Other sources included DBE papers, legal documents, legislative documents related to asbestos, policies, annual reviews, existing training programmes, existing control standards, and resources drawn from a vast spectrum of desktop research material to address the broad scope of asbestos challenges within schools. The comprehensive literature review allowed the researcher to identify existing research, which methodologies have been used in the past, their findings, and recommendations to resolve valid asbestos challenges. A gap in the existing literature shows that no conceptual framework exists for schools within South Africa to help school stakeholders manage asbestos-related safety hazards and transform their schools to ensure long-term sustainable results. To address this gap, the researchers explored the use of generic building blocks to support the implementation of the conceptual framework for safety hazards. Critical building blocks were incorporated into a proposed conceptual framework for the successful management of safety challenges within schools.

In this article, the researchers explain each building block in detail, followed by guidelines for organising the implementation of the conceptual framework through a three-stage approach. The study showed that implementing a conceptual framework within schools to manage safety challenges is significant. Although this is based on qualitative research for the conceptual framework, it has a strong foundation and is helpful for further empirical research. The last section of this article contains the conclusion drawn from the study. The researcher considered the research methodologies used in the studies to ensure data quality and trustworthiness of the content analysis. This was done by identifying asbestos-related topics in schools that shared similar insight and significance in the research (Tracy, 2010). The study maintains transparency to enhance the theoretical, heuristic, and practical insight into the significant contribution made by other studies on this topic. To cross-verify the study, the researcher selected 65 texts for the article. This conceptual paper paves the way for more intensive research into the challenges of asbestos in schools.

The Need for a Safety Framework for Schools

The Gauteng Department of Education (GDE), (GDE, 2014; Veriava, 2022) has indicated that schools listed with asbestos structures are to be replaced, but in the interim, schools should have a conceptual framework in place to reduce risks significantly. This requires having an effective management support structure and systems to control occupational health-related diseases, such as asbestosis. A report published by the Education and Skills Funding Agency (ASFA) revealed that 20% of schools failed to comply with asbestos safety guidelines, which is extensive. The National Institute for Occupational Health (NIOH) has identified asbestos for regulatory purposes since 2003. While schools wait for these asbestos and asbestos-containing materials to be removed and handled safely to prevent exposure, an interim framework is needed to ensure safety. As such, the need to build on safety guidelines through a framework has increased, significantly impacting supporting and maintaining safety challenges (NIOH, 2017). According to the Mail and Guardian (2018) and Fihlani (2018), the framework's application is the foundation for controlling safety hazards and ensuring quality service to all stakeholders. Safe infrastructure is an essential factor and a prerequisite for various stakeholders. Stakeholders include everybody with a vested interest in safety who may be directly or indirectly involved. For safety legal compliance, a conceptual framework for implementation must be formulated to ensure collaborative, supportive awareness and ownership.

Given the large amount of literature available, as indicated in Tables 1a and 1b, an exploration of a systematic literature review is necessary to identify the most important building blocks to construct a conceptual framework to manage safety challenges. Aquilani *et al*. (2017), Fihlani (2018), and Pessl *et al*. (2017) argue that a conceptual framework with holistic and integrated building blocks, which are interdependent, can be used as a generic framework by all, irrespective of the type of business. To bridge the gap between the comprehensive literature review and the 12 identified building blocks, a framework was developed to be a dynamic and flexible methodology or tool for execution during any operation with the prerequisite of action steps that must be taken through three stages to maximise the reduced risks of exposure. The methodology followed an extensive literature review focusing on works such as Aquilani *et al*. (2017), Fihlani (2018), and Pessl *et al*. (2017), among others. This review involved a rigorous selection process, where literature was evaluated based on relevance, quality, and contributions to the field of safety management. The literature review approach provides a reproducible pathway for future researchers to reach the same conclusion. Key themes and concepts were extracted from the literature and critically accessed to assess their applicability and importance in constructing the framework.

The framework provides a holistic package deal and must be used as a prerequisite of these essential building blocks, interconnected in such a way that it is necessary to lead and take responsibility for optimised stakeholder satisfaction. The key outcomes of the framework are to establish awareness of safety hazards, gain knowledge about them, and help to adopt a positive view on how to manage them. The framework, when implemented, will strengthen operational practices by using the framework as a joint initiative to help improve different hazardous situations. This will lead to a better quality of life for all stakeholders.

