KNOWLEDGE SHARING AMONG MALAYSIAN SMART SCHOOL TEACHERS

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by

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TABLE OF CONTENTS

LIST OF FIGURES

Page

LIST OF TABLES

Page

GLOSSARY

combination knowledge creation process	The combination mode of knowledge creation deals with the combination of explicit knowledge obtained from different disciplines in order to come up with new explicit knowledge (Nonaka & Takeuchi, 1995).
explicit knowledge	Knowledge that is easily articulated and often represented in a tangible format such as in published materials, visuals, audiotapes or product specifications (Nonaka & Takeuchi, 1995).
externalisation knowledge creation process	The externalisation mode of knowledge creation deals with the conversion of tacit knowledge into explicit knowledge (Nonaka & Toyama, 2003).
internalisation knowledge creation process	The internalisation mode of knowledge creation deals with the conversion of explicit knowledge into tacit knowledge (Nonaka & Toyama, 2003).
kiasu	A term in Hokkien Chinese dialect referring to the fear of losing out behaviours exhibited by individuals (Ambrosio, 2000).
Multimedia Super Corridor (MSC)	The Multimedia Super Corridor is Malaysia's national ICT initiative designed to attract world-class technology companies while grooming the local ICT industry to spearhead the nation's transformation towards a knowledge economy since its launching in 1996 (MSC Malaysia, 2010).
smart school	Schools that capitalize on leading-edge technologies to facilitate the changing role of teachers in the electronic classroom that employ student-centred learning approaches (Azizah Ya'akob, Nor Fariza Mohd Nor, & Hazita Azman, 2005).
Smart School Management System (SSMS)	An integrated information system that assists in the management and administration of the school, student affairs, educational resources, finances, human resources, external resources, facilities, technology and hostel facilities was developed and deployed in all smart schools (Smart School Task Force, 1997a).

Smart School Qualification Standards (SSQS)	A benchmarking standard developed by the Ministry of Education to evaluate smart schools based on four factors – utilisation (40%), human capital (40%), infrastructure (10%) and application (10%) (Chapman, 2007; Ministry of Education, 2011).
social network	The structure of relationships linking social actors (Marsden, 2000).
socialisation knowledge creation process	The socialisation mode of knowledge creation deals with the conversion of tacit knowledge to tacit knowledge (Nonaka & Takeuchi, 1995).
structural hole	The empty spaces in social structure that result from the social actors not having a tie between them (Burt, 2000).
tacit knowledge	Knowledge that is difficult to articulate, formalise or share with others (Polanyi, 1966).
T-shaped skills	Skills that are both deep in terms of a particular discipline and broad, crossing across several discipline areas (Leonard-Barton, 1995).

PERKONGSIAN PENGETAHUAN DI KALANGAN GURU-GURU SEKOLAH BESTARI MALAYSIA

ABSTRAK

Projek sekolah bestari telah diasaskan sebagai salah satu dari projek utama untuk pelan pembangunan kebangsaan Malaysia iaitu Wawasan 2020 yang bertujuan untuk menjadikan Malaysia sebuah negara maju pada tahun 2020. Oleh kerana perubahan pesat yang dihadapi oleh sektor pendidikan negara, guru-guru sekolah bestari perlu senantiasa menambahbaik dan mengemaskini pengetahuan mereka agar dapat menjalankan tugas mereka dengan efektif di dalam sekolah bestari. Namun begitu, didapati bahawa tahap perkongsian pengetahuan di kalangan guru-guru sekolah bestari adalah rendah dan ini akan menjejaskan pencapaian objektif projek sekolah bestari. Oleh itu, tujuan utama kajian ini adalah untuk mengenalpasti sebab-sebab guru-guru tidak berkongsi pengetahuan dari perspektif pengetahuan yang disebarkan, proses-proses penghasilan pengetahuan, dan faktor-faktor mempengaruhi perkongsian pengetahuan. Kajian ini telah menggunakan kajian kes eksploratori untuk mengumpul data dari sebanyak tujuh buah sekolah bestari dengan melibatkan seramai lapan puluh tiga orang responden. Berdasarkan analisis data yang dikumpul melalui kajian kes, didapati bahawa ciri-ciri pengetahuan yang dikongsi dan diterima semasa proses perkongsian pengetahuan ini akan mempengaruhi keputusan pemberi dan penerima pengetahuan sama ada untuk mengongsi atau menerima pengetahuan tersebut. Tambahan pula, proses penghasilan pengetahuan yang paling lazim adalah proses kombinasi manakala proses sosialisasi merupakan proses yang paling kurang. Faktor-faktor yang mempengaruhi perkongsian pengetahuan yang dikenalpasti termasuklah faktor kepimpinan, sifat *kiasu*, aplikasi ICT, rangkaian sosial dan kemahiran berbentuk T. Oleh itu, sekolah-sekolah bestari perlu mempertingkatkan proses penghasilan pengetahuan masing-masing untuk menggalakkan perkongsian pengetahuan di kalangan guru-guru mereka.

