

A Safety Culture Development Model for the SMEs in the Building and Construction Industry

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Abstract

Effective safety management is significantly associated with enormous cost reduction, efficiency improvement and returns on shareholders' values. While using a qualitative research method, this research evaluates the safety behaviours and practices of the SMEs in the South African building and construction industry. The motive of the study was to identify the major inhibitors and the integrated remedial safety culture development model that can be suggested. Due to the required hefty costs of investing in certain safety improvement measures, underdeveloped safety competencies and poor supervision by the enforcement authorities, some of the SMEs were found to consider safety management as merely peripheral to their core business cultures. Even for SMEs that strive to develop and nurture effective safety culture, findings revealed that as they change from one subcontract to another, the exposure to different safety requirements often limits the development and stabilisation of the SMEs' own internal safety cultures. After triangulating such findings with Flemings and Westrum's models, the paper enriches the existing construction safety culture theories by suggesting a new theory that the SMEs in the construction industry can emulate in the development and improvement of their safety cultures. The study is significant on the basis that it highlights how the development of a strong construction safety culture can enable the SMEs minimise accidents and incidents among their employees and the surrounding communities. This will impact on the SMEs' corporate reputation, cost reduction and the ability to operate more competitively and sustainably.

Keywords: building and construction industry; safety culture development model; smes

INTRODUCTION

Frequent building and construction accidents and incidents are axiomatically linked to reduced operational efficiency, increased costs, reduced profitability and shareholders' values (Hecker and Goldenhar, 2014; Jebb, 2015). It also causes reduced trust and confidence that clients have on a particular building and construction firm (Jebb, 2015). Unless safety culture is effectively embraced as part of the organisational culture and integrated in the conceptualisation, design, scheduling and implementation of a project, frequent accidents and incidents can therefore easily undermine a construction firm's competitiveness, survival and sustainability (Hemamalinie, Jeyarthi and Ramajeyam, 2014; Jebb, 2015). Unfortunately, even for the construction firms that strive to entrench a strong safety culture, the question as to the most suitable safety culture development model that can be emulated seems to be yet a challenge that not only most SMEs face (Agumba & Haupt, 2009; Construction Industry Development Board, 2013; Ezzat, 2012; Smallwood, Haupt & Shakantu, 2014), but also a fact largely unresolved in most of the construction safety culture theories (Chan, 2012; Ezzat, 2012; Misnan and Mohammed, 2007; Zhang, Harley, Blismas and Wakefield, 2014). It

is such conceptual and practical limitations that motivate this research to explore the safety behaviours and practices of the SMEs in the South African building and construction industry, so as to identify the major inhibitors and the integrated remedial safety culture development model that can be suggested.

LITERATURE REVIEW

A safety culture is a set of belief, norms, attitudes, etiquettes, roles, and social, managerial and technical practices that shape the management and employees' safety behaviours and practices (Cesarini, Hall and Kupiec, 2013). To develop a safety culture which is deeply integrated with the organisational culture, conventional theories on safety management indicate the process to be moderated by three steps; the analysis of the state of an organisation's safety culture, the identification and strengthening of the areas of weaknesses, monitoring and evaluation, and the encouragement of continuous learning and safety culture improvement (Cesarini et al. 2013; Chan, 2012; Misnan and Mohammed, 2007). However, authors such as Bandura (1986) and Westrum (1993) highlight different, but coherent approaches on how the development of safety culture can be undertaken

(Cesarini et al. 2013; Chan, 2012; Misnan and Mohammed, 2007).

- **Bandura (1986) Reciprocal Determinism Model**

Bandura (1986) argues in his reciprocal determinism model that in a dynamic environment, safety culture is influenced by the interplay between certain internal psychological factors (person) and the external observable factors (situation and behaviour) (Zhang and Gao, 2012). Internal psychological factors (person) refer to the individual employee's commitment, perception, cognitive skills, knowledge and training competencies to sense and react in a way that minimises incidents or accidents (Bandura, 1986; Zhang and Gao, 2012). It also encompasses the assessment of the personality of the employee and the willingness to share information and knowledge (Bandura, 1986; Bahn and Barratt-Pugh, 2013). Situation is the state within the organisation that encompasses not only the analysis of whether the appropriate safety management systems exist, but also effective leadership, commitment and management support to enhance safety behaviours and practices (Bandura, 1986; Bahn and Barratt-Pugh, 2013). Behaviours examine the safety acts that deal with the extent to which different organisational activities are accomplished according to the safety regulations, standards, guidelines and procedures (Bandura, 1986; Bahn and Barratt-Pugh, 2013; Cooper, 2013; IOSH, 2014; Manjula and Don, 2012). However, Westrum's (1993) evolutionary model of safety culture emphasises that a diagnosis of the stage or the level of evolution of safety culture is critical for the executives to determine the new safety interventions that can be undertaken to ensure that the organisational safety culture evolves from one stage to another (Cesarini et al. 2013; Chan, 2012; Hemamalini et al. 2014; Misnan and Mohammed, 2007; Sellers, 2014).

