Chapter 2
Literature Review

2.1 Chapter Overview

This chapter provides the theoretical context and background to the thesis and provides a comprehensive review of the literature related to various aspects of school safety, lean thinking, knowledge management and other central theories to the research. The chapter represents an exploration of relevant literature, which then forms the basis of later chapters in the thesis, including the methodology and results. The chapter is composed of three main sections, which reflect the main bodies of literature contributing to this work. These main bodies of literature are school safety, knowledge management and lean thinking, but there are a variety of other relevant sub-sections within this general structure. The chapter begins by considering the meaning of school safety and the effective management or administration of school safety and then moves on to discuss how knowledge management can contribute to managing school safety and creating a safe school. It then outlines lean thinking and how this can be applied in synergy with Knowledge management to improve school safety. It concludes by summing up the literature and showing how it contributes to the thesis by providing a means to answer the objectives set out in Chapter 1. Figure 2.1 shows an overview of the key components of the literature.

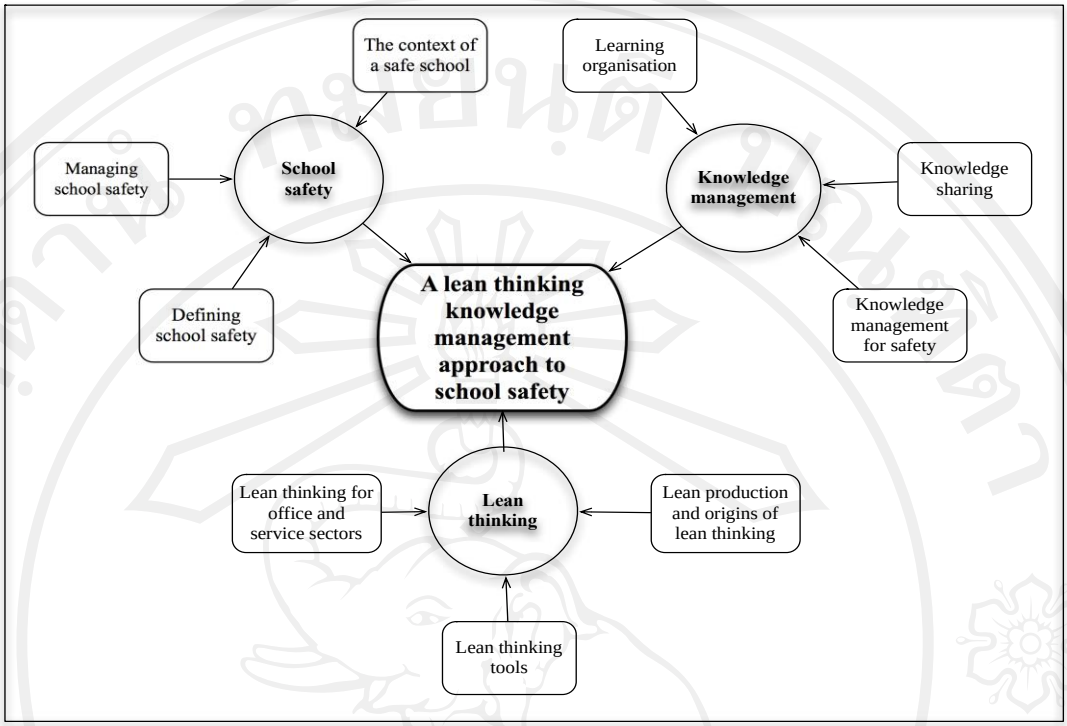

Figure 2.1 An overview of the literature review showing the three keys bodies of literature discussed in this chapter

2.2 The Context of a Safe School: Knowledge, Education Change and Management

The global knowledge economy requires a highly skilled and educated workforce (Wagner et al., 2006), which in turn puts significant pressure on education leaders to manage and deliver an effective education system that matches the needs of society. The continuously expanding global knowledge economy is characterised by a rapid pace of change (Leslie and Roberts, 2012), and such change puts pressure on schools in every phase of the education system. The result is that within this context of educational change, there is growing awareness that the quality of the school environment, including the safety of the school, is critical to policymakers, education leaders, and practitioners (Godfrey et al., 2012). However, despite awareness of the need for a safe school, there are a number of barriers to creating a safe school (Srichai et al., 2012). UNICEF (2009) suggest that on any given day, there are approximately one billion children in school, and thus the management of school safety to ensure these children are kept safe is of critical importance. However, for a variety of reasons, this is not always the case, particularly for schools in developing countries where safety is

considered a low priority issue. Managing school safety is further complicated by the varied definitions and meaning ascribed to safety. School safety has a variety of meanings and nuances depending on the particular school and its location.

The interpretation, and thus the effectiveness of school safety varies at regional, national and international scales, but one thing is common, school safety requires effective management and does not simply happen. While the pace of educational change may have increased in recent years, educational change itself is nothing new (Hargreaves and Shirley, 2009), and is regarded as a controversial subject. Some argue that significant changes to schools are critical, and that the old ways are ill suited to the fast and flexible attributes of today's society. Others suggest the wrong things are being addressed, or that there is change for the sake of change (Fullan, 2007). Against this backdrop of change one area of school management where change is continuously debated is safety. The concept of school safety and creating a safe school continuously shifts from being in vogue, to something that is considered an unnecessary waste of resources. Indeed, school safety is sometimes stigmatised and linked to an unrealistic desire for perfection in schools (Tyack and Cuban, 2003). While defining school safety is challenging, there is consensus that it represents a crucial part of an effective school.

Managing school safety requires careful organization and administration of both the internal and external school environment (Cankaya, 2010). Schools in more developed countries have recognised this, and a mature literature and practical debate exists about what defines safety, and how it should be effectively managed by school leaders. In less developed countries, school safety is naturally a more recent topic, with school leaders in these countries often struggling to meet the school's safety needs against a context of continuously emerging academic requirements, constrained budgets, and a general attitude that the management of safety is a secondary, more peripheral part of school life.

The lack of focus on managing school safety in developing countries is reflected by research which suggests child injures are replacing infectious disease as a leading cause of mortality in less developed countries (e.g. Kozik et al., 1999). While the causes of child injury are often complex, it is suggested that they could be significantly reduced through simple intervention and political will (World Bank, 2008). This simple intervention ultimately translates into the effective management of school safety. However, in recent years, there is evidence that school safety, as one of the areas outside traditional academic programs, is being subject to financial cuts (May et al., 2011).

Before highlighting how school safety can be addressed through the lean thinking knowledge management approach proposed in this thesis, there is a need

to introduce relevant literature and carefully consider what is meant by the term school safety.

2.3 Defining School Safety

School safety goes beyond statistics and government reports (Butcher and Manning, 2005), with Cornell and Mayer (2010) suggesting that it is fundamental to closing gaps in achievement, increasing student engagement and reducing the attrition of teachers. While the benefits of a safe school are often promoted, there are a variety of definitions as to what constitutes a safe school, or which aspects of safety should be managed, promoted and prioritised. The definitions and literature regarding school safety vary geographically, and through time. For example, in the USA, the predominant focus of school safety literature relates to school violence (e.g. Elsaesser, et al., 2013; Hull, 2011; Shelton et al., 2009), and in particular, school shootings (e.g. De Venanzi, 2012; Borum et al., 2010; Altheide, 2009). In the UK, the focus of school safety research often relates to bullying (e.g. Jenkins and Palmer, 2012), or the subjective feelings of safety at school (e.g. Cowie and Oztug, 2008). More recently (i.e. within the last six years), there has been a focus on cyberbullying as a potentially difficult aspect of school safety (e.g. Smith et al., 2012; Nicol and Fleming, 2010). In Europe, the school safety debate has often centred on transport and road safety (e.g. Şimşekoğlu et al., 2012; Wegman et al., 2012). The geographic variability in school safety research often relates to specific problems faced by schools in particular places. For example, the US focus on gun crime and school shootings represents a response to specific and recent issues faced by the US (Flannery et al., 2013). The variance and myriad of issues affecting school safety mean that the definitions of what actually creates a safe school are also spatially variable at regional, national and international scales.

Defining school safety is a fundamentally complex task, with a number of intertwined and different perspectives on what can be considered a safe school. For example, Hernandez et al. (2010) suggest a safe school is a place free from violence, and represented by an environment where there is no perceived fear with respect to the school or its disciplinary procedures. Hull (2010) provides a more practical and management oriented elucidation of school safety, stating that it includes the school's culture and the appropriate training and resources to respond to threats and hazards. Donmez and Guven (2002) indicate that a safe school is one where students, teachers and staff feel physically, emotionally and psychologically safe and without fear. Ogel et al. (2005) expand this definition in a more practical way, by stating that the school's safety status is determined by

the positive relationships that exist between the various school stakeholders, including parents, teachers and staff. While a variety of school safety definitions exist, for the purpose of this research, the remit of school safety relates to the physical wellbeing of the school's pupils, the school's hazards, and finally, road safety around the school. The focus in this thesis is not on the improvement of school safety itself, but rather how school safety can be managed effectively, which should in turn translate to a safe school. The underlying concept of a safe school in this research relates to the relationships between school management, parents (who are customers), staff and teachers. If all these relationships are effectively managed, a school might be judged as being safe (CPCR, 2007). However, achieving all these aspects of school safety represents a considerable challenge, with far reaching management implications. Thus while the definition of school safety is complex, managing school safety in order to create a safe school can be even more convoluted. The literature regarding school safety is now sketched, firstly with regard to the different remits and meanings of school safety, and then with regard to the differences in geographic notions of what constitutes a safe school.

2.4 School Safety Definitions

To create, manage and sustain a safe school, it is critical to understand what a safe school actually is, and to understand what components contribute to school safety, and how they can be effectively managed. This section of the literature review thus presents the key literature relating to what are considered the core aspects of a safe school. These are then brought together under the umbrella of invitational theory and linked to the wider issues of managing and creating a safe school.

Five main meanings and definitions of safety are considered, which reflect the discourses and content within school safety literature. These are:

- School violence (including bullying and cyberbullying)
- Road safety
- The school environment and its hazards
- Fear and psychological safety at school
- Health and hygiene at school (including health education)

Each one of these definitions is also critically reviewed with reference to the situation in Thailand.

2.4.1 School Violence

Violence is one of the most common aspects when considering the definition of school safety. The term violence crosses a number of other aspects of school safety, including bullying, which is considered one of the most common aspects of school violence, and has recently expanded to include forms of cyber bullying.