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ABSTRACT

The smart school project was mooted as one of the flagship applications for Malaysia's bold Vision 2020 national development objectives aimed at achieving a developed nation status by 2020. Due to the rapid changes faced by the education sector, the smart school teachers need to constantly enhance and update their knowledge function effectively in the smart schools. However, it has been found that the level of knowledge sharing among smart school teachers is low and this leads to problems in realising the objectives of the smart school project. Therefore, there is a need to examine the lack of knowledge sharing of these teachers. Hence, the key aim of this study is to identify the reasons why teachers do not share knowledge among themselves from the perspective of the knowledge being transmitted, the knowledge creation processes used and the factors influencing knowledge sharing. The study utilised an exploratory multiple case study design method to collect the data from a total of seven smart schools involving eighty three interview respondents. Based on the analysis of the data gathered from the case studies, it is revealed that the characteristics of the knowledge being shared and received during the knowledge sharing process influences the decision of both the sharer and receiver on whether to share or receive the knowledge. In addition, the knowledge creation process that is most common is the combination while the least common mode is the socialisation. The factors influencing knowledge sharing were identified as leadership, *kiasuism*, ICT tools, social network and T-shaped skills. This therefore indicates that the smart schools need to enhance on their knowledge creation modes to further encourage knowledge sharing among its teachers.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This study examines the knowledge sharing practices among the Malaysian Smart School teachers. More specifically, it examines the processes used by these teachers to create and share knowledge. It also looks at the characteristics of the knowledge and how these characteristics affect the sharing and receiving of knowledge among the smart school teachers. Next, it explores the various facilitators that may influence the knowledge sharing process which include culture, ICT and structure, and the individual.

This chapter will begin by providing a background of the Malaysian Smart School Project and the challenges faced by the smart school teachers in terms of knowledge. After that, the research problem and research questions shall be presented, followed by a statement of the research objectives. A brief description of the research method employed is presented which is then followed by an outline of the study's significance and delimitations of scope. The final section of this chapter shall outline the organisation of this thesis and briefly describe the contents of each of these chapters.

1.2 Background

The fourth Prime Minister of Malaysia, Tun Dr Mahathir Mohamad (1991) boldly unveiled his visionary strategic plan to transform Malaysia into a fully developed country by the year 2020 in which he charted the pathway to this goal as well as the challenges that lie ahead in order to attain development without being a mere duplicate of the other developed states in the world. Instead, the former premier wanted Malaysia to be a developed country in a distinctly Malaysian way in which he termed as being developed '… in our own mould' . Central to the Vision 2020 is the idea of holistic development of the nation from the economic, political, social, spiritual, psychological and cultural aspects that will ensure that all Malaysians will enjoy a good quality of life, social justice and national confidence (Mahathir Mohamad, 1991).

Looking at the experience of the economic miracles of the past, '… it is blindingly clear that the most important resource of any nation must be the talents, skills, creativity and will of its people' (Mahathir Mohamad, 1991). Having identified that the people are the key resource towards attaining the Vision 2020, the government then emphasised on the development of its human capital. Although it has been acknowledged that Malaysia has among one of the best education systems in the developing world, there was an exigent need to have a make-over of the next generation, making it a need to set new standards for the national education system that will yield new results (Mahathir Mohamad, 1991). This new generation of Malaysians need to have the highest standards with regard to their skills, to their devotion to knowledge and to continual knowledge acquisition and upgrading.

To this end and in cognisance of the need for effective human capital development via a dynamic and holistic education system as it moves towards a developed-nation status by the year 2020, the Malaysian government has embarked on a move to redesign the primary and secondary education system by making them 'smart' by equipping schools with computers and multimedia courseware to enhance the teaching-learning process (MSC Malaysia, 2010). The ultimate goal of the Malaysian smart school initiative is to transform all schools in the country to become smart schools by 2010 (MSC Malaysia, 2010).