- **Westrum's (1993) Evolutionary Model of Safety Culture**

It is posited in Westrum's (1993) model that the organisation's safety culture evolves through five main stages; pathological, reactive, calculative, proactive and generative. The pathological stage is when the safety culture is largely underdeveloped. Although in the pathological stage, relevant safety policies, procedures and standards could be in place, the management and the supervisors may still not effectively emphasise the need for safety measures to be integrated in the accomplishment of different project activities (Sellers, 2014; Westrum, 1993). As the management flout safety mechanisms, miscommunication arises to cause fabricated reports or non-disclosure of all safety problems due to the fear of attracting fines for non-compliance (Sellers, 2014; Westrum, 1993). If the safety issue becomes acute, the executives become only

reactionary by responding and addressing only significant areas of failures. In such a stage, the analysis and sensing of the likely safety issues are ignored as part of the proactive approach. Nevertheless, further investments in the reactionary safety management systems causes the executives to develop a calculative safety management system in which only the essential safety management systems are put in place (Sellers, 2014; Westrum, 1993). As the organisation improves its safety management systems and realises the associated business values, the executives become more inquisitive on how to effectively reduce incidents or accidents (Anastacio, Goncalves, Andrade and Marinho, 2010). It is such inquisitiveness that lures the executives to adopt a proactive safety management system by constantly sensing and integrating safety management issues in the process of project conceptualisation and design (Anastacio et al. 2010). Westrum's (1993) evolutionary model of safety culture highlights that the effective management of such a process is often accompanied by the four steps for a change management process that entail; pre-contemplation (raising awareness about the acuteness of safety issues), contemplation to preparation (outline of the safety plan and integration in safety mechanisms), preparation for action (actual implementation of the safety plan), and maintenance (review and entrenchment of safety culture) (Anastacio et al. 2010; Kecklund, Lavin and Lindvall, 2016). Although Fleming's (2001) safety culture maturity model is derived from Westrum's (1993) model, Fleming (2001) seems to provide a different perspective on the process for assessing a safety culture maturity.

- **Fleming's (2001) Model on Safety Culture Maturity**

Fleming's (2001) safety culture maturity model posits that an organisation's safety culture maturity is measured by ten elements; management commitment and visibility, communication, productivity versus safety, learning, safety resources, participation, shared perception about safety, trust, industrial relations, job satisfaction, and training. It is also part of Fleming's (2001) assumptions that an organisation only reaches a safety culture maturity if all the technical and system's aspects of safety are functional at their best with the effect that most of accidents and incidents are only linked to behavioural and cultural factors (Kecklund et al. 2016). In case the organisation does not meet these criteria, it is critical to redirect most of the critical safety resources towards improving the technical and system's aspects of safety as contrasted to the behavioural and safety features (Fleming, 2001; Foster and Houlst 2013). To initiate and improve the organisational safety culture to maturity, it is suggested in Fleming's (2001) model that the executives can use a five levels' (emerging,

managing, relatively low accident rates, cooperating and continuous improvement) analysis framework to gauge the level of the organisation's safety culture maturity. In

other words, the interpretation of the entire findings in this section would certainly echo the articulation in the theoretical framework in Figure 1.