After analysing more than 60 articles, the researcher identified 12 critical building blocks and divided them into six primary and six supportive building blocks, forming the core of the overall approach to managing safety challenges within schools, as indicated in tables 1a and 1b. Tables 1a and 1b summarise each building block's unique meaning, purpose, and characteristics. The integrated generic 12-building block framework is structured and guides the process to form a unity of purpose. However, the execution of the 12-building block framework, as structured in figure 1a and figure 1b, will differ from business to business, depending on the active leadership. The theoretical approach followed and identified 12 building blocks used to construct a conceptual framework to guide the process and understand influences between the 12 building blocks, which are the accountable entry and enabler points to implement and manage the framework. The primary building blocks form the core enabler, integration, and sustainable steps needed to underpin the ability to manage the safety challenges by taking into account the understanding of policies and legislation (i.e., the Occupational Health and Safety (OHS) Act), risk management and their effect on the welfare of all stakeholders.

Challenges Addressed through Primary and Supportive Building Blocks: Explanation of Terms

Table 1a introduces the primary building blocks of the conceptual framework with an explanation for each of the building blocks.

Table 1a: Primary building blocks

Primary building blocks	**Explanation of primary building blocks**
Safety leadership	The primary driver of this framework in the enabler stage is the need for strong, active, dedicated, involved, and committed leaders who can take significant action and advocate contentious processes and outcomes, with a greater focus on workplace safety. Leadership should establish unity of purpose with a flexible attitude, depending on types of challenges, to work collaboratively with all stakeholders, and to find enhanced solutions through rational decision-making to accomplish goals.
Strategic safety plan	In an analysis of strategic planning, Oschman (2017) and Zubair (2013) found that key sensitivities to overcoming any critical factors influencing safety and the environmental impacts of stakeholders require strategic direction, considering the most important priorities to overcome associated risks. Businesses should, therefore, according to Fadol *et al*. (2015), investigate emerging issues extensively and develop new opportunities in the form of an internal strategic plan as a driver to allow a process of steering the course of action of these safety challenges. Strategic planning should follow an executable blueprint formula to pave the way by making all futuristic plans visible and deployable through goal-driven actions within regulatory hazard guidelines, providing a safe and sustainable environment. To achieve this, a careful strategic plan should lead to effective interventions and implementation, ensuring intended outcomes through assigned responsibilities, resource allocation, and a reasonable action plan to support the schools' vision and key success factors with added value toward future stakeholder satisfaction.
Safety hazard identification and risk assessment (HIRA/gap assessment	The relationship between a HIRA/gap assessment and a safety management plan has been widely investigated by Masitsa (2011); Xaba (2014) and Zink (2011). A self-assessment should be conducted so that all the risks linked to the safety challenges will make implementing a rectification plan based on the gap assessment and the resources needed for decision-making easier to support the short-term to medium-term action steps. Stakeholders should perform, facilitate, and record an internal hazard gap assessment to comply with legislation by comparing their existing internal risk level management processes, which they followed, with all identified safety risk exposures that need preventative measures.
Strategic safety management plan (SSMP)	The SSMP should be integrated with the holistic plan and be the core-oriented document for identifying safety risks and preventative measures to be used through procedures, instructions, and control paperwork with records. The function of the SSMP is to give holistic visibility on the status of risk exposure and the action plans deployed to help reduce and control these risk exposures. This plan should assign visibility to all stakeholders to help promote a quality-of-life working environment.