During the genesis of the Malaysian smart school initiative, the Smart School Task Force (1997a, p. 10) defined a Malaysian smart school as '… a learning institution that has been systematically reinvented in terms of teaching-learning practices and school management in order to prepare children for the Information Age' . Apart from that, the smart school will continue to evolve over time, thereby developing its professional staff, its educational resources, and its administrative capabilities to allow the school to adapt to changing conditions, while continuing to prepare students for life in the information age (Smart School Task Force, 1997a).

The smart school initiative aims to contribute to Malaysia's Vision 2020 by being a catalyst to the growth of the ICT industry and creating a well-qualified pool of professionals in addition to preparing Malaysians for the information age through an innovative education delivery process (MSC Malaysia, 2010; Smart School Task Force, 1997b). Regarded as one of the most forward-looking ICT-mediated learning initiatives in the world, the Smart School Initiative attempts to reinvent the teaching-learning processes (MSC Malaysia, 2010; Smart School Task Force, 1997b). The smart school initiative is premised on the belief that ICT is a key enabler in

imparting the desire for learning to every Malaysian (MSC Malaysia, 2010; Smart School Task Force, 1997b).

Capitalizing on leading-edge technologies and the rapid deployment MSC Malaysia's technological infrastructure to jumpstart the deployment of enabling technologies in schools, the smart school project aims to facilitate the changing role of teachers in the electronic classroom from that of mere information providers to facilitators whose main role is to assist students in developing their know-how and judgement to select information that they need to accomplish their tasks (Azizah Ya'akob *et al.*, 2005).

The smart school initiative will witness a radical transformation of the education system in Malaysia where a constructivist approach shall take precedence over the traditional objectivist approach that the existing education system is based upon (Muhammad Z.M. Zain, Hanafi Atan, & Rozhan M. Idrus, 2004). In essence, the smart school initiative aims to provide for a conducive schooling environment that fosters creativity, innovation and thinking which is essentially learner-based (Smart School Task Force, 1997a). With this new approach to schooling and learning, students will be immersed in an environment that embraces information and communication technology (ICT) that would allow for self-discovery and self-paced learning that suit the varied needs of each student. In tandem with this change, teachers need to ensure that their pedagogic practice is relevant and meaningful to students (MSC Malaysia, 2010; Muhammad Z.M. Zain *et al.*, 2004).

With this paradigm shift, constructivist teaching-learning activities that are self-directed, collaborative, learner-paced, continuous and reflective utilising teaching a variety of teaching materials such as printed books, multimedia, software, interactive courseware, the Internet and databases shall be the main focus of these smart schools (El-Halawany & Huwail, 2008; Smart School Task Force, 1997a). The student-centred approach in these smart schools will therefore result these schools and its teachers deploying an appropriate mixture of different learning strategies that would cater to individual student needs, recognising diversity of students with the aim of attaining holistic development for the students (El-Halawany & Huwail, 2008; Ong, 2006). Due to these profound changes in the way teaching is done in the smart schools, more often than not requiring teachers to enhance their professional knowledge to meet the demands of accommodating the changes in teaching and learning as well as a range of their administrative matters, there is therefore an exigent need to appreciate and understand the issue of knowledge sharing among teachers in these smart schools which will be addressed in the following section.

The Malaysian Smart School initiative presents a major paradigm shift in the way our students are being educated in order to develop a competent and capable generation of Malaysians to spearhead Malaysia's march towards the knowledge economy and aim of being a developed nation in her own mould (Mahathir Mohamad, 1991; Ministry of Education, 2011). The teachers in the pilot group of smart schools in Malaysia which began their 'smart' journey in 1999 experienced a great deal of change and with it challenges to embrace new approaches to teaching and learning, utilization of ICT in the classroom and the need to enhance their professional knowledge and skills (Ministry of Education, 2011).

With the major changes in the way teaching and learning is conducted in the smart schools, teachers will therefore need to create learning conditions that will promote self-directed learning by students (Azizah Ya'akob *et al.*, 2005). In addition to that, it was found that too few teachers were trained in the field of courseware development and these skills are not being effectively cascaded to the school community, resulting in the continuous need for the Ministry of Education to provide training which would undoubtedly be an expensive and unsustainable approach to the issue (Azizah Ya'akob *et al.*, 2005).

To further exacerbate the issue many teachers were of the opinion that the courseware supplied to them by the Ministry of Education were not sufficient for their teaching purposes, thereby requiring them to come up with their own customized courseware which many of them are not trained to do (Azizah Ya'akob *et al.*, 2005). Therefore, while teachers are adequately trained and comfortable in terms of subject content they face difficulties when it comes to their technological pedagogical content knowledge (Azizah Ya'akob *et al.*, 2005; Koehler & Mishra, 2005). This issue is also supported by the findings of another study which found that while smart school teachers have positive beliefs on the use of ICT in education, they were not able to translate these into their actual teaching practice in the smart schools (Seri Rahayu Hamid, 2011).