2.4.1.1 Bullying and Cyber bullying

Bullying is a central aspect of school safety, and steps to eliminate bullying are critical to the creation of a safe school (Sapouna, 2008; Farrington, 1993). Bullying can be described in its most simple form as a type of aggressive behavior with intent to cause harm and power imbalance (Olweus, 1999). Farrington (1993) goes on to suggest that bullying is the repeated oppression of a less powerful person, either psychologically, or physically. The main reasons for bullying relate to power and status over the bully's victims as well as boredom, jealously and attention seeking (Besag, 2006). Common to all definitions of bullying is the concept of power and creating a power imbalance (e.g. Smith and Sharp, 1994; Rigby, 2002).

Bullying among children can be considered as a form of abuse (Dawkins, 1995), where the victim is unable to defend him or herself. Bullying can take a number of forms including verbal bullying, physical bullying and relational or psychological bullying such as spreading malicious rumours (Mislom and Gallo, 2006). Verbal bullying includes name calling and insults, while physical bullying involves physical energy or exertion toward other children. Relational bullying involves bullies singling out victims from their peer group (Milson and Gallo, 2006). Boys are more often involved in bullying than girls, with boys tending to be involved in physical bullying. Although bullying itself is variable in its forms, Furniss (2000) suggests that school bullying causes widespread negativity, including fear, anxiety and anger. Bullying thus contributes to the overall feeling of safety in school.

Bullying in schools is a global problem, which can have significant impacts on the overall school climate, the feeling of fear, and the way in which students learn (Piskin, 2003). Bullying therefore has a significant impact on school safety and must form part of any strategy aimed at improving school safety (Smith and Sharp, 1994). Bullying can undermine fundamental rights to health, dignity, safety and freedom. In

Thailand, there are no specific rights or anti discrimination laws, and therefore each school must appropriately address issues of bullying inside the wider remit of school safety. Parents frequently make suggestions to their school regarding bullying and ways to prevent it, and thus taking account of parental comments and suggestions about bullying constitutes a significant part of managing school safety. The school and teachers must work within an appropriately managed set of guidelines to ensure bullying does not become an issue at school (Dawkins, 1995).

The literature on school bullying is mature from the standpoint of more developed education systems in Europe and the USA, but far less so in Asia. It is often considered that in Asia, bullying and fighting are a normal part of growing up (Plan, 2008). Lai et al. (2008) report that the Asia-Pacific region is rapidly developing, but note there is little research or understanding related to bullying.

Once again, as with other aspects of school safety, the existing literature suggests that the best way to minimize bullying and create a safe school rests with the school's management and the way in which it communicates with parents, teachers and students (Bradshaw et al., 2007). While the Asia-Pacific region might be culturally different to the schools investigated in most of the bullying literature, the notion that effective school management can reduce bullying remains the same. The onus is therefore once again on how the school manages its safety rather than responding to *ad hoc* issues of bullying.

In Thailand, bullying is affected by issues such as rural/urban location, religion, gender, family and exposure to media (e.g. television) (Laeheem et al., 2009). There have been a variety of studies related to bullying in Thailand. For example, Wongyannava et al. (2000) investigated perceptions of bullying from the point of view of primary and secondary school students, investigating the differences in how bullying was perceived by different student ages. Work in southern Thailand aimed to investigate the statistically significant factors affecting bullying and showed that gender was not a significant risk factor. The key factors were shown to be related to age, ethnicity, the type of school and parental violence (Yodprang et al., 2009). More recently, Pengpid and Peltzer (2013) showed that gender does play a role in the risk factors associated with bulling in Thailand, and indicated a monthly bullying prevalence rate of 33% for male and 23% for female students. The main

risk factors were shown to be age, physical inactivity, truancy and psychological issues.

The literature related to bullying in Thailand shows changes through time and across the country, and this reflects the wider situation of change and variability in bullying across Thailand. The main risk factors and issues of bullying in Thailand are a reflection of wider society and similar to issues in other countries. A more recent shift in bullying both globally and in Thailand, is the concept of cyberbullying, which uses technology as a method to conduct bullying.

2.4.1.2 Cyberbullying

Cyberbullying is a more recent phenomenon in schools and the related literature has developed coincidently with advances in ICT and mobile phone use (Kowalski, 2012). Cyberbullying relates to the same definitions of the more traditional well-known forms of bullying, but centres on the use of technology, (i.e. as the Internet and mobile phones) as tools or enablers for the bullying to occur. As with traditional forms of bullying, school safety management is a critical part of reducing or eliminating cyberbullying.

Cyberbullying is commonplace in Thailand and has seen growth parallel to the rise in internet and smartphone use, along with the advent of social networking applications. According to Surat (2010), most cyberbullying centers around non-platonic relationships and is most common in adolescents. Cyberbullying is a significant problem in Thailand, and according to Songsiri and Musikaphan (2011), approximately 11% of Thai youth have experienced some form of cyberbullying. Thai schools must therefore be aware of the issue of cyberbullying and consider ways to mitigate its effects on students, as well as ensuring that parents are assured the school is tackling the expanding influence of cyberbullying on students.

2.4.2 Road Safety

As well as school violence and bullying, road safety represents a key part of defining school safety. Road safety is inextricably linked to the overall state of school safety in the sense that schoolchildren must travel to and from the school on a daily basis. Road safety is one of the major components contributing to a safe school and is reflected in the

geographically diverse literature regarding school safety. There are two key themes in the road safety literature for schools. The first theme relates to providing knowledge (education) of road safety to children so that this knowledge will increase their safety when using the roads and other access routes to the school. This theme can be summarised as road safety education. The second body of literature relates to interventions to prevent and reduce the risks associated with school transport.

In terms of providing education and knowledge to children, Zeedyk et al. (2001) suggest that increased knowledge of road safety does not necessarily translate to safer behavior in children. In addition, Collins and Kearns (2005) suggest that interventions to improve school transport safety are limited in their effectiveness due to the prevalence of a car-dominated society. Indeed, McDonald and Aalborg (2009) indicate that the majority of parents choose to drive their children to school, even if the distance is very short, and that the most commonly stated reason for this phenomenon is time. This suggests that rather than focus outside the school, effective road and transport safety should be centered on the school itself, and how the pick-up and drop-off system is organized and managed. This is reflected in other studies, which suggest that in a market-driven education system, there is a strong incentive to reform school safety (Collins and Kearns, 2001), particularly with regard to the drop-off and pick-up of children, which is a customer (parent) facing activity. The road safety literature points to transport being a continuously investigated aspect of school safety, albeit one with no effective solution. The underlying suggestion is that the way to enhance school safety and parental satisfaction in relation to school drop-off and pick-up should focus on effective supervision at busy times and design strategies for the drop-off and pick-up areas (Cooner, 2009).

In less developed countries and education systems, NGOs play a crucial role in enhancing school transport and/or road safety (Ellesevet and Lundebye, 1997). However, this focus is primarily on road safety as a whole, rather than specifically targeting school-related road safety (e.g. Ichikawa et al., 2003). This reflects the Tylosand Declaration (2007) which states that everyone has a fundamental right to road traffic safety. In Thailand, safety law exists, but the level of implementation is described as suboptimal (WHO, 2009). For child safety in terms of roads and transport, parents look to their children's school to provide guidance, and therefore the school has a responsibility to consider road safety and

transport as part of its wider safety remit. Road safety is therefore part of the overall school environment with regard to safety.

Thailand's road safety and the associated injuries and deaths from traffic accidents have become a significant socio-economic problem (Suriyawongpaisal and Kanchanasut, 2003). According to Ruangkanchanasetr et al. (2005), road traffic safety and youth behavior is significant issue in Thailand, with seat belt/helmet use, and driving while under the influence of alcohol being critical issues. According to Tanaboriboon and Satiennam (2005), more Thais are killed in road accidents than in all the wars in which the country has engaged in, with the primary problem relating to motorcycles. For schools in Thailand, the most critical issues relating to road safety involves the transport of children to and from school.

2.4.3 The School Environment and Its Hazards

One of the key aspects of keeping a school safe relates to minimizing hazards within the school. In the context of a school environment, a hazard can be defined as anything that can cause loss or damage to the school or its occupants (NCEF, 2008). Hazards can be further separated into natural hazards (e.g. earthquakes, floods) and everyday hazards in the school. While the school has little control over natural hazards, the management and preparedness of the school has a significant impact on the safety of its students.

Natural hazards can turn into school safety disasters, which can subsequently have a major impact on youth and the education system (Bastidas, 2011). As such, a significant amount of school safety literature focuses on responding and preparing for natural hazards and disasters in schools. In more developed countries such as the USA, there is a greater focus (as expected) on emergency preparedness in terms of natural hazards. Literature tends to focus on funding for emergency preparedness and fostering effective coordination (e.g. Kano and Bourque, 2008). In contrast, the school safety literature regarding less developed countries focuses more on responses and case studies with respect to specific hazards. For example, Haigh and Amaratunga (2011) contrast the fortunes of Haiti and New Zealand in the aftermath of an earthquake. Once again, the literature points to the management and administration of schools as being key to responding effectively to natural hazards and

creating a safe school (Jones and Paterson, 1992). This is a theme that repeats itself throughout all tenets of the school safety literature: that school safety requires effective management and administration, and will not simply happen. The majority of problems in creating a safe school can therefore usually be traced back to deficiencies in the management or administration of the school.

Other than natural hazards, schools themselves are engaged in many activities that create a range of hazards. The literature regarding hazards within the school environment often relates to medical care and management resulting from such hazards (e.g. Scala et al., 1997). There is also a significant body of literature which considers how to reduce unintentional hazards and the resulting injuries. Damashek and Peterson (2002) consider the various types of injuries and hazards, and attempt to classify types of prevention and intervention. Hazard management in the school environment is generally about the day to day administration of the school and ensuring hazards are minimized or eliminated.

In Thailand, the main focus in terms of hazards relates to the surrounding environment and potential for the spread of disease such as Dengue fever (Sabchareon et al., 2004). There has also been significant research into hazardous materials in schools, which are perhaps not controlled as strictly in Thailand as they are in more economically developed countries. For example, TASC (2012) suggest that mercury and other hazards are commonplace in Thai schools. A significant amount of research was also directed at how schools in Thailand can respond to hazards such as that posed by the 2004 Indian Ocean earthquake and tsunami (Siripong, 2010). Whatever the cause of hazards which arise in Thai schools, the response lies with school management and the appropriate methods to mitigate and manage such hazards.

2.4.4 Hygiene and School Safety

Hygiene at school is a critical part of the overall school environment and its safety. Hygiene is the practice of keeping individuals and their surroundings clean, more specifically to prevent the spread of illness and disease. One aspect of keeping a school safe in terms of hygiene, is the effective teaching of personal hygiene and healthy behaviours within the school's curriculum. With reference to school safety literature, hygiene has become less prominent and now more

commonly sits within the domain of curriculum development in relation to personal hygiene and health (e.g. Frumkin and Nodvin, 2006). There are also *ad hoc* projects related to school hygiene (e.g. Keating, 2002), but there is little attention placed on school safety in terms of health and hygiene, and the school safety focus is currently on more tangible aspects of school safety such as the previously discussed violence, road safety and bullying.

