

# Benchmarking Saudi Public Schools Using a Safety Balanced Scorecard (BSC) Approach

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## Abstract

Citizens in newly industrialized countries are demanding higher levels of safety in their built environments, particularly the education environments of their students. Saudi Arabia is an example of a country that is beginning to put a microscope on its current safety practices and performance in an attempt to reduce incident and accident rates. In the authors' prior research, a comprehensive safety performance evaluation framework was developed following the principles of the well-established balanced scorecard (BSC). The statistically formulated Saudi school safety performance BSC included 5 salient perspectives: P1: Safety Management and Leadership (5 factors); P2: Safety Learning and Training (3 factors); P3: Safety Policy, Procedures and Processes (3 factors); P4: Workforce Safety Culture (3 factors); and P5: Safety Performance (3 factors). This subsequent investigation applies the developed safety performance BSC in order to benchmark and compare 6 Saudi public schools. Comparisons were made between schools based on their gender (male and female schools), regions of Saudi Arabia, and school education level (i.e., primary, elementary and secondary). The developed safety performance BSC framework and associated benchmarking methodology applied in this study can aid Ministry of Education officers and school executives in better and more strategically monitoring and managing their respective schools by considering the influence of lead and lag indicators of safety performance.

**Keywords: Safety, School, Balanced Scorecard (BSC), Saudi Arabia**

## 1. Introduction

Education spending has risen dramatically in Saudi Arabia in the last decade, with a 12.8% increase in spending during the last year alone, from 121.9 billion to 137.6 billion Saudi riyals (SR) (Conway, 2010). There are about 25,000 schools, of which 16,000 operate out of rented buildings. The government has spent money acquiring land on which to build schools that will lead to the addition of new buildings (Conway, 2010). Currently, there are 33,000 schools (Ministry of Education in Saudi Arabia, 2012). Saudi public schools are free of tuition fees, and post-secondary students actually receive a stipend. With the increase in student

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numbers, there has been a growing concern for their safety in the school environment, particularly after catastrophic events such as the fire in a girls' school in 2002 that resulted in 15 deaths (Prokop, 2003). Moreover, in the last decade (2002-2012) there were 19 student and teacher fatalities and more than 150 students injuries of which 12 were serious (Ministry of Education in Saudi Arabia, 2012).

While concerns about school safety are growing in the wider community, there are still limited studies addressing the issue of school safety specifically targeted towards the Kingdom of Saudi Arabia. However, in many Western countries, there are numerous studies tackling this issue (Nansel et al., 2001; Pellegrini and Long, 2002; Pepler et al., 2006). Most studies examining school safety in the broader Asian region highlighted a poor safety record in these regions (Ando et al., 2005; Yang et al., 2006). Unfortunately, much of this existing literature focused on the Asian region presented findings that were often based on small data samples, and these findings are not reliable. Furthermore, existing studies focused on developed Western countries are not often transferable to the Middle East region, where an entirely different cultural context exists. Nisbett (2004) presented empirical evidence from social psychology that suggests that cultural, behavioural and perceptual differences exist between different world regions and even countries. On the other hand, Benbenishty and Astor (2005) stated that even though regions or countries may differ based on incident and accident rates, their research posited that many seemingly different cultures have similar patterns and structures of school safety. Therefore, in order to gain a clearer understanding of school safety in the Saudi context, as well as specific comparisons between school gender, type, and region, it is important that further studies are conducted in this specific context. This research study addresses this gap in the current body of knowledge.