Whilst the Ministry of Education organises formal professional development training programmes to develop the skills and competencies of these teachers, a chief issue that emerges is the need for effective knowledge sharing of these skills

and knowledge acquired within the smart school, more specifically, among its teachers (Ministry of Education, 2011). Similarly, advocates of school effectiveness and renewal strategies such as Hargreaves (1999) and Fullan (2002) stressed on the need to encourage knowledge sharing among teachers in schools and for schools to embrace knowledge management approaches to effectively respond to the needs of the teaching profession.

1.3 Research problem

According to the former Minister of Education, Datuk Seri Hishamuddin Tun Hussein, since the government has invested billions of ringgit to develop these smart schools, there was a need to audit the pilot batch of smart schools to identify the infrastructural and human capital issues that need to be addressed by the government in the future (Raslan Baharom, 2006). This would allow the fine-tuning of future budget allocations for the development of smart schools. To this end, the Ministry of Education has come up with a benchmarking system to assess the attainment of these smart schools which is known as the Smart School Qualification Standards (SQSS) that evaluates smart schools based on four factors which are utilization, human capital, infrastructure and application with the first two factors contributing 40% each and the latter two factors 10% each (Chapman, 2007; Ministry of Education, 2011). Based on the scores obtained, the smart schools would then be rated from one (basic) to five (advanced plus) stars (Ministry of Education, 2011).

In the first SQSS benchmarking exercise conducted in 2007, the results were not encouraging as 41 out of the 88 smart schools were rated at one or two stars only, to

which Dr Norizan Razali, the MSC Malaysia senior manager for smart schools explained would receive special attention to bring them up to at least 3 stars (Chapman, 2007). Apart from that, she also stressed that special emphasis would also be given to the other 47 smart schools to enhance their ratings to 5 stars within the next few years (Chapman, 2007). Among the steps to be taken to enhance the attainment of the smart schools would be the placement of 24 subject matter experts in the schools where they will work hand-in-hand with the assigned schools to develop strategies and action plans to achieve 5 star status (Chapman, 2007).

Consequently, the authorities have recognized the importance of knowledge management in enhancing the performance of these smart schools as out of the six key action programmes devised by the Ministry of Education to enhance the performance of these schools, three of these relate to the promulgation of effective knowledge sharing and dissemination of the requisite skills (professional, pedagogical, technical) among teachers (Ministry of Education, 2011). More specifically, these action programmes are the change in mindset and culture, sharing of best practices and ICT buddy support (Ministry of Education, 2011). While there is awareness on the importance of these knowledge sharing related factors, there is no clear indication on the specific knowledge sharing issues faced by these teachers that have an impact on the effectiveness of these action programmes mooted by the Ministry of Education.

According to Bismillah Khatoon bt Abdul Kader (2008) in a UNESCO-funded report, due to the transfer of teachers from smart schools to conventional schools and vice versa, the issue of the lack of training for these new teachers in smart schools emerges. This is because they have not received the necessary smart school teaching training to take on a different approach from instructors to facilitators in the learning process of their students (Bismillah Khatoon bt Abdul Kader, 2008). Teachers need to appreciate that some technologies are more applicable in certain situations and contexts than others, requiring teachers to exercise judgement and expertise on how to deliver their classes effectively (Bismillah Khatoon bt Abdul Kader, 2008; Bromley, 1998; Thang *et al.*, 2010).

Due to these factors, the Ministry of Education has identified that the professional development of smart school teachers is a top priority especially as it aims for the nationwide rollout of making all schools smart schools (Ministry of Education, 2011; Thang *et al.*, 2010). Furthermore, there is a need for more initiatives in terms of knowledge management such as developing collaborative networks and communities of practice to enhance the professional development practices of smart school teachers as well as to enhance the knowledge competencies of these teachers (Ministry of Education, 2011; Thang *et al.*, 2010).