Thailand's school hygiene is approached with strong regional variations related to particular health issues or disease outbreaks, which may occur. For example, Wongstitwilairoong et al. (2007) investigate the prevalence of particular parasite infections in schoolchildren based near the Thai-Myanmar border. In terms of hygiene and safety, there are also fears in Thailand about nutrition and vitamin or mineral deficiencies and the effects these might have on schoolchildren (e.g. Bloem et al., 1990). There have also been concerns about drinking water quality in Thai schools (e.g. Leelayoova et al., 2008) and outbreaks of disease such as Dengue fever and hepatitis A (Sinlaparatsamee et al., 1995). Most recently, Thailand has begun a drive toward lifelong learning and this can be associated with health and hygiene education in schools to improve overall health levels in Thailand (MacDonald, 1997). The fact remains that to improve school hygiene, and effective method to manage and continuously improve school safety is necessary, and despite investment in the education system, Thailand is still lagging behind other Asian nations in a variety of key indices.

Hygiene and health is often something that concerns parents (Park et al, 2007) and although it might be more frequently considered within the domain of curriculum design, it does affect the overall status of safety in a school. Health and hygiene is therefore something which must be addressed, but is perhaps of less importance than violence, road safety and school hazards.

2.4.5 Fear and Psychological Feelings of Safety

A key aspect of school safety is how safe students feel within the school. This is somewhat subjective and psychological, but forms a significant contribution to the overall school safety literature. A key part of the literature relating to fear at school relates to developing countries, where the surrounding political context often affects school safety. For example, in southern Thailand, unrest has affected school children who

fear going about their daily activities, including school (Unicef, 2008). It is suggested that the way schools are managed and operated can create fear and affect students' learning, with issues such as corporal punishment and sexual violence reported in many countries (Plan, 2008). The reality is that subjective feelings of safety and fear are also linked to other aspects of a school's safety, and therefore cannot be considered in isolation. Fear and the subjective feeling of safety is caused by a deficiency in one of the other key components of school safety, and therefore a safe school is one that takes a holistic view of safety, which again requires effective management.

Despite fear and psychology affecting Thai schoolchildren (e.g. Page et al., 2006), Jimerson et al. (2009) indicate that the ratio of psychologists to school-aged children is relatively low. Indeed, Boonruangrutana (1987) introduced the issues with school psychology in Thailand over 25 years ago. Thai culture also has a significant impact on students and the way in which they act and feel at school. Thai culture manifests itself in a variety of ways, contributing to student behavior, attitude, and thus safety (Deveney, 2005). Chaiyawat and Jezewski (2006) show that there are several culturally specific aspects of fear, which have implications for school safety and its management.

Fear and the subjective feeling of safety is something which cannot be measured via school accident statistics, and this brings to the fore the issues associated with relying on numbers and statistics to measure school safety: they do not illustrate the true picture of school safety, and do not provide an indicator of parental (customer) satisfaction.

2.5 The Fallacy of School Safety Statistics

Initial investigations into school safety might consider the number of accidents as a measure of how safe the school is. A school with a low number of reported accidents may appear as a safe school. However, the use of statistics is a crude measure of school safety. The phrase that there are "three kinds of lies: lies, damned lies, and statistics" is variously attributed to Disraeli, Mark Twain and others. However, this sentiment is echoed by a variety of contemporary scholars and professionals who recognize that statistics can be used in a variety of ways depending on the purpose and the skill of the statistician (Chakrabarty, 2012). Statistics can also mask the true effectiveness of a safety program, which was exemplified by Girard (2012) who showed that statistical safety data could be

manipulated in a variety of ways to either argue for or against traffic speed cameras. Risk and statistics are also unavoidably affected by psychology, and depending on how safety issues are framed, can affect how they are viewed (Taleb et al., 2009). This goes some way to explain the discrepancy between parental perceptions of school safety versus the reality.

According to Weir et al., (2006) the perception of parents compared to the statistical reality of safety is significantly different. This represents somewhat of a quandary for schools, who must respond to the needs of parents and ensure that customers (parents) are satisfied with the school's safety. However, a statistically safe school does not necessarily lead to satisfied parents, who are likely to be more impressed with a school which communicates effectively and is seen to be effectively managing safety. This again illustrates why safety statistics and numbers are only one small part of effective school safety. Low accident rates do not necessarily translate into a safe school, or one where parents are satisfied. In addition, accidents are only one small section of a school's overall safety, and the literature review has already shown how diverse and varied the definitions of school safety are. Not all aspects of school safety can be measured with statistics. And while some aspects of school safety are explicit, others are deeply tacit.

The varied definitions of school safety mean that the way safety is managed within a school is critical to its success. One popular concept to bring together the many varied aspects of school safety is invitational theory. Stanley et al. (2004) suggest that invitational theory is a very useful method to address the total culture of the educational environment in order to improve safety.

2.6 Invitational Theory to Manage School Safety

Invitational theory was first introduced by Purkey (1992), who described it as a way to foster trust, optimism, respect and intentionality. Since then, invitational theory has been expanded upon and put into practical use in order to improve education and reform schools in a variety of ways (Zeeeman, 2006). Invitational theory has four main components (Hunter and Smith, 2007), which are as follows:

- Four assumptions
- Five Ps
- Levels of functioning
- Four dimensions

Each of these key aspects of invitational theory are now explained, before outlining how invitational theory has been applied to school safety, and how it can bring together the many varied definitions and nuances of school safety.

2.6.1 Four Assumptions

The four assumptions of invitational theory provide the purpose and direction of the theory and comprise of trust, optimism, intentionality and respect (Purkey, 1992). Trust is one of the four assumptions and assumes that for invitational theory to work, there must be interdependence and trust between humans. The second assumption is respect, which assumes people are valuable and must be respected as such. Without mutual respect, invitational theory cannot work in practice (Purkey, 1992). The third assumption of invitational theory is optimism, which is critical for invitational theory to work and to provide positive changes within schools. The fourth and final assumption is intentionality, which is described as vital to the overall invitational theory of education (Purkey, 1992). Intentionality suggests that for invitational theory to be effective, there must be an intention to create an inviting school and to invite positive changes. These four assumptions are met through the 5 Ps.

2.6.2 Five Ps

In order to practically achieve the positive changes which are suggested by invitational theory, there is a focus on five key areas, which are termed the five Ps. The five Ps are **people**, **place**, **policies**, **programs** and **processes**. Together, these Ps can be described as an ecosystem where people interact to create an inviting school. The five Ps can be elaborated as follows:

1. People - people are the most important of the five Ps, as the success or failure of invitational theory relies on people.
2. Places - refers to the physical environment. Places are an important aspect of invitational theory, as almost everything is affected by the physical environment, which also represents the most visible aspect of most organisations, including schools.
3. Policies - this refers to the rules and codes within an organization, which can be both written and unwritten tacit and explicit. These rules and codes enable the creation of an inviting organisation.

4. Programs - programs relate to specific activities within the school which are undertaken with a specific objective in mind. Programs are a key part of an organisation in achieving particular goals, but according to Purkey (1992), invitational theory must not detract from the overall goals and objectives of the organisation.
5. Processes – this is the final P and relates to how all the previous four Ps are implemented and how they function. This relates to how the four Ps are actually put into practice.

2.6.3 Four Levels

Another key part of invitational theory, are the four levels of functioning (Purkey, 1992). The four levels of functioning act as a way of checking the five Ps in action, and are as follows:

1. Intentionally disinviting - intentionally disinviting aspects of the five Ps which are deliberately disinviting such as individuals who are purposefully insulting or deliberately discriminate or discourage.
2. Unintentionally disinviting - individuals who lack consistency and purpose can become unintentionally disinviting and are often seen to be uncaring, thoughtless and as a result, are disinviting.
3. Unintentionally inviting - those who are unintentionally inviting become effective at functioning, but cannot necessarily describe why they are successful. The main weakness of being unintentionally inviting is not being able to identify the reasons for success or failure.
4. Intentionally inviting - being intentionally inviting means being inviting in each of the five Ps to create an inviting school where everyone is invited to contribute and develop.

The overall goal of invitational theory is to enrich people across four personal and professional dimensions.

2.6.4 Four dimensions

Invitational theory encourages enrichment in four dimensions (Purkey, 1992), two of which are personal, and two of which are professional. These are:

1. Being personally inviting with oneself - this referees to individuals on a personal level who must view themselves as responsible and valuable (e.g. caring for one's own health and wellbeing)

2. Being personally inviting with others - this means that individuals must be inviting with others by taking into account the feelings and wishes of others.

3. Being professionally inviting with oneself - this can take many different forms, but relates to developing oneself professionally for example by learning new skills, trying new methods, reading appropriate professional literature, and presenting work to others.

4. Being professionally inviting with others - This involves treating people as individuals, and paying careful attention to the five Ps, including policies, processes and programs. Combining all four dimensions of invitational theory is difficult to achieve, but distinguishes someone who has become professionally inviting.

Invitational theory for education and school safety can best be described using a starfish analogy (Purkey, 2004), as shown in Figure 2.2.

