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**Teachers' Personal Knowledge
Management: a Case Study in a
Taiwanese Elementary School
Context**

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*A thesis submitted to the Nottingham
Trent University for the degree of Doctor
of Philosophy*

July 2006

Abstract

Under the challenges of the knowledge economy and the implementation of the new national curriculum in Taiwan, both elementary schools and teachers are facing the necessary change in the purposes and practices of teaching and learning. Accordingly, this research sets out to explore teachers' professional development in relation to the concepts and practices of knowledge management (KM) and its influence on 'schools as learning organisations' within the Taiwanese elementary education context.

Within this thesis, the theoretical and practical orientations of teachers' personal KM are built by examining and integrating the subjects of knowledge, KM and personal KM, KM in education and specifically in Taiwanese education, teachers' knowledge, teachers' professional development consisting Kelly's personal construct theory and school improvement with particular reference to 'schools as learning organisations'.

The constructionist research methodology was adopted to explore and understand the social phenomena and multiple realities of teachers' personal KM in a Taiwanese elementary school. The nature of the research, the suitability of constructionism as my worldview, the impact of my prior knowledge and my role on the investigation and the appropriateness of ethics to the research setting and the fitness of case study approach and various qualitative data collection and analysis methods to the research were justified and applied. The school-based investigation was conducted from September 2004 to January 2005 in an elementary school in Tao-Yuan Country in Taiwan mainly involving six teachers and two administrators. The implications of the methodology for trustworthiness, authenticity and reflexivity of the research were subsequently examined.

Within the case school context, the social phenomena of how the teachers carried out the processes of personal KM individually and collectively are reconstructed and the multiple realities of how the school supported an environment to promote such processes are represented. Consequently, the research findings are discussed and a set of practical recommendations are proposed in accordance with my understanding of the literature and the school setting.

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Acknowledgements

It is finally the time to write my acknowledgements to those people who have supported me throughout my Ph.D. study. First of all, I would like to thank my supervisors, Glynn Kirkham (Director of Studies) and Dave Needham, for their great patience, care and sensitivity and for their beliefs in my capability of completing the research. With their strongest possible support, I have been able to overcome the difficulties and uncertain feelings of doing this research.

I am thankful to all the members of the case school especially the six research participants for their time, assistance and kindness. Without them allowing me to undertake the investigation in the school, this research could have never been accomplished.

I am grateful to the teachers (Morwenna Griffiths, Dina Poursanidou, Ron Collier, Mary Hayes, etc.) of the Research Methodology Course in the first and second years of my study for fostering my knowledge of research methodology. I would also like to thank Min Yang, Margaret Simms, Flossie Kainja, Jack Hua, Kelone Khudu-Petersen, Pamela Stagg-Jones and other fellow research students, who have encouraged me constantly and acted as my critical friends

My further thanks go to 3 K members, Terence and other friends who have accompanied me going through the hard times I have come across. Being with them makes my study and life more enjoyable and colourful.

Most importantly, I would like to express my gratitude to my dearest mother and family for their encouragement and unfailing support to continue with my Ph.D. study. No matter how many obstacles I have encountered and how much I have asked for their help, they are always there.

由衷地感謝我最親愛的家人與母親。謝謝他們一路來對我的鼓勵與包容。無論精神上或金錢上的支持，都讓我在英國求學生涯中無所畏懼。對我來說他們是我的驕傲，也希望我的努力能成為他們的驕傲。

Chapter 1 Introduction

1.1 Overview of Chapter 1

The purpose of this chapter is to succinctly specify what the research is about and also to give a full account of the contexts in question. In Section 1.2, I clarify the research focus and aims so that readers may be able to bear in mind them when reading through the thesis. Secondly, in Section 1.3, I intend to indicate background issues by means of analysing the contexts in which the research is involved and also to relate the background issues to the research aims with the purpose of specifying the significance of the research in the particular context. Finally, in Section 1.4, I briefly introduce the structure and the contents of the thesis.

1.2 Research Focus and Aims

The research sets out to explore teachers' professional development in relation to the concepts and practices of knowledge management and its influence on 'schools as learning organisations' within the Taiwanese elementary educational context. In the light of the research focus, I have set out the aims of the research, as follows:

- To draw a context for the research and to specify why the topic being researched is significant.
- To develop the theoretical underpinning of teachers' personal knowledge management by analysing the practices of teachers' professional development and its interrelationship with school improvement with reference to 'schools as learning organisations'.
- To investigate the current practices of teachers' personal knowledge management in a Taiwanese elementary school by employing an appropriate variety of research methods to develop a case study for analysis.

- To apply suitable development methods for participant teachers to experience the practices of self-reflection and knowledge-sharing during the investigation.
- To draw the implications from the case study and subsequently to examine the level of teachers' effectiveness and the school's support for the promotion of teachers' personal knowledge management.
- In the light of the analysis, to provide relevant recommendations for the school and the teachers.

1.3 Background of the Research

To understand the context in which the research is involved, I intend to give a broad introduction of Taiwan and its education and also look at the current economic trend and how it brings an impact on Taiwan and its education. However, those areas are still too broad to be focused to explain how they influence the research directly. As a result, I attempt to narrow the emphases by answering here the below questions which are not proposed as the primary research questions.

- What are the features of the knowledge economy?
- How do those features influence Taiwan and its education?
- What are the directions and emphases of the major educational reforms in the development of Taiwanese education?
- How does the implementation of the new Taiwanese national curriculum, viewed as the most current curriculum reform in Taiwanese compulsory education, influence both elementary and junior high schools and teachers?
- Do those educational reforms prepare Taiwan to meet the challenges of the knowledge economy?

The below figure demonstrates not only the emphases of the contextual review (from internationally to individually) but also the situations Taiwanese elementary schools and teachers encounter.

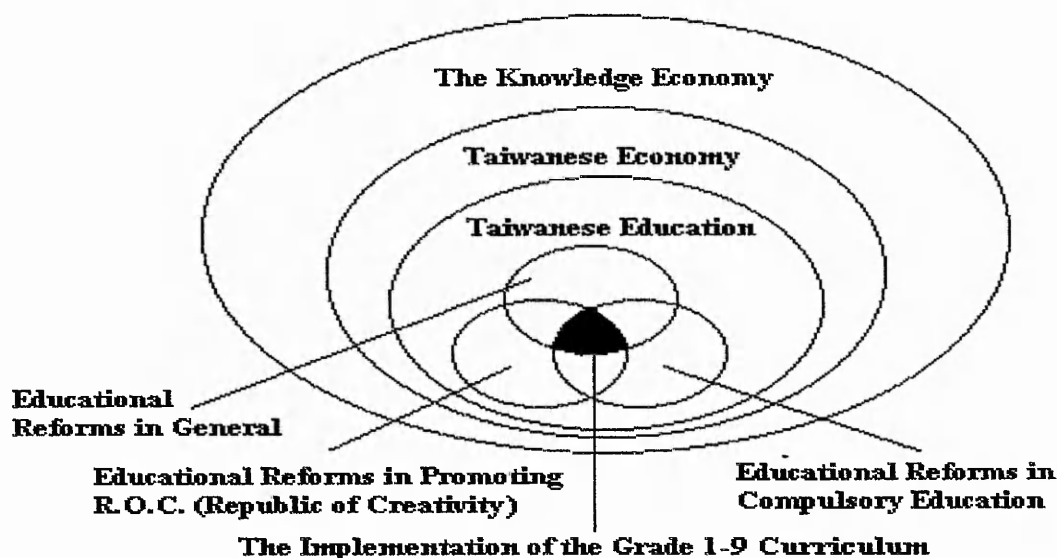


Figure 1.1 Scope of the research context (elaborated by the researcher).

1.3.1 Broad Profile of Taiwan

Taiwan, the first constitutional republic in Asia, is formally known as the Republic of China (R.O.C.) (GIO, 2004). Taiwan, shaped like a leaf, is the largest island between Japan and the Philippines which is 394 kilometer (km) long and 144 km wide. Its jurisdiction also includes Penghu (the Pescadores), Kinmen, Matsu and numerous other islets with 22.61 million population in total in December 2003. Between the two major ethnic groups in Taiwan, 98 percent are Han and the rest of the population belongs to the Austronesian (Malayo-Polynesian) groups which refer to the 12 main indigenous peoples in Taiwan and have their own languages and cultures. However, according to the majority of the population, Mandarin is the official language for communication and Minnanese and Hakka are the common spoken languages in Taiwan.

Taiwan has been colonised by Portuguese, Dutch and Spanish. During the Dutch colonisation, the Dutch had carried out an economic policy of mercantilism and also taught their religion (Christianity) and language. Until the 1630s, Han people from China's provinces of Fujian and Guangdong began migrating to Taiwan. However, Taiwan was ceded to Japan in 1895 under the Treaty of Shimonoseki. During its 50-year forced rule of Taiwan, Japan had developed Taiwan extensively in various areas such as railroads, agricultural research and development, public health, banking, education and literacy, cooperatives and business. Finally, in 1949, the Kuomintang (KMT) government of China lost its battle against the Chinese Communist and relocated in Taiwan. Since then, Taiwan has experienced rapid economic development and also rapid industrialisation, urbanisation and modernisation, which makes the nation one of the world's most vigorous economies and dramatically transforms the lives of its residents over the last 56 years. The Taiwanese Government suggests that all these changes have been achieved by *its people working together with one heart* (GIO, 2004). Consequently, Taiwan is now able to contribute to the peace, prosperity and stability of both the Asia-Pacific region and the rest of the world.

1.3.2 Trend of the World Economy

In the following sections, I intend to indicate the features of the knowledge economy as the new trend of the world economy and how Taiwan concerns and adjusts to this new economic manner in order to foster its national development and competitiveness towards the knowledge-based economy. It is identified that the achievement of the Taiwanese developmental initiatives needs to integrate education as the fundamental work; consequently, I also intend to illustrate the interrelationship between the knowledge economy and education and to analyse the impacts of the knowledge economy on Taiwanese education, which inclines to provide a basis for

its national educational reforms.

1.3.2.1 The knowledge economy

In recent years, it has been argued that the world economy has been moving from the industrial age into a new age of knowledge work (OECD, 1996; Stacy, 2001; World Bank, 1998). The main source of wealth has switched from natural and tangible assets such as land, unskilled labour, buildings, machinery and equipment to intangible assets such as knowledge and capabilities (Dunning, 2000; Drucker, 2000; Sölvell and Birkinshaw, 2000; Teece, 2000). It is defined that the focus of the knowledge-based economy is on *the importance of know-how, innovation, design and branding to the generation of a firm's competitive advantage and the social processes that create these* (Stewart and Tansley, 2002:8). By means of integrating scholars' viewpoints. (e.g. APEC, 2000; CEPD, 2001; Gao, 2000; OECD; 1996; World Bank, 1998), the characteristics of the knowledge economy are described, as follows:

- Intangible assets, such as knowledge and capabilities, are the only potential for individual and organisational development and effectiveness, which is regarded as the key to success or failure in the knowledge economy.
- Competitiveness is the power to decide long-term rise and decline, which is enhanced by the great variation, short life-cycle and high value-added of products (or services).
- Globalisation and stateless economic activities bring about opportunities for new businesses and also risks for failures.
- Entrepreneurship transforms impossible into possible.
- The research and development of science and technology is the basis for innovation, which creates infinite possibilities.
- Information and Communications Technology (ICT) plays a central role in the

development of the knowledge economy.

- The change of management models to be adapted to the economic trend leads an impetus for reformation. For instance, the encouragement of team spirit and collaboration promotes developmental and competitive initiatives.
- Continuous learning and training are necessary to foster the capabilities of people.

The trend of the world economy has changed the nature of society and business. For instance, many countries have drawn attention to the knowledge-driven economy and established enterprises for their national development, such as the publication of the Competitiveness White Paper in the United Kingdom in 1998 (SSTI, 1998), the conference for the new economy led by the previous U.S.A president in 2000 (White House, 2000), the plan of S-One in Singapore in 1996 (IDA, 2001) and The 'Cyber Korea 21' plan in Korea in 1999 (MIC, 1999). Most of the above initiatives emphasise the advantages of linking ICT with national infrastructure, education and commerce as well as illustrate that knowledge, skills and creativity play important roles in improving society and competitiveness of the countries.

1.3.2.2 Impact of the Knowledge Economy on Taiwan

Taiwan has attained international recognition for its economic success, which has been placed on a par with several Asian developed countries such as Singapore (GIO, 2004). Rapid economic growth, low inflation and income distribution can be regarded as the significant examples supporting Taiwan in shifting its economy from agricultural basis towards technological-oriented industry over the last fifty years (GIO, 2004). Since many countries have adapted the core aspects of the knowledge-driven economy to their national growth and development (see Section 1.3.2.1), Taiwan is not an exception. For example, Taiwan has improved its business

environment and established a foundation for the development of the knowledge-based economy by promoting technological advancement, encouraging industries to automate and embrace digital technology and strengthening training in software skills (CEPD, 2001) through the implementation of numerous initiatives in recent years, such as the APROC plan to develop Taiwan as an Asia-Pacific Regional Operations Centre (e.g. Ma, 1995; Tu and Chi, 1995) and the NII plan to build up its National Information Infrastructure. More recently, the 'Plan to Develop Knowledge-Based Economy in Taiwan' is one of the driving forces to transform itself into a 'Green Silicon Island', regarded as a prosperous and strong country, which masters global trends adequately, strengthens its scientific and technological innovations, balances the innovations and its humane and cultural development and creates a high quality environment for productions and living (CEPD, 2001). However, I would argue that without professional and competent people to achieve those goals, good research plans, supportive facilities for new innovations and the infrastructure and environment for the use of ICT may be ineffectual and wasted. Thus, continuous learning and training may be seen as the means to accomplish success in the knowledge economy.

1.3.2.3 Impact of the Knowledge Economy on Taiwanese Education

Education has been viewed (Gao, 2002; Yang, 1994) as one of the keys to Taiwan's modernisation and has been playing an important role in fostering Taiwan's economic growth. For example, the Taiwanese Government has integrated different stages of economic development with its education policies in terms of linking economic developmental plans with educational goals (Tien, 1996; also see Appendix 1). It is therefore expected that as the Taiwanese Government faces the challenges of the knowledge economy, the country is required to consider and to analyse the role of education in supporting its national development in the new

economic trend. Since the distinct characteristic of the knowledge economy is ‘using knowledge to create profits’, the importance of education and human talent needs to be addressed (Taiwan News, 2001) with the purpose of bringing about innovation and continuous learning. The interrelationship between the knowledge economy and education is specified below.

1) Education is the core for knowledge production

As knowledge is viewed as one of the meaningful assets in the knowledge economy, the processes of knowledge obtainment, accumulation, creation and application may bring about technical improvements or innovations in products or services, which maximise profits and increase competitiveness (Liu, 2002). This implies that wealth will increasingly be commanded by individuals, organisations or nations that are capable of contributing to high-skill areas (Neef, 1998). Education (especially higher education) not only carries out the above processes of knowledge production through the collaboration between firms and research and development (R & D) units of universities (Gao, 2002; Wang, 2002) but also offers training for those knowledge-based skills demanded. Such collaborative relationships may provide opportunities of both school-based enterprise for production and work-based learning for students, which fosters the acquisition and creation of productive knowledge close to the actual productive process (Stern, 1998). The implication is that the more advanced the education of a country’s people is, the more valuable knowledge it has resulting in individual and national wealth.

2) Education is the vehicle for the growth and development of the knowledge economy

In the age of the knowledge-intensive industry, the employability of individuals has shifted from brawn to brains, which denotes the advantages of individuals' professional knowledge and skills and the increased focus on the intellectual productivity of them (Gao, 2002; Wang, 2001b). Accordingly, knowledge workers are required to improve their knowledge and capabilities and therefore enhancing the quality of their knowledge production through learning incessantly (Wang, 2001a). However, learning 'about' new knowledge and skills appears to be inadequate to increase the effectiveness of production or services. It is suggested that expanding set of knowledge and competencies and subsequently applying them in new ways to achieve a valued goal such as maximising competitiveness are the means to meet the challenges of the knowledge economy (Seltzer and Bentley, 1999). For this to be achieved, governments and firms must play a role in building a new educational system and lifelong learning infrastructure, which cultivates creativity and may ultimately upgrade the industrial structure and develop the economy of countries continuously (Seltzer and Bentley, 1999; Stern, 1998).

Based on the above arguments, there is no doubt that the investment in education is one of the competitive tactics over countries in the knowledge era. Nevertheless, it is identified that the theory and practice of education for the industrial economy is no longer appropriate to the knowledge-driven economy (Cai, 2003; Huang, 2002). For instance, the educational system in the industrial age is to infuse knowledge into students' minds and requires students to learn and memorise all the taught knowledge in order to pass exams. This kind of system mechanises students with the same quality and causes the lack of critical thinking, which may be appropriate in the

industrial economy. However, the knowledge-intensive age requires people to have professional competence and the abilities to judge, to synthesise and to solve problems (Cai, 2003; Huang, 2002). As a result, the purpose of education has shifted from content-oriented theory to competence-oriented practice, which emphasises students' moral, creativity, enterprise and the ability of how to learn (Wu, 2000; Xie, 2002). More completely, the following table demonstrates the distinct requirements for Taiwanese education in the industrial and knowledge economy respectively:

Table 1.1 Comparison of education in the industrial and knowledge age.

Education	In the Industrial Age	In the Knowledge Age
<i>Purpose</i>	<ul style="list-style-type: none"> • To know learning contents intimately. 	<ul style="list-style-type: none"> • To cultivate learning abilities.
<i>Place</i>	<ul style="list-style-type: none"> • Mainly at schools. 	<ul style="list-style-type: none"> • At various places such as schools, learning centres of local communities or virtual schools.
<i>Opportunity</i>	<ul style="list-style-type: none"> • Learning stages completed through a single channel. 	<ul style="list-style-type: none"> • Lifelong learning through multiple channels.
<i>Content</i>	<ul style="list-style-type: none"> • Textbook-oriented. 	<ul style="list-style-type: none"> • Life experience-oriented.
<i>Teaching</i>	<ul style="list-style-type: none"> • Collectivisation. • Teacher-centred. • Individual classroom teaching. • Uniformity. 	<ul style="list-style-type: none"> • Collectivisation and individualization • Student-centred. • Collaborative teaching. • Diversity.
<i>Learning</i>	<ul style="list-style-type: none"> • Individual independent learning. • Passive learning. • Subject knowledge learning. • Rigid assessment. 	<ul style="list-style-type: none"> • Collaborative learning. • Autonomous learning. • Integrated subject knowledge learning. • Flexible assessment.

Source: adapted mainly from Wu (2001:7-8; also see Cai, 2003; Huang, 2002; Wu, 2000; Xie, 2002).

Table 1.1 not only indicates the essential theory and practice of education for the knowledge age but also implies the importance of taking those necessities into account in the Taiwanese educational reforms with the intention of coping with the challenges resulted from the knowledge economy.

1.3.3 Taiwanese Education and Educational Reforms

In the following sections, I intend to give a broad introduction of Taiwanese educational structure and also to indicate the major educational reforms in Taiwan, especially in its compulsory education.

1.3.3.1 Taiwanese Education – an Overview

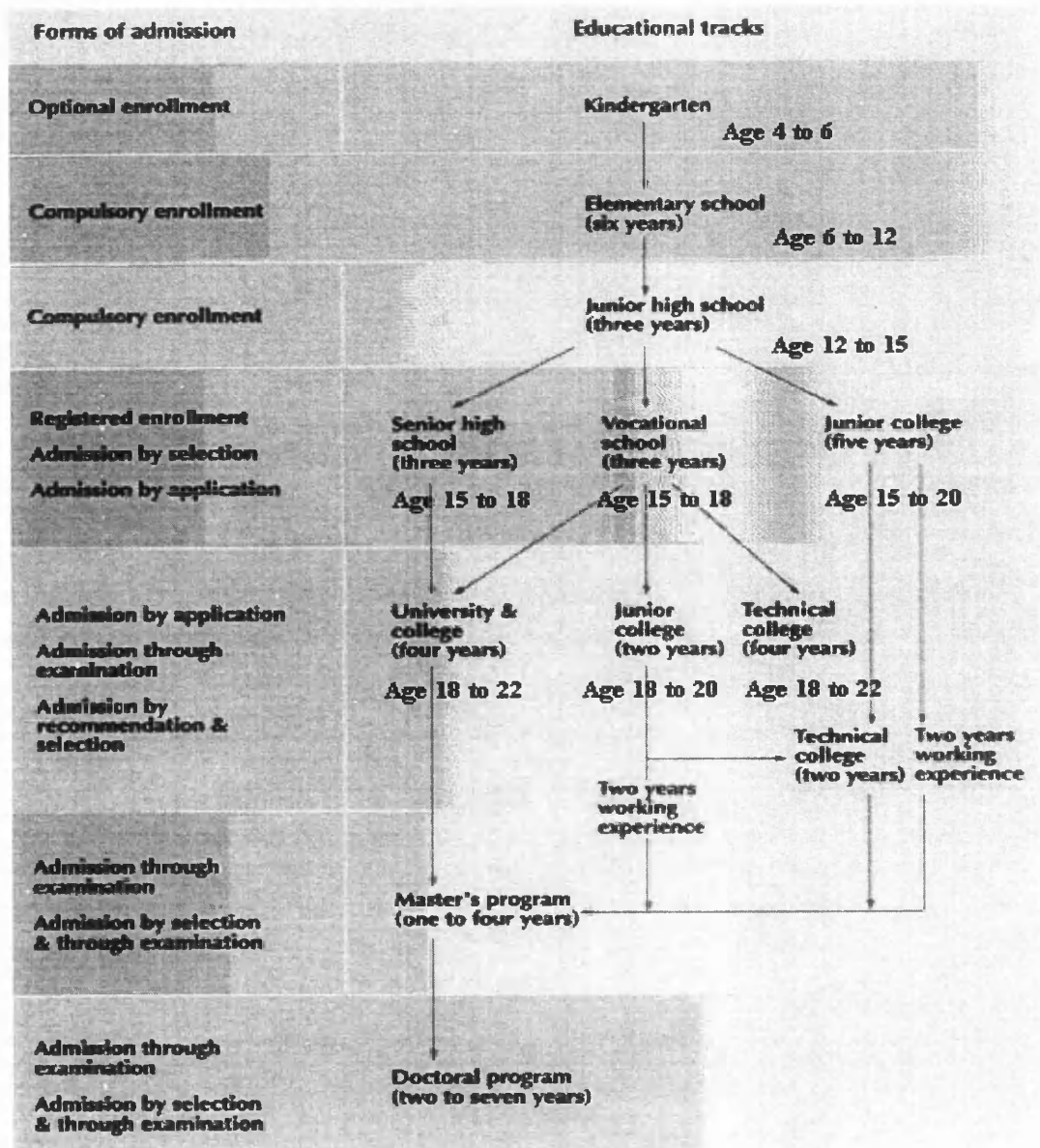


Figure 1.2 Educational structure in Taiwan (adapted from GIO, 2004).

The current structure (see Figure 1.2) of Taiwanese education supports 22 years of formal study. Generally, the whole process requires 2 years of pre-school education, 9 years of compulsory education which was implemented from 1968 (6 years of elementary school and 3 years of junior high school), 3 years of senior high school and 4 to 7 years of college or university. Subsequently, graduate education following on the formal study leads to a masters or doctoral degree and requires 1 to 4 years and 2 to 7 years to complete respectively. Forms of admission to each stage are dependent on the Taiwanese law (Compulsory School Attendance Act amended in 2003) and also students' academic achievements which are mainly the scores of national examinations (GIO, 2004).

Completion time of each stage is flexible, which depends on the academic achievements and needs of every individual student. Curriculum standards follow the goals and policies set by the Ministry of Education (MOE) and those standards would be adjusted in order to adapt the needs of the society. Currently, curriculum standards implemented in elementary, junior high and senior high schools are set by the MOE. However, according to University Law (amended in 2005), higher education institutions have their right to set their own curriculum. Moreover, all schools (including higher education institutions) are able to choose their own textbooks and teaching materials and equipment which as long as is appropriate to the curricula. Furthermore, an academic year is from August to July and divided into two semesters. Mandarin is the language of instruction in all schools (summarised from MOE, 2004a).

Besides the formal education, the MOE (2004b) offers special education for gifted pupils and physical or mentally handicapped pupils to help them make the best of their aptitude. Moreover, it also actively promotes supplementary education and community education with the attempt to bring about opportunities for the public to pursue lifelong learning.

1.3.3.2 Taiwanese Educational Reforms

At the end of the 20th century, concerns and calls for educational reform were rather common in many countries worldwide with the purpose of increasing a nation's competitive edge, improving the society and preparing its citizens to face the challenge of technology, globalisation and democracy of the 21st century (MOE, 2004b). Over the years, Taiwan has encountered a variety of political, economic, social and cultural changes (MOE, 2004c). For instance, its politics has involved more democratic changes and its economy has experienced an accelerated growth rate, a shift in the industrial structure and an impact on the values of goods. Moreover, in its social context, the access of information via the use of ICT has increased and new ideas are replacing old ideas constantly. Consequently, the Commission on Educational Reform was formed in 1994 to analyse the shortcomings of the Taiwanese educational system and make recommendations for the directions of future improvement. At the end of 1996, the Commission published an advisory report with the recommendations of the following five major directions for the future educational reforms of Taiwan (MOE, 2003a; 2003b):

- *Relaxing educational policies,*
- *Taking care of every student,*
- *Creating more channels for higher levels of schooling,*
- *Raising the quality of education,*
- *Establishing a society of lifelong learning.*

According to the recommendations, a five-years' reform programme was implemented from 1998, consisting of twelve reform policies and costing NT\$ 157 billion (MOE, 1999). Those reform policies and their implementation are summarised in Table 1.2 below.

Through the analysis of the tasks for the educational reform, I would suggest that these tasks have attempted to help Taiwan to build up one of the social foundations as education for its development in the knowledge economy over the last ten years. For instance, the implementation of the Grade 1-9 Curriculum fosters individuals' creativity from their fundamental education. Moreover, instead of embracing the traditional single school admission system (purely dependent on the scores of national entrance exams), the implementation of the multi-channel school admission system may make students feel free to develop their interests and aptitudes and therefore they may be more motivated to learn, which facilitates the cultivation of knowledge and capabilities. Additionally, the encouragement of lifelong learning brings about a learning society so that the Taiwanese citizens are able to gain their knowledge and skills through the environment of networking.

Table 1.2 Taiwanese educational reform policies and their implementation.

Educational Reform Policies	Implementation
1. <i>Consolidating elementary education.</i>	<ul style="list-style-type: none"> • Promoting the new national curriculum, the Grade 1-9 Curriculum, to foster pupils' creativity. • Renovating and replacing aged elementary and junior high school buildings. • Promoting the ideal of small classes and small schools.
2. <i>Making pre-school education widely accessible.</i>	<ul style="list-style-type: none"> • Conducting general census of early childhood education. • Issuing early childhood education vouchers.
3. <i>Consolidating existing systems for teacher training and continuing education.</i>	<ul style="list-style-type: none"> • Establishing multiple channels for teacher education and encouraging teacher training institutions to transform themselves in order to create more diversified sources of teachers. • Providing teachers with regular in-service training in order to ensure the best teacher quality and to inspire more creative teaching methods and materials.
4. <i>Creating dynamic and quality technological and vocational education.</i>	<ul style="list-style-type: none"> • Adjusting teachers and curricular of vocational schools to meet the needs of students and industries.
5. <i>Achieving excellence within higher education.</i>	<ul style="list-style-type: none"> • Developing research universities and promoting strategic alliance and mergers among universities. • Promoting 'Programme for Promoting Academic Excellence of Universities' to encourage universities to upgrade their research quality.
6. <i>Encouraging lifelong education and information education.</i>	<ul style="list-style-type: none"> • Legislating lifelong learning law. • Building networks with institutions of social education, community colleges and formal education. • Integrating various lifelong learning systems. • Constructing an internationalised environment, promoting English learning and cultivating citizens with international views. • Setting up six learning websites.
7. <i>Promoting family education.</i>	<ul style="list-style-type: none"> • Legislating family education law. • Establishing a family learning culture.
8. <i>Providing accessibility to the paths for education.</i>	<ul style="list-style-type: none"> • Implementing a multi-channel school admission system, such as the schemes of application, recommendation or entrance exams.
9. <i>Improving education for disabled students.</i>	
10. <i>Enhancing education for aboriginal students.</i>	
11. <i>Reestablishing counselling systems.</i>	
12. <i>Advancing educational research and funding.</i>	

Source: adapted from MOE (1999; 2004b).

In 2002, the MOE specifically initiated a series of projects aiming at making Taiwan a 'Republic of Creativity' (R.O.C.) with the ultimate goal of creating Taiwan as a place where creativity is indispensable to everyone's life and the preservation of creative capital will be accomplished through knowledge management (MOE, 2004d). The goal can be viewed as the extension of the previous educational reform. Those projects such as 'Creative Education' (MOE, 2004d) and 'Embracing Challenges of 2008: E-Generation Human Capacity-Building' (MOE, 2002) emphasise the cultivation of lifelong learning attitude; the promotion of e-learning; the creation of a diverse and dynamic learning atmosphere; the accumulation and access of knowledge resources to the public; and the creation, sharing and dissemination of knowledge to shape a creative culture. The above initiatives exemplify that the Taiwanese Government has integrated education with its current economic development by means of taking the features and effects of the knowledge economy into account in the implementation of the educational reform (also see Section 1.3.2.3). Moreover, these initiatives also denote the recognised advantages of accumulating, accessing, creating, sharing and disseminating knowledge in the knowledge era. This implies that knowledge management may be regarded as one of the meaningful strategies to succeed in the knowledge-driven economy.

1.3.3.3 Taiwanese Educational Reforms in its Compulsory Education

There are two main educational reforms in Taiwanese compulsory education. Firstly, a trial ten-year compulsory education programme was launched in 1994 and implemented nationwide in 1996 to integrate junior high school and senior vocational high school curricula (GIO, 2004; MOE, 2004a). This special programme is designed for junior high school pupils who are interested in vocational training can now do so during their last year of their junior high schools. It addresses pupils' needs and provides them relevant occupational training since they are not going on

for further education and may need those skills for their future. The second compulsory educational reform was the design and development of a nine-year comprehensive curriculum started in 1997 and the pilot outline syllabus for the Grade 1-9 Curriculum was introduced in the September of 2000, followed by the implementation of the curriculum in the first grade of elementary school in 2001. The new curriculum was scheduled to be implemented in all elementary and junior high schools of Taiwan in September of 2004 (MOE, 2003a; 2004e). In the next section, I intend to highlight the implementation of the Grade 1-9 Curriculum among the above-mentioned educational reforms since the research is directly conducted in this particular context.

1.3.4 Implementation of New National Curriculum in Taiwan

In the following sections, I intend to give a brief introduction of the new national curriculum of Taiwanese compulsory education and also to indicate the impact of its implementation on elementary school administration and teachers.

1.3.4.1 Grade 1-9 Curriculum

The initiation of the Grade 1-9 Curriculum is based on the belief that creative thinking and practice in education are the fundamentals for the success in the new century (MOE, 2003a; 2003b; 2004e). The Grade 1-9 Curriculum replaces the separate subjects with the integrated learning areas taught throughout elementary and junior high education. That is to say, in the past, the curricula for these two levels of education were separated. Moreover, learning areas refer to the contents of learning but not the titles of subjects, consisting Language Arts, Health and Physical Education, Social Studies, Arts and Humanities, Mathematics, Science and Technology as well as Integrative Activities (MOE, 2003a; 2003b; 2004e). The

design of the Grade 1-9 Curriculum is based on five basic aspects which are highlighted with their core components respectively in the following table:

Table 1.3 Aspects of the Grade 1-9 Curriculum and their core components.

Aspects	Core Components
1. Humanitarian attitudes	<ul style="list-style-type: none"> • Self-understanding. • Respect for others and different cultures.
2. Integration ability	<ul style="list-style-type: none"> • Harmonious sense with sensibility. • Balance between theory and practice. • Integration human sciences with technology.
3. Democratic literacy	<ul style="list-style-type: none"> • Self-expression. • Independent thinking. • Social communication. • Tolerance for different opinions. • Team work. • Social service. • Respect for Law.
4. Nativist awareness and a global perspective	<ul style="list-style-type: none"> • Love for one's homeland. • Patriotism. • A global perspective culturally and ecologically.
5. Capacity for lifelong learning	<ul style="list-style-type: none"> • Active exploration and problem solving. • Utilisation of information and language.

Source: adapted from MOE (2003a; 2003b; 2004e).

According to the above aspects and core components, the implementation of the Grade 1-9 Curriculum aims to guide pupils to achieve the following ten core learning competences (MOE, 2003a; 2003b; 2004e):

- *To enhance self-understanding and explore individual potential;*
- *To develop creativity and the ability to appreciate beauty and present one's own talents;*
- *To promote abilities related to career planning and lifelong learning;*
- *To cultivate knowledge and skills related to expression, communication, and sharing;*
- *To learn to respect others, care for the community, and facilitate team work;*
- *To further cultural learning and international understanding;*
- *To strengthen knowledge and skills related to planning, organizing, and their implementation;*

- *To acquire the ability to utilize technology and information;*
- *To encourage the attitude of active learning and studying; and*
- *To develop abilities related to independent thinking and problem solving.*

The above goals need to be achieved by focusing on the needs and experiences of pupils, which enables them to not only obtain basic knowledge but also develop their capabilities (i.e. the ten core competences) for lifelong learning (MOE, 2003a; 2003b; 2004e). This infers that the Taiwanese compulsory education may prepare its citizens for the challenges of the future from their childhood. However, throughout the implementation of the new curriculum, both schools and teachers have confronted with issues resulted from the changes in the design of school-based curriculum and in the transformation of teaching and learning approaches. Therefore, it is expected that the success of the Grade 1-9 Curriculum is determined by the endeavours of schools and teachers to cope with those issues. In this regard, in the following sections, I intend to look at the impact of the implementation of the Grade 1-9 Curriculum on schools and teachers and subsequently to indicate how they could react to overcome the situation.

1.3.4.2 Impact on Elementary School Administration

Nowadays, the MOE only provides the guidelines and goals of the Grade 1-9 Curriculum and hands over the authority of the design and development of school-based curriculum to schools (MOE, 2003a). In other words, each elementary and junior high school in Taiwan is able to design, plan and deliver its own school-based curriculum as long as it meets the guidelines and goals. Under this education policy, schools now need to establish a Committee of School Curriculum Development (CSCD), which consists of curriculum panels for the seven learning areas. Members of CSCD include the representatives of school administrators,

teachers from each grade and each learning area, parents and the community. The functions of CSCD are to complete the school-based curriculum plan for the coming semester; to determine the learning periods for each learning area of each grade; to review textbooks compiled by the teaching staff; to develop topics and activities for teaching; and to be responsible for the curriculum and instruction evaluation, which were the responsibilities of the MOE (MOE, 2003a; 2004e). The practice of CSCD denotes the rise of school autonomy and also the importance of collaboration. Accordingly, 'Organisational Structure Re-Creation and Human Resources Plan in Elementary and Junior Schools' (TESEC, 2001) is one of the policy plans for decentralisation, which encourages schools to adapt flexible and appropriate school-based leadership and management as well as to use teachers as one kind of educational resources effectively.

However, as schools encounter the above changes, their existing culture and administrative operations may bring about formalisation; that is, producing paperwork perfunctorily (Yang, 2003). Consequently, it is suggested that the principals of schools needs to lead the progress of school-based curriculum development step by step so that both teaching and administrative staff may increase their willingness to be responsible for the implementation (e.g. Marsh, *et al.*, 1990; Yang, 2003). Moreover, they also need to agglomerate shared consensuses of the inevitable changes for the implementation of the Grade 1-9 Curriculum and the necessary of organisational reform for those changes (e.g. Fullan and Stiegelbauer, 1991; Xu, 2001).

1.3.4.3 Impact on Elementary School Teachers

Both elementary and junior high school teachers also face issues in relation to their daily practice when they attempt to implement the new Taiwanese national curriculum. Firstly, the focus of core learning competences rather than knowledge itself requires teachers to change their beliefs in teaching and learning and subsequently to adopt different teaching approaches (Tang and Lin, 2001; You, 2000). That is to say, traditional teaching approaches, such as description, memorisation and repetition, may be no longer appropriate and effective. Secondly, the notion of integration requires teachers to be curriculum experts (including the understanding of relative subject knowledge in a learning area) and mastering pupils' cognitive progress (Chen, 2002). Consequently, teachers need to be able to, not only understand the curriculum of their own grade/subject, but also make the linkage between different levels/subjects. Simultaneously, while teaching a concept, teachers need to master pupils' cognitive understanding according to the pupils' level. Finally, the diversity of assessment, such as performance assessment and portfolio, requires teachers to not overuse tests to evaluate pupils' learning progress (Tang and Lin, 2001).

For the above issues to be performed, elementary and junior high school teachers need to increase their self-consciousness of the necessary to break through the traditions and to be creative (Kao, 2002; MOE, 2003b). Besides, they also need to make an effort to foster their knowledge and abilities by means of participating in any in-service training opportunities such as professional seminars/conferences and collaborating with other teachers through professional communities, study groups or collaborative teaching (MOE, 2003b; You, 2000).

However, the evaluation of the trial implementation of the Grade 1-9 Curriculum identified that teachers' attitudes towards the new national curriculum tend to be passive and perfunctory and this results in negative behaviours (Sung and Chou, 2002; Yang, 2003). For example, they still embrace old practices and intend to submit 'homework' to the top (means the County Bureaus of Education (BOE) or the MOE) when educational activities are required. Accordingly, I would suggest that while emphasising teachers' commitments to improve professional performance, it is essential for the MOE and BOE to analyse and understand why teachers incline towards having passive and perfunctory attitudes and behaviours. Subsequently, both the governmental agencies (the MOE and BOE) and educators (administrators and teachers in schools) need to communicate their considerations and work out difficulties in order to operate co-ordination effectively.

1.3.5 Conclusion of Contextual Review

Taiwan has previously dealt with short-term rapid growths in its economic output and its impact upon living standards. The contextual review helps to emphasise why and how Taiwan is equipped to face the challenges of becoming a knowledge economy. As Taiwan confronts the effects of other countries' national developments towards the knowledge era, the Government has made efforts to foster human and cultural development, strengthen technological infrastructure and innovations, promote the quality of productions (or services) and living and increase national competitive advantages by implementing numerous national developmental initiatives. Since education is regarded as one of the social foundations to promote the development of Taiwan, the Government has also initiated a series of educational reforms aiming to cultivate its citizens' knowledge, capabilities and creativity and to encourage a lifelong learning society. The direction and emphases of these educational reforms are intended to prepare not only Taiwanese people but also the

whole country to meet the challenges of the fast changing world. From the perspectives of schools and teachers in Taiwan, the implementation of these educational reforms requires them to work in different ways from the traditional ones in order to cope with issues and difficulties resulted from the implementation. Thus, the question, "Are schools and teachers ready with positive attitudes as well as sufficient knowledge and capabilities to face the challenges?", is the key to the success or failure of the educational and thus national development.

Hargreaves (1998) claims that in the knowledge society a model for knowledge creation is necessary to support the continuous development and self-renewal of better teachers and teaching, which makes teachers more confident, energetic and creative to adapt to changing demands and priorities. Accordingly, I would suggest that the practices of teachers' personal knowledge management may bring about such knowledge creation and consequently the effectiveness of teaching and learning. Having the Taiwanese elementary education as an example, as Taiwanese elementary teachers make an effort to promote the processes of knowledge construction, development, sharing and thus creation individually and collectively, they may move towards their professional development. Simultaneously, as Taiwanese elementary schools endeavour to support their teachers to carry out such processes, they to a certain extent lead themselves into the improvement towards learning organisations. The fulfillment of these two elements directly contributes to the development of the Taiwanese education and influentially to the growth of its economy when the Government and firms are facing the challenges of the knowledge economy. In the light of the above discussion, the research is significant in three ways. Firstly, the theoretical underpinning of teachers' personal knowledge management proposed in the research relates with the needs of both elementary teachers and schools to face the challenges of the implementation of the Grade 1-9 Curriculum and the

knowledge economy. For example, the discussion of the practices of teachers' knowledge creation (see Section 2.4.4) may make teachers understand the advantages of employing those activities in their professional development, which may foster their knowledge and capabilities of learning how to learn and also increase the effectiveness of teaching and learning appropriate to the context they are involved in. Moreover, the discussion of conditions encouraging teachers' personal knowledge management (see Section 2.5) may make schools understand how they could provide essential conditions for their teachers' growth and thus their improvement towards learning organisations. Secondly, my interventions through applying the concepts of autobiography, reflective journal and action learning (see Section 2.4) in the course of the investigation provide opportunities for teachers to experience the processes of self-reflection and knowledge-sharing, which may bring about their awareness of potential benefits according to their personal experiences.

Finally, the research intends to examine whether the current practices of teachers in relation to their professional development are sufficient and effective to carry out the processes of knowledge creation (regarded as teachers' personal knowledge management). In the light of the analysis, the Taiwanese educational administrative agencies and elementary schools may be able to realise the gap between the reality and the ideal and consequently to work out a way to deal with the situation. The above three arguments not only specify the meaning of investigating such the areas in the knowledge era but also link the research aims together.

1.4 Structure of the Thesis

In this section, I concisely delineate the structure of the thesis including the purpose and contents of each chapter.

In Chapter 1, I give a full account of the contexts in question and specify the timely significance of the research. This includes: (1) the broad profile of Taiwan, (2) the characteristics and challenges of the knowledge economy and their impact on Taiwan and its education, (3) the overall Taiwanese educational system and reforms and (4) the intention and implementation of the new national curriculum in Taiwanese compulsory education and its impact on Taiwanese elementary schools and teachers.

In Chapter 2, I review relevant literature to the themes in question and attempt to build the theoretical framework of the research. This includes: (1) the perspectives embraced by various philosophical paradigms and knowledge management practitioners on knowledge, (2) different dimensions and practices of knowledge management and personal knowledge management in general, (3) the current implementation of knowledge management in education, (4) the examination of eight postgraduate studies of teachers' knowledge management in the Taiwanese elementary context and (5) the integration of teachers' professional development and school improvement in relation to 'schools as learning organisations' with the implications drawn from the above reviews.

In Chapter 3, I attempt to justify how the constructionist methodology applies in this case study research. This includes: (1) specification of the nature of the research and the research process, (2) review of diverse research paradigms and appropriateness of the constructionist perspectives to my worldview, (3) my choice and application of

case study approach as the research strategy, (4) impact of my prior knowledge and role on the research process, (5) considerations of the research ethics appropriate for the investigation in the case school context, (6) fitness and application of the chosen data collection and analysis methods and (7) implications of the chosen methodology for the trustworthiness, authenticity and reflexivity criteria to evaluate the quality of the research.

In Chapter 4, I present the analysis of various sources of the collected data, which is directed by the themes in question. Those units of analysis involve: (1) the case schools' and the research participants' backgrounds, (2) teachers' knowledge development and creation, (3) the implementation of self-facilitated action learning set, (4) the case school's educational leadership and management, (5) its vision and educational goals, (6) its atmosphere and culture, (7) its organisational knowledge assets and (8) existence of professional communities. Consequently, I also draw the research findings in respect of difficulties and potential conditions of the case school to promote teachers' personal knowledge management from the data analysis.

In Chapter 5, I intend to discuss the research findings by means of examining: (1) fulfillment of the processes of teachers' personal knowledge management in the case school, (2) the school's support for an environment to encourage the promotion of teachers' personal knowledge management, (3) effectiveness of my intervention in influencing the research participants throughout the investigation. According to the discussion, I also propose a set of recommendations to the case school and its teachers.

In Chapter 6, I critically reflect on my conduct of the research and my professional and personal growth throughout the research process. This includes me honestly answering the following questions: (1) whether or not my research achieves its specific aims and answers the research questions adequately, (2) whether or not my research is up to standard in terms of its ethics, trustworthiness, authenticity and reflexivity, (3) whether or not my research relates to existing knowledge and contributes to new knowledge, (4) how the processes of my personal knowledge management are carried out and what are the factors facilitating my growth in the research journey and (5) what are the implications of my growth for my future development as a knowledge management practitioner.

Chapter 2 Literature Review

2.1 Overview of Chapter 2

The research is based on the premiss that it may also be as relevant for educational institutions like business organisations to value the potential of knowledge management to support teachers' learning and continuous professional development with the intention of achieving effective teaching and learning and to facilitate schools to improve and become learning organisations (Senge, 1990; Senge, *et al.*, 2000). Accordingly, the purpose of this chapter is to build the bridge between the aspects of knowledge management and the practices of teachers' professional development and school improvement; that is, taking advantage of the business management strategy to inspire the initiatives of educational leadership and management. The figure below specifies not only themes included in the chapter but also demonstrates how these subjects relates to each other within the research context. The discussion of each theme may initially appear as surface knowledge since my intention is to link these subjects together to develop the theoretical underpinning of teachers' personal knowledge management rather than to describe them deeply and exhaustively here.

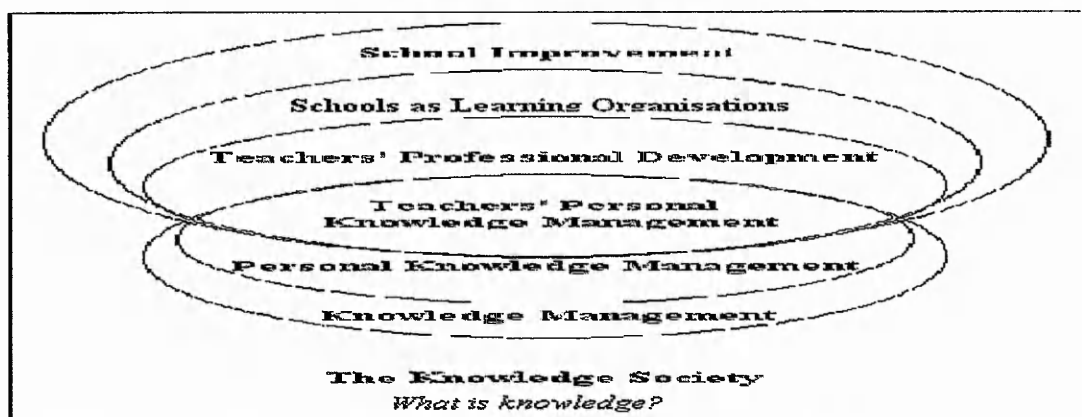


Figure 2.1 Focuses of the literature review (elaborated by the researcher).