Despite these initiatives taken by the government, recent studies conducted in the Malaysian Smart Schools have revealed that the lack of knowledge among teachers in dealing with the new teaching ecosystem in these smart schools have hampered the full attainment of the project (Omidinia, Maslin Masrom, & Harihoddin Selamat, 2012; Wan Zah Wan Ali, Hajar Mohd Nor, Azimi Hamzah, & Nor Hayati Alwi,

2006, 2009). Among the chief complaints mentioned by teachers include the inability to apply what was learned during the already limited training conducted by providers to their school environments due to the different systems and infrastructure as well as the need to ensure that teachers possess the "know-how" on when to apply their knowledge and to share this knowledge with their colleagues to improve the overall teaching-learning environment in their respective smart schools (Omidinia *et al.*, 2012; Wan Zah Wan Ali *et al.*, 2006, 2009). Studies by Bismillah Khatoon bt Abdul Kader (2008); Omidinia *et al.* (2012) and Wan Zah Wan Ali *et al.* (2006, 2009) have all acknowledged that the lack of knowledge and knowledge sharing among smart school teachers as one of the contributing factors to the issues and problems faced by the smart schools but this problem has not been further explored from the knowledge management and knowledge sharing perspective. More specifically, the factors affecting the low level of knowledge sharing among smart school teachers can be broadly categorised into three categories which are organisational culture, ICT and structure, and the individual.

The two main issues affecting knowledge sharing in smart schools with regard to organisational culture is the role of leadership and *kiasuism*. While studies have revealed that strong leadership is crucial in encouraging knowledge sharing in smart schools, the exact type of leadership style demonstrated by leaders in these schools are not known and not examined in the literature (Lokman Mohd Tahir, Mohd Nihra Haruzuan Mohd Said, Khadijah Daud, & Mohd Fadzli Ali, 2014; Marinah Awang, Ramlee Ismail, Flett, & Curry, 2011). Without fully understanding the type of leadership required to encourage knowledge sharing in smart schools, the authorities will not be able to ensure that the school principals and administrators possess the

required leadership skills to encourage knowledge sharing (Lokman Mohd Tahir *et al.*, 2014; Marinah Awang *et al.*, 2011).

The second organisational culture issue that affects knowledge sharing among smart school teachers is the role of *kiasuism* or the fear of losing out to others (Goh, Ryan, & Gururajan, 2006; Hwang, Ang, & Francesco, 2002). Recent findings in knowledge sharing studies in Malaysia and Singapore have revealed the key role played by *kiasuism* in influencing knowledge sharing behaviours in many businesses and multinationals (Goh *et al.*, 2006; Ho, 2006; Hwang *et al.*, 2002; Nurliza Mohammed Fathi, Eze, & Goh, 2011). Kiasuism influences how members in an organisation share knowledge and this cultural trait has not been investigated in the context of smart schools in Malaysia despite findings attributing "knowledge uncertainty and culture" as a reason why teachers refrain from sharing knowledge (Marinah Awang, Omar Abdull Kareem, & Ramlee Ismail, 2014; Marinah Awang *et al.*, 2011). Due to the fear of making mistakes which may result in them losing out to others or paint a negative image of themselves, smart school teachers tend to hold back and not share knowledge with their colleagues (Marinah Awang *et al.*, 2014; Marinah Awang *et al.*, 2011; Thang *et al.*, 2010).

In terms of ICT and structure, ICT tools and social network are two knowledge sharing factors that require attention in the smart schools. ICT tools can be seen as a double-edged sword in knowledge sharing studies where it can act as both a facilitator or inhibiter (Goh *et al.*, 2006; Thang *et al.*, 2010). Technical issues and complexity have been known to negatively influence knowledge sharing in smart schools where the lack of accessibility to the Smart School Management System and

the complexity of the tools employed have led to teachers not wanting to share knowledge with each other (Thang *et al.*, 2010; Wan Zah Wan Ali *et al.*, 2006). On the other hand, if the correct ICT tools are adopted by the school, it would lead to effective use of these tools that would result in better knowledge sharing outcomes among teachers (Thang *et al.*, 2010).

Social network on the other hand is another structural component that has not been extensively studied and understood within the context of these smart schools despite the importance of these networks in influencing knowledge sharing and creation (Burt, 2004; Prell, 2012). Past studies on knowledge sharing in smart schools have recognised the need to better comprehend the nature of social networks to ensure better knowledge sharing outcomes (Siti Nazuar Sailin & Henderson, 2012; Thang *et al.*, 2010). These social networks that emerge and develop in schools are not visible to the human eye but plays a central role in determining the level of knowledge sharing among teachers in schools (Prell, 2012; Siti Nazuar Sailin & Henderson, 2012). Without proper understanding of the elements of the social network in these smart schools, the potential of social networks to facilitate knowledge sharing and creation will be untapped (Siti Nazuar Sailin & Henderson, 2012; Thang, Hall, Murugaiah, & Hazita Azman, 2011; Thang *et al.*, 2010).