In Saudi Arabia, a number of regulations have been introduced in recent years in a bold attempt to rapidly improve school safety performance. For instance, the Ministry of Education put in place regulations that enforce heightened expectations of student safety and ultimately reduced rates of accidents and incidents. These regulations included several aspects, such as compulsory first aid courses for teachers, laboratory safety guidelines and student supervision, to name a few (Bendak, 2006). However, while stricter regulations have now been implemented, safety performance has not improved to the expected degree because there still are no enforcement practices and no ongoing safety performance evaluation. To address this missing link, a safety performance BSC for Saudi schools was recently developed by Alolah et al. (2012). The BSC was first developed by Kaplan and Norton (1992). It was one of the first comprehensive business evaluation frameworks that considered both the lead (e.g. profit, market share, etc.) and lag indicators (e.g. staff learning and innovation) of business performance. This important feature of the BSC and its holistic and long-term evaluation of performance makes it highly suitable to the issue of safety which inherently is the slow build up bad practices that suddenly results in catastrophic events. For example, the BSC framework will be able to pick up a diminishing learning culture in an organisation even when profits are at a record, before its inevitable decline in subsequent years. The developed safety BSC is intended to pick up interconnected poor safety planning, leadership and culture before a school fatality occurs and enable executives to take action. This specially developed safety performance BSC will enable a comprehensive evaluation of safety performance considering both the lead (e.g., accident rates) and lag (e.g., safety

culture) indicators of school safety. Using exploratory factor analysis (EFA) and partial least square (PLS) analysis, a confirmed safety performance BSC consisting of 5 salient perspectives could be developed: (1) Safety Management and Leadership (SML); (2) Safety Learning and Training (SLT); (3) Safety Policy, Procedures and Processes (SPPP); (4) Workforce Safety Culture (WSC); and finally, (5) Safety Performance (SP) (Alolah, et al., 2012). Each perspective had several measurement items, namely: SML, 16 items; SLT, 12 items; SPPP, 15 items; WSC, 13 items; and SP, 8 items. Appendix A provides a full description of each perspective, factor and item in the developed safety performance BSC that has been applied in this paper for benchmarking the safety performance of 6 Saudi public schools.

## **2. Benchmarking study context**

### **2.1 Saudi Arabian education environment**

Like most Muslim countries, Saudis consider male and female roles to be complementary rather than equal (Esposito, 1982; Keddie, 1979; Saleh, 1972). El Guindi (1981) stated that 'one basic feature of Arab sociocultural organization 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). Several studies have reported that safety in girls' schools was greater than that of boys' schools (Baldry, 2003; Bosworth et al. 1999; Chen and Astor, 2009; Hu and Lin, 2001; Kumpulainen et al., 1998; Nansel, et al., 2001; Rigby, 2005).

The Saudi Arabian education system has 3 main school types: primary (ages 6–11), elementary (ages 12–14) and secondary (ages 15–18) (Alshumaimeri, 1999; Sedgwick, 2001). Six schools (3 male and 3 female) were involved in this study. In fact, every school type has its own dynamics, mission and structure, and numerous practitioners have suggested that the prevalence of school safety is dissimilar from school to school due to their distinct characteristics and cultural dynamics (Astor et al., 2002; Benbenishty and Astor, 2005; Benbenishty et al., 2002). Also, Zeira et al. (2003) stated that the prevalence of school safety is highly dependent on the school type.

Another important aspect of school safety is the location of the school, due to the large differences between each region's distinct social and cultural context (Basu, 1992; Dyson and Moore, 1983; Jejeebhoy, 2000). The capital of Saudi Arabia is located in the central region, where there is an apparent concentration of funding and resources assigned to education in general and a greater emphasis on safety. Furthermore, large oil companies are located in the eastern region, where there are a number of expatriate staff who have higher expectations of safety performance in their schools.

### **2.2 Design and sampling frame**

In September 2012, a questionnaire survey was distributed to 6 public schools in Saudi Arabia. The questionnaire contained a cover letter that explained the survey's purpose and benefits, notably the concept of a 'balanced scorecard' to measure the level of safety

performance in Saudi schools. The questionnaire was distributed to teachers, school executives and Ministry of Education officers in Saudi schools, so that they all could express their perceptions of safety performance in their schools. This study consisted of 67 respondents, including 47 teachers, 14 school executives and 6 Ministry of Education officers affiliated with particular schools. Those respondents worked in 3 different school levels (2 primary, 2 elementary and 2 secondary).