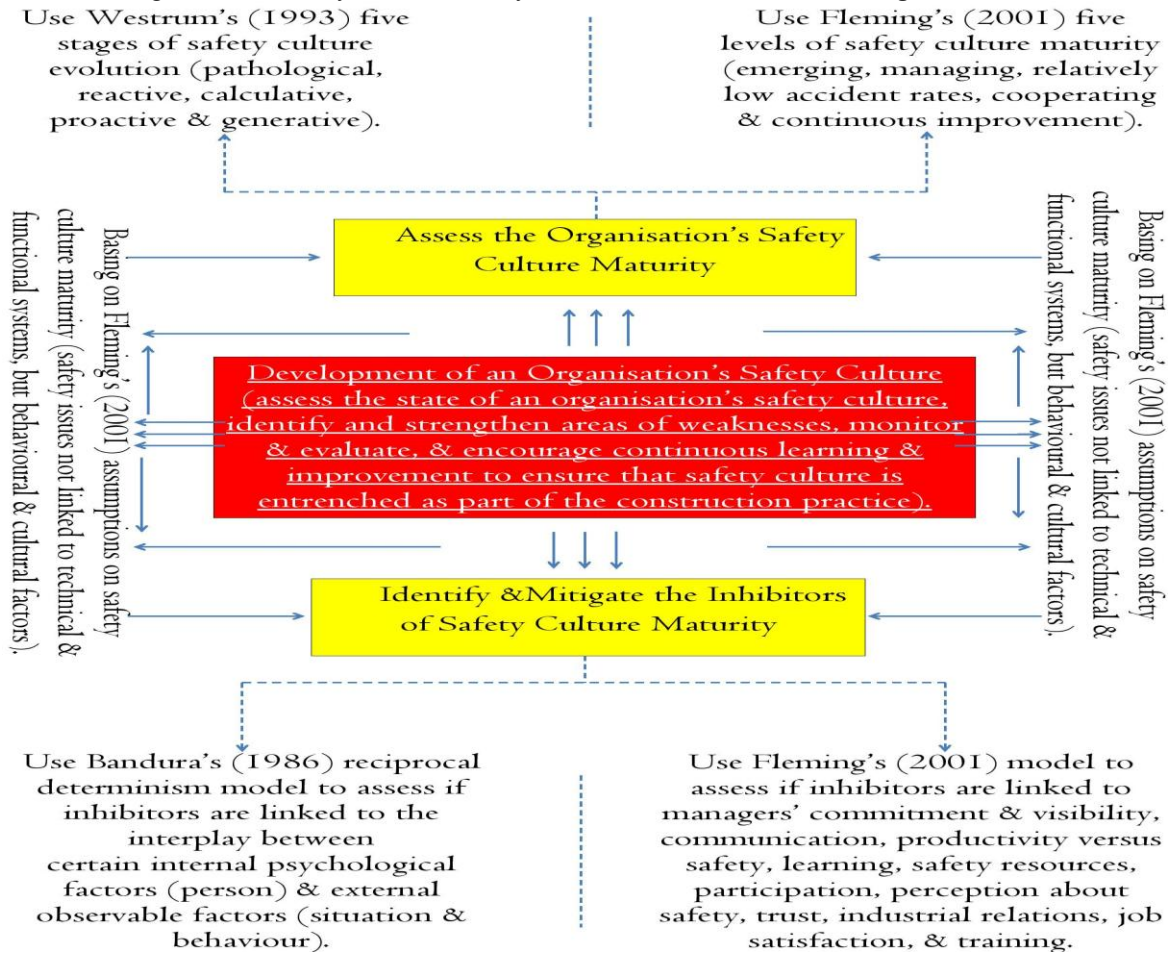


Figure 1: Theoretical Framework: The Development of an Organisation's Safety Culture

Source: As derived from linking of the process of safety culture development to Westrum's (1993) five main stages of safety culture maturity; Fleming's (2001) five levels of safety culture maturity and Bandura's (1986) reciprocal determinism model.

In the context of the theoretical framework in Figure 1, the interpretation of theories implies that after the development of an organisational safety culture, Fleming's (2001) assumptions that lack of a safety culture maturity exists if incidents and accidents are not linked to technical and functional systems, but behavioural and cultural factors provides a basis for diagnosing the state of the organisational safety culture. While basing on Fleming's (2001) assumptions, the theoretical framework in Figure 1 indicates that a diagnosis may be undertaken to assess the organisation's safety culture maturity so as to identify and mitigate its inhibitors. In such a process, Westrum's (1993) five main stages (pathological, reactive, calculative, proactive and generative), and Fleming's

(2001) five levels (emerging, managing, relatively low accident rates, cooperating and continuous improvement) can be used to gauge the level of the organisation's safety culture maturity.