To understand how knowledge is being managed within organisations, it is fundamental to inquire what knowledge is. As a result, Section 2.2 is concerned with how knowledge is regarded in both philosophical paradigms and knowledge management literature. Consequent influences on the emphases and practices of knowledge management are also elucidated. To claim the feasibility of applying knowledge management to the practices of education, in Section 2.3, the current implementation of knowledge management in both Western and Taiwanese educational contexts, research in reference to teachers' knowledge management in Taiwanese elementary schools and the nature of teachers' knowledge are examined. In the light of the theoretical implications drawn from Section 2.2 and 2.3, a framework of teachers' personal knowledge management including its processes and components are developed. In Section 2.4, teachers' knowledge construction, development, sharing and creation are clarified as the processes of teachers' personal knowledge management. In Section 2.5, influential conditions fulfilled knowledge creation, the initiatives of school improvement with respect to the promotion of teachers' professional development, school capacity-building and schools as learning organisations are indicated as the components of teachers' personal knowledge management.

2.2 Knowledge and Knowledge Management

To construct the theoretical underpinning of knowledge management, I attempt to examine the current literature on the subject of knowledge and knowledge management by inquiring the following questions. They are:

- How is knowledge regarded in philosophical paradigms?
- How is knowledge regarded in the knowledge management literature?
- In the light of the examination into knowledge, how may knowledge management be interpreted and what sorts of initiatives are involved in the implementation of knowledge management?
- What is personal knowledge management and how is it different from knowledge management discussed in the majority of knowledge management literature?

2.2.1 Philosophical Perspectives on Knowledge

Before proceeding to discuss so-called knowledge, it is necessary to look at the definitions of fundamental elements involved in the study of knowledge. These definitions include:

- **Ontology:**
Ontology is defined as ‘the nature of existence’ (Crotty, 1998: 10-12) or ‘the nature of reality’ (Lincoln and Guba, 1985: 81-87). Accordingly, the ontological question concerns what the nature and form of entities in the world are.

- Epistemology:

Epistemology is defined as 'the theory of knowledge' (Chisholm, 1977; Hamlyn, 1970). Maynard (1994: 10) claims that *epistemology is concerned with providing a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate*. Accordingly, the epistemological question deals with what knowledge is; how an individual knows what s/he knows; and how the individual justifies what s/he knows.

- Paradigm:

Paradigm is defined as *the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways* (Guba and Lincoln, 1998: 195). Accordingly, paradigms guide the way and seek to explain how the above ontological and epistemological questions are approached.

Ontological debate: realism vs. idealism

The major contradictory ontological debate has been between realism and idealism. Realism considers that there exists a world 'out there' and an entity is regarded as an object independent of human existence and thought. On the contrary, idealism considers that there does not exist a world 'out there' and an entity is regarded as a subject dependent of human thought, analysis and perception (Crotty, 1998; Sayers, 1985). Unlike realism and idealism, dualism rejects the perspectives of them and asserts that there exist distinct material and ideal entities in a world and neither of them can be reduced to the other (Sayers, 1985).

Lincoln and Guba (1985: 81-87) specify four ontological positions of reality, including objective reality, perceived reality, constructed reality and created reality. The first two positions adopt the perspective of realism viewing that there is a reality 'out there' to be discovered. The major difference between these two positions is knowable about that reality; that is, objective reality may be known fully and conversely perceived reality may be known partially. Additionally, the last two ontological positions, according to my interpretation, tend to embrace the perspective of idealism viewing a reality does not exist until it is constructed or created by individuals.

Theory of knowledge

What is knowledge? Traditionally, Knowledge is regarded as a form of justified true belief. For instance, Plato asserts that it is true belief guiding individuals and prompting their mind to be aware of and remember Universals through recollection and ratiocination (Trusted, 1981). For Plato, Universals are external and changeless; therefore, knowing that objects of knowledge (Universals) are propositions of matters of fact. In terms of the perspective on ontology, I would argue that Plato appears to be dualism, claiming that there exist both objects of knowledge and true beliefs of minds in those objects. Moreover, Plato's perspective also inspires that knowledge needs to be justified by mental intuition to be true. Following on from the above point, three conditions must obtain as an individual (S) claims that s/he knows a proposition (P) to be true (e.g. Chisholm, 1977; Hamlyn, 1970; Trusted, 1981), as follows:

- P is true.
- S believes (or accepts) P.
- S justifies that P is true.

Notwithstanding, it is argued (Chisholm, 1977; Gettier, 1963; Hamlyn, 1970; Trusted, 1981) that the process of justification involves the problem to prove that justified true belief is sufficient for knowledge. Here, I do not attempt to indicate what the above-mentioned problem is; instead, I am inspired by the notion of justification and intend to explore how an individual seeks knowledge, which may bring an impact on how s/he understands and makes judgement on a reality. It is specified that experience, reasoning and research are the means for an individual to search for truth (Cohen, *et al.*, 2000). Firstly, personal experiences may service as sources when an individual is confronted with a problem-solving situation. When those sources fail, the individual may tend to find out sources from experts in particular fields or sources hallowed by tradition and custom, which are designated as authoritative. Nevertheless, personal experience is recognised merely as commonsense knowing. Secondly, reasoning and research are regarded as the more systematic means to comprehend a reality and discover truth and are approached differently by numerous theorists (see Table 2.1) who embrace diverse philosophical perspectives on knowledge. Those perspectives are categorised into various epistemological paradigms, as introduced briefly in Table 2.1

Through the review of these epistemological paradigms, it is apparent that these paradigms have either distinct or relative perspectives on knowledge from each other. For example, according to the ontological perspective embraced by these paradigms, empiricists and positivists incline to 'find or discover' knowledge; whereas, interpretivists and constructionists intend to 'make or construct' knowledge (Guba and Lincoln, 1998; Schwandt, 1994; 2003). Another example is that the inductive method developed by empiricists was utilised as the central tool of investigation by positivists (Baronov, 2004). That is to say, part of positivist perspectives is rooted in the evolvement of empiricism. Consequent upon the distinct ontological and

epistemological nature of these paradigms, I intend to explore two contradictory paradigms: positivism and constructionism.

Table 2.1 Epistemological paradigms.

Paradigm	Main Representatives	Perspective on Knowledge
Rationalism	<i>Aristotle (384-322 BC)</i> <i>Descartes (1596-1650)</i>	<ul style="list-style-type: none"> • Knowledge is deduced from a priori or self-evident proposition through a sequence of formal logic.
Empiricism	<i>Bacon (1561-1626)</i> <i>Locke (1632-1704)</i> <i>Berkeley (1685-1753)</i> <i>Hume (1711-1770)</i>	<ul style="list-style-type: none"> • Deductive reasoning does not make new discoveries of the world. • Knowledge is induced mainly through observation and experience to produce reliable predictions about events.
Positivism	<i>Comte (1798-1857)</i> <i>Mill (1806-1873)</i> <i>Wittgenstein (1898-1951)</i> <i>Popper (1902-1994)</i>	<ul style="list-style-type: none"> • The attempt to translate the categories and techniques embraced by physical sciences into social sciences. • Knowledge is generalised and valid through formalised logical and scientific inquiry such as empirical observation and experimentation. • Theory-laden observation and experimentation.
Interpretivism (or Hermeneutics)	<i>Kant (1724-1804)</i> <i>Weber (1864-1920)</i> <i>Mannheim (1887-1947)</i> <i>Schutz (1899-1959)</i>	<ul style="list-style-type: none"> • The awareness of the difference between the subject matter of social sciences and physical sciences. • Knowledge is understood through the analysis of the subjective meanings behind human thoughts and actions as well as social development. • Value-laden social phenomena.
Constructivism and Constructionism	<i>Kelly (1955)</i> <i>Lincoln and Guba (1985)</i> <i>Gergen (1985)</i> <i>Schwandt (1994)</i>	<ul style="list-style-type: none"> • Knowledge is constructed and developed through the interaction between an inquirer and the object of inquiry or other inquirers by meaning making in a social context.

Source: adapted from Baronov (2004), Crotty (1998), Delanty and Strydom (2003), Gergen (1985), Lincoln and Guba (1985) and Trusted (1981).

1) Positivism

The evolvement of positivism comprises three phases: embryonic positivism, logical positivism and postpositivism (Baronov, 2004). The origin of positivism is found by Comte (1798-1857) who claimed that social facts and laws will be uncovered through careful and systematic observation, comparison and experimentation (Baronov, 2004; Crotty, 1998; Hollis, 2002).

From the era of 1920s to 1930s, an array of philosophers and scientists such as Moritz Schlick (the chair), Hans Reichenbach, Philip Frank and so forth, known as the Vienna Circle, inherited the spirit of scientific inquiry and asserted that any meaningful knowledge is required to be accurate and certain under the scientific and logical inquiry (Baronov, 2004; Crotty, 1998; Lincoln and Guba, 1985). In other words, any knowledge that cannot be tested and verified under the scientific and logical ways is viewed as meaningless and non-scientific. The above notion is known as the 'verification principle' (or 'principle of verification'), which is the central tenet of logical positivism. In addition, the other emphasis of logical positivism is the establishment of a precise language (refer to 'protocol sentences') of observation and explanation for the social world, which is influenced by Wittgenstein's work (1968), that is, the content of knowledge may be reduced as it is expressed through individuals' sense perceptions (which are referred as 'atomic sentences') (Baronov, 2004; Newell, 1986).

The discovery of absolute certainty endeavoured by logical positivists is argued by postpositivists as unrealistic (Baronov, 2004; Crotty, 1998). For instance, Popper (1979) claims that observation and experimentation are mainly shaped by theory and take place within the context of theory. As the result of scientific inquiry, his notion of falsification (*ibid*) illustrates that individuals can merely prove something is wrong but they are not able to prove something is true or certain. Moreover, he rejects logical positivists' attempt to create a pure scientific language which restricts the involvement of sense perceptions (Cruickshank, 2004). Thus, the goal of postpositivists is to discover approximate truth (which refers to Popper's 'aboutness' of knowledge) rather than absolute certainty.

2) Constructionism

According to Lincoln and Guba's (1985) naturalistic inquiry (in contrast to scientific inquiry proposed by positivists) knowledge is constructed through the interaction between an individual and his/her world. That is to say, the knower and known are interactive and inseparable. In a similar vein, the notion is also asserted by constructivists who *are deeply committed to the contrary view that what we take to be object knowledge and truth is the result of perspective. Knowledge and truth are created not discovered by mind* (Schwandt, 1994: 125 also see Franklin, 1998; Schwandt, 2003). From the perspective of constructivism, knowledge is the product of cognitive processes which result from an individual's interaction with his/her world. For instance, Kelly's (1955a) personal construct theory is one of the examples of such cognitive constructivism (see Section 2.4.1). Accordingly, there exist multiple realities since the same social phenomenon is interpreted (or understood) by individuals differently from one another (Lincoln and Guba, 1985).

Nevertheless, it is further pointed out that the constructivist perspective focuses exclusively on *the meaning-making activity of the individual mind* but has a lack of consideration to *the collective generation of meaning as shaped by the conventions of language and other social processes* (Schwandt, 1994: 127; also see Franklin, 1998; Schwandt, 2003). Those social processes include communication, negotiation, conflict and rhetoric where individuals express their perspectives and views with communities (Garfinkel, 2003; Gergen, 1985; 2003). That is to say, knowledge can be transmitted through individuals' interaction with each other in a social context. Accordingly, knowledge, viewed by social constructionists, is the product of not only individual cognitive processes but also social processes. Therefore, knowledge is intersubjective within a variety of

particular communities. The notion of intersubjectivity denotes the importance of shared language and understanding throughout knowledge transmission within the specific social contexts.

2.2.2 Knowledge in the Knowledge Management Literature

Throughout the discussion of Section 2.2.1, I have recognised that knowledge is too abstract to be managed if it is only classified into categories. By means of reviewing some of the knowledge management literature relating to knowledge, I have identified that knowledge may be classified under a variety of principles such as degree of abstraction, degree of manifestation, units of storage and purpose and use (see Table 2.2).

Table 2.2 Taxonomies of knowledge.

Principles of Classification	Types of Knowledge
<i>Degree of abstraction</i>	Theoretical knowledge vs. practical knowledge (Beckman, 1999)
<i>Degree of manifestation</i>	Explicit knowledge (know-what) vs. tacit knowledge (know-how) (Nonaka and Takeuchi, 1995; Tiwana, 2001)
<i>Units of storage</i>	Employee knowledge (personal knowledge) vs. knowledge embedded in physical system (organisational knowledge) (Leonard-Barton, 1995)
<i>Purpose and use</i>	<ul style="list-style-type: none"> • Cognitive knowledge (know-what) • Advanced skills (know-how) • Systems understanding (know-why) • Self-motivated creativity (care-why) (Quinn, <i>et al.</i>, 1996)
	<ul style="list-style-type: none"> • Know-what • Know-why • Know-how • Know-who (CERI, 2000; Evan, 2003)

Source: elaborated by the researcher.

From the close exploration of these various types of knowledge indicated in Table 2.2, I have identified that elements and aspects included in these types of knowledge may be broadly categorised into explicit and tacit knowledge. Since the research concentrates on how individuals manage their personal knowledge within a school context, I intend to look at the so-called personal knowledge (including explicit and tacit knowledge) and also how personal knowledge relates to organisational knowledge in detail rather than to introduce all these types of knowledge cursorily.

Explicit knowledge vs. tacit knowledge

Polanyi (1962: vii) regards that true knowledge is *impersonal, universally established, [and] objective*. This infers that he tends to believe that there is something existing 'out there' for individuals to discover (Polanyi, 1967: 24-25). Although his perspective on entities is to some extent similar to positivists, he does not intend to assert that knowledge is totally determined by empirical data in order to be reliable. That is to say, true discovery cannot be entirely accounted for by empirical data (or articulated rules). From his perspective, the process of knowing involves an individual's passionate participation in the acts of understanding (Polanyi, 1962: 3-17). In the course of those acts, focal and tacit knowledge (also termed as focal and subsidiary awareness) are involved in the sense-making processes. Focal knowledge is viewed as knowledge about an object or phenomenon that is in focus. Tacit knowledge is viewed as a tool to interpret or comprehend what is in focus. For example, when reading an article, an individual's understanding of words and linguistic rules operates as tacit knowledge while the attention of the individual is focused on the meaning of the article. Furthermore, he claims that some of tacit knowledge can be articulated in words or symbols (regarded as explicit knowledge) so that the knowledge becomes possible to be distributed and criticised by other individuals (Polanyi, 1962: 82-87).

Nonaka and Takeuchi (1995) draw on Polanyi's (1962; 1967) distinction between explicit knowledge and tacit knowledge to establish their four modes of knowledge conversion. Explicit knowledge can be articulated and codified clearly in words, numbers, drawings and other symbols such as manuals, books, formulas and so forth. It can therefore be transmitted formally and easily. Tacit knowledge, on the other hand, is personal and embedded in individuals' experiences, decisions, associations, originality, subconscious and so forth. It can only be perceived spontaneously but not be explained in words. Moreover, Tiwana (2001) gives a more detailed differentiation between explicit and tacit knowledge in accordance with their characteristics, which is demonstrated in Table 2.3.

Table 2.3 Tacit versus explicit knowledge.

Characteristic	Tacit	Explicit
<i>Nature</i>	Personal, context specific	Can be codified and explicated
<i>Formalisation</i>	Difficult to formalise, record, encode, or articulate	Can be codified and transmitted in a systematic and formal language
<i>Development Process</i>	Trial and error encountered in practice	Explication of tacit understanding and interpretation of information
<i>Location</i>	People's mind	Documents, databases, Web pages, e-mails, charts, etc
<i>Conversion Processes</i>	Converted to explicit through externalisation that is often driven by metaphors and analogy	Converted back to tacit through understanding and absorption
<i>IT Support</i>	Hard to manage, share, or support with IT	Well supported by existing IT
<i>Medium Needed</i>	Needs a rich communication medium	Can be transferred through conventional electronic channels

Source: Tiwana (2001: 39).

Related to Polanyi's (1962; 1967) assumption that both explicit and tacit knowledge exist together along a continuum, Tiwana (2001) further claims that explicit and tacit knowledge are not absolute dichotomies; that is, most of knowledge comprises both explicit and tacit parts. Accordingly, I am inspired to claim that it is possible to convert some tacit knowledge into a more explicit form; that is, enlarging the explicit part of knowledge.

Personal knowledge vs. organisational knowledge

Knowledge assets of an organisation broadly include personal and organisational knowledge, which are classified and demonstrated in the following table:

Table 2.4 Knowledge assets of an organisation.

	Leonard-Barton (1995)	Collins (1993) and Blackler (1995)	Form
Knowledge assets of an organisation	<u>Employee knowledge:</u> An employee's own experiences, skills, intuitions and values.	<u>Embrained knowledge:</u> An employee's cognitive awareness and conceptions for sense-making and decision-making.	Tacit
		<u>Embodied knowledge:</u> An employee's capability to achieve certain tasks.	
	<u>Knowledge embedded in a physical system:</u> The organisation's best practice of operations processes, ICT systems, culture and harmonious collaboration of teams.	<u>Emcultured knowledge:</u> The culture and shared norms and values of the organisation.	Explicit
		<u>Embedded knowledge:</u> Collective created knowledge by employees for operations processes such as service and ICT infrastructure.	
	<u>Encoded knowledge:</u> Knowledge which can be presented by words and symbols.		

Source: adapted from Blackler (1995), Collins (1993) and Leonard-Barton (1995).

By relating personal/organisational knowledge with explicit/tacit knowledge, I identify that the elements of personal knowledge in an organisation tend to involve more tacit characteristics. In contrast, the elements of organisational knowledge involve rather equal of explicit and tacit characteristics.

Bhatt (2002) argues that individual and organisational knowledge are interdependent. For instance, through the process of interactions among employees, their personal knowledge may be amplified and internalised to contribute organisational knowledge, which is reflected in products and services an organisation creates and sells (Beazley, *et al.*, 2002). However, personal knowledge can be taken away by the employee as s/he leaves whereas organisational knowledge cannot be taken away by the employee as s/he leaves (Blackler, 1995; Collins, 1993; Leonard-Barton, 1995). Accordingly, an important task for organisations is determining how to unlock and capture

employees' personal knowledge and convert it to organisational knowledge (e.g. enlarging encoded knowledge or making embodied knowledge apprenticed) sustainable when employees leave (Wilson, 1996).

2.2.3 Knowledge Management Dimensions

Many knowledge management practitioners or scholars classify knowledge management initiatives into a range of dimensions in the light of the initiatives' focuses (e.g. Davenport and Prusak, 1998; Scarbrough and Carter, 2000; Wiig, 2000). By means of synthesising different kinds of knowledge management initiatives within the context of positivism and constructionism (see Section 2.2.1), knowledge management may be interpreted as the following perspectives.

Before embarking on the discussion of those different knowledge management dimensions, I intend to firstly justify why the term 'knowledge sharing' is adopted rather than 'knowledge transfer' throughout the thesis. According to 'The Academia Sinica Bilingual Ontological Wordnet' (2002), one of the meanings for 'share' is defined as *communicate*. This implies that knowledge sharing can be viewed as the process of talking about or communicating thoughts, ideas and experiences. Whereas, the process of knowledge transfer is planned, executed and measured in a systematic way to ensure that knowledge is moved from one place to another (Sammons, 2005). This infers that knowledge transfer involves the need of change which may or may not take place in various circumstances. Some knowledge management practitioners tend to use the term 'knowledge sharing' (e.g. Huysman and De Wit, 2004; Probst, *et al.*, 2000) and others of them tend to use the term 'knowledge transfer' (e.g. Davenport and Prusak, 1998; Goh, 2002). Notwithstanding, in the light of their viewpoints on either term, they all appear to address the importance and practices of spreading, communicating and consequently making valuable skills and knowledge

assets be used by individuals with organisations. From the epistemological perspective of constructionism on knowledge (see Section 2.2.1), knowledge is interpreted and understood by individuals differently. That is to say, the receiver reconstructs his/her version of the supplier's knowledge in the course of the conversation between them. In the light of the above explanations, I tend to use the term 'knowledge sharing' throughout the thesis since I am convinced that knowledge can be talked about or communicated between individuals but not necessary be transferred entirely into others' actions (or practices) and perspectives.

Management information systems

Information systems is defined as *the entire infrastructure, organization, personnel, and components for the collection, processing, storage, transmission, display, dissemination, and disposition of information* (INFOSEC, 2000: 29-30). Such systems are managed by using any telecommunications or computer related equipment as well as software, firmware and hardware (INFOSEC, 2000; Lucey, 2005). The above production-orientated definition implies that management information systems are regarded as the means of producing information. However, Lucey (2005) inclines to view management information systems as the means of processing data; that is, the routine facts and figures of an organisation, into information and subsequently using it for decision-making.

From the perspective of positivism, knowledge is regarded as an object and consequently it can be defined, controlled and transmitted in information systems. In this respect, the focus of knowledge management is on the use of ICT tools, such as data mining, electronic bulletin, databases, discussion forums or workflow systems, to support organisational knowledge management processes; that is, knowledge storage, maintenance, dissemination, sharing and application (e.g. Alavi and Leidner,

2002; Alavi and Tiwana, 2003; Boddy, *et al.*, 2005; Tiwana, 2001; Wensley and Verwijk-O'Sullivan, 2000). For an organisation, knowledge management is considered as a strategy aiming at processing explicit knowledge (coding and sharing good practices), leveraging organisational knowledge to decision-making and subsequently increasing profits and organisational effectiveness.

However, technology is not viewed as a critical factor in knowledge management (Kleiner and Roth, 1998). For example, it assists organisations to capture their existing knowledge and does not pay much attention to how the knowledge is to be used most effectively. In terms of knowledge sharing, it does not take the issues of human relationships into account. Accordingly, Nonaka and Takeuchi (1995) claim that instead of concentrating on tools, methodologies and repositories for knowledge accumulation, it is more important to focus on the tacit elements of knowledge and also the human resources management dimension of knowledge management.

Human resource development

It may be problematic to define human resource development owing to its varied interpretations and roles (Garavan, *et al.*, 2000; Hansen and Brooks, 1994; McGoldrick and Stewart, 1996). Some human resource development practitioners (e.g. McGoldrick and Stewart, 1996; McLagan and Suhadolnik, 1989; Naderler and Naderler, 1990) tend to refer it to learning at individual, group and organisational levels to foster job performance growth and effectiveness. Consequently, the progress involves behavioural change and how the change affects individuals, groups and the organisation (Frank, 1988). By means of examining the definitions proposed by those practitioners, I incline to embrace Chalofsky's (1992: 179) viewpoint and to regard the practice of human resource development as aiming at *increasing the learning capacity of individuals, groups, collectives, and organisations through the*

development and application of learning-based interventions for the purpose of optimising human and organisational growth and effectiveness. Nevertheless, in this thesis, I do not intend to examine the nature of the functioning of the brain, memory and language which may be seen to be comparable with the concept of 'man as a machine'.

From the perspective of constructionism, knowledge is regarded as an interpretation (or construction) and, consequently, it can be constructed, developed and transmitted by individuals through their interactions with their world and other individuals. In this respect, the focus of knowledge management is on learning - including individual and team learning (e.g. Stacey, 2001) and also the ways of interactions among individuals and teams (e.g. Wenger, 2000; Van Wijk, *et al.*, 2003; Von Krogh, 2003). Both individual and team learning involves cognitive and behavioural change (Argyris and Schön, 1978; Miller, 1996) and may therefore bring about impacts on the systems of the organisation (Loermans, 2002). Accordingly, some knowledge management scholars tend to integrate organisational learning into knowledge management (e.g. Vera and Crossan, 2003) since the primary aspects of organisational learning comprise not only how individuals and teams learn and how created knowledge becomes institutionalised (e.g. Crossan, *et al.*, 1999) but also how organisations develop, transform and renew themselves (e.g. Barnett, *et al.*, 1994; Lant and Mezias, 1992). For an organisation, knowledge management is considered as strategy aiming at enriching learning-related activities, enhancing individuals', teams' and organisation's learning capabilities and subsequently improving their performance and effectiveness.

Organisation studies

From the perspective of constructionism, the process of knowledge construction, development and transmission take place in a social context. Moreover, it is specified that *effective knowledge management depends not merely on information technology platforms but...on the social ecology of an organisation – the social systems in which people operate culture, structure, information systems, reward systems, processes, people and leadership* (Gupta and Govindarajan, 2000: 72). Consequently, it is essential to explore and analyse factors and issues involved within that context while implementing knowledge management. In the light of the studies on organisational system, process, strategy and behaviour, the focus of knowledge management is on factors enabling the implementation of knowledge management; that is, providing a better environment for knowledge construction, development, sharing, creation and utilisation (e.g. Von Krogh, *et al.*, 2000). Accordingly, it is possible to relate the organisation studies dimension of knowledge management with learning organisations (LO) since the aspects of LO emphasise organisational learning (e.g. Garratt, 1987; Garvin, 1993; e.g. Senge, 1990) and organisational systems and environment (e.g. Pedler, *et al.*, 1991).

The above discussion implies that knowledge management has its roots in other areas. Moreover, it also implies that practitioners from various firms may perceive knowledge management differently and subsequently adapt diverse emphases and approaches in the promotion of knowledge management. Nevertheless, some other practitioners attempt to integrate different dimensions of knowledge management simultaneously. For instance, Earl (1997) conceives that knowledge-building is multifaceted and, therefore, requires a combination of technological and social actions (including knowledge systems, networks, knowledge workers and learning organisations). Similarly, Jashapara (2004) proposes an integrated approach towards

the implementation of knowledge management, which includes organisational learning, systems and technologies, strategic management, and culture and change management. His proposition also illustrates that knowledge management may draw from existing management strategies or resources an organisation already has in place.

2.2.4 Personal Knowledge Management

Throughout the examination of some knowledge management literature, it appears that the minority of the literature emphasises so-called personal knowledge management. Alley (1999) indicates that personal knowledge management is needed to help knowledge workers to obtain and maintain lifelong preparation for the global knowledge economy. In a similar vein, Cope (2000) claims that personal knowledge, including both explicit and tacit knowledge, can be regarded as personal capital, which has a value dependent on the demand for certain capabilities and a cost related to acquiring certain levels of knowledge and skills. Therefore, to maximise the worth of an individual, s/he needs to take ownership for the development and maintenance of his/her knowledge, which infers the significance of individual commitment. Accordingly, Cope (*ibid*) proposes a model, K-profile, for the exploration of ways from individuals acquiring new knowledge to delivering it to market. The K-profile also facilitates individuals to assess the strengths and weaknesses of their personal capital and take restorative measures as necessary. Both Alley's (*ibid*) and Cope's (*ibid*) perspectives on personal knowledge management are rather individualism.

On the contrary, other personal knowledge management practitioners consider the importance of human interaction and collaboration. For instance, Barth (2000: 31) claims that the principle of personal knowledge management means individuals take responsibility *to acquire, create and share knowledge, extend personal networks and*

collaboration with colleagues without having to rely on the technical or financial resources of the employer. Implemented from the bottom up by one knowledge worker at a time, these techniques can increase productivity and enthusiasm and help to build momentum that can overcome the technological and social barriers to town-down, enterprise-wide KM initiatives.

His perspective implies that the implementation of knowledge management should start from individuals and therefore their motivation to think and act differently is crucial. For this to be achieved, individuals' recognition of personal relevance such as personal benefits and extrinsic reward may increase their motivation (Bailey and Clarke, 2001). Furthermore, in terms of the practice of personal knowledge management, Zuber-Skerritt (2005) points out that many knowledge management studies have focused on what she calls 'hard' methodologies for developing data and the information-processing capability of ICT and 'soft' methodologies for developing human and social capabilities have, however, been largely overlooked. In her paper, she advocates a 'soft' methodology model of action learning and action research (ALAR) consisting of a system of seven values and principles and seven matching actions with applications and examples, indicated through the ACTIONS and REFLECT acronym respectively (see Table 2.5). The values and practices of ALAR not only carry out the access, communication and management of personal knowledge but also develop individuals' innovative and creative capabilities.

Table 2.5 Values and actions of action learning and action research.

ACTIONS	REFLECT
Advancement of knowledge and learning.	Reflection on and in action..
Collaboration.	Effective use of processes and methods.
Trust, respect and honesty.	Feedback from 'critical friends'.
Imagination and a vision for excellence.	Leadership development.
Openness.	Exploration of new opportunities.
Non-positivist beliefs.	Coaching.
Success.	Team results.

Source: adapted from Zuber-Skerritt (2005: 53-60).

In order to clarify these two dissimilar viewpoints of personal knowledge management, I intend to take Cope's (2000) and Zuber-Skerritt's (2005) practices as examples and subsequently compare them. From the Cope's (*ibid*) perspective, explicit and tacit knowledge are viewed as distinct entities which can be sold as tangible and intangible products in market. Consequently, the focus of personal knowledge management is on the different facets of a knowledge cycle (K-profile) by means of analysing the demand of the markets and also assessing the advantages and disadvantages of the knowledge. This infers that the notion of value and competitiveness may be involved in Cope's theory. Whereas, Zuber-Skerritt (*ibid*) defines personal knowledge as tacit knowledge and the focus of personal knowledge management is on individuals' capabilities to access, communicate, create and manage tacit forms of knowledge through the activities of collaboration and reflection under the open and non-positivist attitudes and leadership commitment. This implies that the promotion of personal knowledge management brings about individual and group learning and therefore enhances individuals' knowledge and capabilities.

By comparing the notion of personal knowledge management and knowledge management discussed in the majority of knowledge management literature, it can be identified that personal knowledge management mainly address individuals'

endeavours and responsibility to fulfill the growth of knowledge and skills, which results in individual effectiveness and worth. By contrast, the ultimate purpose of knowledge management in general is for organisational effectiveness and worth. However, I would argue that knowledge management cannot be promoted without individuals' commitment even when there are better ICT facilities. Consequently, the implementation of knowledge management should be people-centred rather than organisation-centred. The promotion of personal knowledge management needs to be socialism rather than individualism. Accordingly, I shall adopt the term 'personal knowledge management' as my research title.

2.3 Teachers' Personal Knowledge Management

To develop theoretical implications for teachers' personal knowledge management, in the following sections, I attempt to answer the below questions.

In order to understand the current emphases and practices of knowledge management in educational institutions:

- How is knowledge management adopted in both Western and Taiwanese education?

In order to take into account of the findings drawn from the studies of knowledge management concerned about teachers' endeavours and professional development:

- What is the current research concerning teachers' knowledge management in the Taiwanese elementary context about?

In order to understand the nature of knowledge involved in schools:

- What are the elements and characteristics of teachers' knowledge?

In order to rationalise responses from the above:

- Are there any implications for this research may be drawn from the above examinations?

2.3.1 Knowledge Management in Education

There exist conferences (e.g. online conference on Constructing Communities of Learning and Literacy in 2004; conference on Higher Education in the Knowledge Society in 2004; conference on Organizational Learning and Knowledge Management in 2002; forum for Knowledge Management in Education and Learning in 2002; conference on Knowledge Management and Educational Reform in 2001) and a variety of publications (e.g. Lin, 2002; Petrides and Nodine, 2003; Sallis and Edwards, 2002; Wang, 2000) in relation to knowledge management in both Western and Taiwanese education. Given this evidence, it may be seen that a number of Western and Taiwanese educators have recognised the potential of knowledge management in the knowledge era and attempted to relate the business concepts and practices of knowledge management to education. For instance, Rowley (2000) utilises Davenport's and Prusak's (1998) four types of knowledge management objectives as a lens to examine the applicability of the aspects of knowledge management to higher institutions in the UK. In the light of the examination, she identifies that there is still scope for considerable progress for universities to create knowledge repositories, to improve knowledge access, to enhance the knowledge environment and to management knowledge as an asset. Another example is that of Petrides and Nodine (2003), who claim that knowledge management can be thought of as an approach which integrates three core organisational resources people, processes and technologies and enables educational institutions to use and share information more effectively. They further provide a set of practical suggestions for the implementation of knowledge management in educational organisations, such as building an understanding of the organisational context and focusing on people and their needs.

According to the above examples, two issues are pointed out. Firstly, educational sectors seem to be weaker than business sectors in the implementation of knowledge management (CERI, 2000) even if they are recognised as the place involving the dissemination and creation of knowledge largely. It may be because the ultimate purpose for educational sectors to adopt knowledge management is for the effectiveness of teaching and learning which is difficult to be indicated and evaluated; on the contrary, the ultimate purpose for business sectors to adopt knowledge management is for the competitiveness and profits of companies which are easily evaluated. That is to say, business sectors appear to be more motivated since competitiveness and profits determine their survivability. The second issue is that arguments in regard to knowledge management in education tend entirely to embrace the general concepts and practices of knowledge management in business and not take the educational context and purposes into account. In this respect, by adapting Nonaka and Takeuchi's (1995) work, Hargreaves (1999) proposes four necessary elements and their applications to turn a school into the knowledge-creating school with the purpose of improving the management of the school and the effectiveness of teaching and learning. These four elements may be summarised as:

- Auditing professional knowledge by mapping the knowledge and abilities of teachers which enables them to know where to find help and advice; and also understanding a school's organisational capitals which underpins the process of knowledge creation and utilisation.
- Implementing initial teacher training to carry out the process of knowledge creation and also providing conditions and factors favouring the knowledge-creating process.
- Undertaking some forms of action research by teachers in order to validate created professional knowledge and subsequently applying it to their practice.
- Disseminating created professional knowledge and simultaneously considering

the notion of transferability (i.e. knowledge movement among people) and transposability (i.e. knowledge movement among places) which make the dissemination complex.

Besides, other initiatives promoting knowledge management in schools are about the use of ICT to accomplish the storage, access, dissemination and sharing of knowledge (e.g. Liu and Juang, 2002; Lyman, 2000; Wallace and Riley, 2000).

Since this research intends to explore teachers' personal knowledge management in the Taiwanese education, it is also relevant to look at how knowledge management is regarded in Taiwanese education. By means of doing so, I firstly identify that most of Taiwanese educators tend to lay their stress on the organisational level of knowledge management; that is, how school administration¹ should operate as the promotion of knowledge management (e.g. Fan, 2001; Ho, 2001; Lin, 2002; Wu and Chang, 2001). Those suggestions include establishing educational information platforms and mechanisms for educational resources sharing; encouraging collaborative learning and the formation of knowledge communities; building a shared educational vision and mission; and establishing knowledge culture and open climate. Secondly, it appears that most of the Taiwanese educators incline to adopt Western initiatives of knowledge management and not take the Taiwanese educational system and culture into consideration, such as how a school system influences the implementation of knowledge management or how Taiwanese culture affects the ways people share

¹ According to Qin (2004:12), school administration is defined as *the continuous processes of planning, coordinatng, implementing and evaluating, resulted from the interactions among educational participants, to manage educational business aiming at solving educational issues effectively*. The main educational participants include principals, all levels of administrators, teachers and pupils. In the light of the perspective *the interactions among educational participants*, I would argue that when administrative staff of a school intend to solve an issue, they need to take teachers' and pupils' opinions and situations into account in the process of planning to solve the issue effectively. Therefore, the administrative and teaching staff need to work cooperatively rather than separately.

knowledge.

Through examining the promotion of knowledge management in both Western and Taiwanese educational contexts, several issues emerge:

- Many of educational knowledge management practitioners incline to relate their arguments to knowledge management in business and the suggestions they make are rather general and conceptual (e.g. Hargreaves, 1999; Lin, 2002; Petrides and Nodine, 2003). That is to say, they seem not to take educational situations and purposes into consideration and also not to focus on practical operational strategies, such as successful stories and lessons, for both schools and teachers to carry out knowledge management.
- Many of the arguments and suggestions seem to focus on the school level rather than the teacher level (e.g. Fan, 2001; Ho, 2001; Lin, 2002; Wu and Chang, 2001). For instance, few of the practitioners illustrate how teachers synthesise and internalise the concepts of knowledge management into their everyday practice.
- Many of the practitioners intend to make knowledge management strategies fit into the system of schools as a new approach (e.g. Huang, 2002 Rowley, 2000; Sun, 2002); nevertheless, it appears that none of them attempt to expand existing strategies and resources of schools to fulfill knowledge management.
- Many of the practitioners talk about data, information and knowledge, explicit and tacit knowledge or intellectual capital while discussing so-called knowledge (e.g. Lin, 2002; Petrides and Nodine, 2003; Sallis and Edwards, 2002; Wang, 2000); however, it appears that none of them give an account of the components and characteristics of teachers' knowledge.

2.3.2 Teachers' Knowledge Management in the Taiwanese Elementary Educational Context

Over the past few years, there have been eight studies as postgraduate research focusing on teachers' knowledge management in the Taiwanese elementary educational context (see Appendix 2). Some of them intend to explore the status quo of the implementation of teachers' knowledge management (or teachers' personal knowledge management) including its feasible strategies and impeditive factors and also background and environmental variables influencing the implementation (Chen, 2003; Chou, 2003; Huang, 2003). Others tend to examine the relationships between teachers' knowledge management and other studies such as the notion of learning organisations (Chin, 2002), teachers' professional growth (Yu, 2002), teaching and classroom management effectiveness (Chang, 2003; Wang, 2003) and teachers' professional performance (Yang, 2004). Moreover, all of these studies emphasise knowledge management primarily at the individual teachers' level as this research does and consequently it may be possible to draw theoretical assumptions from their findings for this research. Like other knowledge management in education studies, none of these studies are concerned about teachers' knowledge. Furthermore, all of these studies are mainly quantitative by employing questionnaire surveys and two of them additionally adopt interview as the supplementary research methods. Therefore, I assume that the findings of these studies may tend to be superficial and may not illustrate the actual processes and strategies of how teachers carry out knowledge management in detail.

By means of analysing the findings of these studies, a number of theoretical assumptions are drawn for this research, as follows:

- Teachers' knowledge management involves the process of knowledge obtainment, storage, sharing, application and creation which are carried out under diverse strategies (Chen, 2003; Chin, 2002; Yu, 2002).
- Those strategies comprise participating in professional seminars and communities, reading up-to-date educational issues, making the most of ICT, talking and exchanging teaching portfolios with other teachers, engaging in the activities of peer observation, problem-solving, brainstorming, benchmarking, experimental teaching and educational research and being flexible (Chen, 2003; Chou, 2003).
- Impeditive factors affecting the practice of the above strategies are seminars do not meet teachers' needs and requirements, professional communities drifting into idle running, incapability to choose relevant knowledge, the lack of ICT equipment and skills, the lack of communication and collaboration skills, the lack of motivation, time and opportunities for learning and interacting with others, the attitude of self-defensive, unwillingness to innovate and incapability to adjust in a changing environment (Chen, 2003).
- In the main, the promotion of knowledge obtainment and application are more significant than it of knowledge storage, sharing and creation (Chin, 2002; Chou, 2003; Huang, 2003).
- Teachers' background and environmental variables engaged in the studies of teachers' knowledge management are teachers' gender, age, educational background, the length of their teaching experiences, their involvement in administrative affairs, their ability and frequency of using ICT and the location and size of schools (Chang, 2003; Chin, 2002; Chou, 2003; Huang, 2003; Wang, 2003; Yang, 2004; Yu, 2002).

- The promotion of teachers' knowledge management fulfills teachers' professional performance including teaching and classroom management effectiveness (Chang, 2003; Wang, 2003; Yang, 2004) and also their professional growth (Yu, 2002).
- Teachers' knowledge management and the notion of learning organisations are interrelated (Chin, 2002).

2.3.3 Teachers' Knowledge

As indicated in Section 2.3.1, educational knowledge management practitioners (e.g. Lin, 2002; Petrides and Nodine, 2003; Sallis and Edwards, 2002; Wang, 2000) tend to involve discussed knowledge in the knowledge management literature and do not include teachers' knowledge in their studies. However, I would argue that one aspect of the organisational knowledge assets of a school is based on the knowledge and competences of its teachers. Thus, it is essential to look at the studies in respect of teachers' knowledge including its elements and characteristics as the knowledge base of teachers' personal knowledge management.

Elements of teachers' knowledge

In terms of the elements of teachers' knowledge, studies such as Elbaz's practical knowledge (1983), Sanders and McCutcheon's practical theories of teaching (1986), Clandinin's personal practical knowledge (1985; 1986), Buchmann's folkways of teaching (1987) and Shulman's wisdom of practice (1987) are examined. By means of integrating these authors' viewpoints, the elements of teachers' knowledge comprise:

- Subject knowledge, that is, teachers' knowledge of specific subjects (Elbaz, 1983; Grossman, 1990; Maynard Reynolds, 1989; Shulman, 1987).
- Pedagogical knowledge, that is, teachers' perspectives on teaching and learning, including organisation of lessons, theories of teaching, evaluation of learners' learning and principles and strategies of classroom management (Elbaz, 1983; Grossman, 1990; Maynard Reynolds, 1989; Shulman, 1987).
- Pedagogical subject knowledge, that is, the combination of subject and pedagogical knowledge, including the understanding of what elements are needed to be taught and particular approaches for teaching a topic (Maynard Reynolds, 1989; Shulman, 1987).
- Curriculum knowledge, that is, teachers' understanding of the whole programme and its materials as well as their competence of engaging in the process of curriculum development (Elbaz, 1983; Grossman, 1990; Maynard Reynolds, 1989; Shulman, 1987).
- Knowledge of self, that is, teachers' image of themselves and how they present it to learners (Elbaz, 1983; Grossman, 1990).
- Knowledge of learners, that is, teachers' understanding of learners' characteristics which determine kinds of interaction with the learners (Grossman, 1990; Maynard Reynolds, 1989; Shulman, 1987).
- Knowledge of educational contexts, that is, teachers' perspectives on the environment in which they involve such as classroom, social relationships with other teachers and school administrators, school administration and the nature of social, political and cultural contexts (Elbaz, 1983; Grossman, 1990; Maynard Reynolds, 1989; Shulman, 1987).

Characteristics of teachers' knowledge

Besides, in terms of the characteristics of teachers' knowledge, it is indicated that teachers' knowledge is not simply existing facts and theories *but a living, experiential, processual, flexible, creative, compilation of insights, memories, information, association, and articulation* that instantly go into the resources of teachers' decision-making and action (Woods, 1987: 122). This implies that teachers' knowledge remain mainly tacit forms of knowledge. In this regard, it is assumed that teachers' knowledge is constructed by individual teachers from their own experiences to be appropriate for their own teaching contexts and therefore it is personalised and context-specific (Gardner, 1989; Marland, 1998). This infers that the development of teachers' knowledge involves the process of self-reflection on their personal experiences. Accordingly, teachers' knowledge is dissimilar as scientific theories, which is complicated to formulate with a formal language and *for the purpose of establishing a public knowledge base to which others have access* (Marland, 1997: 8; also see Sander and McCutcheon, 1986). The above argument illustrates that it is difficult to make teachers' knowledge as 'exact' facts or theories and also test them. However, Buchmann (1987: 7) points that that *members of in-group* are capable of catching the meaning of a teaching situation and knowing a way of acting appropriate to the situation. This infers that most teachers have shared knowledge of teaching in some degree. Thus, it is possible to access, communicate and understand teachers' knowledge by others teachers involved in similar situations.

2.3.4 Implications for the Research

The issues discussed in the pervious sections have serious implications for the way I develop the focus of this research and also define teachers' personal knowledge management. Firstly, according to the nature of teachers' knowledge, I would argue that how teachers know what they know is regarded as constructionist epistemology in which the processes of knowledge expansion and transmission as well as factors and issues engaged in a social context are involved. Therefore, the theoretical orientation of this research is mainly based on the concepts of human resource development and organisation studies perspectives of knowledge management (refer to Section 2.2.3). Secondly, as argued earlier (see Page 56), one part of the organisational knowledge assets of a school is based on the knowledge and competences of its teachers who leverage new ideas and knowledge into their daily practice. Consequently, the practical orientation of this research is primarily on how teachers construct, develop, share and create knowledge individually and collectively (clarified as the processes of teachers' personal knowledge management) and simultaneously how a school could support the above processes by providing an appropriate environment (clarified as the components of teachers' personal knowledge management). That is to say, the implementation of knowledge management in a school needs to be teacher-centred rather than school-centred. Finally, based on the theoretical assumptions drawn from the studies of teachers' knowledge management in the Taiwanese elementary educational context (refer to Section 2.3.2), I further define the practice of teachers' personal knowledge management is seen as the continuous and interrelated process of constructing, developing, sharing and creating knowledge carried out by teachers individually and collectively, which may bring about teachers' professional performance and development with the purpose of achieving the effectiveness of teaching and learning.

In the meantime, the promotion of teachers' personal knowledge management needs to be supported by schools with essential conditions, which also enables the schools to improve themselves continuously towards learning organisations.

