



Determining the causal relationships among balanced scorecard perspectives on school safety performance: Case of Saudi Arabia



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ABSTRACT

In the public schools of many developing countries, numerous accidents and incidents occur because of poor safety regulations and management systems. To improve the educational environment in Saudi Arabia, the Ministry of Education seeks novel approaches to measure school safety performance in order to decrease incidents and accidents. The main objective of this research was to develop a systematic approach for measuring Saudi school safety performance using the balanced scorecard framework philosophy. The evolved third generation balanced scorecard framework is considered to be a suitable and robust framework that captures the system-wide leading and lagging indicators of business performance. The balanced scorecard architecture is ideal for adaptation to complex areas such as safety management where a holistic system evaluation is more effective than traditional compartmentalised approaches. In developing the safety performance balanced scorecard for Saudi schools, the conceptual framework was first developed and peer-reviewed by eighteen Saudi education experts. Next, 200 participants, including teachers, school executives, and Ministry of Education officers, were recruited to rate both the importance and the performance of 79 measurement items used in the framework. Exploratory factor analysis, followed by the confirmatory partial least squares method, was then conducted in order to operationalise the safety performance balanced scorecard, which encapsulates the following five salient perspectives: safety management and leadership; safety learning and training; safety policy, procedures and processes; workforce safety culture; and safety performance. Partial least squares based structural equation modelling was then conducted to reveal five significant relationships between perspectives, namely, safety management and leadership had a significant effect on safety learning and training and safety policy, procedures and processes, both safety learning and training and safety policy, procedures and processes had significant effects on workforce safety culture, and workforce safety culture had a significant effect on safety performance.

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Introduction

Safety in Saudi school environments

The Saudi Ministry of Education recognises that the health and safety of its teachers, school executives, students, parents, visitors and the broader school community are of paramount importance. In fact, the ministry is committed to providing safety conditions in each school and seeks to minimise school accidents by using

successful and accurate safety regulations. A number of regulations have been introduced in recent years in a bold attempt to rapidly improve safety in Saudi schools. The ministry, for instance, implemented regulations that enforce heightened expectations of student safety to ultimately reduce the rates of accidents and incidents. These regulations include compulsory first-aid courses for teachers, laboratory safety guidelines and student supervision, to name a few (Bendak, 2006).

Despite the implementation of stricter regulations, safety has not improved to the degree expected due to a lack of enforcement practices and ongoing safety performance evaluations. The application of these regulations by people who do not have safety knowledge leads to disasters such as the 2002 fire in a girls' school that resulted in 15 deaths (Prokop, 2003). Moreover, in the past decade (2002–2012), there were 19 student and teacher fatalities

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and more than 150 student injuries, of which 12 were very serious (Saudi Ministry of Education, 2013).

Poor communication is the main reason behind the lack of ongoing enforcement of safety regulations and performance evaluation. In Saudi Arabia, male and female roles are viewed as complementary rather than equal (Esposjito, 1982; Keddie, 1979; Saleh, 1972). El Guindi (1981) noted that “one basic feature of Arab socio-cultural organisation is the division of society into two separate and complementary worlds, the men’s and the women’s”. In Saudi Arabia, this division is relatively rigid and strict; sexes do not mix (El Guindi, 1981). This underlying feature of Saudi culture means that communication between the male dominated Ministry of Education and the female school system is often limited and a step removed from the school operational environment. Other issues include a general lack of safety awareness from teachers and school executives and regional schools often not being included in centrally administered safety initiatives. Concerns about school safety are growing in the wider community; however, there are still limited studies addressing the issue of school safety, particularly studies targeted at Saudi Arabia. Although Western countries have conducted numerous studies on school safety (Nansel et al., 2001; Pellegrini and Long, 2002; Pepler et al., 2006), the majority of this research focuses on developed Western countries, whose results are often not transferable to the Middle East region’s entirely different cultural context.

Saudi Arabia’s 33,000 existing schools (Saudi Ministry of Education, 2013), as well as future schools that will be built, must implement a more robust safety management system. Indeed, to gain a clearer understanding of school safety in the Saudi context, it is important that further studies be conducted in this specific context. The following additional aspects should also be considered and taken into account when developing such a system: management (Choudhry et al., 2007; Mearns et al., 2003); safety training (Cooper and Phillips, 2004; Ng et al., 2005); safety processes (Clarke, 2010; Teo and Ling, 2006); safety culture (Grabowski et al., 2007; Mayze and Bradley, 2008; Wadsworth and Smith, 2009); and finally, the most important aspect, safety performance (Grabowski et al., 2007). These aspects cover the key elements of the school safety system and must be concurrently addressed in order to achieve a desired overall level of safety performance.