A 5-point Likert scale was used for rating the performance of each item in the questionnaire (i.e., 1 = Very Poor, 2 = Slightly Poor, 3 = Moderate, 4 = Good, and 5 = Very Good). The unit of analysis for this benchmarking study was the school, with the results averaged from the respondents according to each respondent type for each school. The following section investigates the benchmarking findings for the 6 schools (e.g., number of participants, their education and experience, and school size). More importantly, a comparative assessment is reported based on school level, gender and region.

### **3. Benchmarking 6 Saudi public schools**

#### **3.1 School 1 (S1)**

This school is a male primary school located in the western region of Saudi Arabia. The respondents from this school were 1 Ministry of Education officer, 2 school executives and 7 teachers. The school had a student population of between 1,001 and 1,500 students. The two school executives had masters' degrees in education, while the other respondents had bachelor's degrees. The majority of respondents ( $n=7$ ) had more than 11 years of experience, while 3 had fewer than 10 years.

Results indicated that the overall safety performance of S1 was poor. Individual perspectives about the school were all low, ranging from 1.88 (SPPP) to 2.12 (SP) (Figure 1). This result was due to several issues, including: the school's safety policy, procedures and processes were not reviewed during the last two years; safety didn't feature at all as a standing item at school staff meetings. Also, fire evacuation training was not routinely practiced. Additionally, this school appeared densely populated, meaning that there were too many students for the size of the campus, which could prove problematic for highly active male students.

#### **3.2 School 2 (S2)**

This school is a male elementary school in the central region of Saudi Arabia. The participants in this school were 1 Ministry of Education officer, 2 school executives and 8 teachers. It had between 501 and 1,000 students. All of the respondents had only a bachelor's degree. The majority ( $n=9$ ) had fewer than 20 years of experience, while 2 had more than 20 years.

The school's overall safety performance was rated as poor to moderate. Perspective performance ratings were SML, 2.48; SLT, 2.17; SPPP, 2.47; WSC, 2.35; and SP, 2.37 (Figure 1). This result is due to a number of identified issues at this school, including: although the school staff had received a copy of the school safety policy and procedures,

they were not able to demonstrate that they understood its contents and how to implement it; the majority of staff had not completed basic first aid training.

### **3.3 School 3 (S3)**

This school is a male secondary school in the eastern region of Saudi Arabia. The participants in this school were 1 Ministry of Education officer, 3 school executives and 10 teachers. It had between 501 and 1,000 students. Also, 3 teachers had master's degrees, while the rest had bachelor's degrees. The majority ( $n=10$ ) had fewer than 20 years of experience, while 4 had more than 20 years.

Data recorded S3's safety performance as very good. All perspectives were rated very good: SML, 4.28; SLT, 4.40; SPPP, 4.34; WSC, 4.31; and SP, 4.43 (Figure 1). This school's score was 87%, which led us to consider the safety performance of this school to be very good. This result was for several reasons (Ministry of Education in Saudi Arabia, 2012), including: all staff had received safety policy, procedures, and processes and understood them; the majority of school staff participated regularly in first aid and safety training courses. Furthermore, the fire evacuation training had been done routinely. Finally, there was periodic communication between school management and the Ministry of Education.

### **3.4 School 4 (S4)**

This school is a female primary school in the northern region of Saudi Arabia. The participants in this school were 1 Ministry of Education officer, 2 school executives and 7 teachers. It had between 201 and 500 students. Also, all of the participants had only bachelor's degrees. The majority ( $n=8$ ) had fewer than 20 years of experience, while the Ministry of Education officer and one of the school executives had more than 20 years.

Data recorded S4 as having the worst safety performance. SLT was very poor (1.59), while the other perspectives were slightly poor: SML, 1.86; SPPP, 2.08; WSC, 2.18; and SP, 1.87 (Figure 1). The score of this school was 38%, which led us, in general, to consider the safety performance of this school to be slightly poor. This result is due to several issues (Ministry of Education in Saudi Arabia, 2012), including: the school's safety policy, procedures and processes were not reviewed during the last few years; no fire evacuation training has been done routinely; and the communication between school staff and the Ministry of Education was poor due to social customs.