2.4 Processes of Teachers' Personal Knowledge Management

As a consequence of examining the process-oriented knowledge management literature, it appears that a number of knowledge management practitioners attempt to emphasise organisations' capabilities for the achievement of identifying, acquiring, sharing, creating, utilising and retaining knowledge to support organisations to increase organisational effectiveness and maximise their profits (Probst, *et al.*, 1998; Rollett, 2003). Alternatively, others of them specify that it is individuals or teams' endeavours to accomplish these processes. For example, Hedlund (1994) proposes a model of knowledge categories and transformation processes which indicates that the processes of reflection, dialogue, assimilation and dissemination at individual and group levels bring about the continuous interaction of articulated and tacit knowledge and therefore the generation and creation of knowledge. In accordance with Grant's (1996) claim that knowledge creation is an individual activity, organisations should focus on individuals' capabilities to carry out the processes of knowledge management since organisations themselves will not learn and it is individuals within them learn and share knowledge. Moreover, the processes of knowledge management should be viewed as an interrelated cycle rather than a straight line (see Figure 2.2).

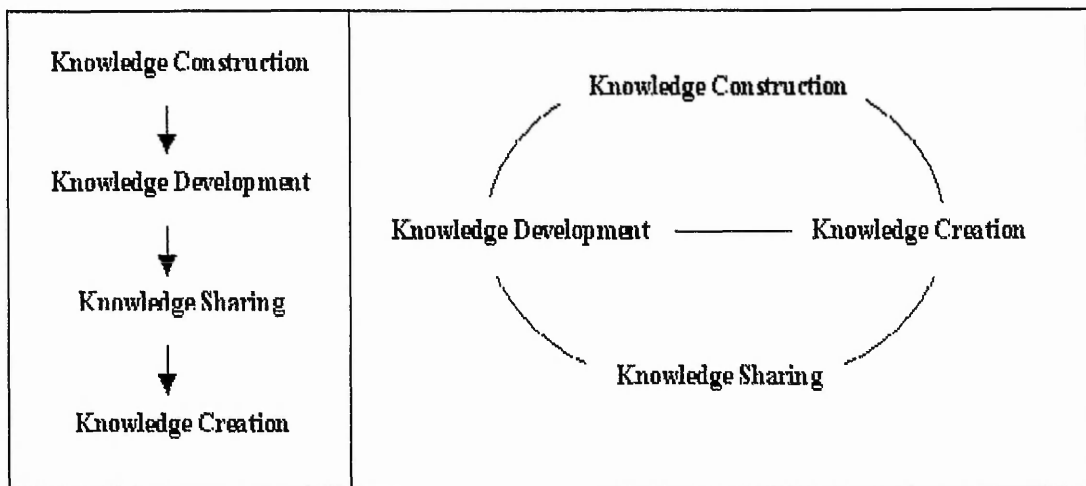


Figure 2.2 Comparison of straight-line and interrelated-cycle processes of teachers' personal knowledge management (elaborated by the researcher).

Notwithstanding, instead of embracing the process-oriented concepts of knowledge management in business, I attempt to synthesise existing educational literature in relation to teachers' thinking and teachers' professional development to develop theoretical assumptions for the processes of teachers' personal knowledge management. Firstly, I adopt Kelly's (1955a; 1955b; 1963) personal construct theory to explain how teachers' construct their knowledge as ordinary people. Secondly, I specify how self-reflection may be crucial for teachers to be aware of their personal construction systems of teaching and also themselves as a person and as a teacher. Thirdly, I specify collaboration may be regarded as a means to fulfill teachers' knowledge sharing. Finally, I intend to exemplify how Nonaka and Takeuchi's (1995) SECI model (Socialisation, Externalisation, Combination and Internalisation) may be applied to educational settings. In the course of writing up the following sections, I incline to provide some examples of these subjects as the development of my understanding of them and also encompass the discussion of autobiography, reflective journal and action learning which are normally included in the methodology chapter with the purpose of demonstrating my progress of combination

and internalisation.

2.4.1 Teachers' Knowledge Construction

In this section, I firstly give an introduction of Kelly's personal construct theory and subsequently integrate Kelly's theory with the studies of teachers' thinking in order to illustrate the process of how teachers' construct their knowledge. Secondly, I adopt Kelly's CPC (Circumspection, Pre-emption, Control) cycle to demonstrate how teachers apply their knowledge when dealing with situations. I do not intend to include criticisms of Kelly's theory, such as ignoring emotions and biological factors in human behaviour, too individualistic and insufficient attention on society and culture (e.g. Cloninger, 1996; Hergenhahn, 1994; Thompson and Antaki, 1984), since the theory is not adopted to explain all the processes of teachers' personal knowledge management but merely to examine the connection of CPC and teachers' knowledge construction and application.

Personal construct theory and teachers' knowledge construction

Kelly (1955a: 4) begins the theory with his metaphor of *man-the-scientist*; that is, individuals have their personal constructs of their own reality like scientists have theories; they have anticipations like scientists have hypotheses; they test out those anticipations in behaviour like scientists do experiments; they improve their understanding of reality based on their experiences like scientists adjust their theories to fit facts. In other words, an individual utilises his/her personal constructs to interpret, explain and predict an experience (or an event). Moreover, Kelly (*ibid*: 15) claims *there are always some alternative constructions available to choose among in dealing with the world*. This implies that individual is free to choose any constructs or ways to construe and anticipate the experience (or the event) s/he wishes. Kelly (1963: 15) further elaborates that *all of our present interpretations of the universe are*

subject to revision or replacement. That is to say, if the anticipation generated by a construct is validated by the experience, the construct will be organised into the construction system to which it belongs. If the anticipation is not validated, the construct will need to be revised or abandoned. The above arguments illustrate the philosophical position of Kelly's personal construct theory termed 'construction alternativism'.

Handal and Lauvas (1987: 9) regard a teacher's theory of teaching as a *personal construct* and define it as *a person's private, integrated but ever-changing system of knowledge, experience and values which is relevant to teaching practice at any particular time.* Evidently, their claim exemplifies the possibility of connecting the concepts of teachers' knowledge with personal construct theory to a certain extent. Through examining several studies on teachers' thinking, Kelly's philosophy of construction alternativism can be adopted to explain the process of how teachers construct their knowledge. Pope (1978: 20-21) claims that *teachers use personally pre-existing theories to explain and plan their teaching and also test these theories for fruitfulness and modify them in the light of such testing.* Besides, McIntyre, Macleod and Griffiths's (1977 cited in McIntyre, 1988) research shows how student-teachers depend heavily on their own repertoires of perspectives for construing and evaluating their teaching. In the light of the research, McIntyre (1988) further points out that both novice and experienced teachers evaluate their teaching mainly in accordance with pupils' classroom activities and typically use hypotheses based on perceptions and evaluations of lessons to guide their behaviour in the next. What so called pre-existing theories or repertoires of teaching, clarified as personal construction systems of teaching, are constructed through previous education and life experiences (Calderhead and Robson, 1991; Goodson, 1992) and also teacher training programmes (Graber, 1995). Accordingly, it is assumed that teachers like

other ordinary people and scientists also tend to reduce uncertainty by developing their personal theories (construction systems) of teaching which support them to predict classroom events accurately.

Kelly's CPC cycle and teachers' knowledge application

The implication of Kelly's (1955a; 1995b; 1963) CPC cycle may also be used to exemplify the relationship between teachers' personal constructs and their behaviour; that is, how teachers apply their knowledge in situations. When a teacher encounters a novel situation, s/he would consider numerous constructs s/he believes appropriate to the situation (circumspection phase). Subsequently, s/he would choose a construct that seems to be the most relevant (pre-emption phase). Finally, s/he would choose the pole of the dichotomous construct and act on it to validate the construct (control phase). Using the example of noise made by a pupil to demonstrate the above procedure, a teacher will ponder several constructs which seems to be applicable to the situation; for instance, ignore-not ignore, advise-not advise, beat-not beat. Let us assume that the advise-not advise construct is chosen. In the next phase, the teacher will choose either advise or not advise which seems most pertinent under the circumstances and will then act on it. Let us say the teacher chooses to advise the pupil not to make such noise in order to not interrupt other students. If the advise action aids him/her to stop the pupil, the construct advise-not advise would be validated and consequently tend to direct the teacher's thinking if s/he meets the same situation. The construct may, however, be invalid when the teacher employs it to different pupils since their personalities could be different from the example. It would, therefore, be crucial for the teacher to deconstruct and reconstruct her/his personal constructs to particular situations in the light of circumstances. The process of deconstructing and reconstructing personal construction systems may be regarded as the development of teachers' knowledge, which is elaborated in the next section.

2.4.2 Teachers' Knowledge Development

In this section, I firstly illustrate how Kelly's creativity cycle can be embraced to explain the process of teachers' knowledge development and subsequently indicate issues affecting the development process. Secondly, I suggest that narrative inquiry carried out by the composition of an autobiography and use of a reflective journal may be viewed as the means to facilitate teachers to explore their knowledge. Finally, I specify the importance of reflecting on personal experiences, pupils' and other teachers' performances and also theoreticians' works in the course of teachers' knowledge development.

Kelly's Creativity cycle and teachers' knowledge development

Unlike the CPC cycle involving exclusively the selection of personal constructs for action, the creativity cycle (Kelly, 1955a; 1995b) involves the development of personal construction systems of teaching. It is employed when an individual attempts to seek solutions for problems or a fresh way of construing events, including three phases – loosened construction phase, tightened construction phase and test phase. For instance, a teacher may begin to loosely think about his/her teaching; s/he then quickly moves into the tightening phase of validation by trying to translate the new insights and the alternative scenarios into his/her daily practice; and finally the newly-created construct is submitted to a test and if it is validated by the subsequent experience within the context, it is maintained as part of the teacher's construction systems of teaching. If not, it is abandoned and the creativity cycle may be repeated.

Furthermore, there are a number of personal issues influencing the development of teachers' personal constructs, as follows:

1) Motivation

It is a teacher's motivational decision affecting his/her desire to either constrict certainty or broaden understanding (Kelly, 1963). That is to say, teachers' motivation may be regarded as the drive to improve their knowledge; that is, broadening and changing their personal construction systems of teaching. Elements, influencing on a teacher's motivation, are clarified as his/her personal goals, beliefs about his/her capabilities, beliefs about the context s/he belongs and emotional arousal process (Ford, 1992). These four elements may bring about intrinsic and social motivation. For instance, when a teacher feels competent and self-determining, resulted from the previous achievement of personal goals, s/he tends to be intrinsically motivated, make an effort to accomplish a task successfully in order to experience pleasure and satisfaction, irrespective of certain external values (Dörnyei, 2001). To foster teachers' motivation to change, school leaders are suggested to consider these elements and subsequently provide associated conditions (indicated in Section 2.5).

2) Critical awareness of personal construction systems of teaching

Diamond (1991) indicates that some teachers fail to test out and elaborate their personal theories of teaching because they keep testing and re-testing the same anticipations continuously and are not aware of invalid evidences and their implications. For this to be improved, teachers need to be able to identify what they have been doing wrong repeatedly and simultaneously to understand the context they are involved in order to seek possible solutions for the problem. That is to say, in terms of enlarging personal construction systems, teachers are

required to understand their existing construction systems of teaching (including current practice and context of teaching) in order to seek new ways of construing experiences (or events).

3) Critical awareness of personal and professional self

It has been identified that the individual characteristics of a teacher such as personalities and manners bring an impact on his/her teaching behaviour and decision to choose what sorts of knowledge to gather (Beijaard, *et al.*, 2000; Clandinin, 1985; Grossman, 1990). For example, the teacher's preferred learning styles may determine his/her teaching styles and approaches used (e.g. Cano and Garton, 2000). Accordingly, s/he may be more interested in exploring teaching ideas or issues in relation to those teaching styles and approaches. Furthermore, both personal and professional identities influence each other and relate to their development (Ball and Goodson, 1985). The above arguments inspire two concepts. One is that the teacher's critical awareness of 'the person I am' may shape his/her identity of 'the teacher I am'. The other one is that the teacher needs to actively and critically explore and understand who s/he is as a person and as a teacher with the purpose of forming a direction for his/her professional development. Through understanding personal and professional self, teachers are the designers of their own professional development (Clark, 1992), who are capable of forming an idea of what they would like to be gradually, and by knowing that, they are capable of how to choose and shape their own version of professional life eventually (Bannister, 1981; Pope, 1978).

Narrative inquiry as a means to explore teachers' knowledge

As indicated previously, not only teachers' motivation but also their critical awareness of personal construction systems of teaching as well as personal and professional self are essentials to enhance the development of teachers' knowledge. The use of Kelly's repertory grid has been applied in teacher training to assist teachers to increase their tacit understanding of personal construction systems and how they theorise (e.g. Anning, 1988; Diamond, 1985, 1991; Hopper and Rossi, 2001; Pope and Denicolo, 1993; Solas, 1992; Yaxley, 1991). Besides, other instruments such as conversations, story-telling, concept-mapping, drawing, metaphor and sentence completing are also employed to explore knowledge teachers apply in their daily practice (e.g. Beijaard, *et al.*, 1999; Black and Halliwell, 2000; Effron and Joseph, 1994; Martin and Kompf, 1996; Weber and Mitchell, 1996; Yonemura, 1982; Zanting, *et al.*, 2001). Some of the above instruments, such as concept-mapping, drawing and metaphor, may not address teachers' awareness of current teaching practice, teaching context involved and self-image and also how personal construction systems have been changed. Moreover, either Kelly's repertory grid or the above instruments require some degree of collaboration to carry out. I would, however, suggest it is more effective for teachers to probe their knowledge on their own first at this stage of teachers' personal knowledge management.

For this to be achieved, narrative inquiry is suggested as a means to enable teachers to raise their critical awareness and also represent decisive changes of their knowledge (Britton and Pellegrini, 1990; Clandinin, 1992; Connelly and Clandinin, 1990). When promoting narrative inquiry in teachers' knowledge development, teachers are able to be conscious of the knowledge they possess, how they use it, what they have expand and how to utilise it more effectively with the purpose of enhancing teaching practice. Moreover, since much of teachers' knowledge is not

articulated, such narrative approach may also facilitate teachers to make tacit knowledge embedded in their experiences and practices more explicit for the access and communication purposes. Autobiography and reflective journal are the two instruments adopted in this research to bring about narrative inquiry. How these two instruments are applied during the stage of research investigation will be illustrated exhaustively in the next chapter.

1) Autobiography

As indicated previously, teachers' past experiences bring about an impact on the construction of their knowledge. For teachers to understand their perspectives on personal and professional self and also their personal construction systems of teaching, they are encouraged to explore their life histories (Goodson, 1992; Kelchtermans, 1992; Knowles, 1993; Raymond, *et al.*, 1992). While narrating life histories, five key elements (adapted from Butt, *et al.*, 1992) need to be included:

- Personal family background and learning experiences.
- Current professional life in the present professional context.
- Teaching methodology and beliefs related to teaching and learning.
- Reflection on how crucial life episodes form teaching and learning beliefs and how these beliefs dominate professional behaviour.
- Scenarios for future professional life.

By means of investigating a teacher's past through structuring an autobiography, s/he may be able to increase critical awareness of how past events, feelings and values affect his/her perspectives on who s/he is as a person and as a teacher and also teaching and learning. Subsequently, the teacher is capable of connecting the reflection and analysis to form actions towards his/her future professional life.

2) Reflective journal

The process of journal writing is a powerful and reflective approach which enables an individual to examine her/his practices in new ways (Maloney and Campbell-Evans, 1997). A teacher's reflective journal describes everyday happenings of classrooms and schools including thoughts, actions, beliefs and attitudes (Francis, 1995; Kerka, 1996). Through synthesising Smyth's (1989) approach to personal and professional empowerment and Francis's (1995) guidelines for reflective writing, a set of questions is developed as references while composing a reflective journal, including:

- What happened?
- Why did the event happen?
- What/how/why did I do?
- How did I feel about the event?
- What does the event mean?
- How does the event relate to my previous experiences?
- What have I learned from the event?

By means of writing a reflective journal, teachers are able to discover meanings and relationships emerged from events and expectantly to elaborate or integrate those meanings and relationships, which may increase their critical awareness of present teaching practice and teaching context involved.

Reflection as a key in teachers' knowledge development

A number of educational scholars and researchers suggest that teachers' intentional efforts to reflect on the experiences of everyday teaching practice may assist them to not only understand their own knowledge but also evaluate their present teaching and thus seek out better ways and opportunities to improve their performance (LaBosky, 1994; Moran and Dallat, 1995). Accordingly, no matter what instruments are employed throughout the process of teachers' knowledge development, deep and critical thinking regarded as reflection is vital to be involved.

Through examining the works on how reflective practice determines teachers' knowledge development, it appears that most of the authors include Schön's (1983; 1987) approach termed *reflection-in/on-action* in their literature discussion. According to the nature of teaching, I would argue that *reflection-in-action*; that is, learning by doing, has less impact on teachers' knowledge development than *reflection-on-action*, since it is criticised *reflection-in-action* lacks for concerning the social conditions of workplace learning (Smylie, 1995), understanding other existing initiatives for reflection which encourage collaboration (Day, 1999) and time available for understanding professional behaviour (Eraut, 1994). On the contrary, *reflection-on-action* allows more time to reflect on a particular event, provides opportunities for teachers to talk about their teaching with others and therefore opens up possibilities for collaborative activities among teachers towards improvement. Furthermore, Kirkham (2003) indicates that the notion of the *reflective practitioner* (Schön, 1983; 1987) tends to focus on the reflection of personal performance, which may only bring about some learning. He (*ibid*) further argues that not only personal reflection but also the reflection on others and their works (including pupils, other teachers and theoreticians) are crucial to becoming a *reflexive professional* teacher who is inspired and applies newly-developed knowledge. That is to say, to create

cognitive change in both teachers' knowledge and practices, they are required to reflect not only before and after their actions but also on others and their works by using a variety of techniques such as questioning and challenging assumptions.

2.4.3 Teachers' Knowledge Sharing

The previous two sections emphasise how teachers construct and develop their knowledge as construction systems of teaching individually through their interaction with their world. However, these two sections fail to address the importance of social interaction and socialisation since constructionists also consider individuals' interaction with other human beings within a social context in the development of knowledge. For instance, Feldman (1994) gives an example of how two physicists, meeting in a research presentation, inspire each other after talking about the findings being discussed in reference to their own work. He (*ibid*) further claims that knowledge grows not only from the readings of books or articles but also through the exchanges of knowledge among colleagues formally and informally. Furthermore, Kirkham's (2003) proposition of the *reflexive professional* specifies the relevance of taking others' actions, experiences or ideas into account in self-reflection. For this to be achieved, the initial step is to identify opportunities and ways to access to others' knowledge. Accordingly, knowledge sharing among individual teachers may bring about an opportunity for them to access, communicate and understand others' experiences or ideas, which commonly takes place at group level informally. It is also important to extend the sharing at organisational level formally so that good practices of teaching and lessons learned may be understood, leveraged or institutionalised by everyone in a school (Collinson and Cook, 2004; Shaw and Perkins, 1992).

In this section, I firstly specify how collaboration is regarded as a ways to promote teachers' knowledge sharing. Secondly, I illustrate why action learning is adopted in this research. Thirdly, I illustrate Nonaka (1998; also see Nonaka, *et al.*, 2002) and also Wenger's (1998; 2000) proposition of *ba* and 'community of practice' respectively to indicate the contexts of knowledge sharing. Finally, I point out influences on teachers' decisions to share and also issues engaged in the process of action learning.

Collaboration in teachers' knowledge sharing

'Three cobblers with their wits combined equal Zhuge Liang, the master mind' is a Chinese phrase which illustrates that three heads are better than a smart one. The phrase infers the significance of collaboration. My argument for *reflection-on-action* indicates the potential of collaborative reflection which is supported as a means to carry out the development of teachers' knowledge through the advantages of peer interactions and contributions (Manouchehri, 2002). Furthermore, Little's (1982; 1990) reveals that the degree of teachers' interactions, such as the frequency of teachers talking about their teaching with others, observing others' teaching or designing and preparing teaching materials together, lead to the significant progress of pupils' learning outcome and also teachers' professional development. The above examples specify the importance of collaboration in the improvement of effective teaching and learning and also imply that various kinds of knowledge sharing are involved and fulfilled throughout the implementation of collaborative initiatives. In the Taiwanese educational context, schools tend to integrate Western literature with the current practice of school administration and consequently to develop such collaborative activities for teachers' professional development, including:

- Professional dialogue:

A group of teachers meet regularly and talk about up-to-date educational issues as well as theories and practices of teaching and learning. The purpose of professional dialogue is to foster teachers' self and collaborative reflection on teaching practices and issues, which facilitates them to be more reflexive decision makers (e.g. Glathorn, 1987; Wu, 2000).

- Study groups:

The purpose of study groups is to encourage life-long learning. Through the process of planning, reading, sharing and discussing, teachers are able to get along and cooperate with others, gain more educational knowledge and increase abilities to think logically, organise, discuss, express, communicate and so forth (e.g. Ho, 2000; Wang, 2000).

- Peer clinic supervision:

A teacher undertakes the process of observing, analysing and discussing the other teacher's teaching by employing appropriate observation schedules and techniques and communication skills. The purpose of peer clinic supervision is to improve teachers' current teaching performance (e.g. Chang, 1999; Glathorn, 1987; Grimmitt and Crehan, 1992; Lu, 1998; Wu, 2000).

- Peer coaching:

The process of peer coaching is similar to peer clinic supervision. However, peer coaching involves more teachers to participate and emphasises the obtainment of new teaching strategies and techniques through observing good practices of teaching (e.g. Chang, 2001; Galbraith and Anstrom, 1995; Minor and Preston, 1991).

- Curriculum development:

Teachers work on the design of the school's curriculum or transform it into practicable lesson plans cooperatively, which is currently practised by the Committee of School Curriculum Development, the Committee of School Curriculum Development in Learning Areas and teaching teams in most of Taiwanese elementary schools (e.g. Chan, 2000; Rao, 1999).

- Collaborative action research:

A group of teachers co-operatively do action research and develop solutions or suggestions for research findings to solve teaching problems or issues. Throughout the research, the teachers play the roles of sharer, transformer and creator of knowledge which may bring about the development of knowledge (e.g. Chang, 2000; Chang; 2004; Chen, 1995; Oja and Smulyan, 1989).

The purpose and practice of the above activities not only carry out varying forms of knowledge sharing such as discussing issues, exchanging ideas or observing good practices but also fulfill the growth of teachers' knowledge and performance. However, it is identified that the implementation of some these activities is normally under the practice and plan of school administration, which is viewed as contrived collegiality. Such an administratively imposed and controlled form of collegiality discourage the development of teachers' collaboration since it is not naturally occurring relation among teachers (Hargreaves, 1991; Little, 1990). Moreover, the implementation of these collaborative activities also requires pre-training for research methods, analysis techniques and communication skills; understanding of up-to-date educational issues in reference to the new Taiwanese national curriculum and teaching and learning approaches; and time for preparation, which may not directly solve immediate teaching problems or issues teachers encountered and also

may put pressure on teachers. It has been identified that as a school attempts to induce teachers' collaboration, it needs to foster *bottom-up problem-solving approaches to school improvement* so that teachers could make use of the practice for their professional needs (Grimmett and Crehan, 1992: 70). In this regard, I suggest that the practice of action learning may facilitate teachers to seek for solutions to immediate problems, which does not require pre-training for certain skills and can be organised by teachers themselves, regarded as self-facilitated action learning sets (McGill and Beaty, 1995: 94).

Action learning has been leveraged and practised as an approach to develop students' criticality in higher education (e.g. Anderson and Thorpe, 2004; Bourner and Forst, 1996) and to enable organisational learning process in knowledge-intensive organisations (Zaharias, *et al.*, 2001). These two examples infer that the practice of action learning may bring about knowledge development and sharing. The implementation of action learning (e.g. McGill and Beaty, 1995; Pedler, 1991; Revans, 1983; 1998; Weinstein, 1999; Zuber-Skerritt, 2002) involves a group of adults (in the educational context teachers), known as a set, working together for a concentrated period of time. Throughout the process of diagnosis, individual teachers learn with and from each other by dealing with real problems and reflecting on their own experiences. In addition, the practice of action learning inspires new ways of thinking and behaving and also brings about an active attitude and confidence since it is defined *the process [of action learning] helps us to take an active stance towards life and helps to overcome the tendency (merely) to think, feel and be passive towards the pressures of live* (McGill and Beaty, 1995: 21). Here, I do not attempt to fully describe the aspects and benefits of action learning from action learning practitioners, which is like estate agents describing their houses. Instead, I will give more details of how I employ action learning as the means for participant teachers in the research

investigation to experience the process of knowledge sharing.

Contexts for knowledge sharing

As specified previously, knowledge sharing takes place in a social context in where individual teachers are involved. In this regard, Nonaka, Toyama and Konno (2001; 2002; also see Nonaka, 1998) propose that *ba* is the context shared by those teachers who interact with each other. Throughout their interactions, they share time and space and simultaneously form a common language. There are four types of *ba*, as follows (also see Figure 2.3):

- Originating *ba* is where teachers share feelings, emotions, experiences and mental models.
- Dialoguing *ba* (or interacting *ba*) is where teachers' mental models and skills are shared, converted into terms and articulated as concepts.
- Systemising *ba* (or cyber *ba*) is where existing explicit knowledge is combined by teachers.
- Exercising *ba* is where teachers communicate and subsequently embody explicit knowledge through virtual media such as manuals or programmes.

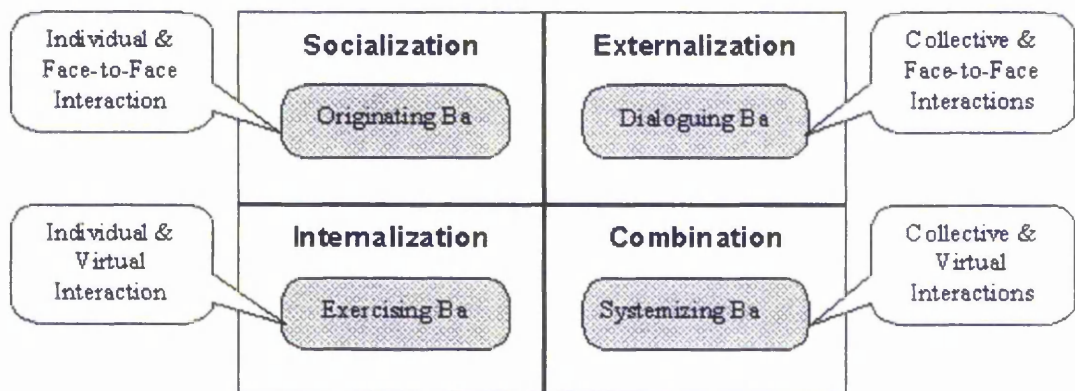


Figure 2.3 *Ba* and the SECI model (adapted from Nonaka, *et al.*, 2002: 51-52).

Additionally, so-called 'community of practice' (CoP) is constantly discussed in the knowledge management literature as a space for knowledge sharing and creation (e.g. Von Krogh, 2003); therefore, it is necessary to examine CoP while taking about the social context of interactions among teachers. CoP is mostly informal and made up of people who interact with each other on a regular basis. Consequently, CoP may be viewed as kind of social structure, distinct from organisational unit, team or network, where shared practice is served as a living curriculum for the members of the community throughout their fully engagement in the process of creating, refining, communicating and using knowledge (Lave and Wenger, 1991; Wenger, 1998). Wenger (2000: 208-215) further proposes that CoP is an ideal structure for the stewarding of knowledge by means of combining its three elements, as follows:

- A sense of *joint enterprise* around a topic brings members together and allows them to know what is relevant to communicate and how to present their ideas or experiences in useful ways.
- *Mutual engagement* allows active negotiation of both explicit and tacit forms of knowledge through joint discussion and problem-solving. By interacting over time, members are able to know each other better and subsequently build trust.
- A *shared repertoire* of communal resources allows members to communicate efficiently and effectively with each other. Moreover, it embodies the community's accumulated knowledge and also provides the resources for members to make sense of new situations and create new knowledge.

By comparing the concepts of *ba* and CoP, it can be identified that both of them have some similarities and differences in some respects (see Table 2.6).

Table 2.6 Similarities and differences between *ba* and ‘communities of practice’.

	<i>Ba</i>	Communities of Practice
Similarity	Teachers learn through participating in <i>ba</i> or CoP and interacting with others.	
Differences	Creating new knowledge.	Learn knowledge embedded in the communities.
	Set by teachers according to their needs.	Set by the task, culture and history of the communities.
	Changes take place at both the individual level and <i>ba</i> itself.	Changes take place at the individual level.
	Membership is not fixed. Teachers come and go.	Membership is stable. Teachers take time to learn about the communities to become full members.
	Participants of <i>ba</i> relate to the <i>ba</i>	Members of CoP belong to the communities.

Source: adapted from Nonaka, *et al.* (2002: 50-51).

Although *ba* and Cop operate in slightly different ways, both of them contribute to the sharing and creation of knowledge throughout teachers’ interactions with others in the contexts. *Ba* occurs and activates in a more natural and flexible manner. At the same time, CoP nurtures its members’ relationships with others and also builds a shared repertoire of the community. Therefore, it is difficult to conclude which one is better than the other. Notwithstanding, I would argue that not every teacher of a school would participate in any CoP; on the contrary, all of them may engage in these four types of *ba* to some degree. Accordingly, schools need to recognise how teachers of the organisation interact with each other in order to capture the naturally emerging *ba* and consequently to form *ba* effectively by providing a variety of spaces such as common rooms or electronic networks (Nonaka, *et al.*, 2001; 2002; Nonaka, 1998).

Influential factors involved in teachers' knowledge sharing

According to the nature of teachers' workplace, professional isolation among teachers results in a barrier collegial interactions and dialogue (Grimmett and Crehan, 1992; Lieberman and Rosenholtz, 1987; McLaughlin, 1993) which are necessities for knowledge sharing. Moreover, the lack of time to meet during the school day and the lack of learning forums are the issues for teachers' professional development (Donahoe, 1993; Fullan and Miles, 1992; Louis, 1994), which also determine the lack of frequency and opportunity for knowledge sharing. Furthermore, teachers' professional autonomy limits them to learn by trial-and-error and also limits them to gain pedagogical knowledge from colleagues' ideas and suggestions (Little, 1990), which determines teachers' attitude towards learning from experiments and others. The above evidences exemplify why it is complicated to foster teacher' knowledge sharing in a school context. Collinson and Cook (2004) identify 43 motivating and 35 restraining factors influencing on teachers' decisions to share their knowledge; subsequently, they classify those factors into a set of categories comprising teachers' relationships and reactions, time issues, attitudes and dispositions, interest and practicality at the classroom level and teachers' individual level of competence. Those factors illustrate the enablers and disablers for teacher' knowledge sharing in everyday circumstances, which incline to concentrate on the quantity of sharing. It is noteworthy to indicate that trust and social relationships are identified as the most influential factors engaged in knowledge sharing in the Taiwanese (or Chinese) culture (Wang and Ashleigh, 2005; Weir and Hutchings, 2005).

In terms of the quality of teachers' knowledge sharing, I attempt to integrate action learning practitioners' (Bourner and Forst, 1996; McGill and Beaty, 1995; Weinstein, 1999; Zuber-Skerritt, 2002) perspectives on interpersonal skills involved in the process of action learning with the purpose of indicating further issues affecting the knowledge-sharing process, as follows:

- Recognition of benefits and achievements.
- Willingness to share knowledge for problem solving.
- Willingness to create change and make significant contributions to others and schools.
- Openness to new ideas, challenges, criticisms and feedback from others.
- Trust in self and others' ability to find solutions to a problem.
- Mutual respect for individuals' needs and differences.
- Listening to others carefully and questioning them critically in order to foster self and collaborative reflection.
- Honest, belonging and love developing friendships and also establishing a safe and caring place for learning.

2.4.4 Teachers' Knowledge Creation

In their book, 'The knowledge-creating company', Nonaka and Takeuchi (1995) explain how organisations create knowledge dynamically through the processes of conversion between explicit and tacit knowledge in Japanese contexts. In this section, I exemplify how teachers' daily practices may be placed in Nonaka and Takeuchi's (1995) SECI model to illustrate the possibility of adopting the SECI model in a school context, as follows:

- **Socialisation (from tacit knowledge to tacit knowledge):**
The process of sharing tacit knowledge between individuals through joint activities e.g. teachers talk about teaching difficulties or educational issues from which solutions or new thinking may be emerged.
- **Externalisation (from tacit knowledge to explicit knowledge):**
The process of articulating tacit knowledge in publicly comprehensible forms e.g. teachers write down teaching ideas or experiences and simultaneously they may also reflect on the ideas or experiences during their composition.
- **Combination (from explicit knowledge to explicit knowledge):**
The process of transforming explicit knowledge into a more complex and systemic sets of explicit knowledge e.g. teachers integrate ideas or knowledge obtained from educational books or articles and subsequently they produce another piece of writing.
- **Internalisation (from explicit knowledge to tacit knowledge):**
The process of internalising and subsequently embodying explicit knowledge into actions, practices, processes and strategic initiatives e.g. teachers search

teaching strategies from educational websites and accordingly adapt new ideas into teaching.

They also claim that these processes are carried out by individuals within an organisation but not by the organisation itself. With this regard, personal knowledge is shared and created at the individual and group level and subsequently expanded at the organisational level. I would argue that a school should establish mechanisms for the dissemination and maintenance of the newly-created teachers' knowledge whereby the new knowledge could become the knowledge asset of the school.

Furthermore, the collaborative activities for teacher's knowledge development and sharing (see Section 2.4.2 and 2.4.3) are placed in the SECI model to demonstrate these activities may also be regarded as the practice of teachers' knowledge creation, as the following table:

Table 2.7 Individual and collective teachers' knowledge creation.

<p>Socialisation (from tacit to tacit)</p> <ul style="list-style-type: none"> • Professional dialogue. • Action learning. • Peer clinic supervision. • Peer coaching. • Collective discussion of the readings read by study groups. • Collective discussion for collaborative action research. 	<p>Externalisation (from tacit to explicit)</p> <ul style="list-style-type: none"> • Composition of autobiography and reflective journal. • Curriculum development. • Findings of collaborative action research. • Records of peer clinic supervision and peer coaching, including lesson plans, observational notes and discussion minutes.
<p>Internalisation (explicit to tacit)</p> <ul style="list-style-type: none"> • Self-reflection on the readings read by study groups. • Review of research methods for conducting collaborative action research. 	<p>Combination (from explicit to explicit)</p> <ul style="list-style-type: none"> • Composition of literature for collaborate action research.

Source: adapted from Nonaka and Takeuchi (1995).

Based on the above table, I would firstly claim the practice of teachers' knowledge development and sharing may promote teachers' knowledge creation. Even Glisby and Holden (2003) argue that the followers of Nonaka and Takeuchi (1995) have ignored the extent to which the knowledge management model is rooted in the Japanese culture, I would secondly suggest that their SECI model may be adopted to categorise the ways of how teachers create knowledge individually and collectively in the Taiwanese culture.

2.5 Components of Teachers' Personal Knowledge Management

In this section, I specify essential elements which are supported by schools when encouraging an environment for the promotion of teachers' personal knowledge management. Noteworthily, those elements are not the main focus of the research; therefore, instead of illustrating every element exhaustively, I incline to lay stress on how those elements connect to the promotion of teachers' personal knowledge management. Further, I intend to link the practice of teachers' personal knowledge management (including its processes and components) with Senge's (1990; Senge, *et al.*, 2000) five disciplines of learning organisations to illustrate the promotion of teachers' personal knowledge management enables schools to become learning organisations.

Conditions encouraging teachers' personal knowledge management

One of the goals of teachers' professional development is the assimilation, renewal and expansion of teachers' knowledge (Earley and Bubb, 2004; Madden and Mitchell, 1993), which may be carried out when teachers actively engage in the processes of teachers' personal knowledge management. Additionally, continuous professional development of teachers is regarded as one of the vital efforts for school improvement, which maintains and fosters the quality of teaching and learning

(Cohen, 1997; Stoll, 1999). Moreover, continuous professional development of teachers is also regarded as one of the characteristics of schools as learning organisations in which schools learn and improve continuously (Johnson and Caldwell, 2001; Silins, *et al.*, 2002; Wu, 2003).

However, teachers' professional development often fails since it is implemented without essential conditions for teachers' learning such as providing opportunities for collegial inquiry, help and feedback as well as connecting teachers to external expertise (Newmann, *et al.*, 2000). If the promotion of teachers' personal knowledge management relates to teachers' professional development, teachers' endeavours for their growth need to be supported by schools with essential conditions. This relates to the subject of 'building the capacity' in the school improvement literature, concerned with creating the conditions, opportunities and experiences for accommodating changes and also promoting collaborative and mutual learning (Fullan, 1999; Harris, 2001; Stoll, 1999). Within the environment, *individuals feel confident in their own capacity, in the capacity of their colleagues and in the capacity of the school to promote professional development* (Mitchell and Sackney, 2000: 78). For this to be achieved, I attempt to integrate conditions enabling knowledge creation discussed in the knowledge management literature with various school improvement practitioners' viewpoints in relation to essential elements which may enhance teachers' professional development and thus school improvement (including the subject of schools as learning organisations). Those conditions and elements are defined as the components of teachers' personal knowledge management in this research and are classified into the following six categories:

1) Educational leadership and management

Leadership and management of schools is identified as the key internal factor influencing teachers' morale and motivation (Varlaam, *et al.*, 1992); therefore, it is essential to address the role of school leaders and managers in encouraging teachers' motivation to create and change their knowledge. There is an increasing acknowledgement of the importance of middle management leadership in both the knowledge management and school improvement literature (e.g. Hargreaves, 1999; Harris, *et al.*, 1995; Von Krogh, *et al.*, 2000). However, principals (known as headteachers) in Taiwanese schools still remain as strategic decision-makers and determine organisational directions. Accordingly, it is more relevant to propose an appropriate leadership style for principals who have a great impact on teachers. As Taiwanese elementary schools are facing issues resulted from the implementation of the Grade 1-9 Curriculum, transformational leadership is recommended to make new things happen, manage those changes and also inspire higher levels of school staffs' commitment and capability in response to those changes (Halsall, 1998; Hopkins, *et al.*, 1996; Leithwood and Jantzi, 1997; Silins and Mulford, 2002). The following practical strategies are suggested to fulfill transformational school leadership and thus foster teachers' motivation to create and change:

- Giving individual teachers or teams responsibility to lead throughout the change process (Hopkins, *et al.*, 1996; Myers, 1995; Stoll and Fink, 1996; Tannenbaum and Schmidt, 1958) and making them be involved in the decision-making process so that they may feel professionally empowered (Stoll, 1999).
- Building shared vision, creating consensus about school goals, demonstrating high performance expectations and establishing a collaborative culture (Leithwood, *et al.*, 1999; Lin, 2004)

- Establishing an appraisal system in which observation and feedback on classroom instruction are involved (Leithwood and Jantzi, 1997) and providing rewards for teachers (Louis, 1994), which need to take into account of collaboration and knowledge-sharing (Davenport and Prusak, 1998).

Lam (2005) points out that teachers under the higher level of professional autonomy, that is, freedom to control, tend to have the higher level of motivation on their jobs and also to grasp more opportunities for mutual learning and professional exchange. According to Mintzberg (1983; 1989), the characteristics of a professional organisation carries out the advantages of democracy and autonomy whereas that of a machine organisation may inhibit teachers' professional empowerment and autonomy. The structures of these two types of organisations are compared in Table 2.8:

Table 2.8 Structures of the professional and machine organisations.

The Professional Organisation	The Machine Organisation
<ul style="list-style-type: none"> • Bureaucratic yet decentralised. • Individual professionals work autonomously but closely with clients. • Middle-line hierarchy. • Standardising the skills and knowledge of professionals. • Support staff to support professionals. 	<ul style="list-style-type: none"> • Centralised bureaucracy. • Formal procedures. • Functional groupings. • Extensive hierarchy. • Standardising work process. • Support staff to reduce uncertainty.

Source: adapted from Mintzberg (1989: 93-220).

Furthermore, hierarchies in an organisation can block knowledge sharing (Goh, 2002; Nonaka, 1994); that is to say, knowledge in such an organisation resides in one area and is not easily moved to other parts of the organisation (Bartlett and Ghoshal, 1998). Consequently, breaking down hierarchies may be difficult to accomplish because the organisational structure of Taiwanese schools are designed by our government. Notwithstanding, developing horizontal communication flows by encouraging cross-functional teams (Goh, 2002) or forming spider's webs (Quinn, *et al.*, 1996) may assist individuals or groups to share knowledge horizontally, which enables the dissemination and communication of knowledge or management information.

2) Awareness of external educational enterprise

A school's awareness of external educational enterprises including the present developmental initiative of other schools allows the school to exploit external knowledge (Hargreaves, 1999). In addition, this recognition and assimilation of the external world also enable the school to understand the circumstances and challenges it currently faces, which facilitates it to define its knowledge visions and consequently develop its developmental initiatives. Moreover, the defined knowledge visions and the initiatives for their development need to be communicated throughout the school (Nonaka and Takeuchi, 1995). Noteworthily, the clarity of purpose and terminology in the communication of the knowledge visions and values is essential in order to form shared understanding among individuals (Davenport and Prusak, 1998). Together with the school's norms, routines and skills, a value system is also defined which determines what kinds of knowledge are to be needed, created and retained, which guides the knowledge-creating process with direction and vitality (Von Krogh, *et al.*, 2000).

3) School vision and educational goals

Vision shapes teaching and administrative staffs' attitudes towards everyday working life and guides their directions towards the future (Halsall, 1998). Based on the school vision, the implications for educational goals and future initiatives may be planned to put it into practice. The vision building and planning process often originates with the principal of a school in the Taiwanese elementary educational context even it is suggested to have all staff to be directly involved in the participatory processes.

However, if not, it is essential to ensure the resulting vision and its implications are understood and approved by as many staff as possible in order to make the vision to be the shared vision of the school (Harris, 2002; Law, 1999).

4) School atmosphere and culture

In the knowledge management literature, it is pointed out that the degree of love, care and trust among individuals determines their willingness to share knowledge (especially tacit knowledge). For example, trust facilitates learning between individuals and their decisions to exchange knowledge with others (Huemer, *et al.*, 1998; Sallis and Edward, 2002). In addition, care plays a pivotal role in knowledge development at individual and organisational levels (Von Krogh, *et al.*, 2001). Individuals should care for their own insight, reflect on it, nurture it and bring it to the people who may be interested in it. Spontaneously, they should also respect others' experiences and withhold negative value judgments on them. In this respect, it is identified that human caring determines the efficacy of teachers' motivation to develop (Ellett, *et al.*, 1997). It is also recognised in the school improvement literature as it is claimed that successful schools share many features of caring families, which determines individuals' willingness to participate

actively in improvement efforts and concentrate on learning and teaching (Stoll and Fink, 1996). The above arguments infer that the social relationships and interactive atmosphere among individuals may influence the quantity and quality of knowledge creation. Thus, establishing positive relationships among teaching and administrative staffs is crucial for increasing their motivation to develop and willingness to share knowledge and work together and also providing a secure environment for learning and improving (Harris, 2002; Stoll, 1999).

According to Schein (1985), culture is defined as the shared values, beliefs and practices of employees in an organisation, which guides and forms its employees' attitudes and behaviours (Robbins, 2005). Consequently, it plays an influential role in the promotion of knowledge management (e.g. De Long and Fahey, 2000) and school improvement (e.g. Angelides and Ainscow, 2000). For example, organisational culture moulds employees' attitudes towards the values of knowledge, which determines how knowledge is stored and shared in different levels of an organisation (Wang, *et al.*, 2003). Moreover, in an organisation with knowledge-sharing culture, employees may share ideas and insights as they see knowledge sharing is something taken-for-granted rather than forced to do (McDermott and O'Dell, 2001).

However, culture is a broad concept which has many dimensions. Two cultural dimensions are introduced as they are crucial to encourage the knowledge-creating process, as follows:

- Collaborative culture.

Hargreaves (1988: 226) claims that *team-teaching, exploration of new methods, collaborative approaches to improve teaching, constructive collegial criticism of classroom performance - none of these things are fostered by the isolation and individualism of the existing culture of teaching*. For the achievement of knowledge creation, these two barriers (teachers' isolation and individualism) need to be overcome by promoting teachers' collaboration. Many educators have also claimed the importance of collaborative culture in building the capacity for school improvement (e.g. Halsall, 1998). For example, Rosenholtz (1985: 352) argues that *the most effective schools do not isolate teachers but instead encourage professional dialogue and collaboration*. In the collaborative culture, teachers are 'willing to share teaching experiences and ideas', 'willing to give advice and help' and also 'willing to work with each other' (Todd, 2001). Collaborative culture may be fostered by implementing the collaborative activities for teachers' professional development as teachers recognise the benefits of participating in collaborative activities. However, as indicated in Section 2.4.3, a school should consider the drawbacks of contrived collegiality when implementing them.

- Experimenting and innovative culture.

The quantity of knowledge creation depends on the level of teachers' motivation to experiment and innovate (see Section 2.4.2). When teachers are being empowered to make decisions, they are more likely to feel free to experiment and take risks. Simultaneously, a school needs to 'encourage and support for creativity' to cultivate an experimenting and innovative culture. Under professional empowerment and the school's support for

creativity, teachers may be 'willing to learn and experiment new ideas', 'open to any thoughts or suggestions' and 'welcome challenges'.

5) School organisational knowledge assets

If organisational knowledge may be regarded as one asset of an organisation, it is essential for the organisation to adapt a strategy to build, maintain and leverage those so-called 'organisational knowledge assets' effectively and efficiently. Hargreaves (1999) proposes that the knowledge-creating school needs not only understand its organisational assets which underpin the process of knowledge creation and utilisation but also audit professional knowledge by mapping the knowledge and abilities of teachers which enables them to know where to find help and advice. Accordingly, a school (meaning all members of staff) needs to know the strengths and weaknesses of the school; therefore, they are capable of recognising what kinds of knowledge are available to them and more importantly what kinds of knowledge they are lacking. To foster organisational knowledge maintenance and access, the establishment of knowledge repositories is suggested to organise good practices into a database so that teachers are able to store and access relevant explicit forms of knowledge easily; additionally, to specify individual teachers' capabilities so that teachers are able to know where to find relevant people to solve their problems (e.g. Alwert and Hoffmann, 2003; Davenport, *et al.*, 1997; Earl, 1997). Alternatively, nowadays, some organisations utilise ICT to offer an opportunity for the access and exchange of knowledge in written form and also for the collaboration of individuals across business units and geographical locations (e.g. Bannon, 1998; Hildreth, 2004). Accordingly, schools are also able to build electronic databases and networks to maintain explicit organisational knowledge and also to support knowledge exchange (see Section 2.2.3 and Section 2.3.1). Hence, teachers are now able to search and access

information or good practices as well as to exchange (or sharing) and discuss necessary information inside and outside schools.