As Bandura's (1986) reciprocal determinism model enhances the assessment of whether the inhibitors are linked to the interplay between certain internal psychological factors (person) and the external observable factors (situation and behaviour) in a dynamic environment. Such analysis also requires the application of Fleming's (2001) model to assess and identify the inhibitors of the entrenchment of safety culture. However, a triangulation of such a view with the findings of the previous studies conducted on the construction safety culture of the SMEs in the South

African building and construction industry would still indicate that there is a challenge of a safety culture development model that the SMEs can emulate in the development and entrenchment of their safety cultures (Agumba & Haupt, 2009; Construction Industry Development Board, 2013; Ezzat, 2012; Smallwood, Haupt & Shakantu, 2014). It is such a theoretical gap that this research fills by evaluating the health and safety behaviours and practices of the SMEs in the South African building and construction industry, so as to determine a safety culture development model that can be suggested.

RESEARCH STATEMENT

Lack of a suitable safety culture development model is a constraint to the development and entrenchment of a construction safety culture of the SMEs in the South African building and construction industry and their ability to significantly minimise risks of accidents or incidents.

PURPOSE OF THE RESEARCH

The motive of this research is to evaluate the safety behaviours and practices of the SMEs in the South African building and construction industry, so as to identify the major inhibitors and the integrated remedial safety culture development model that can be suggested.

METHODOLOGY

In a bid to resolve the issues raised in the research problem statement, the study used the inductive research paradigm and the qualitative research method involving the interview of 20 participants comprising of the managers, site supervisors and employees on safety behaviours and practices of the SMEs in the South African building and construction industry (Leech & Onwuegbuzie, 2007:265; Morse, 2010:483). Purposive sampling was used in the drawing of the 20 sampled participants from 10 SMEs in the South African building and construction industry. It entailed the application of two criteria that required the business to be an SME based in Gauteng Province, but with footprints in two or more additional provinces, and the participant to be interviewed had to be either a human resource manager, site supervisor or ordinary employee with detailed understanding of health and safety procedures, methods and standards in the building and construction industry.

Brief interviews were conducted with each of the SMEs prior to the selection of 10 SMEs and drawing of the two participants from each to make a total of 20 sampled participants. The interview guide was developed in line with the three research questions that entailed the evaluation of: the SMEs' safety behaviours

and practices, their inhibitors and the health and safety culture development and entrenchment models used by the SMEs in the South African building and construction industry. Depending on the venues selected by the participants, interviews were conducted with the engineers, employees, site supervisors and employees on sites and in their respective offices.

Although the questions explored rotated around these three questions, further probe and re-probe were conducted to clarify or elicit more information about the SMEs' building and construction health and safety practices. The obtained interview findings were thematically analysed to reach a logical thematic conclusion about the safety behaviours and practices of the SMEs in the South African building and construction industry (see Figure 2). After a detailed understanding of the SMEs' safety culture related challenges, the study developed a safety culture development model that can be adopted by the SMEs in the building and construction sector (see Figure 3). It entailed the triangulation of the interview findings in Figure 2 with the process of safety culture development in Figure 1 to reach a logical conclusion on the hybrid safety culture development model that can be suggested. The details of the findings are presented and discussed in the next section.

FINDINGS

The results of the thematic content analysis of the views of the managers, site supervisors and employees on safety behaviours and practices of the SMEs in the South African building and construction industry are as presented and discussed according to the two main subsections:

- Safety Behaviours and Practices of the SMEs in the South African Building and Construction Industry
- Inhibitors: Health and Safety Culture of the SMEs in the South African Building and Construction Industry

The details are as illustrated in Figure 2 and discussed as follows.

Safety Behaviours and Practices of the SMEs in the South African Building and Construction Industry

Findings revealed the major motivators of the SMEs to continuously strive to ensure that they accomplish different building and construction activities in a way that enhances the safety and health of all the stakeholders to be linked to what the executives have learnt about the drawbacks of the past unsafe behaviours and practices, legislative compliance and need for the fulfillment of tender conditions or terms required for the

conclusion of a subcontract. Even if the SME does not intend to improve its safety behaviours and practices, experience from the previous accidents and incidents leading to death, injuries and destruction of a lot property was found to lure most of the SMEs to review and adopt better health and safety methods and practices. It was also noted that considering that health and safety activities are also constantly monitored by the enforcement bodies, most of the SMEs tend to

continuously strive to comply by aligning their safety and health activities to the health and safety legislations such as the National Building Regulations and Building Standards Act No. 103 of 1977, the Occupational Health and Safety Act No. 85 of 1993, the Construction Industry Development Board Act No. 38 of 2000, Consumer Protection Act No. 68 of 2008 and the National Environmental Management Act No. 107 of 1998.