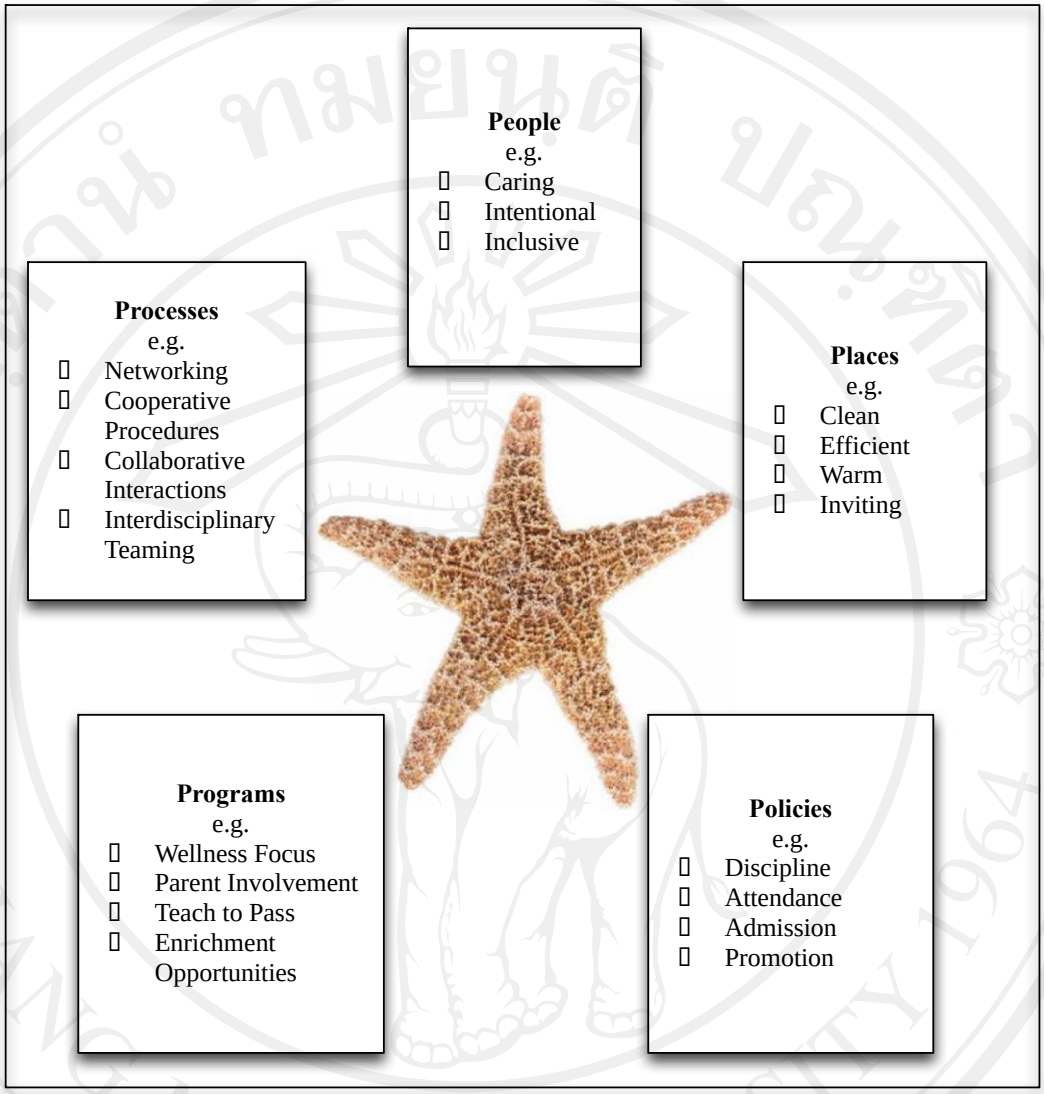

Figure 2.2 The starfish analogy of invitational theory
(adapted from Purkey, 2004)

Components of invitational theory suggest it can be used in different phrases of education (primary and secondary) and in different regions. While invitational theory is effective at bring together disparate aspects of school safety, it is necessary to consider hot school safety varies worldwide and how it differs between primary and secondary schools.

2. 7 Private versus Secondary School Safety

In terms of the literature regarding school safety, there is not a significant difference between discussions surrounding primary or secondary school safety. There are some subtle differences and nuances, but overall, the same issues of safety permeate both primary and secondary schools. In considering some of the subtle nuances, the most common aspects of secondary school safety literature are frequently skewed toward social welfare of students and the relationships with bullying (e.g. Vandekamo, 2013). Discipline is also more frequently discussed with regard to school safety in secondary schools (e.g. Osher et al., 2010).

Primary school safety literature is commonly associated with the journey to school (e.g. Ipingbemi and Aiworo, 2013). There are also frequent discussions of the transition period between primary and secondary school (e.g. Lester, 2012). However, the overall discussions about primary and secondary schools follow the same issues of safety, and most school safety issues can be traced back to problems with school management and administration. One area where school safety differs between primary and secondary school is parental attitude, as parents are perhaps more concerned about safety in primary schools where children require more attention. Some studies have investigated parental attitude toward specific aspects of safety such as school transport (e.g. Mammen et al., 2012), but surprisingly, there is a scarcity of literature relating to parental attitude of safety, and thus the work in this thesis aims to understand how parental attitude differs toward safety among parents of children in different phases of education. Although there is little consideration of how school safety differs between primary and secondary school levels, there is significant geographic variation in how school safety is treated, as illustrated in Figure 2.3 and discussed in Section 2.8-2.10.

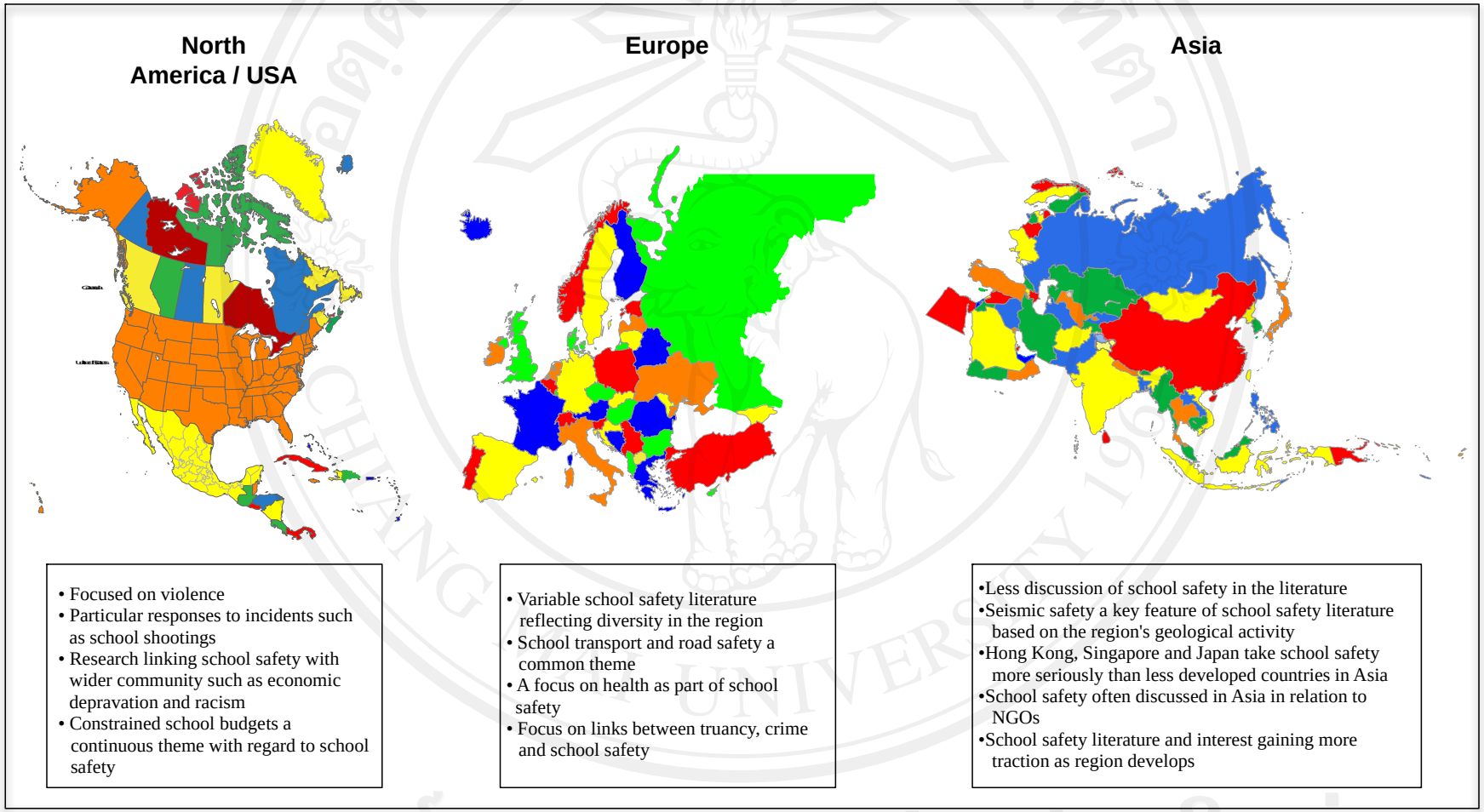

Figure 2.3 School safety literature as it varies worldwide

2.8 School Safety in Europe

According to Shaw (2004), school safety represents a microcosm of the wider neighbourhood, community and society that schools serve. For this reason, approaches to school safety are as diverse as these different neighbourhoods, communities and societies. In Europe, the European Union has embarked upon the CONNECT project to report upon the research and practice into school violence in 17 European counties (Smith, 2003). In the UK, the concern about school violence and its links with society has resulted in a focus on reducing truancy, exclusion and crime, as well as a proactive approach which encourages investment in early education, rather than only focusing on reactive measures to school violence (Shaw, 2004).

There has been a significant focus on health as a key part of school safety in Europe, perhaps more so than in other regions. This has led to the creation of the health promoting schools project (Parsons et al., 1996). Some European countries are more effective with their school safety than others, and the diversity in Europe as a region is reflected in the school safety literature. For example, Sweden is noted as having the lowest child injury mortality rate in the world, and according to Jansson et al. (2006) this is not simply due to chance, or luck, but the way in which different and integrated measures have been put into practice across Sweden. In other words, the decline in child mortality due to injury is the result of effective safety management. Although school safety literature in Europe is diverse, the literature on school safety in the USA tends to be focused on school violence.

2.9 School Safety in the USA

School violence in the USA is a crisis which permeates through the media and consciousness of society (Mulvey and Cauffman, 2001). According to some, the level of concern over school safety has not yet reached such a level in other countries and school violence and safety in the USA is a major issue of concern and debate (Smith, 2002). The primary focus of school safety literature in the USA relates to school violence, although other definitions and aspects of US school safety are also covered infrequently in the literature.

In terms of school violence, one of the biggest areas of discussion in the USA is school shootings and gun crime. For example, there is lively debate about the effects of media on school shootings and other violent behaviours, which represent manufactured risks (De Venanzi, 2012; Borum, 2010). Other forms of school violence in the USA are primarily discussed alongside critiques of the communities these schools serve (e.g. Noonan, 2011). For example, Steinberg et al. (2011) investigate the

relationship between community poverty and depravation, suggesting that high crime and poverty in the community have direct links to the amount and type of school violence. Hirschfield (2008) extends this view and postulates that there is a strong relationship between a troubled domestic economy, unemployment, and disadvantaged minorities. These aspects have together led to the criminalisation of school violence and school safety, with an increasingly legal aspect to creating safe schools. In the USA, school safety is primarily a problem in cities and urban areas (Milam et al., 2010). While school safety in the USA is a controversial subject with significant debate, there is less school safety literature with a focus on Asia.

2.10 School Safety in Asia

Overall, in both Europe and the USA, there is a lively debate about school safety. In contrast, school safety in Asia is a topic with less discussion and an immature literature. There are serious considerations of school safety in some Asian nations, usually those that are more economically developed, such as Hong Kong, Japan or Singapore (e.g. Wong et al., 2011; Holt et al., 2013; Yamanaka, 1993). In other Asian countries, particularly developing nations, the school safety literature is far less mature, and consists mainly of NGO reports or activities to raise awareness of school safety.