The third issue influencing knowledge sharing among smart school teachers is the possession of T-shaped skills where teachers are fluent not only in their area of specialisation but also in other knowledge areas such as pedagogy, ICT skills, etc. (Leonard-Barton, 1995; Marinah Awang *et al.*, 2011). The lack of these T-shaped skills among teachers have been identified in the literature where the low levels of ICT knowledge have hampered the sharing of knowledge and have resulted in

teachers operating in “knowledge silos” where they do not connect with teachers in other subject areas due to the lack of commonality and familiarity with topics beyond what they are assigned to teach in the school (Leonard-Barton, 1995; Siti Nazuar Sailin & Henderson, 2012; Thang *et al.*, 2010). (Leonard-Barton, 1995). Due to these issues (organisational culture – leadership and *kiasuism*; ICT and structure – ICT tools and social network; the individual – T-shaped skills) that have been highlighted as well as the fragmented and scant amount of literature on knowledge sharing in the Malaysian smart schools, it is exigent that in-depth and specific studies on the factors that affect the lack of knowledge sharing and creation among Malaysian smart school teachers be conducted (Azizah Ya'akob *et al.*, 2005; Bismillah Khatoon bt Abdul Kader, 2008; Thang *et al.*, 2010).

In a nutshell, the Malaysian Smart School Initiative is a major paradigm shift in the way schools in Malaysia deliver knowledge to students who are being groomed to be the future leaders of the nation, moving away towards a student-centred teaching and learning approach (Bismillah Khatoon bt Abdul Kader, 2008; Chapman, 2007; Smart School Task Force, 1997a, 1997b). Many elements which include the ICT infrastructure, school administration system, pedagogy and the knowledge of teachers are crucial to the success of the initiative (Bismillah Khatoon bt Abdul Kader, 2008; Chapman, 2007; Smart School Task Force, 1997a, 1997b).

Unfortunately, it has been revealed that many issues plague the implementation of the Malaysian Smart School Initiative with the lack of knowledge sharing and creation among teachers emerging as a concern that affects the effective and efficient delivery of knowledge using the diverse range of ICT tools that have been

invested in these smart schools (Bismillah Khatoon bt Abdul Kader, 2008; Wan Zah Wan Ali *et al.*, 2006, 2009). If the issue of limited knowledge sharing and creation among smart school teachers is not understood and addressed, the full potential of the smart school project towards the development of the nation will not be realised as the lack of knowledge sharing and creation among its teachers will hamper the realisation of the benefits of this bold national initiative (Omidinia *et al.*, 2012; Wan Zah Wan Ali *et al.*, 2006, 2009).

In view of the issues faced by teachers in implementing the Smart School curriculum, it is therefore crucial for schools to enhance its knowledge sharing practices to ensure that knowledge that are required is effectively shared among teachers to ensure that students benefit from the smart school initiative (Bismillah Khatoon bt Abdul Kader, 2008; Omidinia *et al.*, 2012; Wan Zah Wan Ali *et al.*, 2006, 2009). To this end, this study will investigate the issue of the lack of knowledge sharing and creation among teachers in the Malaysian smart schools to illuminate the specific issues surrounding this matter from a knowledge management perspective. With a better appreciation of the issues affecting this problem, more informed and better targeted strategies with regard to knowledge sharing and creation in the smart schools could be formulated. Therefore, the research problem formulated for this study is:

Why are teachers not sharing and creating knowledge in the Malaysian Smart Schools?

To study this research problem, this study will use Giddens' Structuration Theory and Orlikowski's Structurational Model of Technology to guide the analysis and

interpretation of the findings. It is envisaged that the results of this research will help fill the gap that exists in relation to knowledge sharing among teachers in the Malaysian smart schools (Azizah Ya'akob *et al.*, 2005; Ministry of Education, 2011; Seri Rahayu Hamid, 2011; Thang *et al.*, 2010). Furthermore, it will also enable the smart schools, MSC Malaysia and the Ministry of Education to understand the factors that influence the knowledge sharing activities of teachers in order to allow for more effective strategies to be delivered allowing teachers to handle their roles as teachers in these smart schools more effectively.

The next section shall briefly outline the research questions formulated for this study based on the research problem identified.