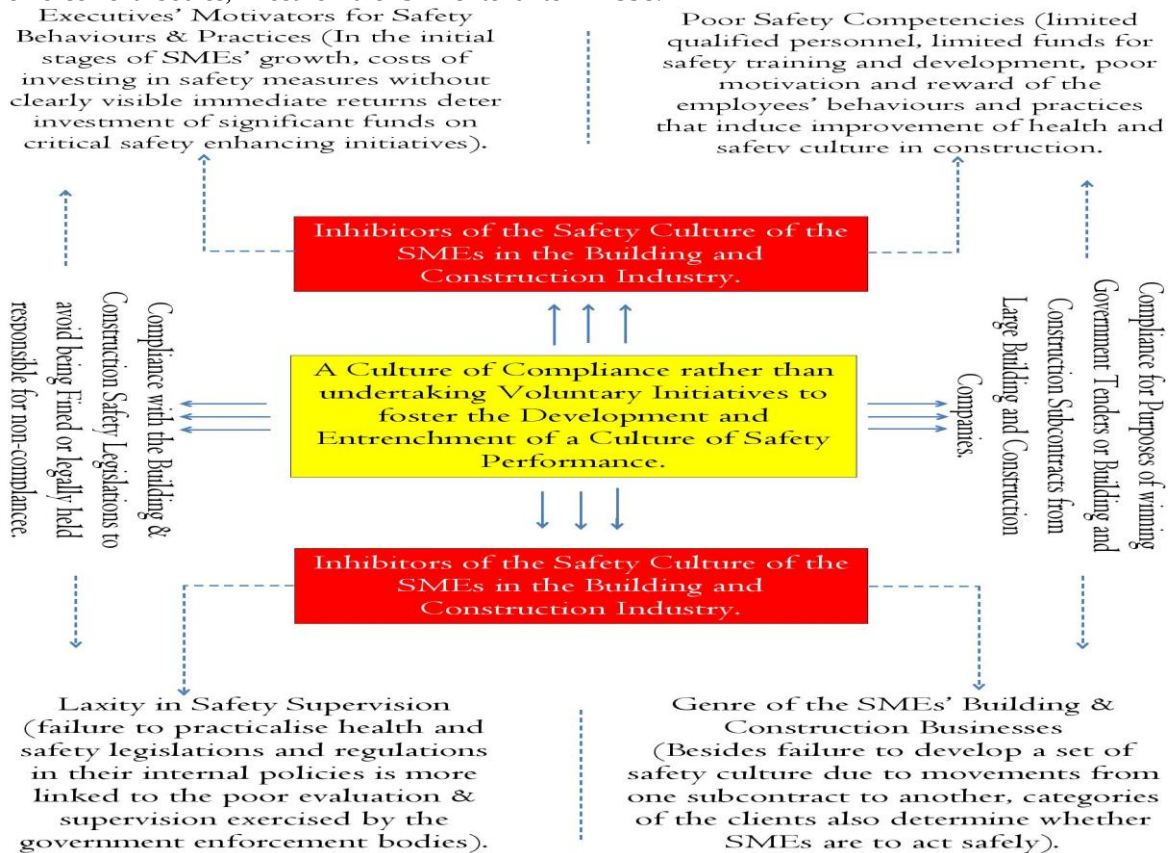


Figure 2: Key Themes and Subthemes: Safety Behaviours and Practices of the SMEs in the South African Building and Construction Industry.

Source: As derived from the thematic content analysis of the interview findings on the safety behaviours and practices of the SMEs in the South African building and construction industry.

The other business motivators for SMEs to adopt better health and safety practices were found to be linked to the conditions in the process for obtaining certain building and construction tenders either from government or subcontracts from the large building and construction companies. However, further analysis of the findings revealed that whether or not the SME was involved in subcontracts and tenders, the initiative to develop a defined set of health and safety culture was still found to be constrained by a combination of factors.