6) Professional communities

Lack of places for dialogue is viewed as one of the general problems in school development (Dalarna, 2001). Building *ba* or CoP may be seen as the solution and therefore increase the quantity of knowledge sharing. Whilst schools are suggested to provide a variety of spaces to form *ba* effectively (see Section 2.4.3), they are also recommended to develop school-based communities as the places where teachers share a clear purpose, involve in professional dialogues and open up their classroom to colleagues (Louis, *et al.*, 1995; Segiovanni, 2000). Furthermore, since there is an increasing acknowledgment of learning from outsiders (Quinn, *et al.*, 1996), teachers are also encouraged to join any professional communities outside the school or via ICT for the purpose of broadening their eyes.

Fulfillment of schools as learning organisations

The notion of learning organisations may gradually be fulfilled when promoting teachers' personal knowledge management in a school context. Senge's (1990) book, 'The fifth discipline', appears to be the most remarkable reference cited in the learning organisation's literature. His proposition of learning organisations comprises five disciplines; they are:

- Personal mastery: cultivating personal aspiration and consciousness.
- Mental models: being conscious of the origins of our thinking.
- Shared vision: making a commitment to joint goals.
- Team learning: changing our strategies for collective thinking.
- System thinking: cultivating the capability of being conscious of complexities,

mutual changes and influences.

It is identified that the practice of the five disciplines has been applied to the context of educational reform, which advocates the notion: ‘schools also need to learn’ (Senge, *et al.*, 2000). Accordingly, I attempt to build the linkage of the essential components of teachers’ personal knowledge management and Senge’s proposition in order to demonstrate the possibility for schools to learn and improve continuously and hence to become learning organisations (see Table 2.9).

Table 2.9 Linkage of teachers’ personal knowledge management and ‘schools as learning organisations’.

Five Disciplines	Initiatives	Objectives
<i>Personal Mastery</i>	Being aware of self, teaching circumstances, personal knowledge and external events critically to develop personal knowledge visions.	To foster the capability for deciding the direction of personal and professional development and the achievement of goals.
<i>Mental Models</i>	Fostering the process of teachers’ knowledge development and sharing through engaging in the activities of reflection and dialogue by asking questions constantly.	To allow everyone to speak their mind freely and also to make tacit perspectives explicit.
<i>Shared Vision</i>	Including everyone’s aspirations in the process of vision planning and goals building.	To enable everyone within a school delineate pathways and strategies for the future and also to pull them together with one heart.
<i>Team Learning</i>	Developing and including collaborative activities for teachers’ professional development in school administrative plan and also supporting teachers to form and join professional communities.	To improve current teaching strategies applied by individual teachers through disseminating good practices in teaching.
<i>System Thinking</i>	Employing transformational leadership and also cultivating collaborative, experimenting and innovative culture.	To enable everyone to understand and manage change processes and also to foster their willingness to collaborate and improve.

Source: adapted from Senge *et al.* (2000).

By means of relating the initiatives and objectives of teachers' personal knowledge management to Senge's (1990; Senge, *et al.*, 2000) five disciplines, I would claim that both teachers' endeavours to foster the processes of teachers' personal knowledge management and a school's supports to fulfill the components of teachers' personal knowledge management lead the school to improve towards a learning organisation.

2.6 Conclusion of Literature Review

In this chapter, I have reviewed some of the relevant literature on the subject of knowledge in philosophy and in organisations, knowledge management, knowledge management in Western and Taiwanese education, teachers' knowledge, Kelly's personal construct theory, the initiatives of teachers' professional development, action learning, the initiatives of school improvement and learning organisations. By means of examining both Western and Taiwanese literature on these subjects, I am able to build the linkage among them, which is viewed as the theoretical underpinning of teachers' personal knowledge management. Accordingly, it also assists me to set the purpose and provisional focuses of the investigation as exploring how teachers synthesise and internalise the concepts and practices of knowledge management individually and collectively as well as examining whether or not schools support essential conditions for the growth of their teachers and themselves.

To conclude, I highlight the aspects of teachers' personal knowledge management, which can be classified into theoretical and practical orientations. The theoretical orientation of teachers' personal knowledge management comprises the following aspects:

- The perspectives of constructionism on knowledge can also be adopted to illustrate the nature of teachers' knowledge; therefore, the human resource development and organisation studies dimensions of knowledge management are embraced throughout the research.
- Teachers' knowledge is changed and expanded by individual teachers involving in the continuous and interrelated process of constructing, developing, sharing and creating knowledge based on their life and professional experiences through interacting with their teaching circumstances and with other individuals in a school context.
- While a school attempts to implement knowledge management, its starting point is to concentrate on the knowledge growth of its teachers and subsequently to disseminate and maintain the newly-created knowledge within the school in order to make it spiral itself organisationally and become the organisational knowledge assets of the school. Simultaneously, the school needs to provide an environment for the above tasks.
- Hence, from the individual teachers' perspective, the promotion of teachers' personal knowledge management fosters the growth of teachers' knowledge and their current performance, which enables them to achieve the effectiveness of teaching and learning and increases their personal values. From the school's perspective, the promotion of teachers' personal knowledge management not only maximises its knowledge assets but also leads it to becoming a learning organisations.

The practical orientation of teachers' personal knowledge management comprises the following aspects:

- Teachers need to frequently reflect on the practices of self and others to fulfill their knowledge development. The process may be facilitated by composing an autobiography and a reflective journal.
- Teachers need to actively engage in the collaborative activities for teachers' professional development, such as professional dialogue, study groups, peer clinic supervision, peer coaching, curriculum development, collaborative action research and action learning, to fulfill their knowledge sharing.
- The process of knowledge development and sharing brings about teachers' knowledge creation.
- Both the teachers and the school need to overcome negative factors involved in the knowledge-sharing process, which are related to the nature of teachers' work conditions, their relationships and interactions with other teachers, their attitudes and dispositions, their recognition of interests and benefits, their level of competence including technology and communication skills as well as time and opportunity issues.
- At the same time, the school (meaning the principal and administrators) need to
 - Design and include relevant and appropriate collaborative activities in school administration plan;
 - Encourage teachers to form and joint professional communities inside and outside the school;
 - Apply appropriate or transformational school leadership;
 - Have teachers involved in the decision-making process;
 - Include every teacher's aspirations in vision building and planning;
 - Encourage horizontal communication flows;
 - Establish effective appraisal and reward systems;

- Monitor up-to-date educational issues and other schools' developmental initiatives to define knowledge visions and future developmental initiatives;
- Communicate any management information such as school vision, knowledge visions, educational goals and decisions made across all levels of the school;
- Cultivate love, care and trust atmosphere;
- Establish collaborative, experimenting and innovative culture; and
- Organise and maintain good practices in teaching and also specify individual teachers' capabilities in knowledge repositories (either in a filing cabinet or an electronic database).

Chapter 3 Research Methodology and Methods

3.1 Introduction of Chapter 3

The purpose of this chapter is to illustrate how the research was carried out by means of discussing theoretical issues and practical matters from the adoption of a research paradigm to the quality evaluation of the research. At the beginning of the chapter, I intend to provide an overview of the research process so that readers may be conscious of the components involved in the subsequent phases of the research (see Table 3.1). These phases are interconnected with each other. That is to say, the decisions and practices of one phase influence that of other phases. Denzin and Lincoln (2003: 29-38) suggest the below five phases of research need to include in order to determine its integrity.

- Phase 1: *the researcher*; that is, how a researcher locates him/herself in a specific study and how s/he considers the ethical and political issues of the research.
- Phase 2: *Interpretive paradigms*; that is, how the researcher adopts a research paradigm according to his/her beliefs on the nature of reality, the relationship between an inquirer and the known and the approach(es) towards the gaining the knowledge of the known.
- Phase 3: *Strategies of inquiry and interpretive paradigms*; that is, how the researcher develops a 'flexible' set of guidelines to carry out an inquiry in the empirical world.
- Phase 4: *Methods of collecting and analysing empirical materials*; that is, how the researcher selects and employs practical methods to collect and analyse empirical materials which are relevant to the understanding of the inquired phenomena.

- Phase 5: *The art and politics of interpretation and evaluation*; that is, how the researcher constructs knowledge from his/her understanding of findings and how s/he justifies the goodness of the above phases.

The aspects of the above five phases not only inspire me with elements necessary to be considered in the conduct of the research but also serve as a guide to the composition of how the research was carried out, which are elaborated in Table 3.1.

Section 3.2 is concerned with the nature of the research and subsequently clarifies the research questions. In Section 3.3, a variety of research paradigms are indicated and the choice of constructionism as my worldview and its implications are illustrated. In Section 3.4, the characteristics and types of case study research are introduced and accordingly the adoption and application of case study approach are justified. Other methodological considerations such as the influences and sources of my prior knowledge, my role in the interactions with the site and research participants, the ethical issues of the research are elucidated in Section 3.5 and 3.6. These sections explicate the elements taken into account in the planning stage of the research process. Furthermore, Section 3.7 provides an overview of the investigation including its length, site and participants. Section 3.8 gives details about why and how interviews, observations and documents were applied as the means to collect data and also indicates issues or bias emerged from the process of data collection. Section 3.9 illustrates how the diverse sources of the collected data were analysed by employing the concepts of inductive analysis, grounded theory analysis and phenomenological analysis. In the end, Section 3.10 evaluates the goodness of the research process by using a set of quality criteria.

Table 3.1 Research process including the planning, implementation and evaluation phases.

Time	Task	Action(s)
January 2003 – November 2003	Contextual and Literature Review	<ul style="list-style-type: none"> • Carried out and wrote contextual and literature reviews on the following areas: (1) the knowledge economy, (2) Taiwanese education, (3) Education in the context of the knowledge economy (4) knowledge management, (4) knowledge management in education and in Taiwanese education, (5) teachers' professional development containing Kelly's personal construct theory and (6) school improvement with reference to 'schools as learning organisations'. • Generated research emphases and questions according to the reviews.
December 2003	Obtainment of Official Permission	<ul style="list-style-type: none"> • Negotiated with and obtained official permission from the chosen elementary school in Taiwan for the conduct of the case study research. • Distributed a questionnaire to identify teachers' voluntary to participate in the investigation within the school.
January 2004 – May 2004	Design of Research Methodology	<ul style="list-style-type: none"> • Made active contact with identified voluntary teachers while I was in Nottingham. • Reviewed the literature on research methodology and methods. • Determined a research paradigm. • Designed flexible and workable research methodology and methods. • Considered certain ethical principles and formulated a set of rational ethical guidelines appropriate to the circumstances of the school.
June 2004	Conduct of Pilot Study	<ul style="list-style-type: none"> • Translated the set of research methods from English into Mandarin. • Searched and negotiated with three Taiwanese elementary school teachers studying in East Midlands to pilot a semi-structured interview schedule and seek for viewpoints in accordance with the design of the research.
July 2004 – August 2004	Contact with the School and Potential Participants	<ul style="list-style-type: none"> • Made active contacts with potential teachers as the volunteers to participate in the investigation and obtained their consent.
September 2004 – January 2005	Actual Investigation	<ul style="list-style-type: none"> • Arranged time and place for interviews, observations and action learning with the six participants. • Transcribed data collected and disturbed the written form of the data to the relevant respondents for their validation. • Kept up a correspondence with my supervisors regularly to report research progress and issues encountered. • Bore in mind the ethical issues and concerned about negative feelings of the participants.
February 2005 – February 2006	Data Analysis and Interpretation & Writing-up of Thesis	<ul style="list-style-type: none"> • Analysed and interpreted data. • Developed suggestions for the school and its teachers in the light of the research findings. • Evaluated the goodness of the research • Wrote up this thesis and submitted it in Spring 2006.

• Wrote the research diary and the thesis.

• Undertook the research methodology course

Instead of separating the theoretical issues and practical matters of the components included in the research process into respective parts, I attempt to integrate those theoretical issues with their practical matters to demonstrate the coherence between my understanding and utilisation of those methodological components. Before proceeding to the discussion of this chapter, it is necessary to clarify what I mean by using the following terms in order to avoid confusion:

- Theoretical perspective: the specific assumption made in conducting research, which is determined by an adopted research paradigm (also termed ‘theoretical tradition’ by Creswell, 1998; Patton, 1990) containing the worldview of the researcher and the purpose of such research (Oliver, 2004).
- Methods: the techniques and procedures used in the process of data collection and analysis (Cohen, *et al.*, 2000; Oliver, 2004).
- Methodology: the theoretical and practical aspects of the conduct of research, including the approach, action plan and process which guides the selection and employment of particular methods to gain wanted outcomes (Cohen, *et al.*, 2000; Oliver, 2004). Accordingly, the methodological question addresses how a knower goes about getting wanted knowledge.
- ‘Research participants’ means people engaged in any other research; whereas, ‘the six participants/the participants’ denotes the teachers involved specifically in this research and their names are encoded according to the level they teach sorting from Grade 1 to 6 (the academic levels of pupils). Moreover, ‘the interview respondents’ represents not only the six participants but also the Principal and the Section Chief of Teaching and Learning of the case school.

3.2 Nature of the Research

Patton (1990) claims that the purpose of qualitative research determines decisions about design, measurement, analysis and reporting; therefore, the initial step of a research process is to clarify about its purpose. He (*ibid*: 150-159) further indicates five types of research with their distinct purpose, as follows:

- *Basic research*: to understand and explain how the world operates through investigating a phenomenon, which contributes to existing knowledge and theory.
- *Applied research*: to help people understand the nature of a problem, an issue or an experience and subsequently to generate potential solutions for it so that people can more effectively manage the situation.
- *Summative evaluation research*: to test the effectiveness of human intervention (i.e. a specific programme, policy, group of staff or product) within its limited context and subsequently to generalise findings.
- *Formative evaluation research*: to improve human intervention within a specific set of activities at a specific time for a specific group of people.
- *Action research*: to solve particular problems of a programme, organisation or community by people engaging in the context.

Sarantakos (1998: 15-16) specifies three types of social research (including positivist research, interpretive research and critical research) and points out four goals of those research, as follows:

- *General goals*: understanding for its own sake.
- *Theoretical goals*: verification, falsification, modification or discovery of a theory.
- *Pragmatic goals*: solutions of social problems.

- *Political goals*: development of social policy; evaluation of programmes or practices; and social criticism, change, reconstruction, empowerment and liberation.

Consequent on the comparison among the above purposes and goals, I incline to adopt Patton's (*ibid*) proposition since it is more wide-ranging and research question-oriented; whereas, Sarantakos's (*ibid*) proposition appears to be research paradigm-oriented. In terms of illustrating the nature of the research, it is more appropriate to consider research purpose(s) and question(s) rather than being restricted by a chosen research paradigm.

In the light of the research aims (see Section 1.2), this research is regarded as the combination of *basic research* and *formative evaluation research* since it intends to answer two research questions which are developed through the literature review.

They are:

- What are the current practices of teachers' personal knowledge management and issues involved in the practices in a Taiwanese elementary school?

By answering this question, I am able to contribute to the existing knowledge on the subject of knowledge management in education and school improvement with particular reference to teachers' professional development and 'schools as learning organisations' within the Taiwanese educational context.

- How can the application of autobiography, reflective journal and action learning foster teachers' self-reflection and knowledge-sharing in that particular elementary school?

By answering this question, I may be able to promote the six participants professional growth throughout the implementation of the above-mentioned activities during the investigation.

In brief, this research is conducted with the purpose of: (1) obtaining knowledge about the themes in question and learning from it and (2) bringing about improvements in the specific educational context, which are regarded as the major principles for doing educational research (Griffiths, 1998).

3.3 Theoretical Paradigm of the Research

Guba and Lincoln's (1998: 195; also see Section 2.2.1) definition of 'paradigm' implies that methodological decisions of research, such as the design of approach, action plan and process and the choice and use of particular methods to gather wanted outcomes (see Section 3.1), are influenced by not only a researcher's worldview on the nature of entities but also how to know and justify what is known (see Section 2.2.1). That is to say, the ontological and epistemological perspectives held by me affect the methodology of the research (Griffiths, 1998). Accordingly, it is essential to clarify the adopted paradigm of the research so that readers may be able to assume how I see the world and act on it when attempting to conduct the inquiry. Based on the above argument, in Section 3.3.1, I intend to look at a variety of research paradigms. Consequently, in Section 3.3.2, I attempt to justify the adoption of constructionism as my worldview and also indicate its implications for the research methodology.

3.3.1 Various Research Paradigms

Through reviewing some of the relevant methodological literature on the subject of research paradigms for social research, I recognise that different writers use diverse labels to broadly categorise various research paradigms. The examples are pointed out in the following table:

Table 3.2 Different versions of research paradigms.

Author(s)	Research Paradigms
<i>Crotty (1998)</i>	<ul style="list-style-type: none"> • Objective/positivist • Subjective/constructionist
<i>Denzin and Lincoln (2003)</i>	<ul style="list-style-type: none"> • Positivist and postpositivist • Constructivist-interpretive • Critical (Marxist, emancipatory) • Feminist-poststructural
<i>Lincoln and Guba (2003)</i>	<ul style="list-style-type: none"> • Positivism • Postpositivism • Critical theory • Constructivism • Participatory
<i>Mertens (1998)</i>	<ul style="list-style-type: none"> • Positivism/postpositivism • Interpretive/constructivist paradigm • Emancipatory paradigm
<i>Patton (1990)</i>	<ul style="list-style-type: none"> • Logical positivism • Phenomenological inquiry
<i>Sarantakos (1998)</i>	<ul style="list-style-type: none"> • Positivist • Interpretive • Critical

The above table denotes that there is no signal means to categorise diverse research paradigms and no exact labels to term them. Nevertheless, except for Patton (1990), the perspectives of positivism/postpositivism and constructivism/interpretivism seem to be included by all of the above writers. In addition, I identify that some of the writers (e.g. Denzin and Lincoln, 2003; Lincoln and Guba, 2003; Mertens, 1998) do not make an endeavour to distinguish the difference between constructivism and constructionism² and also appear to classify the perspectives of constructivism and interpretivism into the same research paradigm. Possibly, these writers (*ibid*) tend to

² Since there exists the different between 'constructivism' and 'constructionism' (see section 2.2.1), in this chapter, I use the term 'constructionism' as the research paradigm of this study unless the term 'constructivism' is directly used by certain writers.

accept that these theoretical paradigms share rather related ontological and epistemological perspectives. For instance, Denzin and Lincoln (2003: 32-35) claim that both constructivist and interpretive paradigms assume there are multiple realities (relativist ontology) are constructed by different inquirers according to their understandings and interpretations of the inquired-into (subjective epistemology). Furthermore, by reviewing methodological literature, I am conscious that there exist more research paradigms, apparently rooted in the theoretical paradigms indicated in Table 2.1. Accordingly, I attempt to broadly classify numerous prevalent research paradigms into the catalogue of positivism and anti-positivism (see Table 3.2). Instead of indicating the theoretical perspectives of these two differing categories which are illustrated in Section 2.2.1, I tend to point out the major purpose of research under those research paradigms.

Table 3.3 Purpose of research paradigms.

Theoretical Paradigms	Research Paradigms	Main Purpose
<i>Positivism</i>	Positivism (e.g. Lincoln and Guba, 1985; 2003; Sarantakos, 1998)	To produce an absolute or approximate theory by testing hypotheses through scientific means.
<i>Anti-positivism</i>	Phenomenology (e.g. Creswell, 1998; Kao, 2003; Patton, 1990)	To explore the meaning of lived experiences of several individuals about a concept or a phenomenon.
	Ethnography (e.g. Creswell, 1998; Hitchcock and Hughes, 1995; Hong, 2003; Patton, 1990)	To describe and interpret a cultural or social group or system.
	Symbolic interactionism (e.g. Cheng, 2003; Hitchcock and Hughes, 1995; Sarantakos, 1998)	To study the structure, functions and meaning of symbolic systems (including symbols and languages) in individuals' interactions.
	Constructionism (e.g. Erlandson, <i>et al.</i> , 1993; Guba and Lincoln, 1989; Lincoln and Guba, 1985; 2003; Rodwell, 1998; Wu, 2003)	To understand a social phenomenon consisting of meaning making activities or processes of groups or individuals in a specific context.
	Feminism (e.g. Olesen, 2003; Sarantakos, 1998)	To transform stereotypical or take-for-granted ideas about women in specific material, historical and cultural contexts.
	Critical theory (e.g. Kincheloe and McLaren, 2003)	To critical interpret the meaning of the changing social and informational conditions or problems.

Sarantakos (1998), for example, tends to regard that research embracing the positivist paradigms as quantitative research and anti-positivist paradigms as qualitative research. One of the reasons may be that quantitative methods are likely to be employed for conventional scientific research and qualitative methods are often stressed within naturalist research since they come more easily to the notion of 'human-as-instrument' (Guba and Lincoln, 1989; Lincoln and Guba, 1985; 2003). However, such a simple divide is argued as misleading (Robson, 2002) since quantitative and qualitative research reflect merely the nature of chosen methods rather than represent the theoretical perspectives of research (Crotty, 1998). For instance, rigorously-defined qualitative methodology can still be adopted in positivist research (Denzin and Lincoln, 2003).

3.3.2 Constructionism as My Worldview

It is complicated to determine a research paradigm for this research to embrace because the purposes of phenomenological and constructionist research are to some degree involved in the research process. Initially, I set out the research to explore teachers' experiences of engaging in the practices of personal knowledge management in a Taiwanese elementary school context, which is viewed as the purpose of phenomenological research. Notwithstanding, as the investigation proceeded, I realised that the primary purpose of the research was to reconstruct how teachers construct, develop, share and create knowledge individually and collectively (the meaning making processes and activities of individuals and groups) in a Taiwanese elementary school (in a specific social context) by not only interpreting their experiences but also observing the actual processes, activities and issues involved in the practices of their personal knowledge management. Thus, I incline to suggest constructionism as the most appropriate research paradigm to adopt.

In the light of the theoretical perspectives of constructionism specified in Section 2.2.1, the ontological and epistemological perspectives I come to hold throughout the research are specified as follows:

1) Ontological position of the research

There is no true knowledge 'out there' waiting to be apprehended and observed. Multiple realities are individually, socially and culturally constructed (or created) and coexist, which can constantly be altered (see Section 2.2.1). This implies that those multiple mental constructs may be in conflict with each other since different individuals from dissimilar community or cultural background may perceive a thing differently. Moreover, these constructs may be changed throughout the process of being in the world individuals possess. According to these ontological assumptions, the conclusions drawn from the research findings may not be 'absolute' truths for readers and the perspectives I currently embrace may be modified as confronting with another circumstances.

2) Epistemological position of the research

Knowledge is constructed and co-created by individuals with their self-consciousness and social interaction within a particular context (see Section 2.2.1); therefore, multiple realities cannot be understood and reconstructed in isolation from their context (Lincoln and Guba, 1985; Rodwell, 1998). In terms of justification, constructionists argue that there is no certain final and ultimate criterion to test knowledge to be valid and truthful; instead, they tend to believe that knowledge is tentative and agreed upon at certain time and under certain conditions (Lincoln and Guba, 2003; Schwandt, 2003; Wu, 2003). Consequently, true or valid knowledge is generated from agreements within a community which are regarded as the subject of community negotiations and as the result of

dialogues (Lincoln and Guba, 2003). In the light of the above epistemological assumptions, I would suggest that me and the inquired-into (the six participants and the site) to a certain extent influence each other in an interactive process, which infers the importance of getting the research outcomes agreed by the inquired-into.

The ontological and epistemological perspectives of the research bring about the implications for its methodology which are suggested by numerous writers (e.g. Guba and Lincoln, 1989; Lincoln and Guba, 1985; Rodwell, 1998; Wu, 2003) (see Table 3.4). Most of those implications were adopted in the course of the research process and are exemplified throughout the chapter.

Table 3.4 Constructionist research methodology.

Stages of Research	Methodological Decisions
<i>Entry</i>	2. Prior knowledge 3. Natural setting
<i>Research design</i>	4. Emergent design 5. Focus-determined boundaries
<i>Data collection</i>	6. Human instrument 7. Qualitative methods 8. Purposive sampling
<i>Data Analysis</i>	9. Inductive analysis 10. Grounded theory analysis
<i>Research outcomes</i>	11. Idiographic interpretation 12. Negotiated outcomes 13. Tentative application of findings 14. Case study reporting mode
<i>Quality criteria</i>	15. Trustworthiness 16. Authenticity

Source: adapted from Guba and Lincoln (1989), Lincoln and Guba (1985), Rodwell (1998) and Wu (2003).

3.4 Case Study Approach

The choice of research strategies, governed by the research purpose and questions, is viewed as the third step of the research design, which puts the adoption of the research paradigm into action and simultaneously connects me to specific methods of collecting and analysing data (Denzin and Lincoln, 2003). Accordingly, the research purpose and questions as well as the methodological implications drawn from the theoretical paradigm of the research leaned me towards the choice of case study approach (e.g. Bassey, 1999; Burton, 2000; Hamel, *et al.*, 1993; Lin, 2003; Sanders, 1981; Stake, 1995; 1998; Wang, 2002; Yin, 1989; 2003). In Section 3.4.1, I give an introduction of case study research taking account of its characteristics and forms. Subsequently, in Section 3.4.2, I intend to justify why I chose the case study approach as the strategy of inquiry and to explain its applications to the research.

3.4.1 Features and Types of Case Study Research

Case study research is defined as *an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used* (Yin, 1989:23). The above definition implies that case study research, in direct contrast to historic research, investigates present-day phenomena within their context while the phenomena and their nature background are inseparable. Moreover, a variety of methods can be employed to collect relevant data with the intention of understanding a full picture of what the phenomena are as well as how and why those particular phenomena happen within their context from different angles. The context of a case (or cases) being studied may be a physical, social, cultural or economic setting (Yin, 1989; 2003). Besides, Stake (1995; 1998) explains that a case study is an exploration of 'a bounded system' (regarded as a case)

through detailed and in-depth data collection comprising multiple sources of information in context. Based on Stake's (*ibid*) perspective, a case study research includes a full description and analysis of the bounded system and stresses the understanding, interpretation and representation of research participants' experiences. This bounded system is the case being studied such as a programme, an event, an activity or an individual which is unique and defined by clear boundaries such as time and place. For instance, a teacher can be seen as a case. His/her teaching cannot, however, be regarded as a case since its boundaries are not explicit (Lin, 2003).

Moreover, an educational reform programme or a Taiwanese school can be a case; nevertheless, the relationship between the educational reform programme and the school cannot be a case since it is too broad and not unique (Lin, *ibid*). Likewise, Sander (1981) claims that a case study methodology needs to be based on the notion of induction, multiple sources of information, detailed description, uniqueness and inspiration. By means of synthesising the above viewpoints, the features of case study research are summarised as follow:

- Focusing on specific phenomena of a bounded system in a natural setting.
- Holistic and detailed description of the bounded system.
- Generating multiple sources of information.
- Understanding and reconstructing research participants' experiences through the utilisation of a researcher's tacit knowledge and induction.
- Representing uniqueness.

Types of case study research are determined by different purposes of studying a case (or cases). Yin (1989; 2003) proposes six types of case studies, which are based on their research design and purpose and demonstrated as a 2 × 3 matrix (see Figure 3.1).

Research Design	Research Purpose		
	Single, exploratory case study	Single, descriptive case study	Single, explanatory case study
Multiple, exploratory case study	Multiple, descriptive case study	Multiple, explanatory case study	

Figure 3.1 Yin's proposition of various types of case study research (adapted from Yin, 1989; 2003).

Firstly, the design of case study research involves either single- or multiple-case. The single-case design focuses on a single case only and is justified by Yin (*ibid*) as an appropriate design under the following rationales: (1) where the case represents test of well-formulated theory, (2) where the case represent a singular or (3) where the case present a revelatory purpose. Conversely, the multiple-case design focuses on two or more cases within the same study and numerous cases need to be selected in order to replicate each other i.e. either predicting similar consequences (literal replication) or contrasting consequences for predictable reasons (theoretical replication). In terms of the unit of analysis, both single- and multiple-case studies take into account either holistic (only one unit of analysis), or embedded (more than one unit of analysis) design. Besides, whether single- or multiple- case studies, case study research can be exploratory, descriptive or explanatory. Yin (2003:5) defines and explicates these three kinds of case studies along the following lines:

An exploratory case study...is aimed at defining the questions and hypotheses of a subsequent study (not necessarily a case study) or at determining the feasibility of the desired research procedures. A descriptive case study presents a complete description of a phenomenon within its context. An explanatory case study presents data bearing on cause-effect relationships - explaining how events happened.

Scholz and Tietje (2002) adopt Yin's (*ibid*) perspective on the design of case studies and further claim that an embedded case study appears to approach the comprehension of the case as a whole in its real-world context. Stake (1995; 1998) puts forward three types of case study: (1) intrinsic case study, (2) instrumental case study and (3) collective case study. The first study is undertaken because of the interest in understanding a particular case. The second study examines a particular case to provide insights into an issue or alteration of theory. Collective case study can be seen as the extension of instrumental case study which involves a number of cases jointly. Bassey (1999) reviews both Yin's (*ibid*) and Stake's (*ibid*) perspective on various types of case study research and further suggests six types of case study which are classified in accordance with their purpose, as follows:

- Focusing on particular issues rather than chosen cases:

This is what Stake (*ibid*) calls 'instrumental case study' inquiring into a particular bounded system with the purpose of providing insights or refining a theory. Additionally, this kind of case study is divided into theory-seeking and theory-testing case studies:

1. 'Theory-seeking case study' is what Yin (*ibid*) calls 'exploratory case study'; that is, identifying the questions and hypotheses of a following study in relation to the issue (the development of theory).
2. 'Theory-testing case study' is what Yin (*ibid*) calls 'explanatory case study'; that is, explaining the relationships between causes and effects in accordance with data (the test of theory).

- Focusing on chosen cases:

There are two types of case study under this emphasis:

3. 'Story-telling case study' is what Yin (*ibid*) calls 'descriptive case study'; that is, describing a phenomenon of the context and containing an evaluation.
4. 'Picture-drawing case study' is what Stake (*ibid*) calls 'intrinsic case study'; that is, learning about a particular case and providing the results of a detailed study.

- Focusing on the value of a educational programme, system, project or event:

This kind of case study is termed as 'evaluative case study' and classified according to its purpose into two categories:

5. 'Formative case study'; that is, aiding the development of a programme.
6. 'Summative case study'; that is, evaluating a programme being implemented.

By means of examining the above writers' viewpoints, I am aware that the diverse versions of the forms of case study research are related and overlap in terms of their concepts. Notwithstanding, I incline to adopt Yin's (1989; 2003) version to specify the contents of the research because it not only inspires me to use the terms descriptive, exploratory and explanatory to give a holistic and detailed picture of the research but also facilitates me to clarify the research themes as the units of analysis within the case study.

I do not tend to view those units of analysis as the research variables (e.g. Brown and Dowling, 1998) since the determination of them cannot be exactly predicted prior to the investigation undertaken. At the same time, I also use Stake's (1995; 1998) version to illustrate the purpose of the research since it comprises the logic of the other writers in distinguishing a particular variety of case study.

3.4.2 Justification and Application of Case Study Approach

In order to answer the research question (see Section 3.2), the research needed to be conducted in a Taiwanese elementary school. I, therefore, decided to employ the case study approach since it is suggested to be the most appropriate design and direction for much school-based research (Hitchcock and Hughes, 1995) and organisational studies (Hartley, 1994). Furthermore, in the light of the characteristics of case study research (see Section 3.4.2), the conduct of such research may bring about certain methodological implications drawn from the theoretical paradigm of the research (see Table 3.4), such as the notion of natural setting, focus-determined boundaries, purposive sampling, inductive analysis and case study reporting mode. Following on the point that the research needs to be carried out in an elementary school in Taiwan, Walker (1993) points out that single-sample studies appear to discard the ideas of sampling and control and also induce the problem of representative for generalisation, which I would attribute to the purpose of positivist research.

On the contrary, Stake's (1995; 2000) notion of naturalistic generalisation specifies that abstract prepositional generalisations result in misunderstandings and also lead readers to see phenomena more simplistically than they are. Consequently, he (*ibid*; also see Donmoyer, 2000) further addresses that capturing unique characteristics of a cases (or cases) being studied and describing them properly is more significant than providing generalisations. This infers that readers are likely to make judgments on

the meanings and relationships of research findings which may be applied to other circumstances and therefore such judgments depend heavily on the degree of 'descriptive verisimilitude' or 'close interpretation' of the complexities of a case (or cases) (Stenhouse, 1985). In a similar vein, Lincoln and Guba (2000) also criticise the idea of generalisation and suggest the necessity of 'thick descriptions' of cases when making an effort to produce transferable conclusions from one case to another which share similarities. Based on the above arguments and the constructionist perspectives I embrace, I attempt to inspire readers by reconstructing the social phenomena of how teachers carry out the practices of their personal knowledge management within a particular context rather than to provide certain generalisations from the inquiry.

Since the research intends to provide insights into the field of knowledge management in education by inquiring into the practices of teachers' personal knowledge management within a Taiwanese elementary school, I would regard the research as an instrumental case study. Based on the epistemological perspective of the research that knowledge is constructed and co-created among individuals within a context (see Section 3.3.2), the units of analysis needed to include not only teachers' practices of knowledge construction, development, sharing and creation but also a school's support for the promotion of those processes. Therefore, the design of the research was leaned towards the choice of an embedded single-case study. This embedded single-case study research was considered as combining certain features of descriptive, exploratory and explanatory case studies (Yin, 1989; 2003). Firstly, it describes the distinct background of the school and the participants as the unique individuals involved in the investigation; and how the whole investigation immersed in that particular educational setting. Secondly, it explores the components and characteristics of teachers' knowledge; issues influencing the processes of teachers'

knowledge construction, development, sharing and creation; and the interrelationship between teachers' personal knowledge management and school improvement towards learning organisations. Finally, it attempts to analyse and explain the cause-effect relationship of how the processes of teachers' knowledge construction, development, sharing and creation emerged within the school context; how these processes bring about teachers' professional development; and how the school's support would benefit not only its teachers but also its improvements.

Subsequent to defining the purpose, the bounded system (an elementary school within a Taiwanese educational context) and the units of analysis of this research, it was also essential to consider two questions: (1) where and when to conduct the research, and (2) with whom to gather what sorts of information (Chen, 2004), which are depended on the choice of sampling. Unlike 'probability sampling' which depends on selecting random and statistical representative samples to produce confident generalisations from the samples to a larger population (Cohen, *et al.*, 2000), 'purposive sampling' addresses the importance of selecting *information-rich cases* for in-depth study (Patton, 1990: 169; also see Creswell, 1998; Lin, 2003) and is suggested to adopt for naturalistic or qualitative inquiry (Lincoln and Guba, 1985; Miles and Huberman, 1994). According to the identification of the units of analysis of the research, the selection of the research samples were broadly divided into the site (an elementary school in Taiwan) and the participants (participant teachers within that school). As the result of reviewing 16 sampling strategies proposed by Patton (1990: 169-183; also see Miles and Huberman, 1994; Kuzel, 1992), I tended to employ the notion of 'convenience sampling' for selecting the site and 'snowball or chain sampling' for selecting the participants owing to the following reasons:

- As the investigation would last for a semester, the geographical location of an elementary school was taken into account so that I did not need to spend a large amount of time and money travelling.
- The design of data collection inferred the need for the high commitment of teachers within the school; therefore, seeking volunteers to participate in the investigation through asking recommendations for whom might be willing to participate such research was deliberated.

Furthermore, in conventional scientific research, methodological decisions are usually made before the collection of data about the phenomena being studied; whereas, the design of constructionist research emerges gradually from the research process (Erlandson, *et al.*, 1993; Guba and Lincoln, 1989; Lincoln and Guba, 1985; 2003; Rodwell, 1998; Wu, 2003). This explains why I was not able to anticipate exactly what would happen in a complex human setting as the chosen site in advance. In other words, those unforeseen but relevant events or issues could not be taken into account in the design of data collection. Nevertheless, it is suggested that my recognition of the complexity of the context being investigated and my understanding of that context and multiple realities collected throughout the investigation may help me to be aware of what is faithful to answer research questions and thus to look for ways to accumulate more relevant evidence by purposive sampling. Consequently, I disposed to adopt the practice of ‘opportunistic sampling’ (Patton, 1990: 169-183) as the means to decide about what sorts of activities or questions were significant to observe and query when the investigation proceeded. For this to be achieved, I attempted to briefly analyse the data collected continuously and accordingly to include my early interpretations of incidents in the subsequent actions of data collection such as seeking out what sorts of activities were significant to exemplify the practices of teachers’ personal knowledge management. I

also acknowledge that the process of emergent design is particularly prosperous when it accompanies with the continuous review of the literature. The review of the literature during the investigation: (1) provided me with insights into the collected data, (2) inspired me with new perceptions and (3) reminded me of the themes of the research.

3.5 Other Methodological Considerations of the Research

Two further issues taken into consideration at the planning phases of the research process are: the use of my personal knowledge and my role in the investigation, which are illustrated in the Section 3.5.1 and 3.5.2 respectively.

3.5.1 Prior Knowledge and its Sources

It is indicated that a constructionist researcher is not as a 'blank sheet' when entering the field of an inquiry (Wu, 2003). For instance, s/he may develop particular interests in certain social phenomena according to his/her personal experiences and also initial understanding of the phenomena going to be inquired based on his/her background of academic training and the study of the field. That is to say, the researcher's prior knowledge constructed from his/her previous experiences and the examination of the literature related to the field brings about an impact on the design of the research (Rodwell, 1998; Wu, 2003). Such tacit knowledge also involves in the processes of conducting data collection methods and analysing collected data (Guba and Lincoln, 1989; Lincoln and Guba, 1985; Patton, 1990). As a result, the researcher's prior knowledge may be gradually expanded and modified when confronting with unpredictable issues in the research process (see Kelly's personal construct theory in Section 2.4.1 and 2.4.2).

Generally, the sources of my prior knowledge which informed the research were from:

- The reviews of the contextual background information and the literature carried out in the first year of my Ph.D. (Doctor of Philosophy) study on the following areas: (1) the knowledge economy, (2) Taiwanese education, (3) Education in the context the knowledge economy (4) knowledge management, (4) knowledge management in education and in Taiwanese education, (5) teachers' professional development containing Kelly's personal construct theory and (6) school improvement with reference to 'schools as learning organisations' (see Table 3.1). Knowledge obtained from the reviews enabled me to clarify the direction and emphases of the research and to formulate themes to be explored.
- The participation in the research methodology course delivered by the Faculty of Education of the Nottingham Trent University and the review of research methodology and methods. Knowledge obtained from the engagement and the review facilitated me to put the predetermined direction, emphases and themes into the design of the investigation.
- My personal experiences including my experiences of studying at one of the Taiwanese elementary schools, growing up in the Taiwanese culture and conducting research in the case school previously. Knowledge constructed from my own experiences supported me to carry out the investigation smoother and to have better understanding of situations.

All of the above were pertinent to my understanding during the process of the research.

3.5.2 Researcher's Role and its Implications

Throughout the investigation, I was viewed as a student researcher from a UK university undertaking the investigation in the elementary school in Taiwan. This reflects my role as an outsider to the six participants and other teaching and administrative staff of the setting. 'Outsider' refers to a researcher who embarks on an investigation as an outsider to a community being investigated (Chen, 2004; Griffiths, 1998). S/he appears to not have any subordinate relationship with the community and has different experiences from its members whose thinking and behaviour may be understood as the consequence of direct observation and listening. On the contrary, 'insider' refers to a researcher who carries out an investigation inside a community to which s/he belongs (Chen, 2004; Griffiths, 1998). With this respect, the researcher shares similar values, life customs and behavioural manners as other members within the community; therefore, they may possess rather consentient opinions about the same situations or issues. Griffiths (*ibid*: 137) further claims that none of educational researchers is *complete* outsider or insider to specific settings being inquired and also highlights the significance of recognising the implications of each role. Based on the argument, I would regard myself as a *relative* outsider to the circumstances taken place within the case school since I was neither a teaching nor an administrative staff working at the school. Notwithstanding, my role, to certain extent, might also be considered as an insider resulted from some characteristics of my academic and personal background. First of all, I had completed my former study at an elementary school in Taiwan, which denotes that I have the background of learning in the Taiwanese elementary educational system. Secondly, just as the teachers and the administrators of the case school are engaging in various educational affairs, I am a Ph.D. student coming from an educational institution in the UK and conducting educational research to improve Taiwanese education. Lastly,

my personal relationship with certain members of the school was established previous to the investigation proceeded because: (1) my mother had been working as a volunteer at the school for three years, (2) my sister was a pupil of the school and (3) I had conducted research at the same school previously for my masters degree.

Such role as a 'relative' outsider to the site brought about a number of advantages and disadvantages. While attempting to specify them, I realised that the factors of those advantages and disadvantages were sometimes common. As a result, I intend to explain how those benefits and drawbacks were resulted from possible factors rather than indicating them respectively.

1) My learning experiences in the Taiwanese educational system

Sharing similar educational background as the six participants denotes that we are brought up in the same culture and able to talk in the same language. Consequently, it appeared that I had no problem to communicate with them verbally and also was likely to perceive the meanings of certain facial expressions and intonations while talking with them. Moreover, I was able to readily take a hint when faced with particular situations or behaviours in the course of my observations. Besides, my learning experiences in the Taiwanese educational system contributed to my knowledge of how elementary schools operated such as the length of an academic year, the styles of teaching and learning or the relationship between teachers and pupils. In short, compared with conducting the research in the UK, I was more capable of utilising my tacit knowledge constructed through my former learning in Taiwan to comprehend circumstances encountered.

2) My experiences of engaging in educational affairs

Throughout my interactions with the six participants, it appeared that they were interested in: (1) my previous experiences of teaching English as a foreign language in Taiwan, (2) my present experiences of living and studying in the UK and (3) my research areas. Some of the participants tended to ask my opinions on how to teach elements included in English class such as alphabet and pronunciation. Most of them were curious about how it was like to live and study in the UK which was usually the topic of conversations. In addition, two of them were particularly concerned about the subject of 'educational administration' to which several themes of the research were related. In this regard, they sometimes discussed issues or shared educational books in regard to 'knowledge management' and 'learning organisations' with me. The above examples demonstrate that there existed some degree of sharing between the participants and me, which was beneficial for building rapport so that the participants might feel more likely to express themselves when they talked about their experiences and views of the issues in question. Furthermore, such sharing might be exemplified as one of the interventions I brought to the participants to spark their insights into the areas they were interested in. Correspondingly, I was also inspired through the interactions with them.

3) My relationship with the school and its members

My mother's relationship with a number of the 'key' members in the case school enabled me to reach the Principal who permitted me to conduct the investigation on site. This relationship also made me feel welcomed in the school. However, not being as an 'absolute' outsider to some of the teachers, I had to be conscious of my personal image. For instance, I needed to pay attention to my dress to avoid negative judgment. Additionally, my sister's relationship with her teacher allowed

me to build a friendship with that particular teacher (T4) who introduced three other volunteers to join the investigation. This kind of friendship fostered the establishment of trust between T4 and me. Hence, she was more likely to tell me her so-called 'gossips' within the school, which made me being able to identify causal relationships of incidents observed. Nevertheless, such friendship did result in a drawback; that is, T4 appeared to involve her personal feelings about me when engaging in the activities of the investigation.

One criticism is that outsiders are sometimes exploitative and disrespectful and cannot understand and represent the experiences of the inquired-into properly (Bridges, 2002). To prevent such a situation in the practice of educational research, several principles are suggested to bear in mind during the research process (*ibid*: 86): (1) *sensitive and reflexive understanding of the experience of others*, (2) *respect for others as persons*, (3) *listening to others in conditions of respect and care*, (4) *mutuality of benefit and gratefulness for giving relationships* and (5) *openness to criticism and the exposure of prejudice*.

3.6 Ethical Considerations of the Research

The conduct of school-based research involves a highly personal matter; consequently, certain ethical and moral dilemmas may occur in interpersonal situations (Hitchcock and Hughes, 1995). For instance, since case study research features the investigation of social life in particular, it is assumed that I may develop a rather close relationship gradually with the participants and other related people within the chosen case school (Simons, 1989). Therefore, ethical issues such as consent, deception, harm and privacy are inescapable and need to be considered and integrated into the design and implementation of the research (Merten, 1998; Simons, 1989). In this section, I intend to specify the below ethical principles taken into account in the course of the investigation.

1) Access and acceptance

Without official permission to undertake this case study research in the chosen school, the design of the research would be 'armchair'. Thus, the initial step of the investigation was to get access and to be accepted by the school, which I would claim as an essential segment of the research process. In accordance with geographical location and expense considerations, I chose an elementary school which was near my house in Taiwan. Moreover, since I had conducted research for my Masters' dissertation in that particular school, I was rather familiar with the school environment and also had built my credentials as a competent, trustworthy and accommodating investigator. Therefore, it was possible for me to regain entry and build further relations with the school (Bryman, 2004; Marshall and Rossman, 1999).