Safety audits with improvement	Various researchers, such as Prinsloo (2005), Foidl and Felderer (2016), and Lee and Kim (2015) hold the view that objective, impartial, and independent audits, through a systematic and documented process, will help leaders to optimise the management of an SSMP proactively, by comparing current practices against their futuristic objectives to overcome safety challenges. Foster (2015), Leonard (2011), and Oschman (2019) suggest that regular internal audits be executed to measure and monitor how the SSMP processes are working. The safety audit and improvement objectives must use the SSMP with its processes as a baseline document to perform regular internal audits, evaluating the overall status of the safety management plan and its effectiveness through performance goals. Audits will identify continuous action measures that can be implemented to ensure compliance through control measures and reporting based on asbestos health and safety risks. With incremental and innovative improvement plans, these audits should add value to the school asbestos work practice documentation and its processes used for forecasting, coaching, education, mentoring of school stakeholders, and futuristic process re-engineering.
Stakeholder satisfaction	Faith-based stakeholder satisfaction should be regarded as the highest priority building block in reducing risks through government and community engagement domains, and its impact on human health. Stringent opportunities and actions exist through the framework building blocks to facilitate risk reduction through a participatory approach, which is a critical component of the intervention of meeting and exceeding stakeholder expectations. The inclusion of all affected stakeholders will ensure collaboration between all relevant stakeholders to help align the regulatory provisions with sufficient resources, thereby ensuring the smooth implementation of the framework's building blocks to achieve better infrastructure safety
References	Aquilani, 2017; Books, 2002; Busby, 2018; Fadol *et al*. (2015); Fary, 2012; Fihlani, 2018; Foidl and Felderer, 2016; Gerbode, 2019; Godfrey, 2018; Goetsch and Davis, 2012; Good and Note, 2009; Grant and Otter, 2017c; Hart, 1998; HSE, 2017; Ing, 2019; Lee and Kim, 2015; To *et al*. (2011); Leonard, 2011, Louton, 2015; Mail and Guardian, 2018; Management, 2017; Masitsa, 2011; Milne, 2013; Murray, 2008; Ndlovu, 2012; NIOH, 2017; Nolan, 2006; Oschman, 2017) Oschman, 2019; Pessl *et al*. (2017); Phillips *et al*. (2012a); Phillips *et al*. (2012); Prinsloo, 2005; Roberts, 2018; Rule, n.d.; Stadnicka and Antosz, 2015; Sony, 2018; Suarez *et al*. (2016); To *et al*. (2011); Turner, 2017; WHO, 1996; Xaba, 2014, Zink, 2011; Zubair, 2013).

Source: Developed by the researcher

Table 1b introduces the supportive building blocks of the conceptual framework with an explanation for each.

Table 1b: Supportive building blocks

Supportive building blocks	**Explanation of supportive dimensions**
Engagement of people and relationship management	To overcome safety challenges, businesses need the engagement of all stakeholders after their upwards, downwards, sideways, and outwards classification to support. A stakeholder engagement plan should be the most critical element as a supportive building block for successful safety management. This can be achieved by showing an empathy-attitude and a trusting relationship by emphasizing human aspects through sharing vital information. Engagement of stakeholders should be used to respond to and act upon the influential resources they provide. Showing them the added value achieved through their engagement is also important.
Support structures and resources	Support structures and resources have a connection to become one, and they should allow businesses to function effectively, serving the six primary building blocks to help shape and guide the safety challenges through the accurate allocation of support structures and resources. These structures and resources as tools and materials are the commitment of various government departments in both financial and non-financial ways, which is crucial and must be properly coordinated through strategic progression to ensure improvement in decision-making for the future. This will ensure collaboration between relevant stakeholders in aligning regulatory provisions and collective planning, ensuring sufficient resources are available to successfully implement the interventions to overcome safety challenges.
Safety change management and continuous improvement forming	The changing world of business – with all its internal and external technological expansions – should be managed systematically and proactively through regulatory requirements changes, procedures, and equipment reorganisation. As a supportive building block, it is necessary to provide constant stable opportunities for sustainable preventive practices to meet these change challenges, ensuring greater preservation of stakeholder requirements. All changes should be managed proactively to demonstrate the willingness to overcome risks. Therefore, changes should be subject to a HIRA/gap assessment to be incorporated into the management plan, followed by formal audits with improvements. Change necessitates the interaction between three conditions: enabling the behaviour of people (capability), activating or inhibiting behaviour (motivation), and enabling the