Inhibitors: Health and Safety Culture of the SMEs in the South African Building and Construction Industry

As noted in Figure 2, findings revealed the major inhibitors of the development of health and safety culture of most of the SMEs in the South African building and construction industry are often linked to the executives' motivators for safety behaviours and practices, safety competencies, the genre of the SMEs' building and construction businesses, and laxity in health and safety supervision and enforcement. The details of these inhibitors are evaluated as follows.

- **Executives' Motivators for Safety Behaviours and Practices**

Most of the SMEs in the construction industry are often not well motivated to act safely. In the initial stages of the SMEs' growth, costs of investing in the required relevant safety measures without clearly visibly immediate returns were found to cause a decline in the commitment of the SMEs to ensure that significant funds are invested in the critical safety enhancing initiatives. Instead, SMEs that consider investing in certain safety measures tend to only do so as part of the regulatory compliance to register with the relevant professional bodies. Most of the SMEs' endeavours to embrace safety measures also only arise in the instances that the SMEs have to apply as subcontractors to the often larger construction firms. However, where SMEs are the main contractors, safety issues were found to be less considered and prioritised. To minimise the cost of investing in expensive safety measures, findings imply that SMEs tend to be more creative and innovative by inventing and using their own safety procedures that minimise exposure to risks of accidents or injuries. Although such methods have proven effective, most of them are not certified by the building and civil engineering professional bodies. Yet, as the SME building contractors continue to apply such unconventional safety mitigating measures, such a culture often gets entrenched as part of the safety culture among most of the SMEs. With such approach, findings imply that it is usually not uncommon to find most of the SME building contractors operating without well written and conceptualised internal safety policy documents that operationalise the provisions of the building and construction legislations such as the Occupational Health and Safety Act No. 85 of 1993 and the National Building Regulations and Building Standards Act No. 103 of 1977. This limits not only the entrenchment of safety culture, but also the development of safety competencies.

- **Safety Competencies**

SMEs are building and construction companies that are formed by only a group of a few individuals with advanced experience and tertiary qualifications in safety as part of the building and construction education and training programme. To ensure the entrenchment of a culture of safety performance, the executives will have to devote sufficient time towards developing safety manuals and training to disseminate the safety best practices to their subordinates. Unfortunately, in most of the cases, effective accomplishment of such activities is often limited by significant workloads that cause them to only concentrate on the activities considered to be core to their construction businesses. In this endeavour, safety is seldomly interpreted as core, unless it is inherently required as part of the process for

accomplishing a particular task. In effect, findings revealed that safety culture tends to degenerate to a pathological state in which the executives tend to go around different safety related activities in order to avoid having to spend a lot of time and money dealing with the required safety issues. All these affect the entrenchment of safety behaviours and practices among the managers and employees of the SMEs. Even if the SMEs in the building and construction industry were to invest in measures that strengthen their safety competencies, some of the interviewed participants still highlighted that nurturing such competencies to become part of the safety culture would still be difficult due to the genre of the SMEs' building and construction businesses.

- **Genre of the SMEs' Building and Construction Businesses**

Findings imply that there are differences on the effects of safety practices and behaviours in circumstances where the SME is the main contractor and the situations where the SME is subcontracted. In circumstances where the SME is subcontracted to well-experienced large construction firms, the safety culture and practices in such experienced large construction firms tend to positively influence the development and the evolution of best safety practices and behaviours among the SMEs' managers and employees. Most of the subcontracts with SMEs require a stronger emphasis of the importance of integrating safety practices in the accomplishment of all activities prescribed in the contract. Failure of which can lead to the termination of the subcontract or exclusion from future contracts. For SMEs that focus on getting subcontracts, a strong emphasis of good safety records was therefore found to influence their safety practices and behaviours in the present activities since it can be a point of safety reference in the future. However, the participants noted that there are also constraints on the basis that subcontracts are often periodical and vary from one firm to another. Unless the SME building and construction subcontractor is flexible, the change from one subcontract to another can therefore easily affect the entrenchment of certain defined safety best behaviours and practices. In the circumstances where the SME is the main building and construction contractor, findings revealed that the role of the client in monitoring safety compliance can only be effective if the client has sufficient understanding of safety issues. However, considering that most of the SME building and construction contractors deal with a majority of the consumers who are not well knowledgeable about safety matters, the role of the client to get SMEs to comply was found to be only minimal. All these tend to further get exacerbated by the laxity in safety supervision and enforcement.