In terms of gaining official permission from a site, Bell's (1993:42) suggests that *as soon as you have an agreed project outline and have read enough to convince yourself that the topic is feasible, it is advisable to make a formal, written approach to the individuals and organization concerned, outlining your plans.* Accordingly, once the research proposal was approved by the Committee of Research at the Nottingham Trent University, I utilised my time back in Taiwan in December 2003 attempting to contact the selected case school. A telephone inquiry led to an appointment with the school's Principal was made via the Section Chief of Teaching and Learning of the school. Prior to the appointment, the nature and scope of the research were clarified again (Cohen, *et al.*, 2000) and this clarification was integrated into the original research proposal which was provided in the meeting with the Principal (see Appendix 3). Moreover, I was also aware that the Principal might consider possible intrusion and disruption brought from me through her decision-making (Cohen, *et al.*, 2000) and therefore I was prepared to address this issue in the meeting.

In the course of negotiating with the Principal, I introduced my background and explained the purpose and planned procedure of the research such as the application of research methods, the research timeframe, the degree of interruption and my role throughout the investigation. At the end of the meeting, written official permission from the case school (see Appendix 4) was obtained and my contact details were left to the Principal for her further inquiries concerning with the research.

2) Informed consent

I proposed to have six teachers from the school to participate in the investigation since six was considered as an appropriate number for collaborative activities (Weinstein, 1999). Subsequent to obtaining official permission from the chosen school, the next step was to seek the six teachers working at the school and willing to engage in the activities carried out as the investigation proceeded and subsequently to gain consent from them.

A questionnaire (see Appendix 5) was distributed to all the teachers from Grade 1 to 6 (including 36 teachers) to seek for volunteers to participate in the investigation in December 2003. According to the finding of the questionnaire, two teachers (T1 and T4) were identified as the volunteers and one of them (T4) promised to find another three teachers to engage in the investigation. While I was away from Taiwan, I had made contact by telephone with these two teachers separately in order to establish rapport with them.

Prior to the investigation started, the six participants were informed of the nature and scope of the research, including the purpose, the research methods to be undertaken, the degree of participants' engagement and the ethical guidelines (BERA, 2003; Cohen, *et al.*, 2000; Punch, 1998). Simultaneously, the written information of the research (see Appendix 6) was supplied with the intention of obtaining written consent from the six participants (Oliver, 2003). According to the principle of informed consent, I was aware that the participants had the right to freedom and self-determination and also had the right to refuse to take part or to withdraw from the research for any or no reason at any time (BERA, 2003; Cohen, *et al.*, 2000).

3) Deception

In order to avoid the feeling of being deceived by me, I made an effort to explain the nature and scope of the research in detail to the six participants and to check their understanding of such information about the research prior to the investigation got underway (Cohen, *et al.*, 2000). Throughout the investigation, I was also aware that some of the participants might be more sensitive and vulnerable than others and therefore I needed to be prepared to deal with certain negative effects by means of concerning about the participants actively. In addition, all information was recorded under the preferred way of the individual participants and a copy of the information collected from each research method was made available for the relative participants to gain their validation (Oliver, 2003).

4) Anonymity and confidentiality

The adoption of anonymity and confidentiality was applied to protect the participants' right to privacy (BERA, 2003). The essence of anonymity and confidentiality was that the information provided by the participants would not be associated with their identity neither internally nor externally (Cohen, *et al.*, 2000). Thus, it was promised that all information would only be used for the publication of the research thesis and would not in any circumstances be given to any other people nor discussed in any conversations with other staff within the school. Moreover, the identity of the case school and the participants would not be mentioned in print so that they would not suffer negative effects as the consequence of the research (Punch, 1998).

Based on the above ethical principles, I formulated a list of ethical guidelines of the research (see Appendix 6) which were shared and agreed with the six participants prior to the investigation with the intention of preventing conceivable negative effects on them and also keeping faith with them.

3.7 Overview of the Investigation

The investigation was conducted from September 2004 to January 2005 (the first semester of the Academic Year 2004) in one of the elementary schools in the northern part of Taiwan. The main participants of the investigation involved four female and two male teachers from Grade 1 to 6 in the case school. In this section, I do not intend to give a detailed introduction of the school and the six participants since it will be illustrated in the next chapter. Instead, I tend to indicate certain elements contained in the discussion of their backgrounds.

The elements included in the discussion of the case school's background (see Section 4.2.1) were: (1) its geographic location and premise, (2) its teaching and administrative staff, (3) the number of pupils included in each class and (4) issues it currently encountered. By providing such information, I attempted to make readers be aware of the unique characteristics of the school. In terms of the six participants' personal and professional background, I intended to specify the elements such as: (1) grade they taught, (2) years of teaching, (3) gender, (4) family status, (5) reason for becoming an elementary school teacher, (6) learning experience, (7) professional life experience and (8) future plan (see Section 4.2.2 and Table 4.1). In a similar vein, such background information might represent the uniqueness of the individual participants and also illustrated the distinct characteristics of the group containing the six different individuals. Furthermore, the above elements might be used as personal variables when indicating and interpreting factors involved in the practices of

teachers' personal knowledge management.

3.8 Methods of Data Collection

Bassey (1999) points out that there are no specific methods of data collection for case study research as long as the use of the methods are appropriate, practical, creative and adventurous to answer the question(s) of research. Since it is suggested (Erlandson, *et al.*, 1993; Lincoln and Guba, 1985; Rodwell, 1998; Wu, 2003) that qualitative methods are more suitable for naturalistic (or constructionist) inquiry, I leaned towards the use of qualitative methods to investigate the complex phenomena of how the practices of teachers' personal knowledge management operated within the particular elementary school in Taiwan. The application of various qualitative data collection methods such as interviews, observations and documents facilitated me to understand the developmental processes of the individual participants and the case school through the obtainment of vivid and in-depth information. Except for the data collection methods, I also applied certain development methods such as autobiography, reflective journal and action learning for the participants to experience the practices of self-reflection and knowledge-sharing during the investigation. Those multiple sources of the collected data were recorded and stored systematically by means of categorising them according to the research methods with back-up files and noting them with date, time and place. In addition, the notion of 'human-as instrument' requires me to be sensitive and flexible when interaction with the data encountered since my tacit knowledge about the themes in question may grow and therefore bring about certain changes in the process of data collection (see Section 3.4.2 and 3.5.1). For this to be achieved, I had kept writing a research diary to note changes made and to monitor my personal growth throughout the conduct of this research. The application of those data collection and developmental methods at various stages of the investigation are indicated briefly in Table 3.5:

Table 3.5 Research methods applied at the stages of the investigation.

Stages	Data Collection Methods	
<i>Pre-stage</i>	Composition of a research diary	<ul style="list-style-type: none"> • A self-completion questionnaire distributed to 36 teachers of the case school to seek for volunteers. • Pilot study of a semi-structured interview schedule with three elementary school teachers studying in England.
<i>In-stage</i>		<ul style="list-style-type: none"> • Composition of a teaching diary by the six participants. • Semi-structured interviews with the six participants, the Section Chief of Teaching and Learning and the Principal. • Informal conversational interviews with the six participants. • Observations of the six participants' classroom teaching and the self-facilitated action learning set meetings. • Observations of the school's educational activities including administrative and educational affairs meetings, Wednesday seminars, peer observations and professional workshops.
<i>Post-stage</i>		<ul style="list-style-type: none"> • A focus group interview with the six participants. • Collection of the school official documents of Academic Year 2004 including School Profile, Administrative Job Plan and Educational Developmental Plan.

As can be seen from the table above, the data collection methods were divided into primary and secondary sources of data. In Section 3.8.1 and 3.8.2, I intend to illustrate the theoretical issues and practical matters of how I carried out diverse forms of interviews and observations as the primary methods respectively. Besides, what sorts of documents were included and how they were gathered as the secondary sources of data are explicated in Section 3.8.3.

As explained in Section 3.8, a questionnaire was used to seek volunteers to participate in the investigation and therefore I do not view such a questionnaire as the means to collect relevant data for the themes in question. Hence, I incline to specify the design and elements of the questionnaire concisely prior to embarking on the discussion of research methods.

Questionnaire

A self-completion questionnaire (see Appendix 5) (Bryman, 2004; Gillham, 2000; Oppenheim, 1992; Simmons, 2001) was distributed to 36 teachers in December 2003 to seek volunteers to participate in the investigation. In order to not occupy much of the teachers' time, the design of the questionnaire was generally based on closed format with dichotomous questions, multiple-choice questions and one open-ended question (Cohen, *et al.*, 2000; Oppenheim, 1992). Moreover, a space was provided under each question for the teachers to expand their opinions if they wished to. Concisely, elements included in the questionnaire were: (1) a brief introduction of the researcher, (2) teachers' awareness of and reflection on aspects about their current teaching and (3) the degree of willingness to participate in the investigation. The questionnaire was returned within one week, which might be viewed as an efficient means to gather responses rather than asking individual teachers separately.

3.8.1 Application of Interviews

Interview is regarded as the process of interchanging views among people on a topic of interest, which generates knowledge in relation to the topic and situates interviewing data in its social setting (Kvale, 1996). Therefore, interview is viewed as the most appropriate method to adopt where research aims to explore: (1) individuals' perceptions of processes within a social unit such as a school and (2) the meaning of specific phenomena to individuals (King, 1994). Accordingly, I attempted to use various interviews to gather the respondents' viewpoints on how teachers' personal knowledge was promoted in the school and also issues involved in such promotion. Three types of interview were carried out with different schedules and respondents (see Table 3.6): (1) semi-structured interview, (2) informal conversational interview and (3) focus group interview.

Table 3.6 Overview of the conduct of the interviews.

Types of Interview		Respondents								
		T1	T2	T3	T4	T5	T6	P	SCTL	
Semi - Structured Interview	<i>Time</i>	09/11/04	21/09/04	23/11/04	20/09/04	19/11/04	22/09/04	21/09/04 & 14/12/04	20/12/04	
	<i>Length</i>	2 hours	2 hours	1.5 hours	30 mins	1.5 hours	1.5 hours	40 mins	3 hours	
	<i>Venue</i>	At their classroom						At their office		
	<i>Schedule Used</i>	Semi-structured interview schedule - A						Semi-structured interview schedule - B		
	<i>Recording Technique</i>	Digital recorder								
Informal Conversational Interview	<i>Time</i>	03/01/05 & 07/01/05	22/11/04	07/01/05	28/12/04	05/01/05	01/11/04 & 03/01/05	/		
	<i>Length</i>	2 hours	1.5 hours	1 hour	40 mins	1 hour	2 hours			
	<i>Venue</i>	At their classroom								
	<i>Schedule Used</i>	Based on informal conversational interview questions								
	<i>Recording Technique</i>	Digital recorder & digital video camera								
Focus Group Interview	<i>Time</i>	20/02/05					/			
	<i>Length</i>	1 hour								
	<i>Venue</i>	Grade 3, Classroom of Love								
	<i>Schedule Used</i>	Focus group interview question								
	<i>Recording Technique</i>	Digital recorder & digital video camera								

Notes: (1) The six participants' names are encoded according to the level they teach sorting from Grade 1 to 6. Moreover, the symbol 'P' means the 'Principal' and the symbol 'SECL' means the 'Section Chief of Teaching and Learning' of the case school. (2) The length of each interview indicated in the table is approximately the same as it was. Moreover, 'mins' means 'minutes'.

The design and application of these interviews are illustrated respectively, as follows:

Semi-structured interview

Semi-structured interview (Drever, 1995; Hitchcock and Hughes, 1995; Scott and Usher, 1999; Wengraf, 2001) was employed to explore the current system of the school by encouraging the interviewees to discuss their interpretations of interview focuses and to express how they understand the environment in which they were located from their own perspectives (Cohen, *et al.*, 2000; Scott and Usher, 1999), which aimed to relate theoretical perspectives with real life circumstances. The focuses of the interview, formulated in the light of the review on the current literature with reference to the concepts of knowledge management and the characteristics of learning organisations, include: (1) the school's awareness of current educational issues, (2) its current vision and mission, (3) its system and strategies, (4) its strengths and weaknesses, and (5) its supports for the development of individuals and professional communities. These focuses were organised into a semi-structured interview schedule (see Appendix 7 & 8) to ensure the coverage of important issues and also to allow for flexibility in responding to individual-initiated concerns (Berg, 2004; Drever, 1997; Hitchcock and Hughes, 1995). The main questions under each focus were formed in a logical sequence with probes and prompts (Fielding and Thomas, 2001) according to the following two considerations:

- The logical sequence of the interview questions might avoid confusion and flow the interview process naturally since the order of questions might affect the interviewees' thinking and influence what they say (Drever, 1997).
- The use of probes and prompts might direct the interviewees towards what they know but have not yet mentioned or be used for clarification and explanation what they have already said (Drever, 1997).

To give the proposed semi-structured interview schedule a trial run under realistic conditions and find out how the pilot respondents interpret the questions (Drever, 1997; Pole and Lampard, 2002), I conducted a pilot study as the final preparation for the investigation. Owing to convenience, access and geographical proximity regarding as the major criteria for selecting pilot participants (Yin, 1989), I sought three Taiwanese elementary teachers currently studying in England. These three pilot participants are my friends who are also doing their Ph.D. studies at the University of Loughborough. The pilot semi-structured interview was carried out on 15th June 2004 and lasted for 1.5 hours. Before the pilot interview started, I explained what the research was about and how it would be conducted in the case school. Consequently, these pilot respondents were asked not only the interview questions but also their opinions about the research. Since they had the better understanding of the Taiwanese elementary educational context than me, they might be more capable of anticipating difficulties or negative reactions which I might be confronted by during the investigation. The pilot data were analysed in order to indicate further modifications for the actual investigation (Mertens, 1998). In sum, the conduct of such a pilot study: (1) provided me a chance to work in practice, (2) helped me to gather various viewpoints from different angles and (3) built my confidence.

Conduct of semi-structured interview

The respondents were classified into two groups: one involved the Principal and the Section Chief of Teaching and Learning and the other one involved the six participants. Two groups of the individuals were interviewed separately with slightly the same questions and sequence in order to increase the comparability of responses (Patton, 1990). The length of each interview was about one to two hours, depending on the availability of the individual respondents' time or the interactions between them and me. Before each interview, I explained the purpose of the interview,

assured of confidentiality and asked permission to tape or make notes (Robson, 2002). Either tape-recording or note-taking technique was chosen by the interviewee according to their preference so that they would feel more comfortable and relaxed throughout the whole process of the interview (Hitchcock and Hughes, 1995). In the course of the interview, I attempted to adopt certain behaviours with the intention of getting the interviewee to talk freely and openly; they were (1) listening more than speaking, (2) asking questions in a straightforward, clear and non-threatening way, (3) avoiding using cues to lead certain responses and (4) showing my enjoyment (Robson, 2002). Subsequent to the interview, I provided the transcripts of the interview to the respondent for his/her validation.

Informal conversational interview

Informal conversational interview is viewed as the most open-ended means to gather the six participants' viewpoints (Patton, 1990). Thus, I did not intend to design an interview schedule for the informal conversational interview since it was difficult to know beforehand what was going to happen or what would be important to ask (Berg, 2004; Patton, 1990). As the result of reviewing some literature in relation to knowledge management during the investigation, I realised that certain issues were not addressed in the semi-structured schedule (see Appendix 9, Question 2-9). Accordingly, in the middle of the investigation, I carried out the conversational interview informally with the six participants individually. The questions of the informal conversational interview involved not only the above-indicated issues but also my concern of the participants' feelings about the application of the research methods (see Appendix 9, Question 1) as well as issues emerged from my observation of the school educational activities (see Appendix 9, Question 10-11). Based on the above explanation, the informal conversational interview might be regarded as one of the examples of emergent design (see Section, 3.4.2). The length

of each interview was varied depending on the participants' experiences of and involvement in the circumstances. As at the semi-structured interview, the purpose of the interview, the assurance of confidentiality and the informed permission of recording, the adoption of particular behaviours and the offer of the interview transcripts were proposed at the various stages of the interview.

Focus group interview

The terms 'group interview' and 'focus group' interview appeared to be synonyms; nevertheless, it is pointed out that 'focus group' interview is the adjunct to group interview (Cohen, *et al.*, 2000; Denscombe, 1998; Robson, 2002). While 'group interview' relies on the interaction between an interviewer and the group, 'focus group' interview stresses the interaction among the group members to discuss topic(s) the interviewer provided (Morgan, 1988). In other words, 'focus group' interview is an open-ended group discussion of a specific topic which is where the 'focus' come from (Denscombe, 1998; Robson, 2002). For that reason, I tended to adopt the notion of 'focus group' interview at the last meeting of the self-facilitated action learning set to gather feedback from the six participants about the effectiveness of providing the classroom observational notes, carrying about the self-facilitated action learning and composing the teaching diary and also their involvement in the research regarding to the development of their personal knowledge management (see Appendix 10). The above issues were categorised into a list of seven broad questions developed mainly from the literature review and it was hoped that the outcomes of the 'focus group' interview might inspire me with the linkage between theory and practice.

However, the interview was not carried out successfully because three of the five participants were late for the set meeting. In order not to waste the on-time participants' time, I could only interview two of them first and the rest of them afterwards. The length of the interview was about one hour which was recorded by tape-recording and video-taping.

Except for the 'focus group' interview, I had had enough time to carry out the interviews with the individual respondents so that in-depth and in-detail data were obtained. However, I recognised that it was time-consuming to transcribe the tapes of the interviews since I attempted to make a full transcript of them, which might be seen as the disadvantage of interviewing (Kvale, 1996).

3.8.2 Application of Observations

Observation is regarded as the means to understand 'live' situations in physical, human, interactional or programme settings by looking at and reflecting on them (Cohen, *et al.*, 2000; Morrison, 1993; Patton, 1990). Instead of adopting systematic observation, I incline to employ the practice of 'participant observation' owing to the reasons that such observation may enable me to be immersed in the natural settings of the school context and conceivably to be aware of the essential factors explaining the events. More specifically, to some degree, I may be able to experience things as an insider and therefore get insights into those events from the insider's point of view (Denscombe, 1998; Robson, 2002). Three major types of 'live' situations; that is, the six participants' classroom teaching, the self-facilitated action learning set meetings and the school educational activities, were observed throughout the investigation (Table 3.7). In terms of my involvement in these observations, I would view my role as 'observer-as-participant' (Gold, 1958 cited in Scott and Usher, 1999) since the administrators, the teachers and the pupils realised that they were being observed.

Table 3.7 Overview of the conduct of the observations.

Types of observation		Time	Length	Venue	Recoding Technique	
Observation of Classroom Teaching	T1	13 times	80 mins	At their classroom	Observational form	
	T2	14 times				
	T3	14 times				
	T4	13 times				
	T5	12 times				
	T6	12 times				
Observation of Self-Facilitated Action Learning	Set Meetings	17/09/04	1 hour	Grade 3 Classroom of Love	Using a digital recorder and a digital video camera	
		01/10/04	1 hour			
		15/10/04	1.5 hours			
		29/10/04	2 hours			
		11/11/04	2 hours			
		03/12/04	1.25 hours			
		17/12/04	2 hours			
		31/12/04	1.75 hours			
		14/01/05	1 hour			
20/02/05	1 hour					
Observation of Developmental Activities	Wednesday Seminars	06/10/04	2 hours		Field note	
		13/10/04				
		10/11/04				
	Peer Observations & Subsequent Group Discussion	26/10/04	40 mins + 1 hour		Audiovisual centre	Observation form
		01/11/04	40 mins + 1 hour			
		20/12/04	40 mins + 30 mins			
		22/12/04	40 mins + 40 mins			
	Professional Workshops	17/09/04	2 hours		Garden	Field note
		01/10/04				
		15/10/04				
Observation of School Meetings	Morning Meetings	16/12/04	30 mins	Audiovisual centre	Observational form	
		20/12/04	30 mins			
		23/12/04	45 mins			
		30/12/04	1 hour			
		03/01/05	15 mins			
		10/01/05	40 mins			
		13/01/05	40 mins			
		17/01/05	35 mins			
	Administrative affairs Meetings	08/09/04		Audiovisual centre	Field note	
		19/01/05	2.5 hours		Observational form	
	Educational affairs Meetings	15/12/04	2 hours	Audiovisual centre	Observational form	
22/12/04		1.5 hours				

Notes: (1) Instead of putting exact dates of the classroom teaching observation, I tend to count the number of observed times for each participant from 06/09/2004 to 17/12/04. (2) The length of each observation indicated in the table is approximately the same as it was. NB, 'mins' means 'minutes'.

However, I intended to not have any contact or interaction with them with the attempt of not disturbing or changing what were being studied and also to gain a more objective view of the multiple realities being investigated (Scott and Usher, 1999). The observation was in a semi-structured manner because the agenda of issues was determined whereas observational data was recorded by the use of a less systematic technique. A narrative system for recoding observational data (Simpson and Tuson, 1995) was adopted since it was economical compared with video-taping and also it might make the teachers feel more comfortable.

These observations are outlined below.

Observation of the participants' classroom teaching

Observation was used to: (1) gain a better understanding of teachers' knowledge within the Taiwanese elementary school setting, (2) understand the teaching circumstances the six teachers involved in and (3) explore how they utilise their knowledge in classroom teaching (Cohen, *et al.*, 2000; Foster, 1996). Prior to the investigation, the six participants were informed that they would be observed and a written observational guideline was also provided (see Appendix 11). Due to time considerations, the six teachers were observed once a week for two hours separately, which was arranged with the teachers according to their preferred time and subject to be observed. Once when the arrangement was made, the observation timetable was rather fixed throughout the whole semester with the intention of getting the participants (including the teachers and pupils) used to me being there at the same time every week. Furthermore, as I did not attempt to influence the teachers' teaching while observing and therefore the standing position of me was negotiated with the individual teacher. The observational form (Appendix 12) was used to record such observation, which was made available for the individual participant at the beginning

of the following week for their validation. As a result, it was hoped that the teachers would increase their awareness of what was going on in their classroom and subsequently self-evaluate their own teaching, which might lead them towards professional development (Wragg, 1999). The teachers were encouraged to share their awareness and evaluation resulting from the review of those observational notes which could also be used as one of the references for the 'self-facilitated action learning' if the teacher wished to discuss her/his teaching with other teachers.

Observation of the self-facilitated action learning set meetings

As specified previously (see Section 2.4.3), I intended to apply the notion of action learning (e.g. McGill and Beaty, 1995; Revans, 1983; 1998; Weinstein, 1999) in the course of the investigation with the purpose of bringing the opportunity for the six participants to experience the process of knowledge sharing as well as exploring how they share their experiences and ideas with each other and issues involved in the sharing process. In addition, I also attempted to evaluate whether the application of action learning carried out potential advantages for the individual participants.

Prior to the investigation, the six participants were informed that they would be involved in a self-facilitated action learning set (McGill and Beaty, 1995) and a written guideline was provided (see Appendix 13). The term, self-facilitation, means that the participants themselves take the responsibility to lead the process of the set meetings. The dates, time and person(s) in charge of the set meetings were negotiated with the participants. Once the above details were communicated, an action learning guide with a timetable was provided to the participants so that they might be able to know the direction of what and how they were going to do. The set meetings took place nearly once every two weeks for 10 times (one to two hours). The major elements of the meetings comprised the use of autobiography (the first six meetings),

the process of brainstorming (carried out mainly at the seventh, eighth and ninth meetings) and a focus group interview (the last meeting).

At the first six meetings, the notion of autobiography was employed as the means to assist both me and the participants to understand how they evolve, develop and change their knowledge in the way they were influenced and shaped by their personal experiences (see Section 2.4.2). In the course of each meeting, the leading participant shared his/her autobiography in either oral or written manner with other participants and attempted to generalise essential aspects according to the autobiography, which would be the focuses for the subsequent peer discussion. By the diagnosis of the autobiographer's own life collaboratively, it was hoped that s/he might be able to sketch his/her knowledge and clarify and theorise certain perspectives formed by his/her past experiences. Subsequently, the autobiographer was capable of connecting the reflection and analysis to form actions towards his/her future professional life. Moreover, the rest of the participants might be able to gain insights from the other's stories. Prior to the seventh, eighth and ninth meetings, I collected and disseminated issues or problems the participants wished to shared and discussed with others, which could be generated from their classroom observational notes or their teaching diaries. The process of brainstorming aimed to increase the effectiveness of the participants' professional development by means of reflecting on their daily practices and issues cooperatively and continuously for emerging learning and subsequently more effective actions.

During the application of the self-facilitated action learning, I had the role as a facilitator to arrange the time and place for the set meetings; to collect and disseminate issues the participants wished to discuss before each meeting; and to prepare tea and snacks. As a result, the participants did not need to spend extra time to deal with the above chores and also a harmonious atmosphere might be encouraged. Unlike classroom observation, tape-recording and video-taping were the techniques adopted to record the process of the self-facilitated action learning set meetings so that the social interactions among the participants could completely be recorded. The discussion of each meeting was transcribed and distributed to the participants for their validation.

Observation of the school educational activities

The observation of the school educational activities, subdividing into developmental activities and official meetings, was not taken into account in the design of data collection. Notwithstanding, in the light of my interactions with the six participants, I was aware that several educational activities implemented for the teachers' professional development, such as Wednesday seminars, peer observations and professional workshops, could be viewed as the practices of teachers' personal knowledge management. Thus, I intended to observe how those activities were delivered and how the teachers' reacted to or behaved in those situations. Besides, I also observed the official meetings held by the school, including the morning meetings held twice a week, administrative affairs meetings held at the beginning and end of the semester and two educational affairs meetings at the end of the semester. During my observation of these meetings, I had paid particular attention to how the administrative and teaching staff interacted and communicated with each other since social interaction and communication play essential roles in the implementation of teachers' personal knowledge management. The above activities

and meetings were observed on a regular basis and recorded using the observational form. Some of the activities were recorded through the use of the observational form; whereas, others were recorded as field notes right after the observations.

Despite the time for carrying out the interviews and the observations, I utilised the rest of the time at the school to talk with the six participants informally and to read newspapers in the 'big office' or educational books/journals in the library occasionally. In the course of those circumstances, I attempted to open my eyes and ears and to be sensitive to the surroundings in order to capture naturally-occurring incidents in relation to the issues in question. Those incidents were described with my opinions in the research diary.

3.8.3 Components of Documents

Yin (1989; 2003; also see Hitchcock and Hughes, 1995) classifies the sources of documents into documentation (e.g. letters, meeting minutes, progress reports, etc) and archival records (e.g. service records of clients, organisational charts and budgets, maps, diaries, etc). The above examples facilitate me to identify the sources of documents of the research, including:

Official documents of the school

Wellington (2000) defines the degree of access to documents from closed or restricted access to openly published. The official documents of the Academic Year 2004 of the case school were collected from the Section Chief of Teaching and Learning since she was identified as the person who had those documents. Accordingly, the degree of access to these documents was classified into the category of *published 2*; that is, *available free on application or via the Internet (ibid: 112)*. The documents gathered comprising School Profile, Administrative Job Plan and

Educational Developmental Plan, which were regarded as supplementary data to provide contextual information of the school and to triangulate the other sources of data.

Research diary

From the time I started this Ph.D. study, I had kept a research diary viewed as a research log with the attempt of monitoring my personal development throughout the various stages of the research process (i.e. the planning, implementation and evaluation of the research) and also providing the future direction of my work. (Bryman, 2004; Glaze, 2002; Silverman, 2004). However, the research diary in terms of the method of data collection was used to assist me to recall events (Denscombe, 1998). The components of the research diary included: (1) supervision forms, (2) emails with my supervisors (3) new ideas and insights emerged from self-reflection, peer conversations and readings and (4) issues and emotions encountered throughout the research and their possible solutions. A list of questions used as the guide of composing such a diary (see Appendix 14) was borne in mind while writing the research diary so that I was able to remind myself not to purely describe events.

Teaching diary

The six participants were encouraged to write a teaching diary regarded as a reflective journal (see Section 2.4.2) assisting them to develop the capacity for meaning making and reflective thinking on specific events and experiences related to their daily teaching. That is to say, the composition of a teaching diary might enable the participants to experience the process of self-reflection. The composition of a teaching diary could provide tangible evidence of mental processes of the participants, which made their thoughts visible and concrete by means of interacting with, elaborating on and expanding ideas (Kerka, 1996). Thus, in the course of writing a teaching diary, the participants might be able to not only make their

knowledge explicit but also articulate connections between new ideas and what they had already known.

Two issues were taken into account as encouraging the participants to write such a teaching diary in order to avoid unwanted outcomes. Firstly, it is identified that some people write their journals descriptively rather than reflectively due to the fact that either the guidelines do not motivate reflection or they do not know how to write reflectively (Francis, 1995; Paterson, 1995). Secondly, there exists a drawback that some journal writers just write for others but not for themselves, namely, they write what they think others wish to see (Paterson, 1995).

At the beginning of the investigation, a notebook was provided for each of the six participants and simultaneously a list of guidelines for writing a teaching diary (see Appendix 15) was also attached and explained in order to give the participants an orientation and to avoid them describing every single activity rather than reflecting on meaningful and relevant events and experiences. Besides, I did not intend to read the participants' teaching diaries since they might tend to avoid writing certain thoughts, beliefs and attitudes if their diaries were going to be read by me (Paterson, 1995). However, they were encouraged to share issues indicated in their teaching diaries as one of the references for the 'self-facilitated action learning'.

3.9 Methods of Data Analysis

Marshall and Rossman (1999) regard data analysis as the process of bringing order, structure and meaning to the collected data. The definition implies that the process of data analysis is rather systematic and comprehensive (Tesch, 1990). The analysis process consists of three succeeding activities: data reduction, data display and conclusion drawing and verification (Miles and Huberman, 1994). Besides, data management is recognised as the initial step of the data analysis process to organise voluminous qualitative data (Creswell, 1998; Patton, 1990). Accordingly, I would suggest that data management, data reduction, data display and conclusion drawing are the four steps involved in the process of data analysis, which are influenced by my tacit understanding of the collected data.

Furthermore, in terms of strategies adopted to approach these data analysis activities, I am aware that there are diverse ways to analyse collected data and the choice of data analysis methods is determined by the nature of the theoretical paradigm and data collection methods of research. For example, phenomenological inquirers tend to adopt the practice of phenomenological analysis (e.g. Douglass and Moustakes, 1984; Moustakas, 1990; Patton, 1990). Constructionist (or naturalistic) inquirers put forward the suggestion of inductive analysis and grounded theory analysis (e.g. Lincoln and Guba, 1985; Rodwell, 1998; Wu, 2003). Moreover, qualitative research involves a minimum of measurement, standardisation and mathematical techniques as quantitative research does (Sarantakos, 1998). In the light of the nature of the data gathered through diverse research data collection methods to respond to the themes in question, I attempted to adapt inductive analysis and grounded theory analysis to deal with observational sources and phenomenological analysis to deal with interviewing sources. Hence, in Section 3.9.1 and 3.9.2, I intend to illustrate how I

applied these data analysis methods in the process of managing, reducing, presenting and interpreting the data collected through the interviews and observations respectively. Since documents are the secondary sources of data, in Section 3.9.3, I also specify a set of questions considered in analysing them. Lastly, in Section 3.9.4, I point out issues taken into account in the presentation of data analysis.

3.9.1 Analysis of Observations

In this section, I attempt to elaborate on the principle of inductive analysis and the practice of grounded theory analysis and subsequently to demonstrate the process of dealing with the observational data.

Inductive analysis

Inductive analysis is suggested to be adopted by naturalists (or constructionists) owing to the reason that the process of such analysis is more likely to interpret multiple realities through the interactions between the inquirers and the data sources (Erlandson, *et al.*, 1993; Lincoln and Guba, 1985; Rodwell, 1998; Wu, 2003). That is to say, the patterns, themes and categories of analysis come out from the understanding and synthesis of collected data rather than being imposed before the processes of data collection and analysis (*ibid*). Based on Znaniecki's (1934) proposition of analytic induction, Robinson (2000) claims that the practice of analytic induction is applied as the means of 'causal analysis' by investigating the occurrence of necessary and sufficient conditions of a phenomenon and also as the means of 'proof' by providing deterministic generalisations. In a similar vein, Goetz and LeCompte (1981) point out that analytic induction is attempted to provide universal generalisations by means of taking all instances into consideration. Conversely, Turner (2000) argues that generalisations drawn from analytic induction can merely be probabilistic rather than deterministic since those necessary and

sufficient conditions may not be applicable to all causal systems. In the light of the above arguments, I tended to accept the principle of examining and explaining all instances of the phenomena in relation to the practices of teachers' knowledge development, sharing and creation to maximum the transferability of conclusions drawn from the research findings. Simultaneously, I was also aware that those conclusions could not entirely represent all the practices of teachers' knowledge development, sharing and creation taken place in other elementary schools in Taiwan.

Grounded theory analysis

Grounded theory is also termed constant comparative method, which concentrates on theory building by means of making comparisons of collected data (Glaser and Strauss, 1967; 1999). Following on the above point, Tesch (1990) suggests that the method of comparing and contrasting is practically used for all tasks during data analysis with the intention of distinguishing conceptual similarities, refining the intensity of categories and discovering patterns. Similar to inductive analysis, grounded theory analysis attempts to focus on the emergence of themes drawn directly from the data without using predetermined categories or hypotheses (Glaser and Strauss, 1967; 1999). That is to say, grounded theorists intend to develop and ground the discovered theories on the data through continuous comparisons. Based on the above principles of comparative analysis, Strauss and Corbin (1990; 1994; also see Chen, 2004; Creswell, 1998; Mertens, 1998) further indicate three steps of the grounded theory analytic process, summarised as follows:

- Open coding:

During the step, the data are broken down into separate parts and subsequently closely examined, reflected on and compared for similarities and differences. Those separate parts need to be classified into a set of categories which are named or labeled to represent different phenomena. The emphasis of this stage is to develop the categories of the data and to look for instances to saturate the categories.

- Axial coding:

During the step, the categories are integrated to build a model of the phenomena in which the context and conditions of how different incidents or events happen as well as the strategies and consequences of how those incidents or events are described are involved and interconnected. The emphasis of this stage is to formulate possible relationships among the categories and continue to search for the data for verification.

- Selective coding:

During the step, a core category or story line needs to be identified initially and subsequently the subsidiary categories are related to the core category. Similar to axial coding, the context, conditions, strategies and consequences of the phenomena are explicated. The emphasis of this stage is to build an intuitive set of theoretical propositions derived from the core categories indicated.

By comparing the notion of inductive analysis and grounded theory analysis, I am conscious that inductive analysis may serve as the theoretical foundation of grounded theory analysis since it originated from inductive reasoning proposed by empiricists (see Table 2.1). In other words, inductive analysis may be applied to any forms of observation taken place in everyday circumstances and grounded theory analysis may be viewed as the practical means to employ in dealing with qualitative observational data. Furthermore, it is criticised that the principles of grounded theory analysis suggested by Glaser and Strauss (1967, 1999) and Strauss and Corbin (1990, 1994) appear to embrace the epistemological perspective of positivist since they stress the importance of the verification of theories discovered (Charmaz, 2002; Henwood and Pidgeon, 1993). Accordingly, I inclined to adopt the practices of open and selective coding since the purpose of verification was not considered in the research. Besides, the notion of the discovery of theories grounded on collected data denotes the ontological perspective of objectivist, which disregards inquirers' subjective creation or interpretation of multiple realities. Consequently, my arguments about the research findings were not the theoretical propositions of teachers' personal knowledge management since I did not intend to build the so-called 'grounded' theories. Instead, those arguments might be regarded as my personal understanding of social phenomena and interactions under study.

Process of analysing observational sources

The minutes (or the observational notes) of the six participants' classroom teaching and various educational activities (including the self-facilitated action learning set meetings) were organised according to whose class it was and the types of activities respectively and these minutes (or the observational notes) were put on both printed and electronic files to back up the data. The steps of reducing, presenting and interpreting observational data were:

- Reading through the minutes organised in different files individually and highlighting instances (i.e. open coding).
- Writing down my personal reflections on the instances (i.e. memo writing).
- Classifying the instances in the light of the reflections into a set of categories which were labeled by me (i.e. open coding).
- Reading through the minutes again in order to not leave out any other instances to exemplify their related category (i.e. open coding).
- Identifying the core categories and relating the other categories to the cores (i.e. selective coding).
- Presenting each core category and its subcategories with a table and the detailed descriptions of all the instances belonging to the categories (i.e. selective coding).
- Providing my commentaries on the instances by counting the frequency of them and seeking the relationships among them.
- Summarising the research findings generated from my commentaries.

3.9.2 Analysis of Interviews

The principles and practices of inductive analysis and grounded theory analysis were applicable to indicate how the six participants carry out their knowledge development, sharing and creation as well as issues involved in these processes within the school which were derived from the sources of the observations. The design of the observations in the research was rather open-ended since I attempted to catch all the incidents occurred. Thus, instead of determining categories or themes prior to the processes of data collection and analysis, I intended to give meanings to those incidents and subsequently to classify them into patterns or issues according to their meaning. Notwithstanding, such methods of analysis might not be appropriate to analyse the interview transcripts due to the reason that various types of interview

conducted in the research were guided by the interview schedules and questions to explore the respondents' (including the six participants, the Section Chief of Teaching and Learning and the Principal) personal experiences with regard to the implementation of teachers' personal knowledge management within the case school. That is to say, the sources of interview data were analysed using the pre-established categories which were derived from the review of the literature. Consequently, I attempt to explicate the practice of phenomenological analysis and its application to analysis of the interview transcripts.

Phenomenological analysis

Different from a phenomenological perspective in philosophy, Patton (1990) addresses that a study with a phenomenological focus pays attention on the descriptions of what people experience and how those experiences are experienced. Therefore, phenomenological analysis is applied to reveal the essence of personal experiences of being in particular social phenomena (Creswell, 1998; Patton, 1990). While looking at how phenomenological analysis is carried out, I have recognised that Moustakas's (1990) suggestion of the heuristic process of phenomenological analysis was more appropriate to be adopted because: (1) it portrays not only the essential meanings of phenomena being experienced but also the inquirer's intrigue and personal significance influencing the search to know, (2) it retains the research participants' existence throughout the examination and presentation of the data, and (3) it includes the inquirer's intuition and tacit understanding of the phenomena in conclusions (Douglas and Moustakas, 1984). The heuristic process of phenomenological analysis involves five stages summarised as follows:

- *Immersion* is the stage that the researcher steep him/herself in the feel, tone, mood, range and content of experiences to make him/herself totally involve in the world of the experiences.
- *Incubation* is the stage of 'quiet contemplation' where the researcher waits for his/her awareness, tacit insights and understanding of the experiences so that s/he becomes more clear about the meanings of the experiences.
- *Illumination* is the stage of expanding and deepening the meanings through forming clusters and parallels of the emergent structures, themes and patterns of the experiences.
- *Explication* is the stage of adding other dimensions of the meanings through further focusing, self-dialogue and reflection on the experiences or building relationships among them.
- *Creative synthesis* is the stage of communicating findings in a creative and meaning way by demonstrating patterns and relationships of the experiences in which the researcher's tacit knowledge is included.

Process of analysing interviewing sources

The data of the interviews were transcribed into texts and those interview transcripts were put on printed and electronic files in accordance with the types of the interviews. The steps of reducing, presenting and interpreting interviewing data were:

- Reading through the interview transcripts from different files separately in order to be familiar with the data (i.e. immersion).
- Bearing in mind of the predetermined categories and questions of the interviews, underlining important themes of the transcripts as codes and subsequently putting those codes into the predetermined categories.
- Noting down the reflections on the instances of the codes (i.e. incubation).
- Counting the frequencies of the instances under each code, comparing the

interviewees' viewpoints and making the relationship among the codes (i.e. illumination).

- Going back to the literature again and subsequently giving meaning to the frequencies, comparisons and relationships (i.e. explication).
- Presenting the codes under each category with a table, providing direct quotations from the interviewees or detailed descriptions of the incidents and adding my commentaries (i.e. creative synthesis).
- Summarising the research findings generated from my commentaries.

3.9.3 Analysis of Documents

Content analysis is the method which is normally used for analysing the content of documents, containing the steps of: (1) *choosing an appropriate sample of texts*, (2) *breaking the text down into smaller component units*, (3) *developing relevant categories for analysing data*, (4) *coding the units in line with the categories*, (5) *counting the frequency with which these units occur and finally*, (6) *analysing the text in terms of the frequency of the units and their relationship with other units that occur in the text* (Denscombe, 1998:168; also see Cohen, *et al.*, 2000: 284-285; Robson, 2002: 352-357). In the light of the above steps, it is realised that content analysis tends to elucidate the meanings of documentary data by enumerating the frequency of units appearing in a text. Besides, content analysts do not consider *either the motives of the producer of the document or the circumstances of the document's production* (Hitchcock and Hughes, 1995: 226). According to the above arguments, I did not intend to use content analysis as the means to analyse the documentary data since the practice of such analysis was less suitable to indicate and understand the contextual elements of the data. Derived from Scott's (1990: 34 cited in Wellington, 2000) claim that texts and documents are *socially situated products*, Wellington (2000: 116-117) further develops a set of questions to take into

consideration as engaging in the practical activity of analysing documents in educational research, specified as follow:

- *Authorship*: who wrote it?
- *Audience*: who and why was it written for?
- *Production*: where and when was it produced?
- *Presentation*: how is it presented? (e.g. colour or black and white, glossy paper, etc.)
- *Intentions*: why was it written?
- *Style, function, genre*: in what style is it written? how direct is the language? is it written to inform, to convince, to provoke, etc.?
- *Content*: what words, terms or jargons are used?
- *Context/frame of reference*: how does it relate to previous documents and later one?

3.9.4 Presentation of Data Analysis

My perspective of multiple realities denotes my respects for diverse worldviews and values of the research participants (Wu, 2003). Therefore, as I made an effort to present the abstracted realities of how teachers' personal knowledge management was practised in the Taiwanese elementary school context, I was conscious of not only my own understanding and interpretation of individual cognitive meaning making processes as well as social processes and phenomena emerged but also how the participants express themselves about those processes and phenomena. That is to say, the presentation of the research included my own voice and also the participants' voices (Hertz, 1997). For this to be achieved, I attempted to use direct quotations from the respondents of the interviews to represent their viewpoints or experiences and also to give a detailed description of incidents to exemplify certain phenomena.

The flowing of data analysis presentation (see Chapter 4) was determined by the themes of the research. Since how the teachers involve in the process of knowledge construction, development, sharing and creation to foster their professional development was the primary focus of the research, I tended to present the aspect A, B, C and D first (see Table 3.1). Subsequently, I present the data and findings of the second emphasis; that is, how the school supports its teachers for the fulfillment of teachers' personal knowledge management in terms of providing appropriate conditions (see Table 3.1, Aspect E, F, G, H, I and J).

Table 3.8 Direction and emphases of data analysis.

Aspect of Analysis	Units of Analysis	Purpose(s) of Analysis
<i>A) Background of the school and the six participants</i>	1. The characteristics of the individual participants.	<ul style="list-style-type: none"> To explore how the participants' personal and professional background influence the practices of teachers' personal knowledge management.
<i>B) Teachers' knowledge development</i>	2. The composition of the teaching diary. 3. The utilisation of the observational notes.	<ul style="list-style-type: none"> To examine the usefulness of the teaching diary and the observational notes which may carry out self-reflection on teaching practices.
<i>C) Teachers' knowledge creation</i>	4. The participants' personal initiatives towards the practices of personal knowledge management. 5. Collaborative activities the school applied for its teachers' professional development. 6. Issues involved in the process of the above initiatives.	<ul style="list-style-type: none"> To explore how the teachers create knowledge individually and collectively. To indicate issues engaged in the knowledge-creating process.
<i>D) Self-facilitated action learning set</i>	7. The progress of the set. 8. Issues engaged in the process of the set meetings.	<ul style="list-style-type: none"> To examine how the action learning set progresses and whether or not the implementation carries out knowledge sharing.
<i>E) School's educational leadership and management</i>	9. The Principal's leadership style. 10. Organisational structure of the school. 11. Information dissemination and communication of the school. 12. Appraisal and reward system of the school.	<ul style="list-style-type: none"> To examine how the school's educational leadership and management influences the teachers' motivation through professional empowerment, the communication of information and the promotion of teachers' collaboration and knowledge-sharing.

<i>F) School's awareness of external educational enterprises</i>	13. The school's awareness of current educational issues. 14. The school's awareness of other elementary schools' developmental initiatives.	<ul style="list-style-type: none"> • To examine whether or not the school and its teachers know what kinds of knowledge are needed to be created and retained.
<i>G) School's vision and educational goals</i>	15. The design and communication of the school's vision, educational goals and future movements.	<ul style="list-style-type: none"> • To examine whether or not the school takes needed knowledge and its teachers' wishes into the design of vision, goals and future movements. • To examine whether or not the school communicates the designed vision, goals and future movements with its teachers to form a shared perspective.
<i>H) School's atmosphere and culture</i>	16. The teachers' interactions with teaching and administrative staff. 17. The degree of trust. 18. The elements of the school's culture.	<ul style="list-style-type: none"> • To examine whether or not the school's atmosphere and culture encourages knowledge-sharing, collaboration and innovation.
<i>I) School's organisational knowledge assets</i>	19. The school's strengths and weaknesses. 20. The organisation and access of organisational knowledge assets. 21. The centre of teaching and learning resources.	<ul style="list-style-type: none"> • To examine whether or not the school is able to recognise what kinds of knowledge are available to them and also what kinds of knowledge they are lacking. • To explore how the school maintains its organisational knowledge assets.
<i>J) Professional communities</i>	22. The existence of professional communities inside and outside the school. 23. The teachers' interaction with professional communities via ICT.	<ul style="list-style-type: none"> • To examine whether or not the school provides formal contexts for knowledge-sharing.

3.10 Quality Criteria for the Research

Evaluating the quality of the research process is essential since it is claimed that unless a researcher is able to show audience the procedures used to ensure the reliability of research methods and the validity of conclusions, it is pointless to conclude a research thesis (Silverman, 2004). Hence, in this section, I intend firstly to look at the concepts of validity and reliability as the most common criteria to be utilised in evaluating either positivist research or anti-positivist research.