The literature pertaining to Asian school safety relates more to developing safe practices and the involvement of wider society, rather than considering isolated issues of school violence. Disaster preparedness resulting from natural hazards is also a key topic in this area of the literature. This mainly relates to seismic safety, which is a key concern in South Asia. As a result of the seismic dangers in these areas, schools are frequently vulnerable places, and therefore considerable literature exists to try to respond and improve schools in terms of their safety given the seismic vulnerability (e.g. Shaw and Kobayashi, 2001). There are also wider debates in Asia about school safety, which relate to serious questions about economic development. Kabeer (2002) suggests that key questions about how countries develop, their policies of decentralisation, along with the contrast between rich and poor have significant impacts on the vulnerable in society, and by natural extension, on school safety. According to Arokiasamy and Krishnan (1994), increasing affluence and industrialisation in Asian countries such as Malaysia has resulted in a surge of injuries and safety issues. This surge has also resulted in issues with injuries at school, along with debates about how to improve education to match the increasing needs of economic growth and the expending knowledge economy. The increased affluence also means parents are beginning to take notice of safety issues at school, and have become more involved in issues of choice when selecting their child's school. Thailand

has also experienced this rapid economic growth, moving away from traditional agrarian and manufacturing activities to focus on knowledge as a driver of growth (Poorfaraj et al., 2011). The increasing growth in Thailand's economy has put pressure on its education system (Hewison, 2011), and this in turn has put pressure on issues of school safety in Thailand.

2.11 School safety in Thailand

Key to the research in this thesis is an understanding of school safety in Thailand. The literature review of safety in schools and the geographic variability has so far provided a comprehensive overview of what constitutes a safe school. This section of the literature review now considers more specifically, the current state and status of school safety in Thailand.

Schools and their leaders have a responsibility to provide a safe and healthy environment, yet although education is considered a fundamental human right (UN, 2012), in the determination to achieve education for all, Wisner et al. (2009) state that children in less developed countries are being put at risk. In Thailand, school safety lacks suitable governmental guidance and is dependent on the school's location, leadership, and financial status.

The recent upgrade of Thailand's economic status from lower-middle to upper-middle income economy (World Bank, 2011) is a reflection of the country's focus on economic growth over the previous decade. However, this focus on economic development is not reflected in the education system, and according to Hewison (2011), Thailand faces a shortage of skilled labour, a lack of innovation, and an education system that fails to deliver quality schooling. For education leaders, the result is a persistent focus on raising academic, vocational and technical skill, but a lower prioritization of issues such as school safety. For example, the 2009 economic stimulus package for education (MoE, 2009) presented 11 key projects, including teacher development, school quality, and school improvement but there was no specific mention of promoting safety, or developing and managing the school environment with regard to the health and safety of pupils. This highlights Thailand's focus in pursuing what it considers key aspects of education, while largely ignoring the critical aspects required to provide a framework for safety management and promotion in schools.

The lack of consistency in Thailand's approach to school safety means variance in the management and quality of safety at local, regional and national scales (Srichai et al., *in press*). This is partly due to governmental decentralization in Thailand, and the resulting dependency on individual provinces to effectively manage

education, which has meant school safety policies and guidelines are fragmented, and rely mainly on the stance of local administrative organisations. For example, Article 24, of Thailand's 2003 Child Protection Act states that district heads have a duty to protect children living within their jurisdiction, and the associated responsibility to inspect schools in terms of safety. As part of the same Act, Article 63 states that schools must provide guidance and training to promote safety, yet in reality, this is not common.

According to Garcia (2003) and the European Agency for Health and Safety at Work (2009), four functional components affect the management of school safety. These components are shown in Table 2.1, along with an assessment of Thailand's current position in achieving these based on a review of the appropriate literature and policies in these areas.

Table 2.1 : Safe school management components adapted from Garcia (2003) and EU-OSHA (2009) along with Thailand's corresponding status.

Components of management leading to a safe school (Garcia, 2003 and EU-OSHA, 2009)	**Thailand's Current Position**
Appropriate and dynamic legislation to facilitate the appropriate management of safety.	• Weak guidelines with no direct or explicit policy to promote safe schools, • A laissez-faire attitude and decentralization of responsibility to provincial authorities. Out-dated policy and guidelines. • Thailand's most recent Private School Act dates to 2007 and focuses only on establishing, managing and controlling the schools. There is no mention about maintaining school safety. • Rather than focus on enhancing existing government schools, the Thai government is rapidly expanding the number of schools. • There is too much bureaucracy/red tape meaning school policy and practice do not match. • Frequently changing governmental stance on education means continuing change and uncertainty in Thai schools.

Table 2.1 : Safe school management components adapted from Garcia (2003) and EU-OSHA (2009) along with Thailand's corresponding status. (Continue)

Components of management leading to a safe school (Garcia, 2003 and EU-OSHA, 2009)	**Thailand's Current Position**
Effective management of communication between all safety stakeholders (e.g. parents, students, staff community).	• Communication is highly variable and dependent on individual schools, including their management, finance and relationship with the local community. • The digital divide means the Internet and associated communication cannot be embraced by all. • Parents do not pay attention to school news/announcements. • Thai culture/habit is reactive rather than proactive, so proactive safety measures are not common. Education politicians and leaders do not have strong intentions to improve and work for political benefits and populism.
A safe environment achieved through effective school policy, which is designed, understood and enforced by school leaders.	• Highly variable and dependent on the individual school. • Private school administrators are aware of school safety, marketing strategy and best practice, but government school administrators pay less attention.
Curriculum management to include safety as part of lifelong learning.	• Thailand recognizes the importance of lifelong learning (e.g. Somtrakool, 2002), but not in terms of safety. • There are lessons about safety in the current curriculum, but these are very limited.

Table 2.1 indicates that in terms of safety, Thai schools currently suffer from a lack of government policy as well as fragmented and variable assistance from local administrative organisations. The result is that they must autonomously manage and design their own grass roots policies and approaches to safety, but often lack appropriate knowledge, experience and motivation. In ventures to remedy this,

external organisations and NGOs have attempted to promote and improve school safety in Thailand. For example, The Alliance for Safe Children (TASC) has implemented a safe school project to manage safety and reduce child injury, while the UNISDR launched the One Million Safe Schools initiative (UNISDR, 2011).

Perhaps unsurprisingly, there is also a significant difference in the safety approach between public and private schools. Private schools in Thailand often use safety as a differentiating factor when attracting new parents and students, and in a competitive market environment, schools must attract students to achieve sustainability (Smith, 1994). When choosing a private school, parents often visit to explore the school, search for information about educational management, and pay considerable attention to safety (Trump, 2012). The school selection process within the private education sector thus provides an additional financial impetus to ensure safety. However, school safety can be costly in terms of resources, time and processes, often making safety an unattractive proposition for schools. The biggest barrier to effective school safety for both public and private schools in Thailand is the creation of an effective management program to address safety. Safety in schools is often overlooked due to the significant management barriers and burdens, including cost, efficiency, organizational strain, and bureaucracy. From a global perspective, in terms of cost, Hull (2010) argues that budget cuts represent one of the biggest threats to safety in educational environments. This is particularly so for Thailand in attempting to balance conflicting demands on its education system (Witte, 2000). Effectively managing school safety is an issue of significant concern for schools in Thailand.

2.12 Managing School Safety in Thailand

Based on a literature review and in depth interviews with 15 leaders from schools in northern Thailand, seven key management barriers to effective safety management and implementation were identified in Thai schools, which are illustrated in Figure 2.4, and described in the corresponding sections. These barriers were introduced in Chapter 1, but are now discussed in more detail and within a wider and more detailed context.

Figure 2.4 Seven management barriers to effective safety in Thai schools

The seven management barriers represent key issues requiring attention if schools in Thailand are to effectively implement and sustain a focus on safety. In reality, these seven barriers could relate to any generic management activity, hence they are explained below, with more specific reference to school safety. Each of the seven components are described independently, but in reality, are inextricably linked.

- **Finance**

  Like any management activity, administering school safety has considerable financial implications, both in terms of the intrinsic cost of safety related activities in the school, and the opportunity costs of spending on safety versus other school needs, such as staff or academic development. The relatively intangible nature of risk minimization and effective school safety adds to the financial burden, and schools would often prefer to spend in more visible ways, especially private schools where attracting parents and students is critical to the school's sustainability.

- **Time**

Time is also a common aspect affecting any form of management, and managing safety in schools requires a significant investment in time. This is set against a backdrop of already constrained time faced by school leadership, staff and teachers.

- **Leadership**

Perhaps one of the most significant aspects of management is leadership, and developing appropriate safety strategies requires strong, committed leadership in order to promote safety and motivate all stakeholders in alignment with the safety strategy and policy of the school.

- **Communication**

Communication lies at the heart of effective leadership and is also a critical aspect of safety. Communicating safety issues throughout the school is an important aspect of managing safety and creating a safe school. Such communication requires appropriate management and strategy to ensure the perception of safety is not one of burden, but a realization of its vital importance to all stakeholders.

- **Stakeholder Understanding**

Effective safety requires the commitment and participation of all school stakeholders. While some stakeholders (e.g. parents) will be more willing to align themselves with safety policy, others (e.g. leaders and staff) may not fully understand the justification for safety, or may feel it adds to their workload.

- **Culture**

Risk taking and safety varies according to national cultures (Hofstede, 1991), and the Thai culture toward safety is markedly different from other more developed countries. While there is a well-established health and safety culture in Europe and the USA, the notion of health and safety in Thailand is still relatively nascent. This often means school management face resistance when attempting to implement safety in a culture where it is not necessarily considered important or necessary.

- **Commitment**

The six previously discussed management barriers all contribute to the issue of commitment. Effective safety requires the commitment of all involved, and achieving such commitment is a substantial management challenge.

These seven management challenges together create inefficiencies, waste and cost for management when attempting to design, implement and transform the school's approach to safety. A research problem therefore exists which requires the development of new ways of thinking about, approaching and managing school safety. The research in this thesis proposes that a lean thinking knowledge management approach could be used to develop, implement and transform school safety from a bureaucratic and inefficient process to a streamlined and sustainable part of schools.

In essence, the school is an organization, and the way this organization is managed has significant impacts on the value delivered to its stakeholders. Therefore the lean thinking framework in this thesis considers the school as an organization, and how it can effectively manage safety to reduce costs, waste and ultimately improve value to stakeholders. Before considering the origins and application of lean thinking and knowledge management, there is a need to understand the school as an organization.