### **3.5 School 5 (S5)**

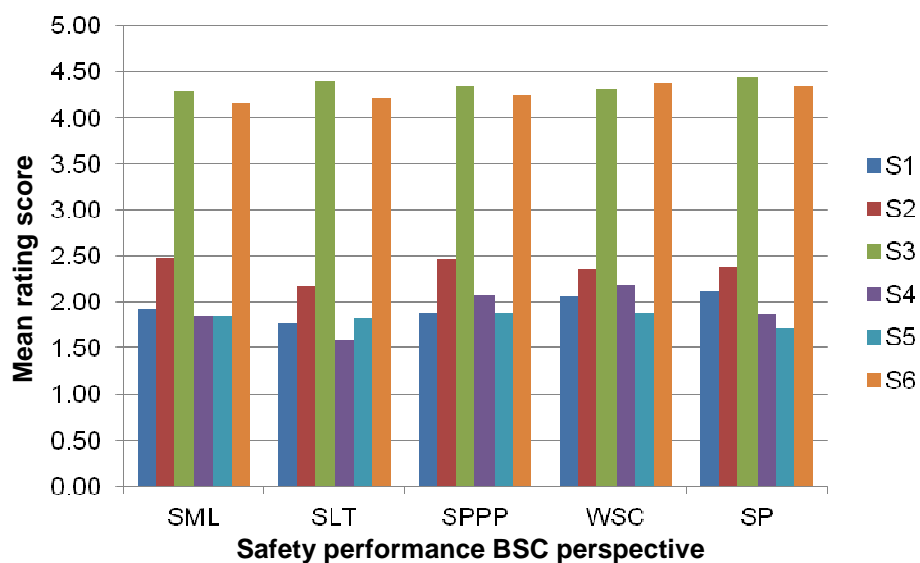
This school is a female elementary school in the southern region of Saudi Arabia. The participants in this school were 1 Ministry of Education officer, 2 school executives, and 6 teachers. It had fewer than 200 students. Also, a school executive had a master's degree, while the rest had bachelor's degrees. The majority ( $n=8$ ) had fewer than 20 years of experience, while one of the school executives had more than 20 years.

Data recorded the safety performance for S4 as the most worst. SP was very poor (1.71), while the rest were slightly poor: SML, 1.86; SLT, 1.83; SPPP, 1.88; and WSC, 1.88 (Figure 1). The score of this school was 37%, which led us, in general, to consider the safety performance of this school to be slightly poor. This result is due to a few factors (Ministry of Education in Saudi Arabia, 2012), including: school staff haven't reviewed the school safety policy, procedures, and processes four years ago; the fire evacuation training wasn't done during the last two years. The communication between school staff and the Ministry of Education was very poor due to social customs and the school's location outside the city.

### 3.6 School 6 (S6)

This school is a female secondary school in the central region of Saudi Arabia. The participants in this school were 1 Ministry of Education officer, 3 school executives and 9 teachers. It had more than 1,500 students. Also, the Ministry of Education officer responsible for this school and 1 school executive had master's degrees, while the rest had bachelor's degrees. The majority ( $n=11$ ) had fewer than 20 years of experience, while 2 (the Ministry of Education officer and a teacher) had more than 20 years.

Data recorded the safety performance for S6 as very good. Four perspectives were very good: SLT, 4.21; SPPP, 4.24; WSC, 4.38; and SP, 4.34. SML was good (4.16) (Figure 1). The score of this school was 85%, which led us, in general, to consider the safety performance of this school to be very good. This result is due to several aspects (Ministry of Education in Saudi Arabia, 2012), including: the safety policy, procedures and processes manual had been reviewed and understood by all the school staff; the school provided monthly first aid, safety and fire evacuation training. However, social customs led to poor communication, and school management communicated with the Ministry of Education, but they were in touch, specifically the school's Ministry officer, by phone/email at various times.