However, these two criteria are further criticised by some writers as being less relevant to the evaluation of naturalistic (or constructivist) research process. As a result, I also illustrate the criteria of trustworthiness, authenticity and reflexivity and exemplify how they were approached in this research.

Validity and reliability

Validity and reliability are the two common criteria to evaluate research. The concepts of them are multi-faceted for different kinds of research such as positivist or quantitative research and anti-positivist or qualitative research (e.g. Cohen, *et al.*, 2000; Scholz and Tietje, 2002; Silverman, 2004; Wang, 2003). Although most of the writers appear to indicate the varieties of validation and reliability for the sake of the simple distinction between quantitative and qualitative research, I intend to broadly divide research into positivist-orientated and anti-positivist-orientated when differentiating the notion of validity and reliability (see Section 3.3.1), as below.

1) Validity

Validity relates to the evaluation of the data and the analysis used in research which is concerned with the degree of accuracy (Denscombe, 2002; Silverman, 2004). The notion of validity is viewed as the crucial key to effective research either it is positivist-oriented or anti-positivist-oriented (Cohen, *et al.*, 2000). They (*ibid*) further claim that it is not possible for research to be 100 percent valid. Taking anti-positivist-oriented research as an example, the subjectivity of researchers and research participants including their opinions, attitudes and perspectives may bring about the degree of bias. Hence, minimising invalidity and maximising validity is the attempt for researchers to achieve. Moreover, such attempt is generally addressed by the principles of member checking (also known as respondent validation) and triangulation in case study research (Stake, 1995). Member checking (or respondent validation) suggests that researchers need to go back to research participants and ask them to examine the actions or words they featured (Guba and Lincoln, 1989; Lincoln and Guba, 1985; Silverman, 2004; Stake, 1995). Triangulation is adopted to combine different means to look at situations, which is regarded as a powerful way of demonstrating validity (Campbell and Fiske, 1959 cited in Cohen, *et al.*, 2000). Four types of triangulation are introduced as follows (Patton, 1990: 464-470; Stake, 1995: 112-115; Wang, 2003: 14-19):

- Triangulation of methods; that is, to employ different research methods to collect data and subsequently to compare or integrate them to answer research questions.
- Triangulation of data sources; that is, to compare or cross-checking the consistency of collected data derived at different times, spaces or respondents.
- Triangulation of investigators; that is, to compare or integrate multiple

interpretations of the same phenomenon given from different researchers.

- Triangulation of theories; that is, to use different theoretical perspectives to look at the same phenomenon to develop more appropriate insights or interpretations about the phenomenon.

2) Reliability

Reliability relates to the evaluation of data collection methods which should be consistent and not distort research findings (Denscombe, 2002; Silverman, 2004). Specifically, reliability in anti-positivist research concerns with the degree of fit between what research records as data and what actually happens in the natural setting being investigated (Bogdan and Biklen, 1992). Nevertheless, the above perspective does not denote the necessity of uniformity since two researchers who are investigating the same phenomenon may arise with dissimilar findings. (Cohen, *et al.*, 2000; Kvale, 1996). In a similar vein, Walker (1993: 177) specifies that case study research focus on *collecting definitions of situations* (i.e. multiple realities) which are open to various interpretations. Such multiple realities constructed by individuals are changing and therefore it is less meaningful to take reliability into account in the evaluation of goodness of anti-positivist research (Kirk and Miller, 1986; Walker, 1993). Notwithstanding the above argument, I incline to accept Seale's (1999) proposition of low-inference descriptors (i.e. recording the data as concrete as possible) as a means to strengthen the reliability of collected data so that readers may be able to formulate their own interpretations based on those reliable data.

Trustworthiness

While some of the above writers tend to adapt the notion of validity and reliability as the evaluative criteria for the quality of anti-positivist research, others (e.g. Altheide and Johnson, 1994; Erlandson, *et al.*, 1993; Guba and Lincoln, 1989; Kirk and Miller, 1986; Lincoln and Guba, 1995; Wolcott, 1994) reject the relevance of such criteria derive from the tradition of conventional scientific research and further target on the trustworthiness of qualitative findings. Lincoln and Guba (1985: 290-301; also see Guba and Lincoln, 1989) propose a set of trustworthiness criteria particularly for naturalistic (or constructivist) inquiry, summarised below.

1) Credibility

Credibility, regarded as the substitution for the positivist's internal validity, is concerned with the issue of *truth value*; that is, how an inquirer can establish confidence in the truth of research findings within the respondents and the context the inquiry is carried out. Thus, the credibility criterion has a two-fold task: (1) to carry out research in a way that the probability of findings is enhanced and (2) to have the findings approved by the constructors of multiple realities being inquired.

2) Transferability

Transferability, regarded as the substitution for the positivist's external validity, is concerned with the issue of *applicability*; that is, how an inquirer can extend the applicability of the findings of a particular inquiry with other respondents or in other contexts. To make a transfer of research findings, researchers are suggested to accumulate empirical evidence related to contextual similarity and to provide adequate descriptions of them to make such similarity judgments potential.

3) Dependability

Dependability, regarded as the substitution for the positivist's reliability, is concerned with the issue of *consistency*; that is, how an inquirer can determine whether the findings of an inquiry will be the same if the inquiry is replicated with the same (similar) respondents in the same (similar) context. To demonstrate dependability, researchers need to specify factors of instability and also phenomenal- or design-induced changes in detail.

4) Confirmability

Confirmability, regarded as the substitution for the positivist's objectivity, is concerned with the issue of *neutrality*; that is, how an inquirer can establish the degree to which the research findings are determined by the respondents and conditions of the inquiry rather than by the biases, motivations, interests or perspectives of the inquirer. Following on the point, instead of focusing on the features of inquirers, the confirmability criterion addresses the features of data.

Based on the above trustworthiness criteria, Erlandson and other co-writers (1993) suggest a number of practical techniques to achieve each of them (see table 3.9). Except for 'dependability audit' and 'confirmability audit', all of the techniques were adopted to establish trustworthiness of the research and how they were applied throughout the process of the research is exemplified below. The reason of not considering the technique of audit trail was that it was difficult for me to designate any auditors to determine the trustworthiness of the research. Here, I do not intend to explicate the application of 'purposive sampling' and 'reflexive journal' since they are illustrated exhaustively in Section 3.4.2 and 3.8.3 (also see the part 'reflexivity' of this section) respectively.

Table 3.9 Techniques for establishing trustworthiness.

Criterion	Technique(s)
<i>Credibility</i>	<ul style="list-style-type: none">• Prolonged engagement• Persistent observation• Purposive sampling• Triangulation• Referential adequacy• Peer debriefing• Member checks• Reflexive journal
<i>Transferability</i>	<ul style="list-style-type: none">• Thick description• Reflexive journal
<i>Dependability</i>	<ul style="list-style-type: none">• Dependability audit• Reflexive journal
<i>Confirmability</i>	<ul style="list-style-type: none">• Confirmability audit• Reflexive journal

Source: adapted mainly from Erlandson, *et al.* (1993: 131-162; also see Guba and Lincoln, 1989: 236-243; Lincoln and Guba, 1985: 301-327; Robson, 2002: 172-176).

Prolonged engagement enabled me: (1) to immerse in the culture of the case school, (2) to avoid temper distortions resulted from the newness of my presence and (3) to build trust and develop a harmonious relationship with the six participants over the time period of the investigation. At the beginning of the investigation, the Principal of the school introduced me as a student researcher to all the administrative and teaching staff at the first morning meeting of the semester so that the administrators and teachers might know the reason and period of me being in the school. Moreover, I attempted to be in the school almost everyday and to actively greet everyone I met with the purpose of making everyone in the school get used to my existence and also establishing a friendly impression of me. However, my major purpose to apply the notion of prolonged engagement was to establish rapport and trust with the six participants to obtain in-depth and accurate data. For this to be reached, I had:

- made active contact with two of the participants before the investigation started.
- made small conversations with the participants individually almost everyday.
- had lunch with three of the participants on almost every Wednesdays.
- invited the six participants to my house to celebrate the Moon Festival (i.e. one of the Chinese festivals) and Christmas.
- had afternoon tea with some of the participants occasionally.

Persistent observation provided me opportunities to seek out relevant sources of data by my immersion in the case school, which was depended on my ability to catch meaningful moments or incidents (Lightfoot, 1983). For instance, the observation of educational activities in regard to the practices of teachers' personal knowledge management was not included in the design of the data collection methods. Nevertheless, by means of being sensible of what was happening and talking with the six participants, I recognised that certain educational activities might be pertinent to answer the research questions. Consequently, I attempted to observe such activities and subsequently to develop questions related to those activities in the informal conversational interview. Furthermore, throughout the observation of those educational activities, I had gained a strong sense of my perspectives developed through the literature review, which led me to the deep understanding of the characteristics and issues involved in the situations. In short, without persistent observation, the research data and my interpretation of them might appear to be superficial.

Triangulation using multiple research methods and data sources facilitated me to maintain a critical attitude towards multiple realities being investigated and to increase the degree of convergence. As indicated previously, the primary methods employed for data collection in the research were interviews and observations. The application of these two methods allowed me to identify emergent issues and to involve those issues in the planning of subsequent actions. Moreover, I also collected certain official documents to triangulate the data, which could be viewed as the supplementary to the other two methods. Thus, the data collected through such a complementary relationship might be integrated to generate a high degree of convergence. In terms of data triangulation, the choice of using multiple participants was determined to collect diverse data from different sources, which enabled me to seek out the similarities and differences of the varied experiences and viewpoints of the six participants and consequently to develop convergent findings. Moreover, I also tended to include the Principal's and the Section Chief of Teaching and Learning's perspectives in the examination of the extent to which the school provided an environment for teachers' personal knowledge management so that I was able to explore issues from various angles.

Referential adequacy materials fostered my understanding of the case school context, which provided background meaning to support the analysis, interpretation and audits of the collected data. Such materials included: (1) the pictures of the school's physical environment and the six participants' classrooms and (2) the 'pupil journal' comprising official announcements of the Principal and the four administrative divisions, good articles and drawings of pupils and pictures of educational activities. Those referential adequacy materials were particularly useful when I intended to recall the memories of being in the school after the investigation ended. Those pictures and the 'pupil journal' were not, however, put in the thesis to avoid revealing

the identity of the school.

Peer debriefing had been carried out formally and informally with my supervisors, fellow Ph.D. students and other critical friends. Those people were recognised as the professionals outside the case school context but had specific understanding of my research areas or graduate research. By discussing issues related to the research, they had not only provided me insightful guidance, advice and challenging criticisms but also listened to my anxious and insecure feelings.

Member checking was carried out at the end of each interview by offering the transcript to the respondent to review. Besides, my immediate interpretations of incidents observed through the observation of education activities were also indicated through the informal conversational interviews to ask for their opinions. Notwithstanding, I did not intend to provide chances for the checking of the interpretations and the conclusions drawn from the process of data analysis due to the reasons that: (1) those reconstructions were in English and (2) some members of the case school might not admit certain criticisms.

Thick descriptions of the case school, the six participants and the empirical evidence may enable readers to apprehend the contextual issues the school and its teachers involved, the characteristics of the individual participants, the causal relationships of phenomena and therefore the research findings. As a result, readers may be able to judge the transferability of the research findings to other educational settings based on their apprehensions and interpretations. For this to be achieved, I attempted to describe the backgrounds of the case school and the six participants, to give detailed descriptions of observed incidents and to draw the storyline of relative incidents of phenomena and to use direct quotations from the respondents of the interviews.

Authenticity

The theoretical perspective of constructivism asserts that multiple realities which are constructed (or created) by different individuals do coexist. Guba and Lincoln (1989) further indicate that the trustworthiness criteria are merely methodological. The adequacy of which is not sufficient for the evaluation of the quality of naturalistic (or constructivist) research since it cannot guarantee that the theoretical assumptions of naturalistic (or constructivist) research paradigm will be served. For that reason, they (*ibid*: 245-250; also see Erlandson, *et al.*, 1993; LeCompte and Preissle, 1993) propose a set of authenticity criteria, including:

1) Fairness

Fairness stresses the necessity of reconstructing the multiple realities of phenomena being studied in a balanced and even-handed way.

For this to be achieved, I attempted (1) to seek relative respondents involved in the situations and to ask for their within-group constructs; (2) to make such constructs and the agenda for subsequent inquiry actions be shared between the respondents' and me by open negotiation; and (3) to represent constructs created through their experiences equally.

2) Ontological authenticity

Ontological authenticity addresses not only the expansion of individuals' own constructions but also the improvement of their ways to experience and apprehend their own worlds through numerous opportunities of accessing their own or others' experiences.

Two techniques were applied to demonstrate this criterion: one was the testimony of the six participants that they had actually enhanced their understanding and expand their constructs throughout the process of the investigation. The other one was to keep the record of the individual participants' constructs at different points of the research process to examine their developmental progress.

3) Educative authenticity

Educative authenticity denotes the enhancement of individual respondents' understanding of and appreciation for other individuals' constructions outside their stake-holding groups.

Similarly, the testimony of individual respondents that they had actually comprehended and understood the constructs of others dissimilar from themselves was one of the techniques to approach this criterion. The other one was to keep the record of the development of understanding or appreciation as seen through the dialectic process during the investigation.

4) Catalytic authenticity

Catalytic authenticity represents individual respondents' decisions and actions facilitated by the expanded and more advanced constructions they have reached throughout the research process.

For this criterion to be assured, two techniques were carried out, including the demonstration of: (1) the individual participants' willingness to use the expanded constructs as a basis for actions and (2) the actual decisions emerging from their learning during the process of the investigation.

5) Tactical authenticity

Tactical authenticity refers to the degree of empowerment to increase stakeholders' willingness to make decisions, plans and actions on the shape of the social context in which they involve.

This criterion was determined by: (1) follow-up observations of how they operated in the social context and (2) the demonstration of empowerment throughout the investigation itself.

Reflexivity

Aside from trustworthiness and authenticity, reflexivity may be taken into account in the evaluation of the quality of anti-positivist research (Griffiths, 1998; Henwood and Pidgeon, 1993; Robson, 2002). Reflexivity is regarded as an important subset of reflectivity. Whilst reflectivity involves thinking critically about the research process, that is, how it was done and why and how it could have been improved; reflexivity stresses reflecting on the self, the researcher, who did it (Wellington, 2000). More specifically, Robson (*ibid*) refers the notion of reflexivity to an awareness of how a researcher as an individual with a specific social identity and background has an impact on the research process. Henwood and Pidgeon (*ibid*) claim that reflexivity denotes the recognition of a researcher's role in the research process. Griffiths (*ibid*) concerns reflexivity with a researcher's own position and also his/her own understanding and values for doing educational research. The above viewpoints imply the identity (or multiple identities see e.g. Alcoff and Potter, 1993; Reinharz, 1997) of a researcher including his/her roles, values, ideas, knowledge, motivation and prejudices may to some extent influence the research process. Nonetheless, such identity (or identities) may bring about bias in different stages of research. For this issue to be overcome, Ahern (1999: 408-410) puts forward a list of suggestions,

called 'reflexive bracketing', to facilitate researchers to recognise and avoid possible researcher bias. Besides, keeping a reflexive journal (1) to record daily (or weekly) research schedule, insights and reasons for methodological decisions and (2) to reflect upon a researcher's values, interests and growing insights with regard to the research is also recommended to approximate to both trustworthiness and reflexivity (Erlandson, *et al.*, 1993; Lincoln and Guba, 1985).

To reach the notion of reflexivity, I intended to define the possible roles of myself before the investigation began and borne them in mind in the course of the investigation with the purpose of not intervening the thinking of the six participants. Besides, I had kept the research diary viewed as a reflexive journal in the course of my Ph.D. study. By composing such a research diary, reflexive thinking on my own identities and the research process was involved, which enabled me: (1) to capture my sense perceptions and tacit understandings and (2) to expand and modify my own constructs when confronting with unpredictable issues. That is to say, the tacit forms of my personal knowledge were involved in the meaning and decision-making processes. Consequently, the process of the composition supported me to make my tacit knowledge applied in the whole research process explicit and also to monitor the growth of my personal knowledge with respect to the fields of knowledge management, teachers' professional development, school improvement and research methodology.

3.11 Summary of Research Methodology and Methods

In this chapter, I have specified a variety of methodological issues concerned with the conduct of the research and how these issues were applied during the research process. In Section 3.1, I have outlined the tasks and actions undertaken within the three-year ongoing research process. In Section 3.2, I have indicated the nature of the research as the combination of *basic research* and *formative evaluation research* to answer the research questions. In Section 3.3, I have examined diverse research paradigms and further justified constructionism as my worldview with its ontological, epistemological and methodological implications. In Section 3.4, I have introduced the characteristics and types of case study research and subsequently explained why and how I employed case study as the approach of the research. In Section 3.5, I have firstly pointed out the sources of my prior tacit knowledge involved mainly in the design of the research and also identified the factors and consequences brought about from my role as a *relative* outsider. In Section 3.6, I have discussed how I used the ethical principles of access and acceptance, informed consent, deception and anonymity and confidentiality throughout the investigation. In Section 3.7, I have mentioned the time frame of the investigation and enumerated the components included in the discussion of the case school's and the six participants' backgrounds. In Section 3.8, I have justified and demonstrated my application of research methods such as semi-structured interview, informal conversational interview, focus group interview, participant observations, action learning, documents to collect data and facilitate the participants to experience the process of knowledge sharing and self-reflection at the different stages of the investigation. In Section 3.9, I have explained and illustrated my application of inductive analysis, grounded theory analysis, phenomenological analysis and a set of questions to analyse observational, interviewing and documental sources of data. Moreover, I have also indicated the

units of analysis of the research and how they would be presented in Chapter 4. In Section 3.10, I have specified how the criteria of trustworthiness, authenticity and reflexivity attempted to be established during the research process with the intention of ensuring the quality of the research.

Chapter 4 Data Analysis and Research Findings

4.1 Overview of Chapter 4

In this chapter, I present and analyse the account of the research diary, the individual participants', the Section Chief of Teaching and Learning's (SCTL) and the Principal's (P) responses to the interviews, the account of the observational notes with reference to the educational activities held by the school and the self-facilitated action learning set meetings and finally the school official documents.

The analysis was directed by ten aspects including their units of analysis in relation to the research emphases and the literature discussed previously (see Table 3.8). In Section 4.2, it introduces the background of the school and the six participants, aiming at providing the natural setting of the investigation and the characteristics of the key players. In Section 4.3, it illustrates and exemplifies the practice of teachers' knowledge development and creation as well as action learning, aiming at exploring the current practice of the six participants in regard to the processes of teachers' personal knowledge management and influential factors involved in the processes. In Section 4.4, it looks at educational leadership and management of the school, its awareness of external educational enterprises, its visions and educational goals, its atmosphere and culture, its organisational knowledge assets and professional communities it engaged in regarded as the components of teachers' personal knowledge management, aiming at examining essential elements affecting the practice of teachers' personal knowledge management and 'schools as learning organisations'. In Section 4.5, it concludes the research findings by highlighting the difficulties and potential conditions of the school to promote teachers' personal knowledge management.

In each of the following sections, I firstly start with an introduction to the units of analysis, secondly give details, examples, explanations given by the individual participants and personal commentaries corresponding to the units and finally conclude findings drawn from the analysis.

4.2 Introduction of the School and the Participants

In this section, I give the introduction of the school's geographic location and its premise, the teaching and administrative staff involved, the number of pupils included in each class and the issues the school currently confronted. Additionally, I also introduce the background of the teachers participated in the investigation and the implications drawn from their backgrounds.

4.2.1 The School's Background

The school was established in 1970 and located in Tao-Yuan County which was in the northern part of Taiwan. The schoolyard was 20310 square metres and contained thirty-eight classrooms, a computer centre, a teaching aids room, a library, three offices for the teaching and administrative staff.

The Principal of the school arrived at her post in the Academic Year 2003. The school comprised four Divisions, one Personnel Office and twelve Sections regarded as the administrative teams as well as thirty-eight classroom teachers from Grade 1 to 6 regarded as the teaching teams and two subject teachers (see Appendix 16). Both the Division Directors and the Section Chiefs (including the Personnel Officer) were required to teach four and fourteen hours per week respectively.

In the Academic Year 2004, the school had thirty-eight classes and more than 1300 pupils from Grade 1 to 6 in total; that is to say, each grade had around six classes (around thirty-five pupils per class). Moreover, one classroom teacher was responsible for nearly thirty-five pupils and the teacher normally stayed in his/her classroom most of the time.

The school currently confronted with two issues: the rapid growth of pupils in number and the impacts of a nearby elementary school established in the Academic Year 2005. Firstly, by comparing the total class number between the Academic Year 1998 (twenty-seven classes) and 2004, it demonstrated that the number of classes has increased rapidly over the past five years. As a result, the number of classrooms and teaching and learning resources centres such as the teaching aids room and the library were insufficient. Accordingly, the Tao-Yuan County Government had planned to establish another elementary school nearby in the Academic Year 2005, which solved the lack of rooms but brought another issue. That is, most of the parents tended to send their children to the newly-established school owing to the new school facilities. Moreover, the school teachers also intended to go to the new school because of the similar reason. Thus, how to cope with the movement of the school teachers and pupils and also to make good use of the school premises might be the immediate challenges the Principal faced.

4.2.2 The Participants' Background

About one sixth (16 %) of thirty-eight classroom teachers from Grade 1 to 6 participated in the investigation. All of the six participants had worked at the school for the past 3 years and expectably they understood the circumstances of the school. Two of the six participants were males and the rest of them were females. It was presumptive that the male and female participants might have dissimilar ways to interact and communicate with people. Half of the six participants were married (two had children) and half of them were single, which implied that they had distinct life styles and experiences from each other. Furthermore, issues concerning the teaching career of the six participants are introduced (see Table 4.1), as follows:

Grade taught

Three of the six participants taught Grade 3 and the rest of them taught Grade 1, 4 and 5. Consequently, the teaching contexts the six participants engaged in were diverse in terms of pupils' age, teaching materials and practical strategies.

Years of teaching

T1 had 33 years of teaching experience; T2, T4 and T5 had been teaching for more than 5 years; and T3 and T6 had less than 5 years of teaching experience. The six participants' teaching length illustrated that they were at the different stages of the teaching career and expectantly the experienced participants might be able to assist the less experienced participants in coping with certain difficulties they had encountered previously. Additionally, owing to the teaching length of T1, it appeared that all teaching and administrative staff respected T1 as one of the senior teachers in the school and therefore they asked for advice from T1 when confronting with problems.

Reason of being an elementary school teacher

In the light of T2's, T3's, T4's and T5's words, their motive of being an elementary school teacher tended to be family-driven. On the other hand, T1 and T6's motive of becoming a teacher was driven by personal aspiration. Accordingly, the participants' motive for becoming and being a teacher might to a certain extent affect their attitudes and behaviours towards their professional development (Beijaard, *et al.*, 2000; Kagan, 1992).

Learning experience

T1, T2, T3 and T4 graduated from national teachers colleges in Taiwan and this signified that they were trained under four years pre-service teacher training programmes to become qualified elementary teachers. Besides, T5 and T6 graduated from private and national Taiwanese universities respectively and they took one year pre-service teacher training courses and subsequently passed the national exam to get the Qualification of Elementary Teaching. Due to the routes to be qualified teachers, it was indicated that the theoretical knowledge in relation to teaching and learning T1, T2, T3 and T4 had might be deeper and broader than T5 and T6.

Professional life experience

Five of the six participants had the experience of being a teaching team leader; and T3 and T6 were being as learning area leaders. Moreover, T1 and T2 had the experience of being a section chief in the school. The evidence showed that all of them not only had classroom teaching experiences but also engaged in administrative activities to some degree. Furthermore, T2 and T5 joined in external communities according to their personal interests, such as the Society of Wilderness Protection and the Tzu-Chi Teachers' Association. It was assumed that T2 and T5 might share their concepts, inspired by these communities, with the other participants throughout the frequent interaction among them in the investigation.

Future plan

Four of the six participants related their future plans to educational affairs such as initiating teaching experiences to novel teachers, obtaining a masters degree, becoming a seeded teacher of the Tzu-Chi Teachers' Association and fulfilling the belief of being a teacher. The others associated their future plans with personal interests such as becoming a chivalry of wilderness and a housewife. Accordingly, the participants' plans for the future might facilitate them to form the directions and develop personal initiatives for their professional development (Beijaard, *et al.*, 2000; Kagan, 1992).

To synthesise the implications drawn from a variety of the six participants' background, it was indicated that this group of the participants to a certain degree had a mixture of life and teaching styles and experiences which might spark their insights through their interactions with each other throughout the investigation. Besides, referring to the discussion of how teachers' personal and professional identities influence their professional development (e.g. Ball and Goodson, 1985; Beijaard, *et al.*, 2000; Clandinin, 1985; Grossman, 1990; also see Section 2.4.2, Page 67), the participants' understanding of their motive of being an elementary school teacher and plans for the future might influence their developmental attitudes and behaviours and consequently facilitate them to define the directions and developmental initiatives for their professional development.

Table 4.1 Background of the six participants.

Participants	T1	T2	T3	T4	T5	T6
Grade Taught	Grade 1 (Class Loyalty)	Grade 3 (Class Piety)	Grade 3 (Class Benevolence)	Grade 3 (Class Love)	Grade 4 (Class Loyalty)	Grade 5 (Class Loyalty)
Years of Teaching	33	9	3	9	7	4
Gender	Female	Female	Male	Female	Female	Male
Family Status	Married, two children	Single	Single	Just married	Married, two children	Single
Reason of Being an Elementary School Teacher	"I love children very much."	"My mum wished me to be a teacher."	"My family suggested me to study at the Teachers' College."	"Everyone in my family is a teacher."	"My husband suggested me to get the Qualification of Teaching after I quit my job."	"I wished to teach History in high schools but could not pass the entrance exam to study a masters."
Learning Experience	Graduated from National Taipei Teachers College.	Graduated from National Pingtung Teachers College.	Graduated from National Pingtung Teachers College.	Graduated from National Hsinchu Teachers College.	Graduated from Private Tam-Kang University, majored in Information Management.	Graduated from National Chung-Hsing University, majored in History.
Professional Life Experience	<ul style="list-style-type: none"> Worked as a teacher and a Principal in kindergartens. Been the Section Chief of Teaching and Learning. Being the Grade 1 teaching team leader. 	<ul style="list-style-type: none"> Been the Section Chief of Guidance and Counselling in the school. Being a member of the Society of Wilderness Protection. 	<ul style="list-style-type: none"> Been a teaching team leader. Being a learning area leader. 	<ul style="list-style-type: none"> Been a teaching team leader. 	<ul style="list-style-type: none"> Been a teaching team leader. Being a member of Tzu-Chi Teachers' Association. 	<ul style="list-style-type: none"> Being a learning area leader.
Future Plan	"To assist new comers and to initiate my experiences."	"To be a chivalry of wilderness."	"To improve myself by gaining a masters degree and to work towards the administrative direction."	"To be a housewife."	"To be a seeded teacher of the Tzu-Chi Teachers' Association."	"To be a teacher who listens to children and discovers infinite possibilities in their world."

4.3 Processes of Teachers' Personal Knowledge Management

In the following sections, I exemplify the practice of teachers' knowledge development and creation with reference to the individual teachers' endeavours and the school's educational activities for its teachers' professional development. Additionally, I illustrate how the self-facilitated action learning set progressed.

4.3.1 Teachers' Knowledge Development

As argued previously, the teachers' self-reflection may facilitate the process of teachers' knowledge development (see Section 2.4.2) and therefore the six participants were encouraged to compose a teaching diary throughout the investigation with the purpose of examining their knowledge development progress. Moreover, it was identified that the observational notes of the six participants' classroom teaching provided by me might also assist them to analyse and evaluate their teaching. Accordingly, in this section, I explain how the participants reflected on their daily practice by means of writing a teaching diary and utilising the observational notes. Additionally, the data used in this section for the analysis only included five of the six participants' opinions since T6 was unavailable to join the focus group interview.

Composition of teaching diary

Only T1 had composed her teaching diary for five times; however, after 10th September 2004, she stopped writing it owing to the lack of time. Moreover, it was identified that T1's teaching diary tended to involve merely the description of everyday events, which implied such composition might not reach the fulfillment of self-reflection. The rest of the five participants did not write a teaching diary from the beginning of the investigation due to the lack of time and motivation. Since the

five participants as classroom teachers required to teach every subject and solve every incident occurred in classroom, it was assumed that they might be too busy to write such a teaching diary in the working hours. Besides, they might also not realise the purpose and usefulness of such composition as the practice towards teachers' professional development, which decreased their motivation to write a teaching diary.

Utilisation of observational notes

Four of the five participants expressed that they looked at every observational notes (around fourteen observational notes for each participant) I had provided for the review, evaluation and improvement of their teaching. They specified that the observational notes comprised the detailed description of incidents happened in their classroom teaching, which enabled them to identify what were happening and their reactions to the incidents and subsequently to find out solutions to deal with inappropriate reactions at that time. The below quotations illustrated that four of the five participants tended to focus on the issues related to classroom management especially in terms of how to interact with the pupils.

"Throughout the review of these observational notes, I am able to indicate where are inappropriate and start to think up solutions. For example, I realise sometimes I do not solve an issue immediately in the class and therefore I will solve it on the next day." (T1)

"For instance, I will ask myself why I was angry at that time?" (T2)

"I would ask myself whether the punishments were appropriate or examine whether the essential elements of the lesson were carried out." (T3)

“When I look at these observational notes, I realise the way how I treat the pupils which sometime might hurt their heart and therefore I will comfort them immediately on the next day.” (T5)

By contrast, T4 had a rather dissimilar viewpoint to the other four participants and expressed she only looked at the first three of these fourteen observational notes. She further explained, *“At the beginning, I was so shocked by my cruel manner of speaking to the pupils. After three times I had looked at these notes, I decided to not read them anymore because they would influence my teaching. I know if I discard my emotions and such the manner of speaking, I cannot handle certain situations.”* According to T4’s words, she appeared to adopt such a power relationship between teachers and pupils; namely, the pupils required to obey the teacher’s words, which might be her belief in classroom management. The above arguments exemplified that a teacher’s belief in classroom teaching and learning might be hard to be changed even there were issues indicated and reflected, which implied that teachers’ beliefs in teaching and learning were involved in the process of their knowledge development.

To conclude the findings related to the practice of teachers’ knowledge development, it was identified that most of the participants did not compose a teaching diary due to the lack of time and motivation. Additionally, most of the participants had a positive attitude towards the use of the observational notes since they thought the notes assisted them to improve their teaching by reviewing and evaluating incidents happened in their classroom teaching and subsequently seeking for possible solutions to deal with them. However, if issues indicated from the review of the observational notes conflicted with certain teachers’ beliefs in teaching and learning, they tended to ignore the issues.

4.3.2 Teachers' Knowledge Creation

In this section, I firstly demonstrate how I adapted Nonaka and Takeuchi's (1995) four modes of knowledge creation when categorising the teachers and the school's initiatives regarded as the practice of knowledge creation (see Table 4.2). Secondly, according to my observations, I also illustrate how those initiatives were implemented and indicate factors engaged throughout the implementation. Some of the initiatives specified in Table 4.2 are not introduced since they were not taken place or observed during the investigation.

4.3.2.1 Individual Initiatives of Knowledge Creation

The teachers' personal endeavours related to the practice of knowledge creation included informal conversations with others, the organisation and sharing of personal teaching portfolios, the use of teachers' handbooks, the transformation of teaching experiences into explicit forms, the search of resources in the Internet and the reading of educational books or journals, as follows:

Table 4.2 Individual and organisational initiatives regarded as the practice of teachers'

knowledge creation.

Socialisation (from tacit to tacit)		Externalisation (from tacit to explicit)	
<i>Individual Initiatives</i>	<i>Organisational Initiatives</i>	<i>Individual Initiatives</i>	<i>Organisational Initiatives</i>
<ul style="list-style-type: none"> • To talk about ideas, issues, problems, and so forth with others. • To observe how pupils progress. • To take notice of other teachers' teaching. • To engage in the activities undertaken by the associations to which personally belong. 	<ul style="list-style-type: none"> • To work with teaching team members. • To participate in the activities of peer observations held by the school. • To participate in professional workshops provided by the school. • To observe how the instructors of compulsory education deliver a particular lesson of a subject. 	<ul style="list-style-type: none"> • To submit writings for publication. • To take part in educational contests. 	
Internalisation (from explicit to tacit)		Combination (from explicit to explicit)	
<i>Individual Initiatives</i>	<i>Organisational Initiatives</i>	<i>Individual Initiatives</i>	<i>Organisational Initiatives</i>
<ul style="list-style-type: none"> • To use teachers' handbooks as references. • To participate in conferences and seminars held by other elementary schools. • To search relevant resources in the Internet. • To read educational books or journals. 	<ul style="list-style-type: none"> • To participate in Wednesday seminars held by the school. • To take part in educational contests. 	<ul style="list-style-type: none"> • To use teachers' handbooks as references. • To organise personal teaching portfolios and adapt relevant materials to pupils. • To share personal teaching portfolios with other teachers. 	<ul style="list-style-type: none"> • The school exchanges the records of activities with other schools and subsequently share them with its teachers.

Source: adapted from Nonaka and Takeuchi (1995).

Informal conversations

The events of informal conversations were observed by accident or pointed out throughout the interviews with the six participants (see Table 4.3). The intentions of the information conversations might be sorted as problem-solving oriented and experience-sharing oriented. The conversations took place in various circumstances such as during the lunch with other teachers in a restaurant or waiting for a seminar speaker in the audiovisual centre of the school. In the course of most

problem-solving oriented conversations, some participants talked about problems/issues with others and subsequently provided suggestions to solve the situations in accordance with their opinions or experiences. Moreover, in the course of most experience-sharing oriented conversations, some participants shared their teaching and life experiences or complained about others and the school with whom they got along. Throughout the analysis of the informal conversation events and the review of some literature related to factors involving in teachers' collegial interaction and dialogue (e.g. Collinson and Cook, 2004; Shaw and Perkins, 1992; also see Section 2.4.3, Page 72), it was assumed that time and opportunity to meet might affect the quantity of informal conversations. Besides, communication skills, personal motivation and attitudes, social relationships with others such as trust and shared interests as well as interactive atmosphere were crucial for the quality of the conversations.

Teachers' personal teaching portfolios

Excluding T2 who was away from teaching for five years, the rest of the six participants kept their personal teaching portfolios mainly in written forms including supplementary teaching materials, interested educational articles and records of activities or events which were collected from various sources (see Table 4.4). In terms of the usage of personal teaching portfolios, three of the five participants adapted relevant materials for pupils. In terms of the sharing of such explicit knowledge, only two of the five participants internally shared their teaching portfolios with their teaching teams and T3 even externally shared it with previous lectures or classmates from the teachers' college he used to study. It was pointed out that feedback from peers determined the willingness of sharing. For example, T5 got criticisms from the previous sharing of teaching resources and therefore stopped distributing them actively.

Table 4.3 Teachers' informal conversations with others.

What	Problem-solving				Experience-sharing			
	After morning meetings	Waiting for a seminar speaker	After class	After class	Every Fridays	Every Wednesdays	Every Fridays	Not identified
When	Audiovisual centre	Audiovisual centre	Classroom of Loyalty (Grade 1)	Classroom of Piety (Grade 3)	On the way home	Classroom of Loyalty (Grade 1)	Restaurants	An elementary school nearby
Where	Teaching teams	T4 and a substitute teacher from Grade 5	T1 and the Director of Counselling Division	T2 and the Section Chief of Guidance and Counselling	T4 and a pupil's mother	Grade 1 teaching team	T3, T4, T6 and the researcher	T5 and the teachers of another elementary school
Who	Morning meetings were the time when everybody met together.	The substitute teacher had the problem in dealing with a pupil whom T4 used to teach.	The Director had the difficulty in delivering an activity since some teachers were against her ideas.	The Section Chief had the difficulty in completing a particular official document.	The mother would like to know how the pupil progressed.			The parent showed T5 a VCD of the effectiveness of memorising Confucian classics in the early years of childhoods
How	Some teaching teams, especially higher Grades, used the time to discuss issues.	The substitute teacher pointed out troubles that particular pupil had brought and T4 shared her experience of dealing with the situations.	T1 gave the Director suggestions and subsequently an informal meeting of teaching team leaders was formed to discuss the issue.	T2 told the Section Chief how she dealt with it previously.	T4 told the mother the weaknesses of the pupil and consequently gave her suggestions of how to help the pupil at home.	"Our team members meet every Fridays to have lunch together. During the time, we talk about teaching issues, pupils, family and so forth." (T1)	These three teachers had had lunch together nearly every Wednesdays. During the time, they complained about other teachers or the school.	"I join a group called 'Mummy Class' in another elementary school nearby. In there, I have met lots of teachers as friends and we chat about everything." (T5)

Table 4.4 Teachers' organisation of personal teaching portfolios.

	T1	T2	T3	T4	T5	T6
Teachers	Yes	No.	Yes	Yes	Yes	Yes
Teaching portfolios						
Classification	By learning areas	No. <i>"I do not really have such kind of portfolios since I have been the Section Chief of Guidance and Counselling for 5 years."</i>	By learning areas	By academic years	By learning areas	By learning areas
Forms	In written and electronic forms		In written form	In written form	In written form	In written form
Sources	<ul style="list-style-type: none"> • Other schools 		<ul style="list-style-type: none"> • Colleagues • Internet • Notes of important events 	<ul style="list-style-type: none"> • Records of activities 	<ul style="list-style-type: none"> • Wednesday seminars 	<ul style="list-style-type: none"> • Wednesday seminar • Internet
Usage	<ul style="list-style-type: none"> • Adapt relevant materials to pupils • Sharing with the teaching team members 		<ul style="list-style-type: none"> • Adapt relevant materials to pupils • Sharing with the teaching team members • Sharing with previous lectures and classmates 	<ul style="list-style-type: none"> • Copy relevant materials to pupils • No 	<ul style="list-style-type: none"> • Adapt relevant materials to pupils 	<ul style="list-style-type: none"> • No
Sharing with others					Used to	<ul style="list-style-type: none"> • No
					<i>"I used to share teaching resources with my team but have always got negative feedback. So I do not do it now."</i>	

Teachers' handbooks

Those teachers' handbooks were provided by book publishers with the syllabuses of subjects, detail lesson plans and supplementary teaching materials. All of the six participants referred to these teachers' handbooks during the preparation of syllabuses, before class and after class; moreover, five of them used the handbooks frequently. According to the benefits specified from the utilisation of the handbooks (see Table 4.5), it was implied that the six participants had a rather positive attitude towards the use of them. That is to say, the six participants tended to use the teachers' handbooks as useful references rather than copying detailed instructions into teaching.

Table 4.5 Use of teachers' handbooks.

Use of teachers' handbook	When	Benefits
<ul style="list-style-type: none">• Always. (5)• Seldom. (1)	During the preparation of syllabuses	<ul style="list-style-type: none">• To gain an overall understanding of textbooks, including guided direction, goals and elements.
	Before class	<ul style="list-style-type: none">• To catch essential elements of a lesson in a short time.• To clarify uncertainties.• To gain more teaching ideas e.g. the development of words, questions related to teaching contents to ask and so forth.• To get supplementary materials.
	After class	<ul style="list-style-type: none">• To remind essential elements where have been left out.

Other initiatives

Other individual initiatives regarded as the practice of knowledge creation are also introduced, as follows (see Table 4.6):

Table 4.6 Other teachers' initiatives of knowledge creation.

Transforming teaching experiences into explicit forms	<ul style="list-style-type: none">• Yes, through submitting writings for publication. (1)• Yes, through photographing classroom activities. (1)• Yes, through making notes on seminar handouts. (1)• No. (3)
Searching resources in the Internet	<ul style="list-style-type: none">• Sometimes when information is needed. (4)• No. (2)
Reading educational books or journals	<ul style="list-style-type: none">• Sometimes when interested in the topics. (4)• No. (2)

1) Transformation of teaching experiences.

Three of the six participants transformed their teaching experiences into explicit forms by means of submitting writings for publication, photographing classroom activities and making notes on seminar handouts. Three of them did not intend to transform their tacit knowledge into explicit knowledge because "*everything is in the mind after a long period of teaching.*" (T4) Moreover, the submission of writings for publication might be regarded as an effort to share knowledge externally. Referring to Cope's (2000; also see Section 2.2.4, Page 46) perspective on the significance of individual commitment to the development and maintenance of personal knowledge, it was expected that such practices of transforming tacit teaching experiences into explicit forms might require a high degree of teachers' commitments.

2) Search of teaching resources from the Internet.

Four of the six participants indicated that they sometimes searched essential teaching resources or information in the Internet. However, T3 and T5 were not able to accomplish this initiative owing to the lack of ICT (Information and Communication Technology) skills and time respectively. Accordingly, it was indicated that the

teachers' needs, ICT skills and time affect their willingness and the process of knowledge obtainment via the Internet.

3) Reading of educational books or journals.

Four of the six participants sometimes read interested books or journals and subsequently adapted newly-gained ideas into their own teaching appropriate to their classroom contexts, which inferred that the motive for reading educational books or journals might depend on the teachers' interests. Accordingly, the motivation of carrying out this initiative might be affected by the teachers' interests and also their time. For example, as some of the participants were interested in certain educational issues, they might tend to use their spare time to read educational books or journals.

4.3.2.2 Organisational Initiatives of Knowledge Creation

The school's developmental activities related to the practice of knowledge creation included Wednesday seminars, peer observations and professional workshops, as follows:

Wednesday seminars

Initially, seven Wednesday seminars were planned to be delivered, including areas such as teaching reading strategies, Law Education, leisure activities and Information Technology Education. Around ten topics were provided by the Section Chief of Teaching and Learning in advance and subsequently chosen by the teachers of the school. As a result, the Section Chief of Teaching and Learning found appropriate speakers for the seminars. However, only four seminars were delivered and three sessions for Information Technology Education could not be delivered due to the insufficient ICT facilities of the school. Three of the seminars were observed and they were all on Wednesdays' afternoon at 1:30 p.m. As the teachers came, they

signed for their attendance in order to accumulate professional development credits. Before 16th December 2004, the teachers were not forced to participate in any Wednesday seminars. They could sign up for any seminars they wished to attend via the school's website. However, after that, the attendance of the Wednesday seminars was the forced request from the Principal of the school. Around forty of the fifty-seven teachers participated in these three seminars I had observed and their behaviours were divided into positive and negative aspects in Table 4.7:

Table 4.7 Teachers' behaviours in Wednesday seminars.

Positive behaviours	Negative behaviours
<ul style="list-style-type: none"> • Listening to the speaker. • Making notes. 	<ul style="list-style-type: none"> • Being late. • Talking on the mobile phone. • Chatting with each other. • Looking at books and pictures. • Marking pupils' homework.

According to Table 4.7, the teachers appeared to have more negative behaviours. Consequently, I had asked the six participants' opinions about the teachers' attitude and willingness to join the seminars and they all expressed that most of the teachers were unwilling to participate in these seminars because of the following reasons:

- The topics were not relevant and interesting.

The following quotations exemplified why some participants had negative perspectives on the participation in the seminars, such as felt bored and waste time. Moreover, it was identified that these negative perspectives were resulted from the quality of the speakers and the unawareness of the teachers' actual needs, which might not be communicated and discussed appropriately between the SCTL and the teachers.

"Very boring and wasting my time. I think that the speakers and topics do not attract me."(T2)

"Sometimes, the topic just does not fit in with its contents and I feel regret to attend. In other words, the contents are not what I want and it is the problem of the speaker."
(T3)

"I really think that they [the school] hold a seminar for holding a seminar. They [the school] do not take the teachers' needs into account. That is the reason why I think it is kind of wasting my time." (T4)

- The contents were not updated.

According to the below quotations, it was assumed that the teachers might tend to seek other sources to fulfill their needs as they had a worthless attitude towards the seminars, which might decrease their willingness to participate in the seminars the school held.

"I feel that the contents are all similar and I would rather to collect useful information by my own. Sometimes, they [the speakers] even tell us the same jokes."
(T3)

"They [the speakers] always give us lots of information which can be found in the Internet; therefore, we [the teachers] always think that seminars held by other schools are better than the school's ones" (T6)

Overall, it was indicated that irrelevant, uninteresting and obsolete topics and contents of the seminars resulted from the quality of the speakers and the unawareness of the teachers' actual needs affected the teachers' attitude, willingness and therefore behaviour.

Peer observations

Four peer observations were delivered in the first semester of the Academic Year 2004, including the subjects such as Health and Physical Education (Grade 1), Science and Technology (Grade 4), Integrative Activities (Grade 6), English (Grade 6). Each instruction was designed by the designated teaching team collectively and delivered by a demonstrator chosen from the team. The process of the instruction was recorded with a digital camera so that it could be viewed by the teachers who were not able to attend the event. About fifteen of fifty-seven teachers (26%) attended each instruction and its subsequent group discussion owing to the job position they had (including teaching team leaders and also subject team leaders). Nine of them were required to fill in peer observational feedback forms including nine criteria (each teacher was responsible for one criterion) in accordance with the demonstrator's performance. The forms were used in the subsequent group discussion which was held on the same day of the instruction after class. A brief description of the process of these peer observations is delineated in Table 4.8.

Table 4.8 Process of peer observations.