	behaviour through opportunity. To predict sustainability and produce correct outcomes, change management should create a relationship with new work culture, short-term wins, and a sense of urgency to narrow the gap and overcome problems.
Systems safety thinking	Systems safety thinking includes all 12 primary and supportive building blocks, which are interrelated to resolve the safety challenges. The relational and influential capabilities between all 12 building blocks should inherently strengthen one another when well implemented through the systems safety thinking approach to plan, execute, and control challenges for all stakeholders. Through the execution and application of the systems safety thinking approach, designed outputs will be delivered by exceeding stakeholder expectations in a synchronised and sustainable manner.
Process safety approach and evidence-based decision-making	Businesses need to improve their facilities as part of improvement process opportunities to deliver increased stakeholder value. These process improvement initiatives should be part of the core and sub-processes to document, organise, standardise, stabilise, and optimise them through a continuous re-engineering and reviewing process to comply with regulatory standards. This entails a well-designed interrelated progression process to transform financial resources and regulatory inputs into logical and functional cost-effective outputs, thereby facilitating facilities' general upkeep and maintenance.
Safety culture	Businesses need to build an effective safety behavioural culture, creating an institutional-wide safety awareness among employees and other stakeholders to promote safety management. Businesses should transform all stakeholders by using an ownership culture and demonstrating the implementation of principles, values, norms, ideologies, climate, attitude, and collaborative efforts to achieve service excellence by applying a safety culture. Such a culture shows deep concern for stakeholders' well-being through communication, training, led by example, team participation, safety committee contributions, audit rectification actions, and legal duties. Developed safety cultures should have a regulated influence on the unity of purpose and a sense of identity with the added value where stakeholders take ownership themselves.
References	Anderson and Anderson, 2010; Books, 2002; Braun and Kisting, 2006; Conti, 2010; Eberlein, 2009; Fadol *et al*. (2015); Fary, 2012; Fihlani, 2018; Gerbode *et al*. (2019); Goetsch and Davis, 2012; Grant and Otter, 2017a, 2017b; Godfrey, 2018; Good and Note, 2009; Hart, 1998; HSE, 2017; Ing, 2019; Lee and Kim, 2015; Louton, 2015; Mail and Guardian, 2018; Masitsa, 2011; Milne, 2013; Murray, 2008; Ndlovu, 2012; NIOH, 2017; Nolan, 2006; Pessl *et al*. (2017); Phillips, Norman and Renton, 2012; Phillips *et al*. (2012); Prinsloo, 2005; Roberts, 2018; Rule, n.d; Sony, 2018; Stadnicka and Antosz, 2015; Suarez *et al*. (2016); To *et al*. (2011);; Turner, 2017; WHO, 1996; Xaba, 2014

Source: Developed by the researcher

From the 12 building blocks discussed in tables 1a and 1b, a conceptual framework was constructed, dividing the primary and supportive building blocks (see figure 1) to meet the first objective, namely, to develop a conceptual framework with generic building blocks for managing safety challenges.

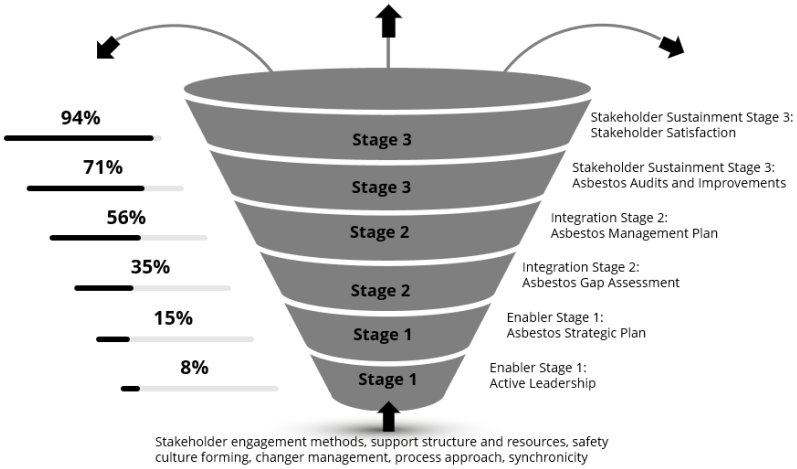

Figure 1: Proposed conceptual framework
Source: Developed by the researcher

To implement the framework illustrated in figure 1, it is vital to create awareness through three implementation stages. The implementation stages of the conceptual framework, as per figure 1 and table 2, explore three theoretical implementation stage approaches to achieve the aim by supporting businesses in overcoming safety challenges for sustained results. While there are interrelated overlaps between the 12 building blocks, it is

important to facilitate the 'how-to' support for carrying out the practical implementation of the framework based on the 12 different building blocks. The framework that denotes 12 building blocks and the relations between them aims to ensure long-term success by fitting the building blocks in such a way as to involve all the stakeholders.