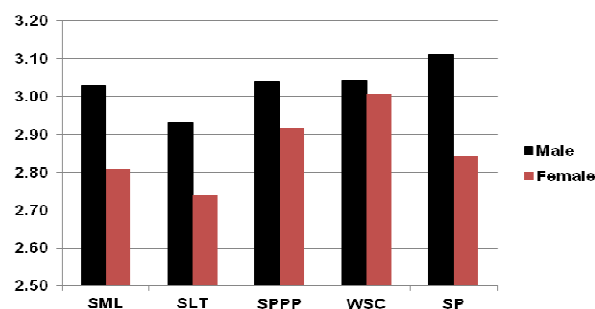
**Figure 1: Perspectives rating for all schools**

## 4. School comparative assessment

A comparative assessment of the above 6 schools was conducted based on clustered benchmark results for school gender, level and region. This enabled a comparison of these groupings in order to reveal whether they were critical factors contributing to safety performance across the 5 perspectives of the safety performance BSC framework.

### 4.1 School gender comparison

As described previously, schooling in Saudi Arabia is strictly divided by gender. Figure 2 illustrates the performance rating for the 6 schools across the 5 perspectives when clustered into gender categories. Surprisingly, even though males are viewed as being more active and more inclined towards partaking in riskier activities, this study indicated that male schools had a higher performance rating across all 5 perspectives. Some explanations have been provided in the previous section as to why the female schools examined had lower safety performance (e.g., social customs). This benchmarking study in the Saudi context had different results from those previously reported in the literature, where girls' schools generally had high safety performance (Baldry, 2003; Bosworth, et al., 1999; Chen & Astor, 2009; Hu & Lin, 2001; Kumpulainen, et al., 1998; Nansel, et al., 2001; Rigby, 2005). In fact, there is a belief that girls do not engage in risk-taking behaviour, so safety is given no attention at girls' schools. Furthermore, girls are valued less than boys are, so their safety is not valued as highly.



**Figure 2: Comparing schools by gender**

### 4.2 Schooling level

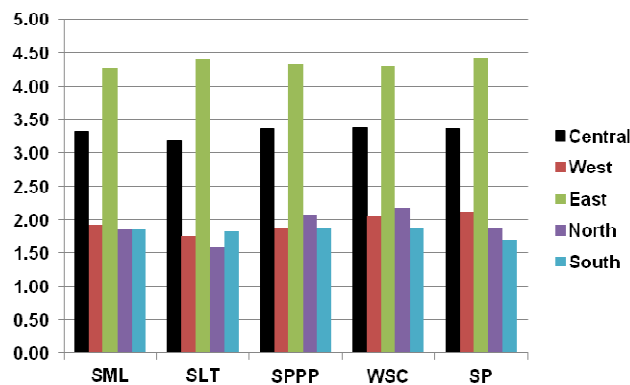
The Saudi Arabian schooling system is divided into 3 levels, namely, primary, elementary and secondary. Figure 3 illustrates the performance rating for all perspectives across the 3 levels. Findings indicated that the level of safety performance for all perspectives in secondary schools was higher than that in primary and elementary schools. Various safety studies and practitioners reported in the literature that the prevalence of school safety is dissimilar from school to school due to distinct dynamics in each individual school level and type (Astor, et al., 2002; Benbenishty & Astor, 2005; Benbenishty, et al., 2002). The predominant explanation for higher safety performance in secondary schools is that this age group (i.e., 15–18) is more mature and educated, is less prone to risky behaviour and tends to follow safety procedures.



**Figure 3: Comparing schools by schooling level**

### 4.3 School region

As described previously, this study considered 5 regions in Saudi Arabia, namely, central, western, eastern, northern, and southern. Figure 4 illustrates the performance rating for all perspectives in the 5 regions. Results indicated that the safety performance for all perspectives in the eastern region was higher than that in other regions. As discussed earlier, the social systems that characterise a particular region will provide a macro framework for school safety performance in each region (Basu, 1992; Dyson & Moore, 1983; Jejeebhoy, 2000). Because the eastern region and its population are mostly affluent employees of the oil industry, and many are expatriates, they have a high regard for personal safety; this culture is also reflected in the schooling system in this region. Furthermore, the results showed that the safety performance of all perspectives in the central region was also moderately good. This is because the densely populated central region is where the capital is located and therefore may receive a higher degree of investment and concern than the more sparsely populated northern and southern regions do. Overall, the regional comparative analysis confirms expectations that the more educated and affluent central and eastern coastal region also have a higher regard for safety in their schooling systems. A challenge for the government will be to ensure a homogenous level of safety performance across the entire country.