1.4 Research questions

Based on the research problem that has been formulated in the previous section and the existing body of literature on the lack of knowledge sharing and creation among smart school teachers, three research questions are developed for this study:

Research Question 1: **Why are teachers not sharing knowledge in the Malaysian smart schools?**

The first research question will look at the reasons that result in teachers not sharing knowledge from a sharer's and recipient's perspective as any knowledge sharing process would involve two agents or parties which would be the one who is sharing the knowledge (the "sharer") and the one who receiving the knowledge (the "recipient") (Nonaka, Konno, & Toyama, 2001; Norizah Supar, Azizi Ali Ibrahim,

Zainal Abidin Mohamed, Mastura Yahya, & Mohani Abdul, 2005). After understanding the reasons why teachers do not share and receive knowledge based on the characteristics of the knowledge that is being shared, the second research question which looks at the knowledge creation process in these smart schools is formulated.

Research Question 2: How is knowledge being created by teachers in the Malaysian smart schools?

The second research question will study the knowledge creation processes used by smart school teachers using Nonaka and Takeuchi's Model of Knowledge Creation or SECI Model that is based in part on the Giddens' Structuration Theory in which knowledge is created through the interplay of production and reproduction of social structure and human agency via social interaction (Giddens, 1984; Nonaka & Toyama, 2003). It aims to understand the modes of knowledge creation that is being used by these teachers and how this affects the knowledge creation process in the Malaysian smart schools.

Understanding these four modes of knowledge creation which are made up of socialisation, externalisation, combination and internalisation among teachers would shed light on the modes that are applied and those that are not. This will then provide a better understanding on how the knowledge creation processes adopted by the smart school teachers and how this impacts the lack of knowledge sharing among them. Having understood the ways in which knowledge is being created by the smart school teachers, it would then be necessary to appreciate the range of

factors that influence the knowledge sharing process in these smart schools. With this in mind, the third research question that examines the factors influence knowledge sharing is therefore proposed.

Research Question 3: **What are the factors that influence knowledge sharing among teachers in the Malaysian smart schools?**

The third research question examines the factors that influence knowledge sharing activities among smart school teachers from the perspective of organisational culture (leadership and *kiasuism*), ICT and structure (ICT tools and social network) and the individual that have not been fully investigated and examined in the extant literature.

These research questions that have been identified would enable the research problem of "Why are teachers not sharing and creating knowledge in the Malaysian Smart Schools?" to be examined in greater detail and depth. In summary, this section identified the three corresponding research questions which will aid the identification of the objectives for this study. These research questions drive the data collection process and data analysis to address the research problem of the study. The next section will outline the three corresponding research objectives that are based on the three research questions that have been identified.

1.5 Research objectives

Based on the research problem and three research questions formulated, the following research objectives are identified for this study:

1. To understand the reasons why the Malaysian smart school teachers do not share knowledge among themselves from a "sharer" and "recipient" perspective.
2. To investigate how the Malaysian smart school teachers go about creating knowledge using the Nonaka and Takeuchi (1995) Model of Knowledge Creation.
3. To identify and understand the organisational culture, ICT and structure, and individual factors that influence knowledge sharing among the teachers in the Malaysian smart schools.

1.6 Research method

This study employed the use of a multiple case study design involving seven smart schools and a total of eighty three interview respondents. The main activities involved include conducting exploratory convergent interviews with five experts followed by a pilot case study at a smart school with eight interview respondents. After that, the main case study involving the seven smart schools was conducted using interviews, document review, observation and social network analysis. A detailed explanation of the research method and the justification for the decisions made is presented in Chapter 5.

1.7 Significance of the study

This study is significant as it attempts to add to the limited body of knowledge in the area of knowledge management which is a relatively new field in Malaysia and also on the Malaysian Smart School project which one of the country's flagship applications that is a part of the Vision 2020 programme. The study of knowledge management in the Malaysian education sector, especially among the smart schools are very scant and limited which this study would like to improve on.

With this study, it is hoped that it could assist the smart school teachers to enhance on the knowledge creation processes used to create new knowledge and to ensure that the smart school ecosystem is effective in knowledge creation and sharing. In addition, this study will be able to inform education policymakers on the ideal combination of factors that will enhance the knowledge creation and sharing processes in these schools. It is also envisaged that this study will aid in the theory development with regard to knowledge sharing among the smart school teachers in Malaysia.

1.8 Delimitations of scope

As the study of knowledge sharing is a broad field that is multi-disciplinary in nature, it is important that this study be constrained in terms of its scope that would affect the generalisability of the findings of this study. The first delimitation of scope is that this study will focus on the knowledge creation process from the perspective of Nonaka and Takeuchi's (1995) Model of Knowledge Creation that will be composed of the four modes of socialisation, externalisation, combination

and internalisation. In terms of examining the reasons why the smart school teachers share knowledge, this study will look at it from the perspective of the knowledge that is being transferred and received between the sender and the recipient as it would not be possible to include or consider the wider range of issues within a single research project for a doctoral programme.