Subjects	Integrated Activities	Health and Physical Education	English	Science and Technology
Year taught	Grade 6	Grade 1	Grade 6	Grade 4
Date	26/10/2004	09/11/2004	20/12/2004	22/12/2004
Numbers of Participating teachers	14 teachers	12 teachers	23 teachers	11 teachers
Characteristic of the instruction	<ul style="list-style-type: none"> • Showed good practice. 	<ul style="list-style-type: none"> • Showed good practice • 6 classes of Grade 1 had a joint lesson. 	<ul style="list-style-type: none"> • Showed good practice 	<ul style="list-style-type: none"> • Showed the most difficult class of the instructor.
Description of the group discussion	<ul style="list-style-type: none"> • 9 appraisers said what the good aspects were in the teaching. 	<ul style="list-style-type: none"> • 9 appraisers said what the good aspects were in the collaborative teaching. 	<ul style="list-style-type: none"> • 9 appraisers said both good and weaker aspects in the teaching. 	<ul style="list-style-type: none"> • 9 appraisers gave the instructor suggestions related to their teaching experiences. • The Section Chief of Teaching and Learning played an expert role in the discussion and she also provided the pupils' reflections on their behaviours.
Instructor's self-reflection	The instructor reflected that he was too nervous to speak slowly.	The team leader of Grade 1 explained how the team designed a teaching approach as class competition and how they integrated taught elements together.	The instructor said, <i>"I feel more confident than before and I know now that I am capable to teach English well."</i>	The instructor said, <i>"My intention is to show the class with which I always have difficulties. I am here to learn from you and now I am going to try those suggestions in that class."</i>

As a result of reviewing some relevant literature with reference to interpersonal skills engaged in the process of knowledge sharing (e.g. Bourner and Forst, 1996; McGill and Beaty, 1995; Weinstein, 1999; Zuber-Skerritt, 2002; also see Section 2.4.3, Page 81), two aspects were pointed out in compliance with the analysis of these four peer observations. Firstly, most of the demonstrators showed so-called good practices of

teaching; however, one of them showed the class she always had difficulties with. In this case, it was assumed that a high degree of trust in other teachers' abilities to assist her to find out solutions must be involved when delivering such a lesson. Secondly, throughout the subsequent group discussion, it is suggested that the demonstrators need to have an open-minded and healthy attitude towards criticisms, challenging comments and suggestions. Moreover, when criticising or advising, the appraisers need to adopt appropriate communication skills such as listening to others carefully or suggesting in a softer manner. With this positive attitude and appropriate communications skills, the knowledge-sharing process may be fostered.

Furthermore, T4 pointed out that the observational feedback forms were provided by a school inspector for the use of his Ph.D. research and the use of the forms was not communicated and approved by the teachers so they felt displeased when asked to fill the feedback forms in.

In terms of the benefits of the peer observations, two of the six participants who participated in the English one pointed out that they identified the usefulness of the teaching pronunciation technique employed by the English teacher and would like to adapt that technique into their classroom teaching.

Professional workshops

One of the features of the school-based curriculum was in traditional sports; that is, rope skipping (for lower grades), diabolo (for middle grades) and traditional martial art (for higher grades). Since most of the teachers (especially female teachers) did not know how to play diabolo and traditional martial art, the Section Chief of Physical Education as a seeded teacher trained the teachers how to play these two traditional sports. Two professional workshops for traditional martial art (the Grade 5

and 6 teachers) and diablo (the Grade 3 and 4 teachers) were carried out on Thursdays and Fridays respectively once every two-week for three times. During these professional workshops, the seeded teacher demonstrated how to play and subsequently the teachers practised. It was assumed that such an immediate demand for teaching particular abilities might influence the teachers' motivation and willingness to attend such professional workshops.

4.3.2.3 Issues Involved in the Process of Knowledge Creation

Influential factors affecting the practice of teachers' knowledge creation were drawn from the analysis of both individual and organisational initiatives and were categorised into personal, team and organisational levels (see Table 4.9).

Table 4.9 Influential factors affecting the practices of teachers' personal knowledge management

Personal level	Team level	Organisational level
<ul style="list-style-type: none"> • Time • Motivation • Aspiration • Beliefs • Interests • Demands • Willingness • Attitude • Communication skills • IT skills 	<ul style="list-style-type: none"> • Time • Opportunity • Social relationship: shared interest and trust • Social interaction: feedback from peers and interactive atmosphere 	<ul style="list-style-type: none"> • Time • Opportunity • Administrative support

Motivation issues

The teachers' motivation was influenced by their personal beliefs, aspiration, interests or demands, which affected the degree of their willingness to engage in the initiatives introduced previously. For instance, the motivation and the degree of willingness to read educational books/journals depended on the participants' interests. Besides, it appeared that the number of the problem-solving oriented conversations

was more than it of the experience-sharing oriented conversations, which implied that the teachers tended to be more active and motivated to talk with others when confronting with difficulties. Another example was the teachers' participation of the professional workshops. Their motivation and willingness to engage in the workshops appeared to be high because they were required to teach the traditional sports which they did not know how to play.

Attitude issues

The teachers' attitude towards the initiatives affected their willingness and behaviours. For example, some of the teachers tended to have a worthless attitude towards the Wednesday seminars resulting in low willingness to participate in these seminars and negative behaviours. However, the teachers' attendance of the seminars inclined to be high (about 70%) because the attendance was required for the obtainment of professional developmental credits and also from the Principal's forced request. Moreover, the teachers' attendance of the peer observations and their subsequent group discussion were determined by the job position they had. The examples illustrated that the motive of the teachers for participating the internal knowledge-creating activities was driven from the school requirement and their attitudes towards them were rather being passive.

Time and opportunity issues

Time and opportunity affected the quantity of the knowledge-creating initiatives. For instance, when the teachers had more time and opportunity to meet each other, they appeared to talk more about their pupils, teaching and life through informal conversations. Moreover, the composition of a teaching diary, the search of teaching resources from the Internet and the reading of educational books and journals were also determined by the availability of the participants' time. Furthermore, time and opportunity for the teachers to join in the organisational initiatives of knowledge

creation were provided by the school.

Ability issues

Communication skills were essential for the teachers when criticising and advising; otherwise, others would get negative feelings of the criticisms and suggestions. For instance, in the subsequent group discussion of the peer observations, the appraisers needed to employ appropriate communication techniques carefully when commenting on the demonstrations. In addition, the teachers' skills in ICT seemed to affect their willingness to search teaching resources from the Internet and its process. For example, T3 and T5 did not search teaching resources from the Internet as the other participants due to their insufficient ICT skills.

Social relationship issues

The teachers' social relationship with other teachers decided their closeness with each other. Moreover, the elements involved in the social relationship issues were shared interests and trust. For example, in the most of experience-sharing oriented conversations, it appeared that the teachers tended to share their teaching and life experiences with other teachers who they got along and had the same interests. Besides, one of the demonstrators of the peer observations showed the troublesome class she had (see Table 4.8). This inferred that trust in other teachers who would not look down on her and would help her to overcome the difficulties was involved in her decision-making to deliver such a lesson.

Social interaction issues

The elements involved in the social interaction issues were feedback from peers and interactive atmosphere. For instance, T5 got criticisms from the previous sharing of teaching resources and therefore stopped distributing them actively. Furthermore, it was assumed that the interactive atmosphere among the teachers was crucial for the

quality of the informal conversations; that is, the more harmonious the atmosphere was, the more effective the conversation was. For instance, the Grade 1 teaching team and the group of T3, T4 and T6 met regularly on every Fridays and Wednesdays respectively to have lunch together (see Table 4.3). During the lunchtime, they not only talked about their teaching, pupils and families but also were able to get emotional supports from others through complaining. Accordingly, it was assumed that the interactive atmosphere of the lunchtime among them was harmonious and enjoyable.

Administrative support

Administrative support was important in implementing the organisational initiatives such as fitting the initiatives in appropriate time, gathering the teachers' needs for the initiatives, finding and inviting relevant speakers for the Wednesday seminars and searching the seeded teacher inside the school to train the teachers with the traditional sports.

4.3.2.4 Conclusion of the Findings Related to the Practice of Teachers' Knowledge Creation

The initiatives regarded as the practice of teachers' knowledge creation were classified into the teachers' personal endeavours and the school's developmental activities. Moreover, by numbering these personal and organisational initiatives indicated in Table 4.2 (see Page 187), they seemed to concentrate on socialisation, internalisation and combination.

The informal conversations tended to be problem-solving oriented and took place in various circumstances privately. All of the participants kept their personal teaching portfolios; however, only two of them shared such explicit knowledge internally and

externally. Instead of copying detailed instructions into teaching, most of the participants frequently used those teachers' handbooks as useful references. Half of the participants transformed their teaching experiences into explicit forms through submitting writing for publication, photographing classroom activities and making notes on seminar handouts. Most of the participants searched resources in the Internet and read educational books/journals when the information was needed and interested in the topics. Most of the teachers tended to have a passive attitude, low willingness and negative behaviours in the Wednesday seminars because the topics and contents of the seminars did not meet their actual needs. Most of the peer observation demonstrators tended to show so-called good practices of teaching. Moreover, the process of the peer observations (including their subsequent group discussion) provided not only an opportunity for the demonstrators to evaluate and discuss their teaching collaboratively with other teachers but also new teaching ideas for the observers to adapt to some degree. Finally, the teachers' motivation and willingness to participate in the professional workshops was high because they were designed and delivered to meet the teachers' actual needs.

The influential factors affecting the practice of teachers' knowledge creation were classified into personal, team and organisational factors. It appeared that the personal factors, such as time, motivation, beliefs, aspiration, interests, demands, willingness, attitude as well as communication and ICT skills, were more than the other two sorts of the factors. That is to say, the effectiveness and fulfillment of these initiatives depended on the teachers rather than the school.

4.3.3 Self-Facilitated Action Learning Set

In this section, I firstly describe how the six participants shared their knowledge through the self-facilitated action learning set meetings, secondly relate issues involved in the process of the meetings to the factors affected the process of knowledge creation and finally illustrate the participants' opinions on their participation in the set.

Knowledge sharing through the set

In the course of the set meetings, each leading participant firstly described his/her own autobiography. However, it appeared that they tended to purely describe what were happened in the past and to not reflect on how the past experiences influenced the development of their knowledge. As a result, before and on the 3rd meeting, I intended to remind the leading participant (T3) and the rest of them to try to think about how past experiences affected the development of their knowledge and also to generalise importance aspects of the autobiography for the subsequent discussion. Still, the rest of the participants seemed to follow the way how the previous participants described their autobiographies. Subsequently, in the brainstorming part, the participants intended to bring up issues or difficulties they had encountered; subsequently, others provided their opinions or suggestions in relation to their past experiences. For example, T4 asked T1 about the pupil whom T1 previously taught and afterwards T1 told T4 about the pupil's personality and how she helped the pupil in the past (see Appendix 19, Example 1). Moreover, these issues or difficulties related to not only classroom teaching but also school affairs. For instance, T1 and T6 brought up questions such as how to prepare curriculum in order to increase its effectiveness and efficiency; how to implement performance achievement in order to provide a stage for pupils and also integrate teaching; how to create a harmonious

atmosphere between administrators and teachers; and how administrators and teachers could complement each other. At that time, the school confronted with inharmonious atmosphere resulted from the arguments between certain teachers and administrators about the preparation of curriculum and pupils' performance achievement (refer to Appendix 21 and 22). Sometimes, the participants shared their current practice of certain teaching techniques with each other. For instance, T5 asked T1 how she gave household jobs as one type of homework and subsequently how others related the discussion with the implementation of 'good sentence activity' (see Appendix 19, Example 2). Besides the sharing of so-called tacit knowledge, T2 shared children storybooks and how she used the storybooks to educate her pupils certain meanings. Moreover, T5 also attempted to share books and CDs related to moral education and their usefulness. Furthermore, some participants complained certain events or people and the others tended give them consolations. For instance, T4 brought up the argument she had with the Grade 3 teaching team leader and appeared to seek for opinions from other participants on the event (see Appendix 19, Example 3).

Issues involved in the process

In terms of issues involved in teachers' knowledge-sharing process, I intended to relate the factors indicated in the process of knowledge creation with those appeared in these self-facilitated action learning set meetings, as follows:

1) Motivation to participate in action learning.

With reference to the six participants' willingness to join in the investigation, it was identified that T1 tended to have intrinsic motivation since her intention to join in the investigation was to broaden the knowledge related to this research and to share her teaching experiences with me. Besides, the rest of the six participants'

motivation to join in the investigation tended to be extrinsic and was based on the social relationship with the researcher and the colleague. For example, T4 joined in the investigation because she was my sister's teacher. Moreover, T2, T3, T5 and T6 joined in the investigation because they got along well with T4 in the school.

2) Attitude towards action learning.

The six participants' attitude towards action learning was complicated to indicate and conclude. All of them excluding T4 prepared notes prior to describing their autobiographies and T3 and T6 even typed their autobiographies in written forms; T1 appeared to bring up more issues than other participants for set discussion; and T2 and T5 shared children storybooks as well as books and CDs related to moral education respectively. The above examples demonstrated that most of the six participants made great efforts to share their life and teaching experiences with each other and also attempted to absorb knowledge from others. However, it was identified that all of the participants seemed to not concern about their involvement in the implementation of action learning. Even I had reminded them I would collect issues they wished to discuss in the seventh set meeting, they appeared to not understand what was going on when I asked them for the issues. Moreover, they tended to not put the participation of the set into the top priority when confronting with various circumstances simultaneously, such as talking with administrators or parents, preparing for exam papers and doing family affairs. Furthermore, in terms of attitude determining behaviour, T4 appeared to have more negative behaviours in the course of the set meetings. For example, she was the only one reminding me what time it was; she sometimes talked with other participants while the others were discussing; she was the only one who did not prepare the autobiography and told others she would only need twenty minutes to finish her autobiography; and she talked with an administrators loudly in front of

the set members and also made pupils' achievement results while others were discussing in the last meeting. It was assumed T4's motivation to join in the investigation was based on the social relationship with me and therefore she tended to act in a perfunctory manner.

3) Time and opportunity issues engaged in the process of action learning.

As argued previously, opportunity determined the quantity of teachers' knowledge creation. It was proved that without providing the opportunity for the six participants to experience the process of knowledge sharing through the implementation of action learning, their experiences of joining in professional development initiatives would decrease one time. Furthermore, time issues were also engaged in the process of action learning. The time for the set meetings was arranged with the six participants on Fridays after working hour; however, they were always late. The meetings were last for no more than two hours. It was inferred that the participants' allowance of time for such activity was two hours even they were willing to join in the activity after working hour. Besides, the process of action learning was interfered with by administrators, parents or family. For example, T1 and T3 were late because of talking with parents; some administrators came and talked with certain participants while they were engaging in set discussion; and T5 always left earlier before five o'clock because she needed to pick out her children. That is to say, time for participating professional development activities might partially be intervened by a variety of factors.

4) Meeting management skills.

It appeared that the six participants had the lack of meeting management skills; that is, being clear about the purpose and contents of each meeting and also being able to lead the flow of the meetings. For instance, in the fourth and sixth set meetings, as T6 and T4 finished describing their autobiographies, they did not have time to practise the brainstorming activity. In addition, although I had told the six participants the notion and purpose of self-facilitated action learning twice prior to the set started to cooperate, they seemed to lose the direction and focus of the set meetings at the beginning. Consequently, I reminded the participants to focus on experiences affected the construction of professional knowledge and educational beliefs when describing their own autobiography, to generalise essential aspects according to their own autobiography and to lead the process of the set meeting including moving on the stage of brainstorming in the third meeting (refer to Appendix 18). It was assumed that it was the participants' first time to engage in such an activity and therefore they might not be familiar with how it should be operated.

5) Social relationship among the set members.

T2, T3, T4, T5 and T6 had not only colleague relationship but also friend relationship since they (T2, T3, T4 and T6) travelled together during summer vacations. Moreover, as mentioned previously, T1 was regarded as one of the senior teachers in the school and therefore the participants tended to respect her. That is to say, the social relationship among the set members was fraternal excluding the relationship between T1 and T4. It was indicated that T4 had negative preconceived ideas about T1, which determined her behaviours such as expressing T1 was affectedly and criticising T1's issues as commonplaces in front

of me in private. However, it was difficult for me to conclude whether T4's attitude towards T1 affected the process of knowledge sharing since it was appeared that T4 sometimes actively asked T1 questions but sometimes ignored T1's questions.

6) Social interaction among the set members.

I intended to create a relaxed environment, such as a staff common room, for the set meetings and therefore I arranged classroom furniture and prepared tea and snacks before each meeting. Moreover, I had held parties at the beginning and middle of the investigation with the purpose of making the social relationship among the participants such as trust stronger, which might also influence the interaction among them. Throughout the set meetings, the interactive atmosphere was identified as harmonious since the participants acted as talking with friends informally with laughs and without arguments. Besides, the participants were able to get feedback from others such as opinions or suggestions to overcome certain issues or problems as well as consolations to soothe bad moods.

7) Researcher's support as the administrative support.

As explained previously, my role in the process of action learning was regarded as the facilitator in terms of arranging time and place, preparing tea and snacks, providing written meeting minutes and providing the written outline of issues to be discussed previous to the meetings so that the meetings could run smoother and the participants did not need to spend extra time to organise the meetings in advance. The above example implied that satisfactory administrative support was required when implementing activities for teachers' professional development.

Evaluation of the set

When asked the five participants' (T6 was not available to participate in the last meeting) opinions on how they regarded this self-facilitated action learning set, they all tended to have a positive attitude towards the set. They identified benefits by means of sharing teaching experiences and knowledge with each other. For instance, through the set meetings, they "*are able to find out the solutions immediately*" (T1) when confronted with issues or difficulties, "*to organise and integrate [their] thinking and experiences*" (T2) which they did not used to have time to accomplish, "*to encourage and assist each other in order to improve*" (T3) and "*to know how others think, integrate others' strengths into [their] beliefs and consequently modify [their] weaknesses continuously.*" (T5) Besides the above advantages, T4 expressed that her bad mood was calmed down after complaining certain issues with the set members. The evidence showed that the implementation of action learning assisted the set members not only technically but also emotionally (refer to Appendix 20 for the full quotations). Furthermore, T1 pointed out that she wished to continue this action learning set even the investigation ended and all the other set members agreed with her. This inferred that the participants might realise the value of action learning and regard the practice as one of the useful strategies for their professional development.

To conclude the findings related to the implementation of the self-facilitated action learning, the six participants were willing to utilise their free time to engage in the practice of action learning when the opportunity was provided; thus, they were able to experience the process of knowledge sharing which other teachers might not have a chance to experience. In most of the set meetings, they worked on real issues or problems collaboratively by means of sharing their ideas and past experiences. They intended to not only provide solutions to overcome the issues or problems but also

share tacit teaching experiences and explicit teaching resources with each other. Moreover, some of them complained about certain events or people and they were able to obtain both technical and emotional supports.

The participants' motive to join in the action learning set excluding T1 was based on their social relationship with the researcher and the colleague (particularly means T4). Throughout the set meetings, most of the participants made great efforts to share their experiences and knowledge; however, they appeared to not consider their participation in the set seriously and also as the top priority. In addition, it was assumed that T4 might have a perfunctory attitude towards the engagement in the set and therefore she tended to have negative behaviours in the course of the set meetings. The social relationship among the participants was fraternal and therefore the interactive atmosphere in the set meetings was harmonious. However, T4 had negative preconceived ideas about T1 and consequently she tended to make captious comments about T1 in private or ignore T1 in some respects. Even though T4 had the above behaviours to be against T1, the interactive atmosphere and sharing process of the set meetings were not influenced significantly. With regard to the other factors involved in the process of action learning, it was identified that the participants' time to engage in the set meetings was intervened by a variety of elements to some degree, such as administrative, teaching or family affairs. Besides, the participants seemed to have insufficient meeting management ability such as losing control of meeting time and also losing meeting direction and emphasis. One of the reasons to explain the situation was that they were not familiar with how self-facilitated action learning set should be operated. Finally, the satisfactory administrative support was required so that the participants did not need to use their spare time to organise the set meetings.

In terms of the evaluation of this action learning set, all of the participants expressed that they benefited from the implementation. By means of working on the real issues or problems collaboratively, they were able to organise their thinking and past experiences, to reflect on others' ideas or opinions and thus to modify their current practice if inappropriate. Simultaneously, they were also able to get emotional support from the set members. By and large, the implementation might be regarded as one of the useful initiatives for teachers' knowledge sharing and creation since the participants indicated the benefits they had gained and expressed they wished to continue even if the investigation ended.

4.4 Components of Teachers' Personal Knowledge Management

In the following sections, I illustrate aspects in relation to the essential components fostering the processes of teachers' personal knowledge management, which comprise the educational leadership and management of the school, its awareness of external educational enterprises, its current visions and educational goals, its atmosphere and culture, its organisational knowledge assets and finally the professional communities it had or engaged in.

4.4.1 Educational Leadership and Management

In this section, I firstly specify the Principal's leadership style and the six participants' opinions about the advantages and disadvantages resulted from the features of the leadership style; secondly, introduce the organisational structure of the school in school administration and curriculum and its implications; thirdly, illustrate how a variety of information was disseminated and communicated; fourthly, indicate the appraisal and reward systems in the school and their impacts; finally, conclude the research findings drawn from the analysis of the above aspects.

4.4.1.1 Leadership Style of the Principal

It was identified that the Principal of the school adopted the behavioural theories of leadership (Qin, 2004):

“Basically, I am democratic. I employ the notion of high in initiating structure and consideration. My initiatives are the impetus to educational principles and school strategies. Simultaneously, I need to concern about the teachers by means of assisting and solving their needs and difficulties. It is important to advance these two factors at the same time with the purpose of achieving my goals and obtaining desirable results.” (P)

The above quotation illustrated the Principal’s perspectives on ‘initiation of structure’ and ‘consideration’ which needed to be fulfilled simultaneously in order to accomplish desirable goals and results. Subsequently, I intended to relate the six participants’ thoughts on the features of the Principal’s leadership style (see Table 4.10) to these two aspects, as follows:

Table 4.10 Participants' thoughts on the features of the Principal's leadership style.

The leadership style of the Principal		Strengths	Weaknesses
Personality	Traditional. (1)		
	Being particular about embellishing the schoolyard. (3)	<i>"The schoolyard is more beautiful than before."</i> (T1)	
Initiation of Structure	Focusing on details rather than on bigger pictures. (4)		<i>"She focuses on details more so that the teachers do not have a direction or basis to follow, which does discourage us."</i> (T2)
	Building a hierarchy. (2)		<i>"The channel for communication is not flowing and therefore there always misunderstanding exist."</i> (T2)
			<i>"She demarcates everyone's duty clearly, which makes teachers think that she tries to escape from the responsibility. Therefore, teachers feel that they are not able to get a strong support."</i> (T6)
	Dignified. (1)		<i>"She does not speak to the Directors or Section Chiefs nicely."</i> (T4)
Consideration	Not interfering in how the teachers teach. (2)		<i>"I feel that she is not harmonious enough."</i> (T6)
	Open to opinions but having her own thoughts in her mind. (4)	<i>"She does not force the teachers to do things they are unwilling to do, which makes me feel I can bring my professions into teaching."</i> (T5)	
	Doing things with steady steps. (1)		<i>"She asks everyone to follow her ideas. Sometimes, she is open to any thoughts but it seems that she does not take our suggestions into account."</i> (T3)
	Being reasonable. (1)		

Initiation of structure

This leadership behaviour draws a clear line of the responsibility between a leader and his/her subordinates by means of defining job duties, relations and goals explicitly (Qin, 2004). Four of the six participants indicated that the Principal tended to focus on details rather than on bigger pictures *“so that the teachers do not have a direction or basis to follow.”* (T2) To compare the Principal’s words (see the above quotation) with the participants’ thoughts, it was assumed that the Principal’s initiation of educational principles and school strategies were not communicated with and therefore understood by the school teachers. Additionally, two of the six participants expressed that the Principal *“demarcates everyone’s duty clearly”* (T6) by means of building a hierarchy. In this manner, both the administrators and the teachers might be able to know what they were required to do. However, according to T2’s and T6’s opinions, building a hierarchy caused the lack of communication and supportability, which might discourage the adoption of consideration.

Consideration

This leadership behaviour demonstrates a leader’s willingness to build a trust relationship with his/her subordinates, to respect their opinions and to concern about their feelings (Qin, 2004). One of the six participants felt that the Principal was dignified. However, T4 and T6 also pointed out that the Principal did not speak to the administrators nicely and was not harmonious enough. The evidence showed that being dignified equaled to keep aloof and alienate oneself from people which might broaden the distance between the Principal and the school teachers. Two of the six participants indicated that the Principal did not interfere in the teachers’ teaching after the job description was stated, which might make the teachers feel that they were respected and trusted. On the other hand, four of the participants pointed out that the Principal was open-minded but not necessary accepted their comments,

which might impede their willingness to express thoughts and ideas and also might bring about the negative feeling of not being respected. These two conflicting behaviours implied that apparently the Principal respected the teachers by listening to their opinions and not interfering in their ways of teaching; however, she clung obstinately to her own opinions which were difficult to be changed. Furthermore, one of the six participants expressed that the Principal did things with steady steps and also being reasonable. Under these two behaviours of the Principal, it was assumed that both the administrators and the teachers might be confident and willing when implementing certain tasks.

4.4.1.2 Organisational Structure

The organisational structure of the school was categorised in school administration and school curriculum which dealt with administrative affairs and educational affairs respectively (see Table 4.11), as follows:

Organisational structure in school administration

In accordance with Mintzberg (1983; 1989), the organisational structure of the school in administration (see Appendix 16) was described as the mixture of machine and professional structure. When a Section Chief received a task from Tao-Yuan Bureau of Education, s/he would propose a plan for activities to the Director of Division. Subsequently, the Director would propose the plan to the Principal. Once the plan was approved by the Director and the Principal, the Section Chief would inform the plan to the teaching team leader of grades who would therefore inform his/her team teachers. That is to say, most decisions were made by the Principal and the Directors. Moreover, daily work operations were controlled by the Section Chiefs. Moreover, so-called techno-structure and staff support activities were included in the working contents of the Section Chiefs. The school tended to adopt the notion of

centralisation by the hierarchical authority given to the top management team (the Directors) and the middle managers (the Section Chiefs). Nonetheless, some teachers or Section Chiefs did have the power of expertise to influence the process of decision-making. As teaching was regarded as one of the professions, the coordination strategy was based on the trust in the quality of the teachers' teaching. Consequently, the adoption of the mixture of machine and professional structure might bring about three drawbacks. Firstly, when the top management team (the Directors) or middle managers (the Section Chiefs) responded to the problems proposed by the teachers and subsequently provided solutions, those suggested solutions might not meet the real needs of the teachers because they were being distanced from the situations. Secondly, communication across different levels of the hierarchical structure might not be flowing which might create misunderstanding in some respects. Finally, it might be difficult for the Principal or top management team to implement changes or dealing with incompetence since since the teachers had their autonomy. In this regard, conflicts among the administrators and the teachers might occur if the implementation of changes or suggestions to overcome incompetence were not communicated and approved.

Table 4.11 School system, including its structure, information dissemination and communication as well as appraisal and reward systems.

Organisational structure	In school administration		In school curriculum	
	The Principal ↓↑ Administrative Divisions ↓↑ Administrative Sections ↓↑ Teaching teams		The Committee of School Curriculum Development ↓↑ The Committee of School Curriculum Development in learning areas ↓↑ The Committee of School Curriculum Development in teaching	
Information dissemination	<ul style="list-style-type: none"> • Via the meetings of administrative affairs at the beginning and end of semesters. • Via morning meetings held twice a week during semesters. • Via the bulletin board in the big office and school website. 			
Information communication	<ul style="list-style-type: none"> • Administrative Affairs: discussed in administrative meetings. • Educational Affairs: discussed in the meetings held by the Committee of School Curriculum Development • Teachers' comments: <ol style="list-style-type: none"> 1) pointed out by teaching team leaders to relevant administrators. 2) pointed out by the teachers in morning meetings 			
Appraisal system	No			
Reward system	Ways	How	Impacts on the teachers	
	<ul style="list-style-type: none"> • Each academic year, one fifth (20%) of the teachers are proposed as excellent teachers to the Ministry of Education. • Prize from the Parents' Association. 	<ul style="list-style-type: none"> • Teachers who join educational contests will be proposed first and others take turns according to the rest of number allowed. • Teachers who win educational contests. 	<ul style="list-style-type: none"> • No. (4) • Encourages teachers. (2) • Encourages teachers. (1) 	

Organisational structure in school curriculum

Under the implementation of the Grade 1-9 Curriculum, an elementary school's curriculum is not developed by the Division of Educational Affairs but is now developed by the Committee of School Curriculum Development (CSCD) (see Section 1.3.4.2). In other words, it was the school's CSCD (see Appendix 17) defining the focuses of the school-based curriculum. Consequently, each team of learning areas under the CSCD discussed plans for activities for next semesters compliant with the focuses defined and proposed to the CSCD. Once the plans were approved, the CSCD would announce the final decision as the Educational Developmental Plan in Academic Years to the teaching teams. Consequently, each

teaching team would design activities appropriate to the pupils. Ideally, the notion and design of the CSCD were to involve every teacher in the course of the development of the school-based curriculum. However, the Section Chief of Teaching and Learning (SCTL) expressed that she was still responsible for the development of the school-based curriculum which should be schemed collaboratively by the CSCD.

"I am the person who is in charge of the school-based curriculum development. However, I hope that every teacher could join me in the implementation of new national curriculum. I do not want them [the teachers] to just follow my words."

(SCTL)

T6 explained, *"The teachers are not used to the Committee of School Curriculum Development. Some of the members [of the CSCD] even do not turn up in the meetings."* This implied that the teachers were used to the previous practice, that is, complying with what the top said. Although some teachers were not aware the initial purpose and practice of the CSCD, others considered the need to integrate all the teachers' ideas and thoughts in the process of the school-based curriculum development.

"We [the CSCD] have discussed that it is better to generate teaching teams' ideas and thoughts first in the process of curriculum development. I think it is not a good idea to let only few people make decisions on the school's curriculum. Integrating the teachers' shared ideas and thoughts may foster a higher degree of coordination in the implementation of educational activities. However, the issue has been discussed with no result." (T6)

The above examples inferred that the school confronted with the issue of implementing the change since some of the teachers tended to embrace the old practice and did not take the new practice into account.

4.4.1.3 Information Dissemination and Communication

Information was defined in relation to administrative affairs, educational affairs and teachers' comments. Owing to the nature of the information, some might only need to be disseminated and other might need to be communicated by both the teaching and administrative staff, as follows:

Information dissemination

Administrative information was disseminated through morning meetings held twice a week and administrative affairs meetings held at the beginning and end of the semester, in which everybody except pupils needed to participate (refer to Table 4.11). Throughout the morning meetings, each Section Chief used the time respectively to report official announcements from Tao-Yuan Bureau of Education and tasks the teachers needed to do in relation to the official announcements; to ask the teachers' opinions when had opposite views against other Section Chiefs; or to share information gained from seminars. Following on, each Director of Divisions concluded the Section Chiefs' reports belonging to his/her Division and also announced decisions made by the Division if there were any. Finally, the Principal pointed out issues she wished the teachers to pay more attention or announced decisions made by her. Towards the end of each morning meeting, there was a time for the teachers to express their comments, which will be explored later. Subsequently, the relevant administrators put the official announcements indicated in the morning meetings in the bulletin board in the big office or school website.

Information communication

Information related to educational affairs and teachers' comments was communicated and discussed mainly through educational affairs meetings held by the Committee of School Curriculum Development and the morning meetings respectively. How the educational affairs and the teachers' comments were communicated and discussed, concentrating on the interaction between the administrators and the teachers as well as issues engaged in, are introduced along the below lines:

1) Educational affairs.

There were four causal meetings observed in relation to the development of school-based curriculum for the next semester, which are described in a series of subsequent scenarios in Appendix 21. A number of issues are pointed out with respect to the effectiveness and efficiency of the meeting described in Scenario 1, as follows:

- The members of the CSCD were about ten-minute late.
- The Section Chief of Teaching and Learning (SCTL) guided the meeting and required the members of the committee to follow her ideas in a rather compulsive manner. For example, she stipulated each teaching team leader to give her at least three topics for Wednesday seminars and also required the teachers to prepare the syllabuses for the next semester consistent with the forms she provided, which brought about negative feelings among the members.

“She [the SCTL] guides every meeting and wants everyone to listen to her, which is the cause of negative and uncomfortable feelings. We [the members of the CSCD] are there to discuss issues together but not to listen to what she wants and her explanations.” (T6)

Moreover, being conducted in the course of the meeting might also make the members feel that they were not being involved in so-called discussion and therefore impede them to contribute their ideas.

- Another reason to explain why the members tended not to speak up their opinions might be that the chairwoman (the SCTL) and the Principal seemed not to provide sufficient space and time for the members to reflect on their thoughts and express their ideas. For example, the SCTL assumed that the members did not have any opinions or difficulties when asked for comments and got no responses; subsequently, she moved on to the next issue. Why the members did not express their thoughts directly in the meetings was asked and T1 and T6 explained:

“Some teachers presume she [the SCTL] will not accept their propositions and therefore there is no purpose to express any thoughts or ideas.” (T1)

“Our [the teachers] standpoint is to solve problems by means of communication and discussion but she think all of our comments are excuses. So, what is the difference between to propose and not to propose?” (T6)

The above quotations illustrated that the SCTL persisted in her opinions and had a preconceived view about the teachers which brought about a passive attitude of the members in the group discussion. That is to say, the SCTL's behaviour and attitude caused the members to be used to not giving responses to issues discussed, which might discourage the process of sharing and creativity. For instance, when the leader of Information Management Education proposed to adopt software to make pupils' achievement results, he also did not get any reply, which might stop him to contribute in the next time.

- It was indicated that the SCTL *"always insists on her own opinions and does not accept others' comments, which makes the atmosphere terrible."* (T6) Besides, she used incisive words to provoke the members when got unsatisfactory reactions, which might also affect the atmosphere of meetings.

"Sometimes, the teachers feel uncomfortable because of her [the SCTL] manner of speaking and use of incisive words, which makes the atmosphere become worst." (T1)

In response to the SCTL's manner, some teachers might pay her back. For example, when one of the members disagreed to adopt the form used for pupils' achievement results, he acted in a drastic manner by standing up suddenly and speaking loudly.

- T1 and T6 expressed that when the SCTL *"gets the microphone, she will keep talking and never stop. Therefore, the teachers think our meetings are inefficient."* (T6) Accordingly, it was assumed that the SCTL's manner of leading a meeting might influence the efficiency of the meeting.

- By and large, the meeting was not effective and efficient since three of the four topics were not concluded by the members in one hundred minutes. The flowing of the meeting could have been controlled more fluent if the leaders (including the SCTL and the Principal) and the members were aware and solved the above issues.

As the result of the meeting, the members were not agreed with the SCTL's decision on the preparation of the curriculum for the next semester. Instead of responding to the SCTL directly in the meeting, the members formed another informal meeting to discuss the issue, which brought about the conflict between the SCTL and the six teaching team leaders (see Appendix 21, Scenario 2, 3 and 4). However, those negative reactions of the SCTL and the teachers did not help to solve the issue. By the end, T1 convened a provisional meeting (see Appendix 21, Scenario 5) to solve the issue since *"the previous meeting was not effective in terms of communication. We [the teachers] do not know how to prepare the curriculum for the next semester. It is nearly the end of the semester and the problem needs to be solved as soon as possible. Therefore, there is a need to convene another meeting for the CSCD."* (T1)

The process of the provisional meeting appeared to be smoother than the previous meeting and the solution was approved by the members of the CSCD within one hour. T1 reflected and indicated why the meeting was effective and efficient. She said, *"I think paving a way in advance for a meeting is essential so that everybody may have a shared perspective on the purpose and meaning of the meeting. Moreover, the control of atmosphere is also important. The leader of a meeting should guide the direction of topics discussed, calm negative feelings down, which may avoid conflicts and consequently work out everything just in the meeting."* By means of comparing these two meetings, it was identified that the manner of the meeting leader to guide a meeting and also the attitudes and behaviours of the meeting members in the meeting

affect the success of the meeting.

2) Teachers' comments.

Suggestions or comments on implementing tasks were pointed out by the teaching team leaders to the relevant Section Chiefs in private circumstances. Alternatively, some teachers expressed their comments in the morning meetings (see Appendix 22). According to the examples of why and how some teachers specified issues in the morning meetings described in Appendix 22, it was indicated that these teachers seemed to utilise the power of the masses to be directed against particular administrators or issues. For instance, owing to the personal feud between the Director of Counselling Division (DCD) and the Preparatory Committee of the Teachers' Association (PCTA), the PCTA intended to be opposed to the task, integrating pupils' musical concert into one of the activities for the parental education day, the DCD proposed. In the course of these morning meetings discussed the parental education day event, several points related to communication and discussion were recognised, as follows:

- The attitude of the PCTA seemed to be against the DCD but not the event.
- Some members of the PCTA appeared to adopt a negative manner of speaking while questioning the DCD and expressing their opinions.
- The Principal tended to reconcile the dispute between the DCD and the PCTA by explaining the intention of the DCD to ask for the teachers' comments and also praising the past endeavours of T2.

Overall, the initial intention of the PCTA to solve the event was to deny and their action arguing with the DCD wasted other teachers' time since other teachers did not have particular comments on the event and also agreed with the plan the DCD proposed (see Appendix 22, Scenario 4). Moreover, the furious reactions of the DCD and the PCTA in these morning meetings might affect the school atmosphere.

4.4.1.4 Appraisal and Reward System

Referring to the discussion of the practical strategies suggested to fulfill transformational leadership and thus foster teachers' motivation to create and change (e.g. Leithwood and Jantzi; Liou, 1994; also see Section 2.5, Page 87), the intention to identify whether or not there existed an appraisal system in the school was to analyse its usefulness for both the administrators and the teachers to be aware of their current practices. Besides, it is indicated that the purpose of providing rewards is to increase people's extrinsic motivation to achieve certain tasks. Accordingly, I also intended to examine whether the existing reward system of the school motivated the teachers to share knowledge and work together with each other. These two systems are introduced respectively, as follows (refer to Table 4.4):

Appraisal system

There was no appraisal system to evaluate both the administrators' and teachers' works. For the administrators, they might not be able to indicate whether the daily work operations were done in effective and efficient ways. For the teachers, they might not be able to indicate whether their current teaching increased the effectiveness of teaching and learning. As a result, both the administrators and teachers might be blocked to identify the advantages and disadvantages of their current practices, which might impede them to form a basis for personal knowledge creation; that is, being aware of which parts of current practices needed to be

improved and what sorts of knowledge were essential to acquire (e.g. Diamond, 1991; LaBosky, 1994; Moran and Dallat, 1995; also see Section 2.4.2, Page 66 and 71).

Furthermore, similar as the practice of peer clinic supervision (e.g. Chang, 1999; Glathorn, 1987; Grimmatt and Crehan, 1992; Lu, 1998; Wu, 2000; also see Section 2.4.3, Page 74), the process of appraisal involves feedback from an appraiser (see Section 2.5), which may bring about an opportunity for the appraiser and the person being appraised to talk about specific issues and expectedly to improve his/her current teaching practice. However, since the school did not employ any appraisal system, such kind of knowledge-sharing might not be carried out.

Reward system

The school administration itself did not design such a reward system. However, there were two types of rewards offered by the Ministry of Education and the Parents' Association of the school:

1) Selection of excellent teachers.

Each academic year, one fifth of the teachers (about eleven individuals) including the administrators would be proposed as excellent teachers to the Ministry of Education. The administrators or teachers who joined in any educational contests would be proposed first. If there were any numbers remained, the rest of the administrators and teachers would take turns in order to make up for the number allowed. Consequently, individuals might have a rather passive attitude assuming that there would be an opportunity for them to be selected as excellent teachers eventually. For that reason, four of the participants expressed that this type of reward did not bring about any impacts. Conversely, two of them indicated that being selected as an excellent teacher could encourage the administrators or the

teachers to join in educational contests. In relation to this manner of reward, the Section Chief of Teaching and Learning thought, *"It is better to have a mature and healthy system, which is not for the purpose of comparing who is good or who is bad but for the purpose of encouraging people who should be applauded. Otherwise, it is strange to get the same thing for the different endeavours."*

2) Prize for winning in educational contests.

T1 pointed out that there was a little amount of prize for individuals who won educational contests, which might encourage the winners to join in other contests again. Since five of the participants were not aware of the prize provided from the Parents' Association, it was assumed that this type of reward might only encourage certain administrators or teachers and therefore bring about very few or no impacts on the others.

Additionally, it appeared that none of these two types of rewards took collaboration or knowledge-sharing among individuals into consideration since both of them concerned about individuals' achievement of educational contests

4.4.1.5 Conclusion of the Findings Related to Educational Leadership and Management

The Principal attempted to fulfill the concepts of 'initiation of structure' and 'consideration' simultaneously in order to accomplish desirable goals and results. However, most of the six participants appeared to identify more disadvantages resulted from the features of the Principal's leadership style such as the lack of a clear direction towards the future, the lack of communication and supportability, the distance between the Principal and the teachers and the lack of being respected.

The school tended to adopt the notion of centralisation; however, the teachers did have their professional autonomy in teaching. Accordingly, one of the drawbacks caused by the adoption of the mixture of machine and professional structure was the difficulty in implementing changes which was exemplified when introducing the practice of CSCD.

Administrative information of the school was disseminated mainly through the morning meetings and the administrative affairs meetings by the administrators such as the Division Directors and the Section Chiefs. Educational information was communicated and discussed through the educational meetings which appeared to be ineffective and inefficient due to the lack of communication and meeting management skills. Teachers' suggestions or comments were mainly pointed out by the teaching team leaders in private; however, some teachers expressed their comments in public to be against specific administrators, which might waste the meeting time and affect the school atmosphere.

The school did not adopt an appraisal system to evaluate both the administrators and teachers, which might block them to identify the advantages and disadvantages of their current practices and also impede one kind of knowledge-sharing. Additionally, selection of excellent teachers and prize for winning in educational contests were regarded as the reward system of the school which inclined to not take collaboration and knowledge-sharing into account and most of the six participants expressed these two types of the rewards did not bring any impacts to them.

4.4.2 Awareness of External Educational Enterprises

In this section, I point out the educational context the school currently involved in. Moreover, I also intend to examine whether those external educational enterprises were disseminated and communicated successfully across all levels of the school by asking the six participants the educational issues and other schools' developmental initiatives about which the school currently concerned (see Table 4.12).

Awareness of educational issues

It was identified that the six participants' thoughts on the school's current awareness of educational issues included the Grade 1-9 Curriculum, Information Technology Education, reading skills and English Education. However, none of the six participants recognised all of the educational issues. It was expected that at least T1, T3 and T6 should fully understand the educational context the school involved in since they were the members of the Committee of School Curriculum Development. T6 gave me an explanation of why not everybody in the school was aware of the educational context they lived in.

"I feel that things are always done by the same people and only these people know the situations. Therefore, it is hard for other teachers to realise what is going on."

(T6)

The above quotation implied that the information was only known by people who were in the positions and needed to understand the situations. It was assumed that the educational issues might not be disseminated by the people who were in the positions and therefore these issues were not communicated and understood by all the teachers of the school. In addition, notwithstanding the new information was not disseminated by related people, it was also the teachers' responsibility to actively recognise the

world s/he lived in. The above argument implied that the teachers might not be ambitious enough and therefore might not pay much attention to be aware of currently-discussed educational issues.

Awareness of other schools' developmental initiatives

It was the Section Chief of Teaching and Learning who observed other schools' developmental initiatives, brought good practices back and afterwards shared with the teachers. However, the information was shared but not necessary be transferred into practice since the six participants expressed the dissemination of other schools' initiatives only made them gain new information and did not influence them. For example, in accordance with Appendix 21, Scenario 1, the Section Chief of Teaching and Learning showed the forms used by the other school for the preparation of syllabuses and required the teachers to adopt the forms. Although the explicit knowledge was shared, it was not approved to be used by the teachers and therefore not being transferred into practice. The example illustrated that in order to transfer new ideas or knowledge into practice at the school level not only the ideas or knowledge needed to be disseminated but also needed to be communicated and approved by related individuals of the school.

Table 4.12 Awareness of current educational issues and other schools' developmental initiatives.

Awareness of current educational issues	The school's responses to the issues	Impacts on the teachers and their teaching
The implementation of the new national curriculum – Grade 1-9 Curriculum (3)	<ul style="list-style-type: none"> • To develop the school-based curriculum features. • To train seeded teachers. • To choose textbooks which are appropriate for the curriculum features of the school. 	<ul style="list-style-type: none"> • The focus of diversification pushes the teachers to learn new abilities in order to teach pupils; consequently, teaching hours are not sufficient for main subjects and the teachers are overloaded. • Contents for moral education of textbooks are ignored; therefore, supplementary materials for moral education are applied in order to make up for the neglect.
The training of IT (Information Technology) skills (1)	<ul style="list-style-type: none"> • To encourage pupils to join IT contests. 	<ul style="list-style-type: none"> • IT teachers train pupils with the skills they need.
The training of reading skills (1)	<ul style="list-style-type: none"> • To deliver relevant seminars. • To create a reward system for pupils when achieving certain amount of readings. • To publish a student journal. 	<ul style="list-style-type: none"> • The teachers are aware that the focus is not on the quality but quantity.
The learning of English	<ul style="list-style-type: none"> • To implement English from Grade 1. 	<ul style="list-style-type: none"> • English is a new subject for all the teachers; therefore, some of them worry about their capability to teach English.
Awareness of other schools' developmental initiatives	The school's responses to the initiatives	Impacts on the teachers and their teaching
To view how other schools implement the new national curriculum and IT education	<ul style="list-style-type: none"> • To bring good practices back and share with the teachers; subsequently, to adapt others' experiences to the school's context. 	<ul style="list-style-type: none"> • To gain new ideas. (3) • No influences. (3)

To conclude the findings related to the school's awareness of external educational enterprises, it seemed that none of the six participants recognised all of the educational issues the school currently concerned about because those issues were not disseminated by the people in the positions and therefore understood by the teachers. Additionally, good practices brought back from other elementary schools were shared by the Section Chief of Teaching and Learning but not transferred into the teachers' practices because they were not communicated and approved by them. As suggested by several knowledge management practitioners (e.g. Hargreaves, 1999; Nonaka and Takeuchi, 1995; Von Krogh, *et al.*, 2000; also see Section 2.5, Page

88-89) about the importance of recognising, communicating and assimilating external knowledge, it was assumed that without the school members' active awareness and communication of currently-discussed educational issues and also other schools' developmental initiatives, it might be difficult for the school to define its knowledge visions; that is, what sorts of knowledge were needed, created and retained, and therefore to guide its teachers with the direction and vitality in the process of knowledge creation.