**Figure 4: Comparing schools by region**



## **5. Conclusion**

Generally, Saudi Arabia has higher rates of school incidents and accidents than most other developed and newly industrialised countries have. In this study, the developed safety performance BSC was utilised to benchmark safety performance in 6 schools and confirmed that there is still considerable room for improvement in the country. The findings showed that male schools had a higher level of overall safety performance compared to that of female schools, which is contrary to prior reported studies. Primary schools had a poorer overall safety performance when compared to that of elementary and secondary schools; secondary schools had the highest safety performance. There might be a greater appreciation for safety by teachers and executives in secondary schools, and the cohort of older students might be more likely to engage in safer behaviours and better understand safety policies and procedures set by the school. Finally, the safety performance of the more affluent eastern and central regions was higher than that of the more densely populated and less affluent northern and southern regions.

## **6. Recommendations**

The completed benchmarking study of safety performance in the Saudi public school system, using the developed safety performance BSC, shed light on a range of issues that need to be considered. To address school safety deficiencies in the Saudi context and create a culture of continuous safety performance improvement in the country, the following recommendations are provided:

1. Apply the developed comprehensive safety performance BSC to continuously evaluate and benchmark the safety performance of Saudi schools and to pinpoint areas for improvement in each school, region and school level and across the country.
2. Provide more attention to safety performance in the less affluent and more densely populated rural areas of Saudi Arabia where there appears to be a lower level of safety performance.
3. Conduct further studies to understand why there is a lower level of safety performance in female schools and invest in gender-focused safety strategies that heighten safety performance across the 5 safety BSC perspectives.
4. Invest in improved school facilities to ensure that the schools are not overpopulated and that the educational built environment is safe for all school activities.
5. Create [the government] a safety performance funding scheme that is linked to evaluation ratings established by the safety BSC, thereby creating incentive for school executives to promote a heightened level of safety performance in their schools.

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## Appendix A

**Table 1: Safety performance BSC perspectives, factors and items (Alolah, et al., 2012)**

**SML: Safety Management and Leadership (Perspective)**

**SML1: Management Commitment to Safety (Factor)**

SML11: Management actions safety issues

SML12: Management provides adequate resources to safety

SML12: Management encourages employees to voice concerns and safety improvement proposals

SML14: Management provides adequate safety information (i.e. media, mission statements, accident statistics, etc.)

SML15: Management involves employees when setting safety objectives, decision making and improvement plans

**SML2: Management's Active Participation in Safety (Factor)**

SML21: Management promotes a safety culture

SML22: Management actively participates in risk assessments, consultative committee meetings and inspections

SML23: Management ensures that information (i.e. procedures) is visibly present in the workplace

**SML3: Safety Communication and Relations (Factor)**

SML31: Management and supervisors have an open door policy

SML32: Safety information is regularly brought to my attention by supervisors

SML33: Supervisors are more attentive to safety issues than the average employee

SML34: Supervisors are trusted and can relate with employees about safety

**SML4: Safety Practice Incentives (Factor)**

SML41: Monetary (e.g. bonuses) or recognition (e.g. safe employee of the month) incentives are provided for employees for good safety practices

SML42: There are punitive measures for the continued poor safety practices of employees (e.g. fines, demotions, etc.)