2.13 The School as an Organization

The consensus surrounding research descriptions of schools is that they are primarily a social system, with relatively ordered and cohesive elements (Tyler, 2012). The analysis of schools as organizations has therefore most frequently been from a sociological perspective (e.g. Slavin, 2013; Woods, 2011; Elmore et al., 1996), which has sought to understand the interactions and relationships between people in the school, including teachers, students and parents. Despite research over the last few decades, according to Ball (2012), such research has resulted in very little understanding of how the school operates as an organization on a day-to-day basis. Eisold (2009) corroborates this, and suggests that schools contain a variety of conflicting aims, and are highly dependent on tacit or intangible aspects such as trust, communication, relationships and flexibility. For school safety, the interactions of people within the school are undoubtedly important, but little attention has been paid to the management of safety from the perspective of school leaders, the seven previously mentioned management barriers, and how the school can manage its safety on a day-to-day basis. By leveraging knowledge management and lean thinking, the research suggests that this new approach can be used as a management tool to improve school safety. Such an approach is critical given the growth of private schools both globally and in Thailand (Winkler and Rounds, 1996), which must be carefully managed to attract parents and students if they are to maintain competitiveness and remain sustainable.

2.14 Private vs. Government Education: School as a Business

Choice, competition and segregation are key issues with regard to schooling (Waslander and Thrupp, 1995), and as far back as the early 1980s, there have been debates and long-standing concerns as to the cost, effectiveness and fairness of schools (Hanushek, 1986). Along with such debates, the private education sector has grown, and more recent debate has focused on whether competition between schools improves student achievement (e.g. Hoxby, 2005; Dee, 1998). One of the key impacts private schools have had upon government and other public sector schools, is that they have created a competitive marketplace for education. The increase of private schools has been seen chiefly as a way to increase competition and raise standards, without requiring government intervention (Ball, 1993). While the effectiveness of this strategy of raising standards has been an issue of contention (Gamoran, 1996), the result has increasingly been that schools must compete for students and operate as if they are a business aiming to satisfy their customers (parents/students) (Goldring and Shapira, 1993)

This puts increasing pressure on schools as more than simply places to learn. Instead, they must be carefully and skillfully managed to ensure that parents and students are satisfied, and the school is sustainable. In less developed countries, the delineation between government and private schools is perhaps greater, and there has been considerable growth of what is known as the affordable private school (APS) (Andrabi et al. 2005).

2.15 Affordable Private Schools

According to Andrabi et al. (2006) there is a small revolution happening with regard to private schooling in South Asia. The rise of private primary schooling has led to an increase in choice, increased educational performance, and better results from public sector schools due to the increased competition. Affordable private schools also challenge the assumption that private schools serve only the upper classes and predominately provide for lower income families (Tooley and Dixon, 2003). Affordable private education is mainly a phenomenon is low income and developing countries where the government cannot provide free and effective education for all with its limited resources (Thorat, 2011). Here, affordable private schools bridge the gap between government provision of education and what is required by society. Although the majority of literature surrounding affordable private schools is from developing countries, the contribution of quality private schools offering education at an affordable price has been recognised in other regions, for example, Garnett (2010) suggests that governments in the USA should make quality private education cheaper

and more accessible for parents with low incomes in order to solve some of the wider education and community issues.

While the debates and issues surrounding affordable private schools are deep and varied, the ultimate effect of these affordable private schools is one of choice. By creating private schools which are affordable to those with modest means, there is a greater emphasis on choice when selecting schools (Garcia, 2013). In low income countries, this choice has begun to fuel general improvements in schools and education, challenging the assumption that the state should be the sole provider of free education (Dixon, 2013). The creation of a school marketplace means that schools must compete for students and satisfy the needs of their customers if they are to remain a sustainable and viable organisation or business. For issues such as school safety, the rise of affordable private schools and education choice suggests that these schools must take into account their safety in order to ensure they attract and meet the needs of their customers (parents and students). However, a key question is: how much attention do parents pay to school safety when choosing a school, and is it something that really matters to parents?

2.16 School Safety and Parental Choice: Meeting the Needs of School Customers

According to Halloran (2013), the marketing of school safety is a growing area, particularly in the USA where school crime and shootings have placed school safety in the public eye. However, while schools are keen to show they are taking safety seriously, they are doing so against constrained budgets, where spending on one thing often means sacrificing another. The economics of parental choice is an important factor for schools to understand, particularly private schools aiming to sustain or expand their business. Chakrabarti and Roy (2010) suggest that within the economics of parental choice, non-cognitive and non-tangible aspects such as school safety are of critical importance.

Parental choice is thus strongly affected by school safety, and the safety of a school is one of the key criteria parents use when choosing which school to enroll their children (Vassallo, 2000). Parental choice is not constrained to only more economically developed countries. For example, in Thailand, school safety is frequently used by parents when choosing a school. A survey involving five schools in Bangkok reported that 90% of parents see child safety as a critical issue(CSIP, 2007) and school safety can be considered integral to efforts to improve school quality (e.g. Furlong & Morrison, 1994; Verdugo & Schneider, 1999). According to Epple and Romano (1998), discontent with the primary and secondary education system has

become the norm in many countries which results in fierce debate over private versus government education.

School choice, and meeting the needs of parents means schools must understand their customers and continuously improve in order to remain competitive and sustainable. The safety of a school is a key part of this competitiveness and sustainability, and schools must effectively manage their safety. Schools must become learning organisations and share and manage safety aspects, which fits within the domain of knowledge management. Knowledge management therefore has significant potential to help schools manage their safety, and increase the satisfaction of parents.

2.17 Knowledge Management for School Safety Education to Feed the Knowledge Economy

Before outlining how Knowledge Management (KM) can be applied to school safety, there is a need to introduce and discuss knowledge management from a more general standpoint before moving to safety specific applications.

The concept of knowledge is broad, with a plethora of epistemological debates about the meaning of knowledge and how it can be effectively managed (Alavi and Leidner, 2001). Knowledge management is a subject which has a wide remit, reflected by a variety of definitions. The concept of knowledge management began to gain traction in the early 1990s, with Newman (1991) suggesting knowledge management is a collection of processes that determine the creation, utilisation and dissemination of knowledge. As the field of knowledge management progressed, further attempts were made to define the emerging phenomenon, including the widely cited definition by Davenport (1994), who stated in a clear way that knowledge management is simply about capturing, distributing and using knowledge. Early on in knowledge management debates within the literature, there were discussions about knowledge management and whether it is about knowledge sharing, or knowledge making. As the theoretical and practical aspects of knowledge management have become more closely linked, the definitions about knowledge management have grown more useful and McElroy (2003) suggests that in the second phase of knowledge management, there are two core aspects to the filed: supply side knowledge management and demand side knowledge management. Supply side KM relates to the increasing knowledge in an organisation through the traditional concepts of knowledge management including sharing, storing and codifying knowledge. Demand side KM moves beyond this to suggest that instead of enhancing the supply of existing knowledge, there should be strategies to enhance the capacity of individuals to produce knowledge. In reality, the definition of KM relies on how it is

used, and in what circumstances. The theoretical debates about KM have increasingly turned to practical uses and considerations of issues such as organisational learning, (e.g. Vera and Crossan, 2003; Senge, 1990), sharing and transferring knowledge within an organisation (e.g Dyer and Nobeoka, 2002), lifelong learning (e.g. McAndrew et al, 2004) and continuous improvement/organisational competitiveness (e.g Beckett et al., 2000). The wide array of expertise in the field of KM provides significant potential and opportunity to utilise KM to create an effective and holistic way to manage school safety. Indeed, knowledge management naturally fits many of the requirements of effective safety management, and the strong link between knowledge management and safety is now detailed.

2.18 Knowledge Management and Safety

Knowledge management and safety are a natural fit in terms of the way knowledge is a critical part of effective safety. According to Gherardi and Nicolini (2000), safety is a form of organisational expertise and has both tacit and explicit aspects as well as being tempered by physical, psychological and representational factors. In other words, to effectively transform and change an organisation's safety requires the appropriate knowledge, as well as the effective management of that knowledge.

There is a strong relationship between safety performance, safety culture, organisational culture, and safety knowledge. Knowledge is therefore a critical aspect of safety, yet there remains a distinct shortage of literature regarding the links between safety and knowledge, or how to manage safety knowledge. According to Neal et al. (2000), there are three main aspects to creating a safe organisation, categorised as antecedents, determinants and components. These aspects are illustrated in Figure 2.5.

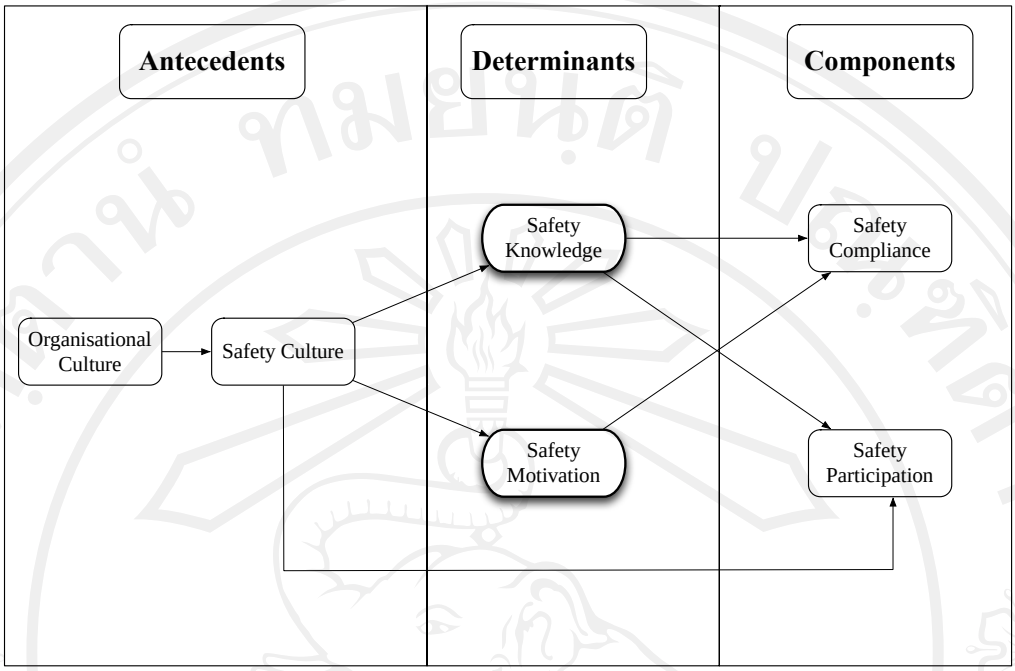

Figure 2.5 The three main aspects to create a safe organization (adapted from Neal et al., 2000)

2.18.1 Knowledge Management for Safety Antecedents

There are prerequisites for a school (or any other organisation) to be safe and these are known as the antecedents of safety. The key antecedents of a safe school are an effective organisational culture and secondly, an effective safety culture. Both the organisational and safety culture can be enhanced through knowledge management. Knowledge, skills and aptitude are critical to creating an effective organisational culture, and are all within the domain of KM (Martensson, 2000). However, the relationship between KM and organisational culture represents somewhat of a paradox. This is because KM is required for effective organisational culture, but an effective organisational culture is required in order to create an appropriate organisational culture. The result is that the link between organisational culture and KM is not always well defined. However, there is strong consensus in the literature that KM and organisational culture work together in a synergistic way. There is also acknowledgement that organisational culture and safety should work together in synergy. Carroll and Quijada (2004) report that organisational culture can be a key barrier to change and creating an effective safety climate. They cite issues such as teamwork, problem reporting, sharing and learning as key issues in organisational culture which are difficult to adjust and which have significant impacts on safety. In all these areas, KM can offer solutions,

for example it can enhance knowledge sharing, organisational learning, and provide solutions to knowledge capture, which can be used in problem reporting.