- **Laxity in Safety Supervision and Enforcement**

The poor management's commitment to practicalise health and safety legislations and regulations in their internal policies is often more linked to the poor evaluation and supervision exercised by the government enforcement bodies. The participant explained that the supervision and the monitoring of the SMEs' compliance with the relevant safety legislations are undertaken by the Occupational Health and Safety Inspectorate in the Department of Local Government. However, in most of the cases, the effectiveness of such evaluation and supervision exercises has often been constrained by the over-reliance on just certain limited checklists. This undermines the undertaking of in-depth analysis of the safety culture and behaviours of the SMEs. The other challenges were found to be linked to the fact that most of inspection visits are not done as frequently as required by the legislations. Although during such inspection visits, some of the participants were found to have flouted safety legislations, the enforceability to ensure compliance has often also not been effective. In the midst of all these challenges, the participants noted that it often turns difficult to get SMEs in the building and construction industry to adopt good safety practices and influence the emergence of a safety culture that minimises the risks of accidents and incidents.

DISCUSSION

To develop an effective organisational safety culture, conventional theories on safety culture management indicate the process to flow along four main steps; the analysis of the state of an organisation's safety culture, the identification and strengthening of the areas of weaknesses, motivating the process through monitoring and evaluation, and encouragement of continuous learning and improvement to ensure that safety culture is widely adopted as part of the building and construction practice (Cesarini et al. 2013; Chan, 2012; Misnan and Mohammed, 2007). As much as some of the SMEs in the South African building and construction industry were found to attempt to integrate such safety culture development measures in their building and construction services, the analysis of the interview findings highlighted that there are challenges that are still often linked to the motivators of the safety behaviours and practices of the SMEs, the development of the appropriate safety competencies, the genre of the SMEs' building and construction businesses, and the laxity in safety supervision and enforcement. However,

in his reciprocal determinism model, it was noted that Bandura (1986) argues that the organisational safety culture is often influenced by the interplay between certain internal psychological factors (person) and the external observable factors (situation and behaviour) in a dynamic environment. Such a view echoes Westrum's (1993) model that for an organisation's safety culture to evolve, it must be flow through five main stages that include; pathological, reactive, calculative, proactive and generative. However, when the safety culture of the SMEs in the South African building and construction industry are examined in the context of such theoretical articulations, it can be noted that most of the common causes of unsafe performance are not only linked to Bandura's (1986) situational and behavioural factors, but also a safety culture which is still largely calculative and reactive in the context of Westrum's (1993) safety culture model.

MANAGERIAL IMPLICATIONS

From the illustration in Figure 3, findings signify that it is critical for the executives of the SMEs in the building and construction industry to recognise safety culture development as an investment rather than as an expenditure.

Through the development of the appropriate safety culture, they can be able to achieve enormous business values linked to lower operational costs, and efficiency improvement. An effective safety culture can also influence the reduction of absenteeism and retention of the valuable human resources, the stability of the work climate, the elimination of the cost of repairs of damaged items, and better reputation and relationship building. As contrasted to the present approach where safety is considered just as a measure for enhancing compliance with the relevant construction health and safety legislations and regulations, the SMEs' executives' recognition of the enormous business values associated with safety culture management will influence their voluntary application of the measures for improving safety culture performance. However, as it highlighted in Figure 3, it is still critical that the recognition of such motivators for effective safety culture management is accompanied by the use of a transformational safety leadership to enable the development of the appropriate safety culture strategic plan, safety vision, mission, goals, objectives and targets and integration with corporate strategy.