Evaluating school safety systems holistically

Senge (2006) advocate that to achieve any shared goal of an organisation, the fifth discipline of ‘systems thinking’ is paramount to ensure that all stakeholders learn from each other. Rasmussen (1997) argues for a system-oriented approach to safety risk management and accident prevention that is based on abstraction rather than structural decomposition. His research helped move the narrowly focused safety control system agenda to one that was broader and covered the entire socio-technical system. This transition from creating safety management control systems to strategic safety management systems that considers a destination statement (i.e. safety goal) for the organisation is imperative to create long-term sustainable improvements in safety outcomes.

A number of systems thinking tools have been developed in recent years in order to conceptualise, operationalise, model, diagnose or evaluate natural, scientific, engineered, social or conceptual systems. Systems thinking theory has been applied to safety problems across a range of disciplines including road safety (Larsson et al., 2010), hazardous waste fire causation (Goh et al., 2010), aerospace safety (Leveson, 2007), to name a few. All of these studies highlight that all aspects of the multi-faceted socio-technical system must be considered in order to interpret safety outcomes. Safety systems theory is often applied after a series of significant incident or accidents occur in order to determine the key determinants of accident causation within that system. Such accident

causation mapping exercises can also be utilised to build holistic safety system evaluation frameworks that encapsulate all pieces of the safety puzzle and lead to sustainable reductions in incidents and accidents. Such safety systems can be underpinned by systems theory but also need to be operationally definable and user friendly for laypersons to interpret and implement on a day-to-day basis.

The Balanced Scorecard (BSC) developed by Kaplan and Norton (1992) is an internationally recognised and commonly utilised tool for evaluating performance across range of disciplines and areas (e.g. Mohamed, 2003; Stewart, 2008). The first generation BSC was control orientated with only a simplistic attempt to encapsulate all aspects of a system through including both lead and lag indicators of a particular performance outcome. This original BSC framework has four performance perspectives (i.e. internal business, financial, customer and, innovation and learning) and attempted to integrate all the interests of key stakeholders on a scorecard. The term ‘balanced’ in the name reflects the balance provided between short- and long-term objectives, between quantitative and qualitative performance measures, and between different performance perspectives. The diverse interests and measures are categorised in the above-mentioned four performance perspectives of the scorecard.

However, over time the BSC has evolved into one that can map entire systems and also embed complex systems dynamic modelling techniques (e.g. Capelo and Dias, 2009). Lawrie and Cobbold (2004) argue that the third-generation balanced scorecard has transitioned from a strategic control tool to one that enables organisations to strategically map causal relationships between particular factors to some key goals related to a ‘destination statement’. Kunc (2008) also demonstrates how the balanced scorecard provides a robust foundation for developing causal system models as they include all facets related to a particular desired outcome. In this study, the authors have attempted to conceptualise and empirically construct a safety scorecard for Saudi schools that includes the causal relationship between enabling and outcome perspectives of safety performance.

Developing a new safety performance evaluation framework for Saudi schools

The Saudi Ministry of Education has introduced safety rules to regulate aspects related to school safety and associated risk factors. The aim of these regulations is to ensure student safety and to decrease the rate of accidents and incidents. However, these systems have not generated the desired level of safety in schools because the regulations neither address the system-wide leading and lagging measures of safety performance nor provide methods for evaluating safety issues in Saudi schools. Applying the concept of a BSC could address this gap by effectively providing a measure of school safety. According to Kaplan and Norton (1996), the BSC provides employees (i.e. school personnel) with the necessary knowledge and skills acquired through learning and growth. The BSC approach also can innovate and build appropriate strategic capabilities and efficiencies. Some scorecard elements would also identify cause-and-effect relationships, that is, the impact of school safety processes and improvements on overall safety performance, goals, measurements, and perspectives. Strategic aspects would include the development of areas that define the scope of a BSC system, the strategic grid or logical framework for organising the various objectives, and the strategic framework, which is the combination of all the strategic grid’s objectives. Incorporating such strategic aspects would provide one complete framework to manage the overall strategy and its constituent elements. The BSC system would also include the desired targets and templates, i.e., the visual tools to guide people in constructing and achieving the desired long-term objectives. The fact that performance is always an integral part of the BSC would help ensure that

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