**SML5: Perceived Supervisor Competence (Factor)**

SML51: Supervisors have adequate skills and authority to tackle safety issues

SML52: Supervisors are committed to, and convinced of, the benefits of safety

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**SLT: Safety Learning and Training (Perspective)**

**SLT1: Safety Training, Seminar, and Promotional Strategies (Factor)**

SLT11: Regular safety seminars and updates are provided to employees (e.g. short talks, group meetings, etc)

SLT12: Adequate provision of up-to-date safety training to all employees

SLT13: Adequate resources allocated to safety training

SLT14: Safety training adequately covers emergency response and provides first-aid competencies

SLT15: Enhanced safety awareness by clearly visible mission statements in the workplace (i.e. slogans and logos)

SLT16: Readily available published materials on safety in the workplace (i.e. library, statistics, and newsletters)

**SLT2: Safety learning openness (Factor)**

SLT21: Employees give tips to each other on how to work safely

SLT22: Accident/incident reports are used to improve safety

SLT23: Employees learn lessons from near misses, incident and accident reports

SLT24: Feedback is used to improve safety in the workplace

**SLT3: Safety knowledge and competence (Factor)**

SL31: Employees are competent in fulfilling their safety obligations

SL32: School students are instilled with sufficient knowledge on safety management procedures

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**Safety Policy, Procedures, and Processes (Perspective)**

**SPPP1: Safety procedures, audits and reviews (Factor)**

SPPP11: Safety inspections are regularly conducted

SPPP12: Employment of a safety officer and safety supervisors

SPPP13: The results of accident investigations are fed back to the supervisory level

SPPP14: Adequate emergency planning and procedures

SPPP15: Safety management systems include strong auditing requirements

SPPP16: Safety equipment, tools and other accessories are maintained and tested regularly

SPPP17: Sufficient training on the use of safety equipment is available to employees

SPPP18: Safety is viewed as an important consideration in the design process for new School buildings and facilities

**SPPP2: Safety accountability and feedback (Factor)**

SPPP21: Safety auditors are sufficiently familiar with the appropriate safety policy and procedures

SPPP22: Employee/parent satisfaction with the feedback given on accidents/incidents, near loss and injuries that occurred

SPPP23: Employee/parent satisfaction with the follow-up actions taken after incidents and accidents have taken place

SPPP24: Periodic maintenance of safety resources to reflect current best practices

SPPP25: Safety operations are conducted professionally and adequately governed by senior management

**SPPP3: Built environment safety (Factor)**

SPPP31: A safety checklist is regularly completed for School buildings/facilities to ensure that they are safe to use

SPPP32: Maintenance issues that are viewed as high safety risks are given high priority and addressed quickly

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**Workforce Safety Culture (Perspective)**

**WSC1: Individual responsibility to safety (Factor)**

WSC11: Employee's at all levels generally have a personality that is conducive to good safety practices

WSC12: Value is placed on strong personal safety responsibility

WSC13: Employee's place a high priority on safety

WSC14: Employee's demonstrate 'Duty of Care' towards one another

WSC15: Employees safely utilise available machines and technical equipment

**WSC2: Perceptions of work situation and pressure (Factor)**

WSC21: There are enough employees to carry out required work in a safe manner

WSC22: Employee's have enough time to carry out their tasks in a safe manner

WSC23: A realistic amount of time is generally scheduled for completing assigned tasks in a safe manner

WSC24: Work procedures are presented clearly and logically

WSC25: Employee's feel comfortable to inform management of safety issues

**WSC3: Propensity to report incidents and accidents (Factor)**

WSC31: Employee perceive that the incident/accident reporting system is effective

WSC32: Employee's are willing to account for a co-worker's ongoing failure to report incidents/accidents

WSC33: Employee's have confidence in the ability of executives to correct safety issues and concerns

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**SP: Safety Performance (Perspective)**

**SP1: Safety accident and incident rates and appropriate responses (Factor)**

SP11: There is a low frequency of incidents in our school

SP12: There is a low frequency of accidents in our school

SP13: Accident reports always result in a range of appropriate corrective and preventive actions

**SP2: General safety behaviours of staff (Factor)**

SP21: There are good safety attitudes and behaviours in the school environment

SP22: There is strong willingness to comply with safety policy, procedures and practices

SP23: Employees are always willing to assess incidents or accidents that occur and organise appropriate emergency care

**SP3: Emergency response (Factor)**

SP31: There is a quick emergency response to accidents

SP32: Emergency planning and response is effective

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