The organisational culture therefore feeds the safety culture, or safety climate as it frequently described. Gulden mound highlights that there has not been much consensus about how best to manage organisational and safety culture, and suggests there is a lack of models and a need to bring together these two antecedents of a safe organisation (Guldenmund, 2000). Organisations can embed and embrace KM in order to create an appropriate organisational culture, and an effective safety climate (Rowley, 1999).

2.18.2 Knowledge Management for Safety Determinants

The key aspects influencing safety in a school or organisation are appropriate safety knowledge and the motivation to create a safe organisation. The motivation to create a safe school or organisation is obviously one of the key determinants of how safe an organisation is. The other key determinant is safety knowledge. Without appropriate safety knowledge, a school or any other organisation cannot become safe. In terms of safety knowledge, there are two key aspects: tacit and explicit. It is critical to capture these tacit aspects of safety knowledge in order to create a safe organisation (Hadikumsumo and Rowlinson, 2004). Tacit knowledge was first intorudced by Polanyi (1983) who suggested that we can know more than we can tell. In terms of safety, tacit knowledge refers to safety knowledge that is known by individuals throughout the organisation, but is difficult to codify or transfer (Hallowell, 2012). Such data might include reactions to safety situations, or how to mentor staff to become safe in their duties. It is critical for a safe school to manage the tacit components of school safety and to effectively share and transfer such tacit knowledge throughout the school.

The second type of safety knowledge is explicit knowledge. This type of safety knowledge might include the school processes and safety rules and regulations. However, the regular update, maintenance, storage and sharing of such knowledge remains a challenge, to which KM is well suited. Overall, both tacit and explicit aspects of safety knowledge are critical to the creation of an effective school, but both these aspects of knowledge require effective management. Figure 2.6 shows via the iceberg model, the tacit and explicit aspects of school safety. The iceberg model represents the fact that like an iceberg, a large proportion of safety related knowledge is unseen (tacit), but

this does not make it less important. The other explicit aspects of safety are visible within the organisation.

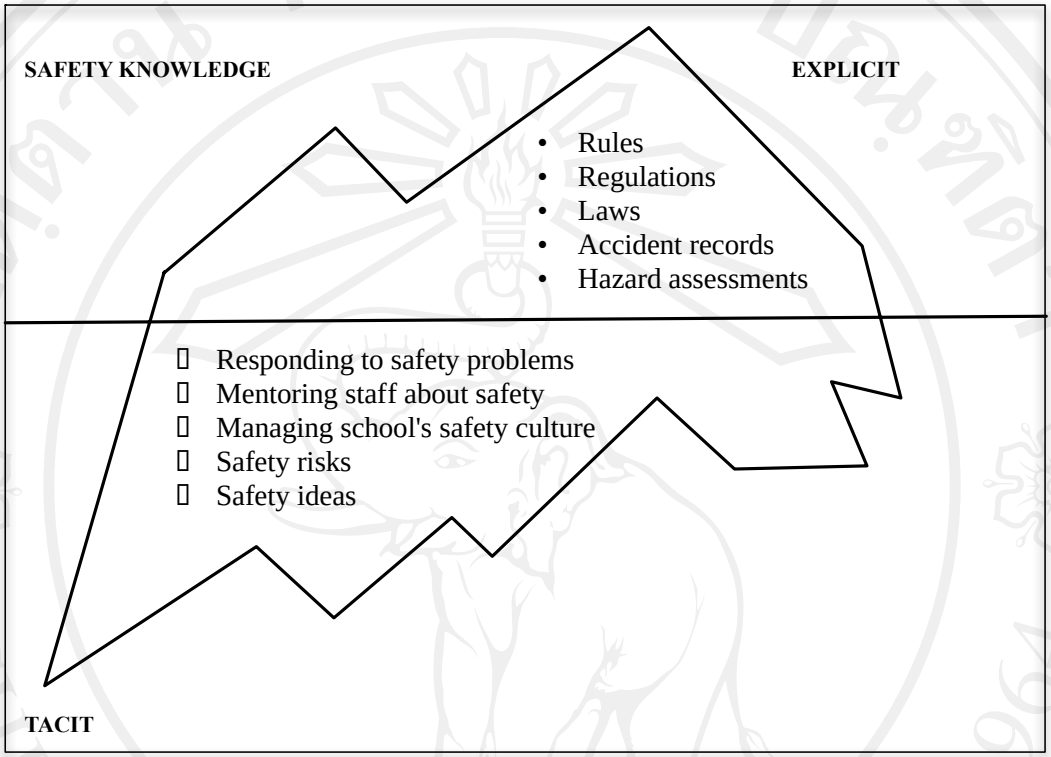

Figure 2.6 Iceberg model of tacit and explicit of safety knowledge

2.18.3 Knowledge Management for Safety Components

The key parts of safety are ensuring everyone participates to become safe and complying with any regulations or law regarding safety. The previously noted safety antecedents and determinants come together in order to ensure the safety components are met, which are firstly making sure that any safety compliance issues are met, and secondly ensuring that everyone participates in safety. If the safety antecedents and determinants (sections 2.18.1 and 2.18.2) are appropriately met, then it follows that the components of a safe organisation (i.e. safety compliance and participation) will also be appropriately met.

2.19 Knowledge Management for School Safety

The importance and difficulties of managing school safety create a complex situation for schools, especially those with limited budgets or who lack understanding about safety. One of the potential solutions to this is to utilise knowledge management to enhance the administration of a safe school.

As noted above, knowledge management has a key role to play in creating a safe organisation and ensuring the tacit and explicit aspects of knowledge are addressed. However, schools are increasingly faced with bureaucracy and waste, with difficult and convoluted processes. This research therefore suggests that the potential of KM a could be linked with lean thinking in order to create a highly effective way to manage and administer a safe school.

2.20 Managing School Safety: The Potential of Lean Thinking

Both the literature and practical reports suggest the same thing about school safety: it is often bureaucratic, wasteful, and considered a secondary or more peripheral aspect of a school's success. Part of this perspective comes from the intangible nature of school safety, as shown in the literature defining school safety, which is varied and does not point to a single easy to digest definition of safety. The variability of the discourse on school safety means the most effective ways to manage school safety are also varied. One method which has not been applied to school safety is lean thinking, yet this has potential to reduce the key problems in managing school safety, especially when linked to the KM approach.

2.21 Origins of Lean Thinking

Lean thinking has its roots in lean manufacturing, which was a method established by the Japanese car manufacturing industry, particularly Toyota. Lean manufacturing emerged as a new method to supersede mass production and according to Womack and Jones (2003), in the late 1980s and early 1990s, organisations, managers, employees and investors were stuck in the old-fashioned ways of mass production. According to Liker (1997) there is a better way in which to organise and manage all aspects of business including customer relationships, the supply chain, product development and product operations. The method, which was pioneered by Toyota, is known as lean production, or sometimes, the Toyota Production System (TPS).

Holweg (2007) explains that the advent of lean production signified the start of a wider realisation that there is something beyond the high volume and repetitive manufacturing environment. Lean resulted in careful thinking about the relationship between productivity and quality. In the 1980s, prior to the advent of lean thinking as a method of production, mass production had been heralded as the only way to produce things, and there were related debates about how the mass production of cars had shifted whole sections of society, resulting in the concept of Fordism. Prior to lean, Ford initiated the one-car-per-minute production model in 1914, which in turn put pressure on competitors and other businesses to move beyond craft production and compete with aspects of mass production (Shioni and Wada, 1995). According to Duguay et al. (1997), the 1980s marked the end of US dominance in mass production, and a move toward flexible and agile methods of production such as lean. The origins of lean can be traced to the factory floors of Japan, and innovations at Toyota (Shingo, 1989). However, Womack et al. (1990) argue that the development of lean was mainly due to necessity, and as a way to compete rather than a carefully considered theory which was planned, and put into practice. Others argue that lean is not the only way (e.g. Berggren, 1993; Florza, 1996), and that there are other ways of producing that are not related to lean. Despite some of these doubts over lean as the ultimate method of production, lean thinking has gained traction as a formidable way to produce, and has spawned a variety of tools and an equally varied number of organisations who have decided to adopt lean production.

2.22 Lean Thinking Benefits

Lean is not just about changing a few steps or using a few tools, lean is about complete organisational change and changing the whole process, not just a part of it (Melton, 2005). As such, lean offers significant benefits to organisations who are able to successfully implement a lean approach. However, while there are clear benefits and examples in the literature, according to Bhasin and Burcher (2006), there is a need to view lean thinking as a strategy rather than simply a set of tools or processes. This suggests that lean thinking must be embraced from a wide perspective, and across the whole organisation, rather than considering it as a simplistic tool to solve an isolated problem. There have been a number of successes in the application of a lean thinking philosophy, and these are now discussed to provide some insight as to how lean could be applied to school safety.

2.23 Lean Thinking Applications

After the successes experienced by practitioners of lean manufacturing, the concept of lean thinking, and has subsequently borrowed from the original concepts in order to apply the tenets of lean to the service sector (Stone, 2012).

According to May (2005) productivity in the service sector currently lags significantly behind manufacturing. This has resulted in a variety of service-oriented industries and corporations turning to lean thinking to improve their business practices (e.g. Jaca et al., 2012). However, as well as private sector businesses, there has been wide interest in the application of lean to healthcare (Neufeld et al., 2013). The application of lean to healthcare (and other service sector organisations) has shown that the concepts of cutting waste, bureaucracy, and increasing the amount of value added time, are universal, and not just for manufacturing industries. The universal principles of lean mean that it could justifiably be applied to school safety in order to cut waste and increase the amount of value added time spent on safety related processes. This echoes sentiments by Womack and Jones (1996) who believe that the car manufacturing industry is fundamental to many aspects of society, and that principles originating in lean manufacturing have relevance not just to traditional industry, but to all sectors.