Next, a socio-technical approach shall be adopted in the examination of the factors influencing knowledge sharing in these smart schools that will include organisational culture, ICT and structure, and individual perspectives. In terms of data collection, this study will conduct multiple case studies in the smart schools located in the states of Penang, Selangor, Kuala Lumpur and Melaka only due to logistical and cost constraints.

1.9 Structure and organisation of the thesis

This thesis is composed of seven chapters.

Chapter 2 The Malaysian Smart School Project provides an overview of the Malaysian smart school project which is the context of this study. It begins by explaining the role of education for national development and then proceeds to the country's Vision 2020 and the Multimedia Super Corridor project. This brings rise to the smart school concept and the changes it would bring to the teaching and learning processes in these schools. This chapter will then outline the key issues faced by the smart schools and the lessons learnt from which the research problem for this study shall emanate from.

Chapter 3 Theoretical Framework presents the theoretical framework employed for this study which is based on Giddens' Structuration Theory and Orlikowski's Structurational Model of Technology. The salient features and key concepts of these two theories shall be discussed in this chapter.

Chapter 4 Knowledge Creation and Sharing shall discuss the key concepts related to the study which include an explanation on what knowledge is and the different types of knowledge. Next, it shall provide a description of knowledge management and explain the knowledge creation and sharing process. The role of knowledge in influencing the sharing and receiving process shall be discussed followed by the knowledge creation process involved. Next, the factors influencing knowledge sharing shall be discussed. The research questions for this study shall be presented in this chapter followed by the proposed research framework that is developed for this study.

Chapter 5 Methodology and Methods provides a detailed explanation of the research design and issues for the study. It shall first describe the multiple case study research design. After that, the process of conducting the case study involving the exploratory convergent interviews, pilot case study and main case analysis shall be explained. The selection of the cases and interviewees are also explained together with the data collection and analysis methods. The issue of validity and reliability, limitations of the study and ethical considerations are also explained in this chapter.

Chapter 6 Findings and Analysis presents the findings and analysis of the multiple case study research conducted. It shall first provide an overview of the data analysis process and the cases. Next, the summary of the pilot case study is presented before the findings of the main case analysis are presented according to the three research questions of the study.

Chapter 7 Conclusions and Implications shall discuss the findings of the study in comparison with the literature before drawing the conclusions for the three research questions. After that, the conclusions on the research problem shall be presented. Next, the implications of this study are discussed followed by a discussion of the study's limitations and suggestions for future research.

1.10 Summary

This chapter has prepared the foundation for this thesis by outlining the key elements involved in this study. First of all, it began by providing a background on the Malaysian Smart School Project and the challenges that the smart school teachers face when completing their tasks which include the constant need to get new knowledge to stay abreast of developments in the field as well as the lack of knowledge sharing among teachers. Next, the research problem which has been identified as "Why are teachers not sharing and creating knowledge in the Malaysian Smart Schools?" was proposed. After that, this chapter outlined the three research questions that emanated from the research problem identified for this study and then stated the research objectives. A brief description of the multiple case study research method was presented together with the significance of this study. The delimitations

of scope for this study were also stated and the final section outlined the structure and organisation of this thesis. The next chapter shall provide an overview of the Malaysian Smart School Project which sets the context for this study.

CHAPTER 2

THE MALAYSIAN SMART SCHOOL PROJECT

2.1 Introduction

This chapter shall begin by providing a brief background and overview of the importance of education for national development. Next, this chapter will then present Malaysia's national development aspirations that resulted in the creation of the Multimedia Super Corridor (MSC Malaysia) that is meant to leapfrog the nation into developed nation status by 2020. Due to the importance and emphasis on human capital development, the Smart School Initiative was developed as one of the MSC Malaysia's flagship applications with radical changes in terms of ICT infrastructure and the teaching-learning approaches adopted in these smart schools. This will then be followed by a brief account of the teaching-learning components as well as ICT infrastructure models deployed. After that, a discussion of the smart school pilot project in terms of the learned lessons in the key components of the project. With an appreciation of the strengths and weaknesses of the pilot project, this chapter also outlines the lessons learned from this initiative and presents the setting upon which this study is conducted.

2.2 Background

In pursuit of Malaysia's national development goals, it is exigent that the country invests and develops its human capital to ensure that a trained, skilled and well-