A grid or matrix (figure 2) shows the multiple reporting relationships of the six supportive building blocks within the six primary building blocks to strengthen all 12 building blocks through thorough layers of interrelationships. To enhance the implementation of the framework in figures 1 and 2 and as outlined in table 2, implementation stages are necessary to deploy a well-defined framework that can be executed in business operations (Birken *et al*., 2017). Each stage has different conditions and activities before it is embedded in the implementation. Fixsen *et al*. (2013), Nilsen (2015), and Oschman (2019) draw on an extensive range of sources to indicate that different incremental stages accompany any implementation process. These should be managed according to a system thinking process where no stage can be skipped. Table 2 illustrates the three stages that need to be implemented through the systems thinking approach before achieving sustained stakeholder satisfaction results. Table 3 strengthens the three-stage implementation process, showing how the 12 implementation key building blocks, as seen in figures 1 and 2, are linked to their critical role in the three implementation stages, coupled with hard (μ) or soft (§) science. Table 3 summarises the crucial role of every building block within the conceptual framework and highlights which building blocks are soft and hard science. For this paper, the terms "soft science" and "hard science" are used to compare the 12 building blocks, where soft science building blocks have an impact on human behaviour (intangibles) and hard science building blocks have an impact based on perceived tangible natural work to be conducted.

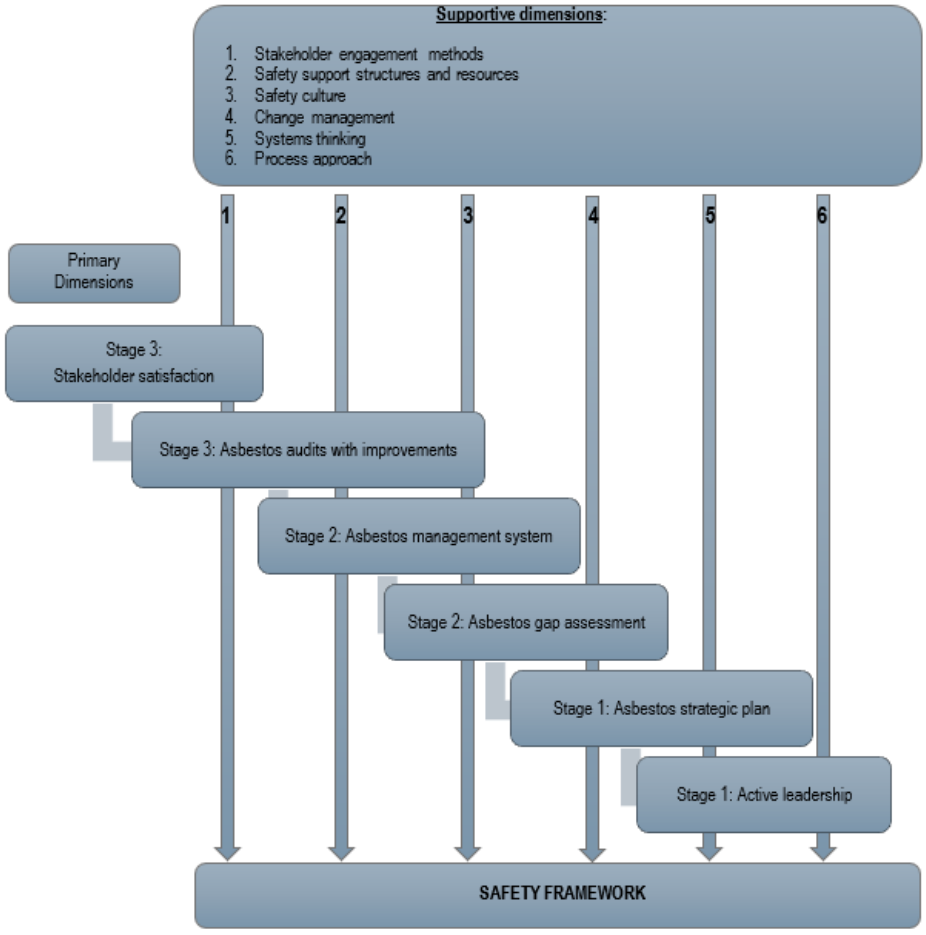

Figure 2: Integrated relationship matrix between the primary and supportive dimensions in figure 1
Source: Developed by the researcher

Table 2 illustrates how the 12 key building blocks (the six primary and six supportive building blocks highlighted in tables 1a and 1b and figures 1 and 2) are organised and divided between the three stages, showing their visible relevance within every stage.