Lean thinking has made a significant impact in both academic and industrial applications, and has been utilised in a wide variety of sectors beyond simply automobile production (Hines et al., 2004). However, it has also faced criticism, particularly for its lack of human integration, and its fuzzy boundaries, and lack of definition. Therefore, while the utility of lean is clear from empirical research and practical application, there is debate about some aspects of lean which are lacking, thus in this thesis, the weaknesses of lean thinking are recognised in order to enhance the utility of lean thinking. A synergy between lean thinking and knowledge management is proposed, which suggests knowledge management has the capacity to leverage the strengths of lean thinking, while also solving the issues and problems associated with a lean thinking approach.

The key strengths of lean thinking can be combined in synergy with KM in order to create a new way of administering a safe school. The lean management approach has been used in a variety of settings to effectively tackle issues of cost, inefficiency and waste, but so far has not extended to educational management. The main conjecture from this chapter is that lean thinking management tools can be combined with KM to effectively address issues of school safety in Thailand, and potentially beyond. While the literature has so far focused on the research context and underlying concepts, the final section underpins these by introducing some of the key literature behind the main tools used in this thesis. These include the analytic hierarchy

process (AHP), unified modeling language (UML) and specific lean tools including value stream mapping, the three main lean precepts (muda, muri, mura).

2.24 Literature Review of Research Tools

2.24.1 The Unified Modeling Language (UML)

Processes are critical to managing school safety, and one of the key tools used to map these processes was the unified modeling language (UML). The UML is a standardized and general purpose modeling language, which has its origins and primary use within the field of software engineering (Hamilton, 1999). The key aspect of UML is that it consists of a family of graphical notations that are backed up by a single meta model, and while its origins are in the field of software engineering it has expanded to become useful to many people in a variety of fields (Fowler, 2004). For example, Eriksson and Penker (2000) suggest that UML is a powerful way to improve a business, by creating a model, which simplifies a complex real world.

The shift away from UML as simply a tool for software engineering has continued, with many realizing the power of UML at representing complex aspects of the business. For example, IBM (2003) state that a visual model of a business can result in powerful insights and go on to show that UML does not belong solely in the domain of software engineering.

UML represents a set of semantics for creating formal and structured models of business processes (Kalnins et al., 2004). Chapter 3 outlines in more detail how UML has been adjusted and applied to the processes of school safety at the case study school, but it is worth illustrating the breadth of application of UML via an exposition of some examples from the literature.

In terms of safety, UML has been used on several occasions to reduce safety risk within processes and systems. For example, Jürjens (2003) states that the precision of UML and its standardization provide a useful foundation for modeling safety processes. Pap et al. (2001) go on to show that UML is necessary given the increasing complexity of systems, processes, and the associated level of safety. In Thailand, UML has been utilized in order to show key relationships processes in the activity of rice production (Naivinit et al., 2010). The UML has also been applied to natural resource management in Thailand (Bousquet, 2005). What is clear from the literature is that UML is one of the most useful and well-used tools for modeling complex real world

business processes (Selic, 1998). In this work, the UML is used to model complex systems of safety in the school, and is combined with other tools in order to reduce complexity and solve the issues highlighted by the UML models. The next section introduces the analytic hierarchy process (AHP), which is used to solve some of the issues shown in the UML activity diagrams.

2.24.2 The Analytical Hierarchy Process (AHP)

The analytic hierarchy process (AHP) decomposes a complex problem into a multiple hierarchical structure in order to assist in making decisions (Saaty, 1990). AHP was first described by Saaty (1977) within the field of decision science, and has continued to expand and find use in a wide variety of decision making applications. The complexity and frequency in which decisions are made by individuals and organizations means that AHP has become a popular and well regarded method of making decisions and reducing the complexity associated with making such decisions. The variety of AHP applications is as wide as the concept of making a decision (Vaidya and Kumar, 2006) and includes a wide ranging and diverse range of applications in the literature.

More recently, there have been modifications and adaptations of the AHP model to create decision support systems (DSS) which are capable of handling significant complexity in order to assist with making a decision. In this thesis, one of the key research problems relates to the sheer number of safety suggestions given to the school by parents. Each suggestion must then be assesses, and a decision made about whether to implement or reject the suggestion. Making decisions about the school safety suggestions and choosing which to select and which to reject is complex, and fits the multi criteria domain of AHP. AHP is therefore used in this research to reduce the decision making complexity when dealing with parental suggestions.

2.24.3 Lean Tools

While the literature has so far described the theoretical background and origins of lean, this section presents the more practical tools associated with lean. The application of these tools to the case study is described in more detail in Chapter 3, but the core components of lean are now introduced.

2.24.3.1 Value Stream Mapping (VSM)

Value stream mapping (VSM) is a lean technique that is used to analyze and design the flow of information required to bring a product or service to a customer (Rother and Shook, 2003). As with other lean techniques, the origins of value stream mapping can be traced back to Toyota, where the technique was known as 'material and information flow mapping'. The origins within manufacturing are now obscured by the many varied applications of VSM, including logistics, office applications, healthcare and the service industries.

Value stream mapping provides a detailed understanding of the processes involved in a particular activity and identifies all the value adding and non-value adding steps so that waste can be eliminated and the process improved (Lee, 2001). Value stream mapping is an instrument which is systematic in the way it identifies and then eliminates waste (Masadynski, 2007). Key findings from the literature are that value stream mapping is a valuable tool not just from a theoretical perspective, but a practical one too (Lasa et al., 2008). In line with the practicality of VSM, a range of case studies exist in the literature showing how VSM can enhance organizational process to deliver more value to the customer and eliminate cost, waste and other forms of inefficiency. According to Jones and Womack (2002) value stream mapping is about learning how to see particular processes within an organization in order to identify how to improve them. To achieve this, the value stream map has two main components; firstly, the mapping of the current state, and secondly, the design of a future state map. When assessing the current state map in order to generate improvements for the future state map, a variety of other lean tools can be used to help eliminate waste and maximize the efficiency of the processes.

2.24.3.2 Muda, Muri and Mura

The three Japanese terms of muda, muri and mura are often described as the central components of lean (Womack et al., 1990). Together these provide a focus when attempting to improve existing processes. Muda is the Japanese term for waste, and when applied within the framework of lean, it includes seven main wastes, which are as follows:

1. Motion
2. Waiting time
3. Over production
4. Processing time

5. Rejection (defects)
6. Inventory
7. Transport

Each one of these wastes is considered in relation to the value stream map and the organizational process, whether in the domain of manufacturing or the service sector. These seven wastes are also strongly linked with mura, which is the Japanese term for unevenness.

Mura (unevenness) relates to process fluctuations in terms of time, quality, or any other variation within a process. If mura is not reduced in a process, it raises the possibility of increasing muda (waste) or muri (overburden).

Muri (overburden) frequently arises due to muda or mura, and leads to problems with machines or employees. In the service sector, muri relates to employees being overburdened due to too many activities or too much time spent on particular activities. The current state value stream maps help to identify muda, muri and mura in current processes and activities before developing a future state map which attempts to eliminate them. One of the other key lean tools to eliminate muda, mura and muri is the 5S tool.

2.24.3.3 The Five S Tool (5S)

5S is the name of workplace organization methodology originating and maintaining a central position within the lean framework (Chapman, 2005). As with muda, mura and muri, the 5S originate from Japanese terms, which are as follows: seiri, seiton, seiso, seiketsu, and shitsuke. Translated, these terms can be described as follows:

1. Sorting
2. Straightening (setting in order)
3. Systematic cleaning (shine)
4. Standardizing
5. Sustaining

Sorting involves sorting items or processes that are needed or not needed. Straightening involves putting things in an appropriate place and ensuring they are arranged effectively. Shining means cleaning the workplace, while standardizing means ensuring consistency throughout processes. Sustain pertains to making sure that the earlier 5S steps are continuously followed to sustain the earlier improvements.

2.24.4 The Lean Tools for the School Safety Suggestion System

One of the primary candidates for improvement via the lean tools are the school's safety suggestions, which are currently not effectively managed. The large number of suggestions coming from school parents creates burden for the school's staff, teachers and management. There is no consistent process at present, and it appears as if all aspects of lean could be applied to improve the safety suggestion system. In Chapter 3, the methodology of applying AHP and the lean tools to the safety suggestions is described in detail and shows how it is an ideal technique to improve upon the current method of managing parental suggestions.

2.25 Chapter Summary

This chapter has outlined key literature needed to understand the research problem and design the solution. It has considered the meaning of school safety worldwide, and particularly in Asia and Thailand, focusing on what makes a school safe, and what school safety means to different school stakeholders. It has shown that the key issues with school safety can always be traced back to school leadership and management, but has also indicated that school leaders are often unprepared to invest financial and human resources into school safety, which is most frequently a less visible aspect of school safety. In developing countries, this affects school safety even more, where school leaders are under pressure to improve academic rather than other secondary aspects of school safety. The review of the literature has also shown that there is a rise in the phenomenon of the affordable private school, which often plug the gap between government provision and educational needs in developing economies. For private schools, safety is even more critical, with parents acting as customers of the school, and frequently having access to choice when selecting their child's school. The literature review then considered how knowledge management is a key aspect of safety, and should be part of any effective school safety management system. The key elements of knowledge management such as organisational learning and knowledge sharing have been shown as critical to effective school safety. Finally, the chapter has considered how lean thinking should also be a key part of school safety, where issues such as cost and waste are preventing effective school safety, lean thinking has been shown as having significant potential to reengineer the school safety processes and cut out unless ray waste, bureaucracy and cost. The next chapter now brings this theoretical background and literature together to create a practical methodology aimed at creating the lean knowledge management approach to school safety.

The key findings emerging from this literature review can be summarized as follows:

- Lean thinking should be combined with KM and applied to school safety in order to assess the potential of the lean thinking knowledge management approach.
- It is evident that school safety is a key marketing tool, which can add value and should be leveraged to affect parental (customer satisfaction).
- School safety should not necessarily be a burden and does not have to detract from other important aspects of the school and its management (e.g. academic achievement). This is despite the notion that safety is less important in developing countries.
- Lean thinking offers a comprehensive and useful framework to assess the current situation of safety in schools and is not only a gimmick.
- Developing countries should embrace, not ignore school safety, and lean thinking can enable them to do so by addressing fears related to cost, bureaucracy and waste .
- Schools should learn from industry and service sectors and must improve the service given to parents and students. Lean thing can provide a starting point for this to happen and thus improve competitiveness of schools.
- Lean thinking can raise awareness about safety related processes, and shows that to master a school's safety is firmly in the domain of the school's leadership and management, thus lean thinking and KM are well suited to helping school management achieve effective school safety.