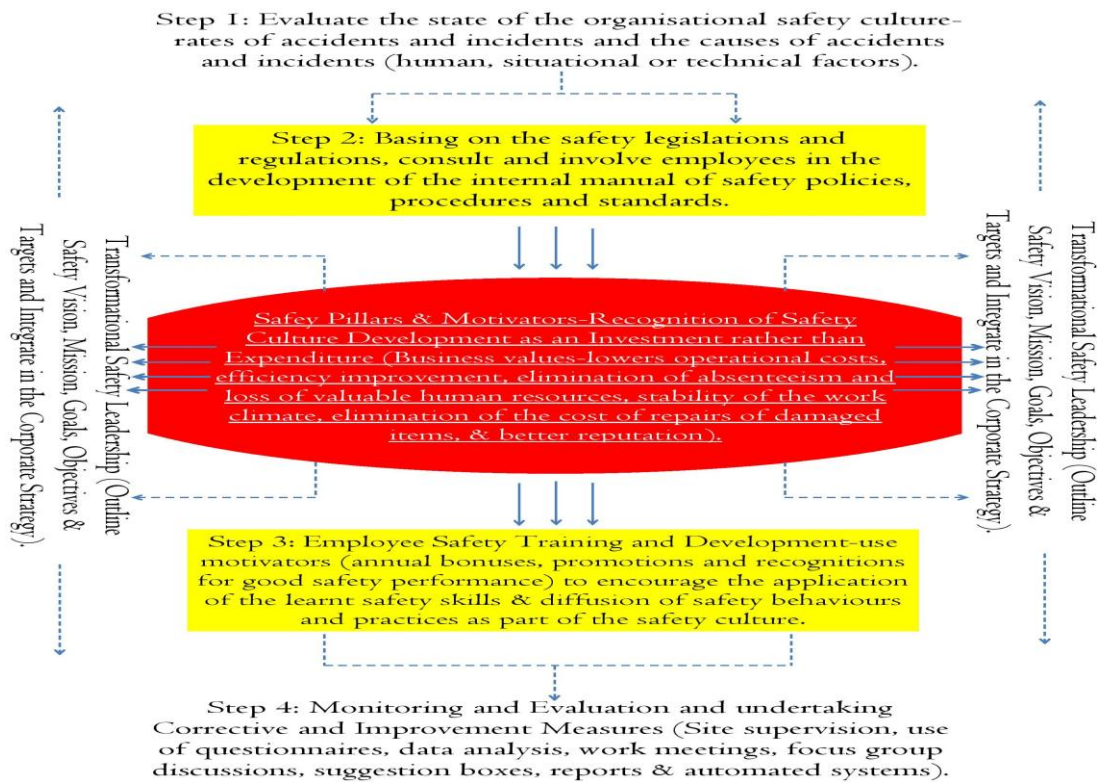


Figure 3: A Safety Culture Development Model for the Small and Medium Size Building and Construction Firms

Source: As derived from the triangulation of the interview findings on health and safety behaviours and practices of the SMEs in the South African building and construction industry with the linkage of the process of safety culture development to Westrum's (1993) five main stages of safety culture maturity; Fleming's (2001) five levels of safety culture maturity and Bandura's (1986) reciprocal determinism model.

Following the accomplishment of such initiatives, the actual process of the evaluation and application of the relevant safety culture improvement measures can commence. Significant focus can also be directed towards the assessment of whether the major causes of accidents and incidents are linked to human, situational or technical factors. With such information, the executives can then start the process of developing the construction safety policies, procedures and standards that the employees can make reference to during the process of the accomplishment of different building and construction activities. However, it is critical that the development of such a safety management manual must still be accompanied by the investment in the employee safety training and development programmes. This will lead to the next step that will require constant monitoring and evaluation to enable the identification and correction of new deviations. The techniques and methods that can be applied in the accomplishment of such initiatives encompass site supervision, the use of questionnaires, data analysis, work meetings, focus group discussions, suggestion boxes, reports and automated systems.

SUGGESTION OF FURTHER RESEARCH

Effective safety culture management is certainly a pillar of the initiatives that edify effective performance of the building and construction firms. However, the findings imply that as a result of the hefty costs of investing in the relevant safety measures and poor supervision by the governmental enforcement authorities, undertaking the measures for entrenching a culture of safety performance is still considered as peripheral by most of the SMEs in the contemporary South African building and construction industry. The implications are latent in the fact that when using Westrum's (1993) model, the state of the safety culture of most of the SMEs are either pathological or largely reactive and calculative. To enhance the development and improvement of the safety culture maturity of the SME contractors, the paper suggested the model in Figure 3. However, further studies can still explore how such a model can be applied for developing the safety culture in the industries other than the building and construction industry. This will certainly contribute to addressing the limitation of this research which was its restriction to the evaluation of the safety behaviours and practices of

the SMEs in the building and construction industry, and not in the other industries such as chemical manufacturing, gas extraction and mining.

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