Table 2: Implementation stages

Stage	**Purpose**
Enabler stage	The core of the framework comprises of active leadership and the asbestos strategic plan, with the latter highlighting and including all the important factors and requirements that drive the probability of the successful implementation of the complete framework. Leaders should foster a visible, supportive climate during this enabler stage to drive innovation for guiding an implementation plan, outlining all the secured resources to operationalise stage 2.
Integration stage	At the end of stage 2, there should be an operationalised plan that incorporates the first four building blocks, namely active leadership, the asbestos strategic plan, asbestos gap assessment, and the asbestos management plan, which are interrelated to work towards the common goal of making progress to resolve asbestos challenges.
Sustainable result stage	After full implementation of the first two stages, stages 1 and 2 should be fully embedded in stage 3 to achieve sustained stakeholder satisfaction results. The resulting stage involves translating the enabler stage and the integration stage into action to achieve long-term sustainable results for schools.

Source: Developed by the researcher

Table 3 outlines the implementation of these fundamental building blocks by linking them to the three implementation stages.

Table 3: Implementation of key building blocks linked to their critical role within the three implementation stages and coupled with hard (μ) or soft (§) science

Primary building blocks	**Supportive building blocks** **••• Critical impact on primary building blocks,** soft (§) science, hard (μ) **science**					
Stages one to three	**Stakeholder engagement methods** soft (§) science	**Safety support structures and resources** hard (μ) **science**	**Safety culture** soft (§) science	**Change management** hard (μ) **science**	**Systems thinking** soft (§) science	**Process approach** hard (μ) **science**
Stage 1: Active leadership soft (§) science	•••	•••	•••	•••	•••	•••
Stage 1: Asbestos strategic plan hard (μ) **science**	•••	•••	•••	•••	•••	•••
Stage 2: Asbestos gap assessment hard (μ) **science**	•••	•••	•••	•••	•••	•••
Stage 2: Asbestos management plan hard (μ) **science**	•••	•••	•••	•••	•••	•••
Stage 3: Asbestos audits and improvements hard (μ) **science**	•••	•••	•••	•••	•••	•••
Stage 3: Stakeholder satisfaction soft (§) science	•••	•••	•••	•••	•••	•••

Source: Developed by the researcher

According to Burke *et al*. (2012) and Moir (2018), the 12 building blocks of the framework, with its linkages and overlapping influences from stages 1 to 3, should be optimising within every stage of the framework to strengthen the awareness of all these building blocks as a collective, integrated implementation solution to overcome safety challenges. The relationship interactions between these 12 building blocks are fully embedded to add influenced

quality value, which should create a safety culture outcome. Birken *et al*. (2017) and Moir (2018) list two reasons to implement frameworks: (1) transforming the impact of every building block into a capability and influence result, and (2) showing a how-to-action outcome benefit implication at all levels when the framework is implemented. In their framework implementation research, these authors point out that all these holistic efforts will help to form a safety culture. The stakeholder engagement methods of communication and training, together with the aid of support structures and resources applied through a progression process, will transform the building blocks into outcomes to achieve long-term benefits to overcome safety challenges.

In addition, several researchers such as Prinsloo (2005), Stadnicka and Antosz (2015), Turner (2017), and Fihlani, (2018) indicate that stakeholders should work together as a collective team, irrespective of their role, by taking responsibility within each building block, to optimise the safety strategic plan with the findings of the safety gap assessments conducted (Evans, 2017) and transform all the efforts into collective improvements with solutions to overcome all the identified safety challenges. Businesses should follow stages one to three, with a series of action steps within each stage to overcome safety challenges. In the same vein, Gerbode (2019), Meyers *et al*. (2012), Nilsen (2015), Rojas-Andrade and Bahamondes (2018), and Tabak *et al*. (2012) recommend the following action guidelines as opportunities to achieve long-term optimised sustainable results throughout all the building blocks in the three stages with the focus on stakeholder satisfaction:

- Reflect commitment with understanding what is to be achieved within each building block initiative.
- Reflect personal involvement through the engagement of contributions and exploration of creative ideas.
- Explore whether employees, supported by other stakeholders, have the skills to do so and whether training is needed.
- Ensure strong leadership within each building block to advocate improvements through effective communication.
- Explore accountability and responsibilities for the workload involved in each building block.
- Explore whether all resources are dedicated, such as budget, time, material, equipment, and support consultants.
- Encourage teamwork when progress monitoring for feedback is necessary during assessments and audits.
- Make evidence-based facts that emerged from assessments and audits visible, showing the benefits.
- Record successes through re-engineering processes, procedures, and work activities and document emerging evidence of failures and successes.
- Align all improvement initiatives within building blocks with the strategic safety plan to strengthen the strategic safety management plan (SSMP). All these initiatives should become part of the policies and procedures.
- Guide support improvement initiatives by continuously exploring tools to make added value changes.
- Optimise core and support processes and their execution, ensuring quality services to stakeholders.
- Become knowledgeable in the application of the framework with its building blocks.
- Establish a preventative and corrective action plan as an intervention strategy within the SSMP after audits for improvements have been completed.
- Invest in all stakeholders through a mentoring and coaching progression approach to act as skilfull participants in all 12 building blocks.
- Strengthen the framework through correct processes, ensuring an improved quality of life for all stakeholders.
- Ensure long-term results and sustainable improvements by making changes throughout all the building blocks to stabilise the work environment by using safe facilities.

These recommended action guidelines should provide sufficient challenging opportunities that require efforts through engagement to optimise stakeholder satisfaction. For managers to improve safety by reducing safety challenges, the highest priority is to satisfy stakeholders, achieving between 94% and 100% satisfaction, as shown in figure 1. Each building block from stages one to three, with its unique characteristics, plays a crucial role and must be a package deal integrated through the systematic approach to achieving results effectively. Responsibilities throughout each building block stage supported by documentation in the strategic plan, hazard identification and risk assessment (HIRA), the SSMP, and audit with improvements should be 80% or more. These four building blocks are the hard science of the framework, which are supported by the soft science building blocks,

namely active leadership, and stakeholder satisfaction (see table 3). Streamlining the business activities through these stages will significantly impact the overall school health situation and empower stakeholders to do their best as a team to help grow from the inside out, thereby achieving sustained stakeholder satisfaction.

Conclusion

Employers have a legal responsibility and are accountable in terms of the OHS Act No. 85 of 1993, (see section eight (general duties of employers to their employees). According to section 16(2) of the OHS Act No. 85 of 1993 the employer is accountable and cannot be delegated. The employer is thus responsible for appointing competent employees to manage, coordinate assessments, and conduct internal audits. The SSMP should identify how safety risks are identified according to priorities to gain the potential benefits of implementing an innovative safety management system. The developed framework, as outlined in tables 1a and 1b, and figure 1, proposes to guide employers through the supportive building blocks to manage their safety challenges. The shift towards the number of recorded safety challenges has forced employers and employees to pay attention to safety management to ensure stakeholder satisfaction. Providing a safe environment should be sufficient to satisfy all stakeholder needs, which has become increasingly important in the business environment. This research contributes to the literature by demonstrating the importance of effective building blocks in the context of a framework. The development of such a framework revealed the importance of successfully managing safety hazards, such as asbestos, in a coordinated manner. All the relevant resources studied and consolidated reveal valuable information to identify the 12 building blocks integrated within a conceptual framework (Figures 1 and 2). The strong relationships between the 12 building blocks also support Oschman's (2019) notion of an integrated framework strongly linked to the stakeholders' requirements and responses.

The findings in the study indicate how to manage safety hazards such as asbestos, where we must assume that the resulting effects and more distinct outcomes of the framework provide a sense of value to stakeholders. This study contributes to the literature in many ways: the framework builds on the foundations of six primary building blocks and six supportive building blocks to offer guidance on managing safety challenges, such as asbestos, daily, thereby ensuring a safety culture for all stakeholders and the broader community. The primary building blocks are the framework's core, while the supportive building blocks are the technical and behavioural aspects to support the execution of the core building blocks. Three stages are proposed to implement the framework, involving different building blocks in different stages in an integrated manner. The framework intends to manage and systematically reduce occupational exposure to a minimum with support from all the stakeholders. This should improve the quality of life of all stakeholders by reducing or eliminating occupational exposure through good safety practices. The framework expands as an executable blueprint building on the guidelines, which will help businesses manage their safety challenges. The framework uses generic building blocks that businesses can adopt to manage safety challenges, such as asbestos, and follow the three stages of implementation, thus ensuring sustained results.

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