4.4.3 School Visions and Educational Goals

In this section, I intend to firstly indicate the school's visions and educational goals and subsequently examine the linkage between the consciousness of the external world and the design of the school's educational visions and goals. Secondly, I also specify the analysis of whether the designed visions and goals were disseminated and communicated successfully across the whole school. Finally, I attempt to explore the Principal, the Section Chief of Teaching and Learning and the six participants' directions towards the future.

From the school official document, Administrative Job Plan in the Academic Year 2004, the defined educational visions and goals are pointed out in Table 4.13:

Table 4.13 Official educational visions and goals of the school.

<p>School's visions</p>	<ul style="list-style-type: none"> • To cultivate pupils the capability in IT (Information Technology). • To cultivate pupils the capability to communicate used languages with the purpose of expanding their local and international eyesight and consciousness. • To cultivate pupils conscientious, gregarious, cooperative and optimistic views of life. • To cultivate pupils the capability to tolerate leniently, to obey democratically, to think independently and to solve problems. • To build a safe, happy and healthy learning environment.
<p>School's educational goals</p>	<ul style="list-style-type: none"> • To develop a learner-centred and experience-focused school-based curriculum and to cultivate 21 century citizens in accordance with the five principles of the new national curriculum. • To open up pupils' potentials and develop ten basic abilities of them through humanistic, life-focused, learner-centered and integrated educational activities. • To cultivate pupils to develop professional competence and improve continuously according to their aspiration. • To cultivate pupils' self-ambition towards desirous goals as well as optimistic and enterprising learning attitudes.

The linkage between the awareness of the external educational enterprises and the design of the educational visions and goals was analysed by means of comparing Table 4.12 and Table 4.13. The comparison illustrated that the recognition of the Grade 1-9 Curriculum, Information Technology Education, reading skills and English Education were involved in the school's current visions and educational goals.

Furthermore, whether the designed visions and goals were disseminated and communicated successfully across the whole school was also analysed by comparing Table 4.13 and Table 4.14, as follows:

Table 4.14 Teachers' thoughts on the school's visions, goals and future movements.

School's visions	<ul style="list-style-type: none"> • Unclear. (2) • To be full of the sounds of singing, applause and laughter. (4)
School's belief in educational goals	<ul style="list-style-type: none"> • Unclear as long as there are no serious troubles happened. (3) • To manage parents' wishes and opinions. (2) • To train pupils for learning how to learn. (1) • To develop moral, intellectual, physical, social and aesthetic education. (1)
School's future plan	<ul style="list-style-type: none"> • The reduction of school classes in the Academic Year 2005. (6)
Impacts on the teachers	<ul style="list-style-type: none"> • No influence. (2) • To change school. (2) • The decrease of pressures. (2) • The increase of recourses. (1)

Current visions

The school's visions were not identified explicitly by the six participants. Two of them expressed that they were unclear about the school's visions.

"I do not know the current vision of the school since the school does not make it [the vision] known to everybody. I think you are able to find it [the vision] in the school's website" (T3)

"I cannot feel there is a particular vision of the school. Even there is one, the school does not put it [the vision] into practice. That may be the reason why I do not know our vision" (T5)

The above quotations exemplified that the school (including the Principal and the top management team) did not attempt to make its visions known clearly and also to put them into practice were the reasons why some of the participants did not know the visions. Nevertheless, T3 indicated that the visions were able to be found in the school's website, which inferred that the teachers did not make an effort to know something they did not know even though they knew where they could find it.

The other four of them specified the vision which was defined by the previous Principal. Moreover, even the current Principal designated the vision stated by the previous Principal.

"When the previous Principal was here, it was the sounds of singing, laughter and applause were full of the school." (T1)

"...as though the sounds of applause, laughter and study." (T2)

"...the sounds of laughter, joy and study. I forgot the complete term." (T4)

"...as though happy and creative." (T6)

"We [the administrative and teaching staff] hope the school can be full of the sounds of singing, applause and laughter. This vision implies that all pupils are learning happily in an environment which is full of love and encouragement." (P)

The above versions of the school's visions were different from the ones stated in the school official document. This implied the school had two versions of its visions. One was the official visions designed to show Tao-Yuan Bureau of Education; the other one was the actual vision embraced by the Principal and some teachers. As a result, these unclearly stated visions might confuse the teachers' perspective on the school's vision.

Educational goals

The educational goals of the school were also not identified explicitly by the six participants. Three of them expressed that they did not know the educational goals.

"I do not know. She [the Principal] only focuses on details and also changes her mind all the time. Until now, I still do not know where she [the Principal] is going to direct us [the teachers]." (T2)

"There are no specific goals as long as we [the teachers] do not make any troubles."
(T4)

"It is difficult to answer this question since the new Principal does not tell us [the teachers] explicitly." (T6)

Accordingly, it was pointed out that the Principal did not attempt to disseminate and communicate the educational goals of the school. Moreover, the Principal's behaviours such as focusing on details and changing mind frequently might also affect the teachers' recognition of the educational goals.

The educational goals indicated by the other three of the participants were rather different from the official educational goals. Similar as the situation of the school's visions, some teachers might tend to adopt their beliefs in teaching and learning as the educational goals, others might hold the goals which they came across previously.

Future movements

All of the six participants pointed out that the school's future plan was the reduction of classes since there would be another elementary school established nearby in the Academic Year 2005. The Section Chief of Teaching and Learning pointed out that the school was moving towards the cultivation of pupils' reading, Information Technology and English abilities. Additionally, when asked the Principal to indicate three vital elements to make the school improve, she said: "*the first one is good teachers; the second one is good facilities; and the last one is a supportive administrative system.*" Accordingly, the six participants' identification of the school's future movements tended to be short-range and self-related. Both the Section Chief of Teaching and Learning and the Principal tended to focus on the long-range plans. However, their perspectives on the future were teaching-related and school-related respectively. The above argument illustrated that the Principal (the leader), the Section Chief of Teaching and Learning (the middle manager) and the teachers (front-line knowledge works) had dissimilar standpoints which influenced their perspectives on the future of the school and might guide them to move towards various directions.

To conclude the findings related to the school's visions, educational goals and future movements, it was identified that the school attempted to involve its awareness of the external educational enterprises into the design of its current visions and educational goals. However, it appeared that all of the six participants' perspectives on the school's current visions and educational goals were not explicit because these visions and goals were not disseminated and communicated as well as not put into practice. Additionally, people from different levels of the school might be guided to move towards various directions since they had dissimilar standpoints and perspectives on the future of the school.

4.4.4 School Atmosphere and Culture

In this section, I explain the interactive atmosphere of the school and its impacts affecting the collaboration and knowledge-sharing among individuals as well as indicate the essential elements of the school culture influencing the processes of teachers' personal knowledge management.

4.4.4.1 School Atmosphere

It was explained that the school atmosphere influenced by the interaction among the administrative and teaching staff might affect the degree of the teachers' willingness to share or to work with each other (refer to Section 4.3.2.3). Consequently, I intended to explore how the six participants regarded their interaction with other teachers and also with the administrators, the consequences of the interaction which might also affect the degree of trust and finally how the school and the teachers dealt with those consequences (see Table 4.15).

Table 4.15 Teachers' thoughts on the school atmosphere.

Interaction with other teachers	<ul style="list-style-type: none"> • Harmonious. (5) • Ok. (1)
Interaction with the administrators	<ul style="list-style-type: none"> • Fixed views and failing to compromise. (6)
Reasons cause conflicts between the teachers and the administrators	<ul style="list-style-type: none"> • Disregard of the teachers' difficulties and situations. (5) • Lack of communication. (2) • The Principal. (2) • Shirking responsibility when the teachers ask for assistance. (2) • Being overbearing. (1) • Interfering the teachers' teaching. (1) • Having an inequitable feeling when seeing the administrators not working as hard as the teachers. (1)
Degree of trust	<ul style="list-style-type: none"> • High. (2) • High but the degree of trust in the administrators is low. (3) • High but only in the teachers' professional abilities. (1)
How does the school deal with the problem?	<ul style="list-style-type: none"> • No. (1)
How does the teachers deal with the problem?	<ul style="list-style-type: none"> • No but complaining behind the backs. • Forming a teachers' association.

Interaction with other teachers

Five of the six participants felt that the interaction among the teachers was harmonious. They described that the teachers were *"like a big family"* (T1), *"as friends"* (T5) who *"tolerate and communicate with each other without schemes"* (T2). Besides, T4 described the interactive atmosphere among the teachers was *"ok"* and she further explained the teachers were *"rather independent and do not interact with each other much."* When asked the Principal about the school atmosphere, she indicated, *"The teachers are friendly and harmonious."* Moreover, the Section Chief of Teaching and Learning had a slightly similar point of view about the interactive atmosphere among her colleagues, saying:

"Everyone is moderate. When having conflicts, we will try to turn big problems into small problems and small problems into no problem at all by conceding. In other words, shrill issues are avoided to talk about in order to save the ok and harmonious atmosphere." (The SCTL)

On the whole, by integrating different opinions from three sources, the teachers' interaction with other teachers was harmonious. The reasons were firstly that some teachers took a friend or family attitude towards the others and secondly some of them tried to avoid talking about shrill issues which might bring about conflicts.

Interaction with administrators

By contrast, all of the six participants pointed out that the teachers and the administrators had fixed views and were failing to compromise, which caused conflicts between them. The participants' thoughts on the reasons why there were conflicts existed between the teachers and the administrators were specified as the aspects below (refer to Appendix 23 for the full quotations):

1) Disregard of the teachers' difficulties and situations.

Most of the six participants expressed that the administrators did not take their comments and difficulties into account when implementing tasks. The explanation of the above situation was that the teachers and the administrators had diverse perspectives and therefore their *"ways of viewing the same thing are different."* (T3) For instance, there was the conflict between the Section Chief of Teaching and Learning and the teachers about the preparation of the next semester curriculum (refer to Appendix 21). T1 further explained that both the Section Chief of Teaching and Learning and the teachers were contradictory to the event since the SCTL required the teachers to write detailed lesson plans in order to make any substitute teachers take over the lessons and the teachers thought the requirement was kind of wasting their time.

2) Interfering the teachers' teaching.

T3 expressed that the teachers and the administrators had dissimilar perception of implementing activities and the administrators *"sometimes interfere in the teachers' teaching when implementing tasks and think the teachers do not understand their situations."* The above evidence provided another example to exemplify why the different perspectives on the same issues brought about the conflicts between the teachers and the administrators.

3) Other perceptions of the administrators.

It was indicated that some administrators seemed to shirk their responsibility when the teachers asked for assistance. For example, T4 specified that some administrators tended to pass the teachers' requests on another administrators. Additionally, it was also pointed out that the teachers had an inequitable feeling when seeing some administrators not working as hard as them. The above two

impressions of the teachers on the administrators might result in the teachers' unwillingness to do things which the administrators required them to do.

4) Lack of communication.

It was pointed out that the administrators had perceived perception about the teachers or they were *"too overbearing and cling obstinately to their course"* (T6) when communicating issues. In the course of communication, the administrators regarded the teachers' opinions *"as excuses of being lazy"*, *"unwilling to do things"* and *"bringing troubles to them on purpose."* (T6) Consequently, the teachers' *"suggestions or comments are sometimes rejected."* (T2) That is to say, the administrators appeared to have a negative attitude towards the teachers when discussing issues. In this regard, some teachers might tend to gain the initiative by striking first. For example, when discussing the use of the form for pupils' achievement results in the meeting of the CDCD (refer to Appendix 21), one of the members acted agitatedly by stood up suddenly and spoke up loudly on order to show the SCTL the form Grade 3 currently adopted and the Grade 3 teachers did not want to use the form the SCTL provided.

5) The Principal.

T2 pointed out that the Principal's leadership style did affect the interaction between the teachers and the administrators. She further gave an example and said, *"A Section Chief will gain pressure just because of one sentence from the Principal and then pass the pressure on the teachers with considering our side."* It was assumed that the teachers might tend to have negative reactions to the administrators when the administrators put pressure on the teachers, which might cause arguments between them.

In addition, T3 expressed that *"the channels for communication are not flowing as before since [the school] have changed a new Principal which brings about misunderstanding."* It was implied the teachers and the administrators might tend to have negative attitudes and behaviours to each other if there was misunderstanding existed among them.

By relating the above five aspects with Qin's (2004: 265) categorisation of conflict sources in Taiwanese educational organisations, it could be argued that the fundamental cause of conflicts between the administrators and the teachers of the school was *the confrontation between school bureaucrat and professional community.*

Degree of trust

Five of the six participants expressed that the degree of trust among the teachers was high; however, three of these five participants specified that their trust in the administrators was low. T3 and T6 explained that the conflicts or frictions between the teachers and the administrators made their degree of trust in each other become lower.

"The degree of trust among the teachers and among the administrators is high respectively. However, when it is between the teachers and the administrators, the degree of trust becomes lower and lower. We [both the teachers and the administrators] stand in opposing positions which causes conflicts and frictions."

(T3)

"I think the degree of trust in the administrators becomes lower because of the unpleasantness caused by previous conflicts and those preconceived negative ideas about each other do keep a strong hold." (T6)

Even from the administrative perspective, the Section Chief of Teaching and Learning was also aware of the distrust between the teachers and administrators, saying:

"Every individual trusts members in his/her own group but not necessary in other groups. You [the researcher] are able to identify this easily especially in the groups of the teachers and the administrators. The teachers always divide that they are administrators and we are teachers which I think might bring about danger." (The SCTL)

Besides, T4 pointed out that she only *"trusts in other teachers' professional abilities but not necessary in their personalities."*

Overall, most of the teachers trusted in the other teachers but not in the administrators as a consequence of their previous conflicts or frictions, which was recognised as a crisis by the Section Chief of Teaching and Learning.

How the school dealt with the problem?

Interpersonal conflicts between administrative and teaching staff exist in most of Taiwanese elementary schools and it is identified that elementary school principals play crucial roles in managing those interpersonal conflicts (Hsin, 2003; Hu, 1996; Lin, 2003; Shen, 1999). However, according to the Section Chief of Teaching and Learning's words *"our leader does not have wisdom, daring and resolution to solve*

this crisis", the Principal seemed not to do something particular to deal with the negative consequences resulted from the conflicts or frictions between the teachers and the administrators. T6's opinion also supported the Section Chief of Teaching and Learning's thoughts, say:

"I cannot feel that the school has specifically and squarely faced the issue. I do not know. Maybe they have done something but the action is too small to be realised."

(T6)

In sum, from the administrative and teaching staff's perspectives, the Principal did not attempt solve the problem and T6's words inferred that the Principal's solutions to the feud might not work out and therefore hardly be realised.

How the teachers dealt with the problem?

Similar as the school's reaction, most of the teachers did nothing specific when confronted the conflicts or negative feelings except grumbling in private. Nevertheless, a group of five teachers, known as the PCTA (see Appendix 24), intended to form a teachers' association as a consequence of a working hours event (see Appendix 24). The purpose for the PCTA to form the Teachers' Association was *"to express the school's teachers' opinions in an appropriate time and also to react to unreasonable things directly in an appropriate way but not to be against specific people in the school."* The above quotation was indicated in the announcement from the PCTA (see Appendix 24) and illustrated that the PCTA would support the teachers but not to attack against certain people or events. However, the Section Chief of Teaching and Learning questioned the real intention of the PCTA to form the Teachers' Association, saying:

"I remember I have invited a speaker to present a seminar in relation to the purpose and meaning of teachers' associations and encouraged the teachers to form a teachers' association. However, no one responded to this issue at the time. Now, they [the PCTA] wish to form the Teachers' Association because of the working hours event. I feel uncomfortable with this and would like to ask them [the PCTA] their real intention." (SCTL)

I further asked the Principal and the other five participants (T2 was the member of the PCTA) about the formation of the Teachers' Association. The Principal appeared to have a positive attitude towards the formation of the Teachers' Association since *"such the association can agglomerate the teachers."* Nevertheless, she was aware of the development of the Teachers' Association and expressed that it *"should develop towards a positive path and strive for their rights with a reasonable manner."* In a similar vein, all of the five participants pointed out that there was a need to form such an association and all of them would join the Teachers' Association. However, they were also conscious of the attitudes and behaviours of the PCTA. For example, they concerned about the PCTA would act drastic when speaking up in defence of the teachers' comments which might affect the school atmosphere or use the name of the Teachers' Association to oppose against the school for personal benefits which might bring about frictions among the teaching and administrative staff (see Appendix 25 for the full quotations).

In order to avoid the above concerns, T1 and T3, the elected supervisors of the Teachers' Association, expressed that they would watch over whether the executives of the Teachers' Association (mainly the members of the PCTA) did things in appropriate ways and try to avoid them avenging a personal wrong in the name of the Association. Moreover, the Section Chief of Teaching and Learning also pointed out

that she *"will join the Teachers' Association and express [her] admonitions if they [the PCTA] do something inappropriately."*

By and large, most of the teachers wished to have such an association to speak up for them and strive for their rights; on the other hand, they were worried that the PCTA would act in an unreasonable manner or lead the Teachers' Association to develop towards a negative path. It was hard for me to conclude the actual intention of the PCTA to form the Teachers' Association and the development of it since it was formed nearly by the end of the investigation. However, I tended to have an optimistic attitude towards the operation and development of the Teachers' Association because forty-eight (84.2%) of fifty-seven teaching and administrative staff joined it and some of them even attempted to monitor the executives' behaviours or to influence them.

4.4.4.2 School Culture

It is claimed that the school culture may have an effect on the promotion of teachers' personal knowledge management by moulding teachers' attitudes and behaviours towards the values, beliefs and practices of knowledge construction, development, sharing and creation (see Section 2.5, Page 89-92). How certain vital elements of the school culture affected these processes are itemised in Table 4.16.

Table 4.16 Vital elements of the school culture affecting the processes of knowledge management.

Vital elements of school culture	The processes of teachers' personal knowledge management
<i>Willing to share teaching experiences and knowledge</i>	Knowledge sharing
<i>Willing to give advice and help</i>	Knowledge sharing
<i>Willing to learn and experiment new ideas</i>	Knowledge development and construction
<i>Open to any thoughts or suggestions</i>	Knowledge sharing
<i>Welcomes challenges</i>	Knowledge creation
<i>Encourages and supports for creativity</i>	Knowledge creation

Accordingly, I intended to examine whether the school culture involved the vital elements specified in Table 4.17 by means of integrating the teachers and administrators perspectives, as follows:

Table 4.17 Teachers' thoughts on the vital elements of the school culture

Teachers are	Willing to share teaching experiences and knowledge	<ul style="list-style-type: none"> • Yes but mainly with teaching team members or in private occasions. (6)
	Willing to give advice and help	<ul style="list-style-type: none"> • Yes. (6)
	Willing to learn and experiment new ideas	<ul style="list-style-type: none"> • Yes. (2) • Yes but not all of the teachers. (3) • Yes but need to understand situations first. (1)
The school (is)	Open to any thoughts or suggestions	<ul style="list-style-type: none"> • No. (2) • Yes as long as teachers will do them. (2) • Yes if the school identifies the positive results. (1) • Yes but not necessarily accept them. (1)
	Welcomes challenges	<ul style="list-style-type: none"> • Conservative. (1) • Yes as long as it brings benefits. (2) • Yes as long as rules are stated clearly. (3)
	Encourages and supports for creativity	<ul style="list-style-type: none"> • Yes in terms of joining in educational contests. (4) • Yes by giving freedom in teaching. (1) • No. (1)

Willing to share teaching experiences and knowledge

All of the six participants pointed out that the teachers were willing to share their teaching experiences and knowledge because *"everyone gets along well with each other."* (T5) Moreover, it was specified that the teachers' willingness to share depended on certain circumstances mainly within their teaching team and in private occasions. Firstly, three of the six participants expressed that their sharing was mainly with their teaching team since the opportunities for the team members to meet were more than for the other teachers. The following quotations exemplified why the sharing took place more frequently within the teaching team members and how the sharing was practised by the teaching teams.

"Experience-sharing is the activity practised in every teaching team due to the fact that the teaching team members meet and interact more frequently than with the other teachers." (T4)

"Our teaching team members meet and share our teaching experiences almost every Friday afternoon. Normally, we have lunch together in my classroom and talk about how we teach a particular unit. For instance, we distribute seven learning areas to individuals and ask each member to read on it so that everybody will share what they have read with others. In this way, we do not need to read all of the materials by our own. No matter in teaching, pupils or family, we talk about everything and share our thoughts and ideas." (T1)

"Yes, I think the teachers are willing to share. For example, I have not been a classroom teacher for five years and my teaching team members share their supplementary teaching materials with me." (T2)

Secondly, two of the six participants also added that the sharing only occurred in private occasions. The following quotations explained why the teachers tended to talk about problems or issues in private and also implied that most of the teachers' knowledge sharing appeared to be informal and the opportunity available might determine the quantity of the sharing.

"If having problems, everyone [the teachers] will bring up the issues and search for solutions together by chance. For instance, I will talk to the teachers who were previous teachers of my class pupils. However, all this kind of sharing will only happen in private. If you want to make it [the sharing] public, the teachers will

repel." (T3)

"I use Wednesday lunch time or after class to discuss issues with T3 or ask suggestions from the higher grade teachers. All these occasions of sharing are informal." (T6)

The Section Chief of Teaching and Learning also thought that the teachers were willing to share; however, *"not many people do it"*. She further explained, *"Our school is like any other schools. The interaction among the members of each teaching team is frequent. If a teacher participates in a seminar or conference held by other institutions, s/he will bring up the ideas to his/her own teaching team and consequently the team might try to apply the new ideas. However, this kind of sharing across the whole school levels ceases making progress. For that reason, I think our teachers are willing to share with everyone but they only have the intention and do not put it into practice."* The SCTL's words not only provided another evidence showing that the teachers' knowledge sharing happened mainly within the teaching teams but also implied that the teachers' attitude towards knowledge sharing was positive and needed to be encouraged in order to put into practice.

Willing to give advice and help

When asked the six participants' thoughts on whether the teachers were willing to give advice and help, they all responded with a definite answer: yes. The following quotations exemplified how the teachers gave advice and help each other.

"Everybody [particular means the Grade 1 teaching team] helps each other. For instance, if there is a difficult pupil in my class, everyone will be on the initiative to give me a hand." (T1)

“Other teachers will tell me the results of doing certain things and subsequently give me advice for dealing with them.” (T2)

“Everybody [both the teaching and administrative staff] is willing to provide advice and help. For example, there was a big trouble happened to me and everyone not only supported me but also gave me suggestions.” (T3)

Nevertheless, T4 indicated that she would only actively give advice and help when someone asked and she went on to explain, *“I do not know what others need but if someone asks me for experiences or opinions, I am willing to help him/her.”* Accordingly, it was indicated that some teachers provided suggestions or assistance only when others actively talked about their problems/issues in front of them.

The Section Chief of Teaching and Learning indicated that the teachers *“do not talk about shrill issues”* and also they were *“subjective”*. She further explained, *“Sometimes when I provide advice to some people, the only respond is oh! oh! oh! Not many people will take the suggestions into account and make changes. Everybody is still doing things under their own way...However, if the issues are about teaching difficulties, such as how to teach a phonetic notation, the suggestions are easily accepted and the applications are effective.”* The above quotation inferred that when the suggestions involved criticism, some teachers seemed to not accept them since they tended to be subjective about their professional daily practices. However, when the suggestions attempted to solve problems/issues related to teaching, they were easily taken into account.

Willing to learn and experiment new ideas

Two of the six participants expressed that the teachers were willing to learn and experiment new ideas.

"We [the Grade 1 teaching team] will apply new ideas, gained through Wednesday seminars, the Internet or informal conversations with parents, to pupils immediately." (T1)

Other three participants pointed out that most of the teachers were willing to learn and experiment new things due to *"the average age of the teachers is young"* (T4), *"the teachers' personalities"* (T5) and *"abilities required to teach new things."* (T6) Besides, T3 expressed that the teachers *"would like to understand the situations completely first. If not, our [the teachers] aspiration will be low."* Accordingly, it was indicated that most of the teachers were willing to learn and experiment new ideas affected by the age, personalities, abilities required to teach or understanding the circumstances first.

Conversely, the Section Chief of Teaching and Learning identified *"only one third of the teachers are willing to learn new knowledge and employ it in the classroom and the other two third of the teachers are rather conservative staying in his/her own classroom."* She went on to explain, *"The teachers are used to adopting traditional teaching methods and subsequently infuse given knowledge from textbooks to pupils. However, Taiwanese education reforms emphasise the notion of breakthrough and change, which is rarely seen in our school."* From the SCTL's perspective, it was implied that most of the teachers tended to have a conservative attitude towards changes and their motivation to improve might not be sufficient. Subsequently, I intended to look at how the school made an effort to solve this issue.

When asked the SCTL how she motivated the teachers' aspiration, she said, *"There is a key factor. Individuals may not try to employ new ideas by their own but a team would. Because I have seen the pressure and positive results of teamwork, I, therefore, require the teachers to work collaboratively with their teaching team in delivering a lesson for peer observation. During the process of collaboration, everybody provides ideas, which may bring about creativeness in teaching. In the light of seeing the success of good practices, the other teachers may perhaps bring the ideas back to his/her classroom."* Accordingly, the SCTL adopt the notion of collaboration through teamwork in order to foster the teachers' creativity and aspiration. However, it was difficult to conclude whether teamwork influenced the teachers' motivation to create and change since it was difficult to indicate the teachers' intention to work collaboratively and achieve certain goals was resulted from self-aspiration or administrative pressure.

Being open to any thoughts or suggestions

When asked the six participants whether the school was open to any thoughts or suggestions, two of them gave me a negative answer: no. The following quotations indicated the Principal's attitude towards the teachers' thoughts or suggestions and also the reaction of the SCTL to them.

"Maybe because the Principal is going to retired soon, she has a rather conservative attitude. As long as the school does not confront with any serious troubles, she will feel ok with everything!" (T5)

"Not open! For instance, when we [the teachers] give the Section Chief of Teaching and Learning suggestions, she will tend to think all these suggestions are excuses." (T6)

Dissimilar as the above views, the rest of the six participants expressed that the school was open to thoughts or suggestions. However, T3 pointed out that welcoming comments did not necessary mean accepting them. Moreover, the other participants indicated conditions needed prior to the school considered their propositions. Firstly, *“as long as someone is going to do the job; then, the school will say ok. But if we [the teachers] need them to carry out our suggestions, they will have a conservative attitude.”* (T2) Secondly, *“if everybody has a shared perception, everyone will carry out things effectively. Maybe some people may rebel at the beginning. However, when the time is longer or when positive results are identified, they will follow.”* (T1) That is to say, the teachers' initiative in carrying out the suggestions, a shared perception of the suggestions among individuals in the school and the identified positive results of the suggestions needed to be indicated by the school in order to accept comments or advice.

From the viewpoint of the Section Chief of Teaching and Learning, *“the school is not open enough and the degree of acceptance is low.”* The SCTL then gave me an example when suggested an appraisal system to the school.

“Our school does not implement any teaching appraisal system. I was thinking to introduce forms used for the appraisal of teachers' teaching designed by Tao-Yuan Bureau of Education. When proposed the idea to the Principal, she told me the teachers would gain lots of pressure and asked me to not adopt the forms. I insisted on my standpoint and explained that the teachers might improve when there was a little pressure. Finally, the Principal agreed. Unfortunately, when introduced the forms to the teachers, they all rejected to use them.”

The above example provided another evidence to show why the Principal had a conservative attitude towards new thoughts or suggestions and also pointed out that the teachers rejected to certain ideas. By comparing the SCTL's and T6's viewpoint, it was identified that both of them thought the other side was not open enough to consider any thoughts or suggestions. It was assumed when introducing comments or suggestions, both the SCTL and the teachers might not attempted to communicate the comments or suggestions with identified initiatives and positive results in order to form a shared perception of them and make them be accepted.

Welcoming challenges

Two of the six participants said that the school (means the Principal and administrative staff) was rather conservative in terms of welcoming challenges. The following quotations provided other evidence to show the Principal tended to be conservative.

"Up to now, I cannot feel the school has particular done something to welcome any challenges. The school is rather conservative and I think it is because of the Principal." (T5)

"The teachers have the courage to embrace challenges but not the school. I think the Principal does not have any new ideas entirely. She is satisfied to just maintain current conditions." (T2)

From the teachers' attitude, four of the six participants expressed that "80%" (T6) of the teachers would welcome and also accept challenges *"if the challenges bring about advantages, most of them are accepted"* (T1), *"if the challenges will not affect the teachers' teaching and benefit our teaching, the teachers are willing to accept*

them.” or “as long as the rules of the games are explained and stated clearly in advance.” (T3) Accordingly, the teachers would welcome and accept challenges when the implementation and possible advantages of the challenges were communicated under the principle of not interfering their teaching.

Conversely, the Section Chief of Teaching and Learning expressed her thoughts on whether both the school and the teachers had the courage to embrace challenges. She said, “*The school does not welcome challenges for sure. Throughout the time of being in this position, I have felt so hard and had a lot of troubles when implementing some tasks. I sign that our school cannot be compared with other schools after I observe the development of the other schools. No matter in the teachers’ desire to seek knowledge or in their attitudes of doing research. I feel I have been trying some hard to push them but not seen any fruitful results. Sad and disappointed!*” Similar as my argument about ‘being open to any thoughts or suggestions’, the SCTL and the teachers might not attempt to communicate the process and potential results of implementing certain tasks with in advance and therefore the teachers might tend to have a negative attitude thinking that the SCTL tried to force them to implement the tasks.

Encouraging and supporting creativity

When asked about whether the school encouraged and supported creativity, four of the six participants expressed their thoughts regarding joining in educational contests as the activity for creativity.

“*Always. When receiving official announcements about contests, the school will encourage both the teachers and pupils to join.*” (T1)

"The school supports any educational contests and welcomes the teachers to sign up eagerly for joining in. Even there is no one sign up, they [the Section Chiefs] will actively ask relevant teachers to participate." (T3)

In terms of being creative in teaching, T4 expressed that *"the Principal does not interfere in the teachers' teaching as long as it is appropriate to the pupils so that we can adopt our own beliefs and ideas in our own class."* That is to say, the Principal encouraged the teachers to be creative in teaching by means of giving them professional autonomy. This might be the reason why T5 pointed out that *"the school says so in words in terms of encouraging creativity but I cannot feel they have done anything particular in practice."* Since giving professional autonomy was too abstract to be realised, some teachers might have appeared to think that the school did not intend to encourage creativity in teaching. Moreover, the adoption of teamwork might also foster creativeness through the teachers working together.

The Section Chief of Teaching and Learning had a similar view as most of the participants, saying, *"Our Principal likes to praise others very much. She always encourages everybody to join in contests no matter the result is good or bad."* By integrating the SCTL's and the six participants' opinions, it was identified that the Principal encouraged the teachers to join in educational contests and be creative in teaching by means of praising their endeavours and giving them freedom in teaching.

4.4.4.3 Conclusion of the Findings Related to the School Atmosphere and Culture

In terms of the school atmosphere, the interaction among the teachers was harmonious due to their social relationships and their avoidance of conflicts. However, the teachers' interaction with the administrators was discordant due to the conflicts resulted from the disregard of each other's difficulties and situations, the administrators' interference in the teachers' teaching, the negative perception of each other, the lack of communication and its flow and the pressure brought from the Principal. As the result of the interaction among the teachers and administrators, it appeared that most of the teachers trusted in the other teachers but not in some administrators owing to their previous conflicts or frictions. It was identified that the Principal and most of the teachers did not attempt to do anything specific to solve the problem. By contrast, a group of five teachers (known as the PCTA) intended to form a teachers' association in order to speak up for the teachers and to strive for their rights. Although some of the teaching and administrative staff were worried about the PCTA would act in an unreasonable manner or lead the association to develop towards a negative path, 84.2% of them still joined it and some of them even attempted to monitor or influence the PCTA's behaviours.

In terms of the vital elements of the school culture, they were classified into the teachers' attitudes and the school's behaviours along the below lines. The teachers were willing to share their teaching experiences and knowledge mainly within their teaching teams in private circumstances. The teachers were willing to give advice and help when others actively brought up problems or issues. However, as the suggestions involved criticism, they were not easily being accepted. It appeared that only one part of the teachers were willing to learn and experiment new ideas because

of their age and personalities, the abilities required to teach certain subjects and the understanding of the situations. The other part of them tended to have a conservative attitude towards changes and their motivation to improve might be insufficient. Furthermore, the Section Chief of Teaching and Learning indicated that both the Principal and some teachers tended to have a conservative attitude towards new thoughts, suggestions or challenges. However, it was identified that when necessary initiatives of individuals and positive results of the suggestions were identified and communicated to form a shared perception of the suggestions among individuals, the school (including the administrative and teaching staff) was open to any thoughts or suggestions as well as welcomed challenges. Finally, both the Section Chief of Teaching and Learning pointed out that the Principal encouraged and supported for creativity by means of encouraging the teachers to join in educational contests, praising their endeavours and providing them freedom in teaching.

4.4.5 School Organisational knowledge Assets

Referring to the discussion of the importance of building and maintaining organisational knowledge assets of schools (e.g. Alwert and Hoffmann, 2003; Davenport, *et al.*, 1997; Earl, 1997; Hargreaves, 1999; also see Section 2.5, Page 92-93), it is suggested that a school needs to not only understand and audit its organisational knowledge (including its members' knowledge and capabilities) but also organise it into so-called knowledge repositories or databases with the purpose of enabling its members to indicate what sorts of knowledge they are lacking and also find relevant resources to solve problems. Accordingly, the exploration of the school's organisational knowledge assets included the recognition of the schools' strengths and weaknesses, the organisation and access of organisational knowledge and the centre of teaching and learning resources (see Table 4.18). In this section, I intend to firstly integrate both the administrative and teaching perspectives on the

identification of the school's strengths and weaknesses, secondly look at how so-called management and intellectual information was organised and accessed, and finally to examine whether there was a resources centre for the teachers.

Table 4.18 Teachers' thoughts on the school's strengths and weaknesses.

Strengths of the school	<ul style="list-style-type: none"> • Near to the motorway junction. (1) • Schoolyard is beautiful. (3) • Teachers are harmonious and conscientious. (4) • Teachers share and use supplementary teaching materials together. (1)
Areas need to be developed	<ul style="list-style-type: none"> • School facilities includes teaching equipment, IT (Information Technology) facilities and hardware such as an indoor stadium. (5) • The interaction between the teachers and administrators i.e. the understanding of each others' standpoints and communication. (2) • Administrative interconnected system. (1) • Parents re-education. (1) • Sentiments among colleagues. (1)
Organisation of knowledge assets	<ul style="list-style-type: none"> • School policies and strategies as well as daily work processes: related administrative sections organise official documents into files. • Collective teaching experiences: the Section Chief of Teaching and Learning organises the files of activities according to learning areas. • Individual teaching experiences: individual teachers organise their own teaching portfolios. • Student portfolios: teachers organise their pupils' portfolios during semester time and give them to Counselling Division before school breaks.
Access of knowledge assets	None of the six participants would look at the above documents.
Centre of teaching and learning resources	Not available.

Strengths of the school

The six participants' thoughts on the school's strengths comprised geographical aspects such as the school was near to motorway and beautiful and also humane aspects such as the teachers were harmonious, conscientious and willing to share teaching materials. The Section Chief of Teaching and Learning was on the same wavelength as four of the participants and said, "*Most of the teachers are moderate even a few of them are drastic.*"

Weaknesses of the school

In terms of the school's hardware, five of the six participants pointed out that the school did need to reinforce its hardware such as teaching equipment, ICT facilities and school buildings. For instance, T1 explained that an administrative interconnected system should be adopted in order to improve the storage and utilisation of management information such as pupils' background details. In a similar vein, both the Principal and Section Chief of Teaching and Learning also indicated that the school had old and inadequate facilities especially when compared with the newly established elementary school nearby.

In terms of the school's software, some participants specified that the interaction between the teachers and administrators, sentiments among colleagues and parental education needed to be improved. Secondly, the Section Chief of Teaching and Learning expressed, *"The school should spend more time for implementing initiatives which cater for the new national educational reforms."* Additionally, the Principal were aware of the degree of the teachers' acceptance of new issues was insufficient since *"they [the teachers] are afraid of and thus tend to reject those new issues."*

Organisation and access of organisational knowledge

Under the school's circumstances, the school's organisational knowledge was defined as the school's policies and strategies, administrative daily work processes and pupils' portfolios (management information) as well as individual and collective teaching experiences (intellectual information). Owing to the focus of this case study research, the organisation of the management information was indicated in Table 4.18 and the organisation and access of the intellectual information is introduced in the following lines:

1) Collective teaching experiences.

Collective teaching experiences regarded as the educational activities implemented collaboratively by the teachers such as peer observations and end-of-semester performance achievements of pupils were organised into files by the Section Chief of Teaching and Learning.

2) Individual teaching experiences.

Individual teaching experiences were organised by individual teachers as personal teaching portfolios including supplementary teaching materials and interested educational references.

Furthermore, with regard to the access of the organisational knowledge, none of the six participants actively looked at both the management and intellectual information unless they needed the information. Nevertheless, it was indicated that the access to the knowledge assets was flowing since both the administrators and teachers were willing to share the records of activities or supplementary teaching materials.

Centre of teaching and learning resources

The six participants pointed out that there was no particular resources centre for teaching and learning in the school; however, they were able to find teaching resources in the school library and the bookcases in the health centre and behind the seat of the Section Chief of Teaching and Learning. In addition, it was identified that there were no specific consultants on teaching and learning in the school; however, the six participants would ask for advice from the Section Chief of Teaching and Learning or experienced teachers. In other words, even though there was no such a centre (or so-called a knowledge repository or database), the teachers knew where to find needed teaching resources and also were able to seek out experienced teachers to

solve problems.

To conclude the findings related to the school's assets, all of the six participants and the Section Chief of Teaching and Learning expressed that most of the teachers were harmonious as one of the strengths of the school. Moreover, the weaknesses of the school were classified into hardware elements such as insufficient teaching equipment, ICT facilities and school buildings as well as software elements such as dissatisfactory interaction between the teachers and administrators, sentiments among colleagues, parental education and the degree of the teachers' acceptance of new issues. In terms of the organisation and access of the school's organisational knowledge, both the management and intellectual information was organised by related Section Chiefs and individual teachers and the access of it was flowing since both the administrators and teachers were willing to share the records of activities or supplementary teaching materials. Furthermore, the school did not have a centre of teaching and learning resources; however, the teachers knew where to find needed teaching resources and also were able to identify experienced teachers assisting them to solve problems.

4.4.6 Professional Communities

In this section, I introduce the existence of professional communities inside and outside the school and also the teachers' interaction with professional communities via ICT (see table 4.19).

Table 4.19 School and teachers' connection with professional communities.

Channels	Professional communities
Inside the school	• No. (6)
Outside the school	<ul style="list-style-type: none"> • Guidance and Assistance Department of Compulsory Education from Tao-Yuan Bureau of Education. • Relevant communities for seminars. • Book publishers.
Via ICT	<ul style="list-style-type: none"> • SMART teachers website. (1) • College classmates website. (2)

Inside the school

Professional communities inside the school are regarded as 'Practice Community' or 'Community of Practice' (Lave and Wenger, 1991; Wenger, 1998; also see Section 2.4.3, Page 78) forming by teachers themselves who have the same interests or professions with the purpose of learning through the process of knowledge sharing (e.g. Liou, *et al.*, 1995; Segiovanni, 2000; see Section 2.4.5, Page 93). When asked the six participants whether there existed such communities in the school, they all gave me a definite "No!" answer.

However, throughout my observation and also my conversation with T1, I realised that how the Grade 1 teaching team cooperated had some features in common as CoP. For instance, the team met regularly on "every Friday afternoon" and talked about their shared interests such as "how they teach a particular unit." (T1) They also delivered a 'collaborative teaching' lesson for the peer observation (see Table 4.8). To deliver such a lesson, joint discussion and problem-solving among the team members must be involved in advance. The above examples inferred that even there

were not formal professional communities in the school; however, certain groups of the teachers (or the administrators) might cooperate as such CoPs.

Outside the school

Three types of professional communities were connected actively and passively by the school and the teachers outside the school, as follows:

- The Section Chief of Teaching and Learning would actively invite relevant counsellors from the Guidance and Assistance Department of Compulsory Education from Tao-Yuan Bureau of Education to deliver a lesson which the learning area was new to the teachers.
- The administrative sections would actively invite relevant speakers from other communities such as other elementary schools to give seminars.
- The teachers would passively receive supplementary teaching materials from the publishers of textbooks. Moreover, those book publishers would organise a series of seminars or conferences in relation to currently-discussed educational issues.

The first two examples illustrated that the active connection of the professional communities outside the school was based on the needs of the teachers and made by the related administrators.

Via ICT

T1 pointed out that she sometimes searched teaching resources or shared teaching experiences with other teachers from different elementary schools through SMART teachers website. Moreover, T3 and T6 sometimes shared their experiences with previous classmates in college classmates website. According to my understanding of these six participants, it was assumed that the participants' (especially T4 and T5) ICT skills might affect their capability and therefore willingness to connect with professional communities via the Internet.

To conclude the findings related to professional communities, it was indicated that there was no professional community existed inside the school. However, how certain groups of the teachers interacted with each other to some degree shared similar features as CoPs. In terms of learning from outsiders, the school's connection with certain professional communities outside the school was actively made by the administrators according to on the developmental needs of the teachers. Besides, only one third of the six participants sometimes connected with specific professional communities via ICT owing to their sufficient ICT skills.

4.5 Conclusion of Research Findings

In this section, I intend to indicate the main difficulties and potential conditions of the school (including the teachers), generated from the findings of the above sections, to promote teachers' personal knowledge management. The difficulties include:

- The teachers' motivation to engage in some individual and organisational knowledge-creating activities was driven mainly from their demands or issues encountered and their attitudes towards most of these activities tended to be passive and perfunctory.
- Numerous disadvantages resulted from the characteristics of the Principal's

leadership style such as the lack of a clear direction for the future, the lack of communication and supportability, the distance between the Principal and the teachers and the lack of being respected.

- The school's organisational structure emphasised centralisation by the Principal giving the hierarchical authority to the administrators, which caused the conflicts between the administrators and the teachers. (Mintzberg, 1983; 1989; Qin, 2004)
- The lack of communication and meeting management skills made the information communication of the school ineffective and inefficient.
- The school did not adopt an appropriate appraisal system (Diamond, 1991; LaBosky, 1994; Moran and Dallat, 1995) to evaluate the teachers' practices and therefore they were less likely to be assisted to form a basis for their personal knowledge creation. Moreover, the school did not have a reward system, which was designed to encourage the teachers' collaboration and knowledge-sharing.
- The teachers tended to not recognise what sorts of knowledge were needed to be created and retained since they were not aware of all the currently-discussed educational issues.
- The planning and building of the school's visions, educational goals and future movements inclined to not take the teachers' wishes into consideration and were not disseminated and communicated effectively across all levels of the school, in which the direction and vitality of knowledge creation were difficult to be internalised (Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995; Von Krogh, *et al.*, 2000).
- The interactive atmosphere between the teachers and the administrators was discordant owing to their conflicts between each side, which lowered the degree of the teachers' trust in the administrators and also affected the school's atmosphere.

- The school tended to not solve the conflicts between the teaching and administrative sides and a group of the teachers tended to solve the problem drastically by forming a teachers' association, which might make the atmosphere worse.
- Not all of the teachers were willing to innovate and make improvements in their teaching. Moreover, some of them had a rather conservative attitude towards new thoughts, suggestions or challenges unless positive results of them were identified and communicated.
- The school did not establish formal contexts for knowledge sharing such as professional communities.

The potential conditions are:

- The teachers had their professional autonomy in teaching.
- The interactive atmosphere among the teachers was harmonious owing to their positive social relationship with each other and their avoidance of conflicts.
- The degree of trust among the teachers was generally high.
- Most of the teachers were willing to share their teaching experiences and materials and also to give advice and help in certain circumstances.
- The Principal attempted to promote creativity by encouraging the teachers to join in educational contests, praising their endeavours and providing them freedom in teaching.
- Although the school did not have knowledge repositories, the access of intellectual information; that is, teaching resources, was open and the teachers were able to identify experienced teachers for assistance.
- Although there was no professional community existed in the school, there were informal groups of teachers supported each other under the features of CoP to some degree.

Chapter 5 Discussion of Research Findings

5.1 Overview of Chapter 5

The purpose of this chapter is to discuss how the processes and components of teachers' personal knowledge management were carried out within the case school context with reference to the literature review and the research findings. In Section 5.2, I examine the level of the teachers' effectiveness for their professional development. Moreover, in Section 5.3, I specify the level of the school's support for its improvement towards a learning organisation. In addition, I also tend to evaluate the level of usefulness of the development methods undertaken by the participants to experience the practices of self-reflection and knowledge-sharing, which is discussed in Section 5.4.

5.2 To what extent were the processes of teachers' personal knowledge management fulfilled in the school?

In the following sections, I intend to access the fulfillment of teachers' knowledge development, sharing and creation in the school and also to specify the most influential factors affecting these processes. In Section 5.2.5, I summarise the main conclusions drawn from the discussion and accordingly provide a set of recommendations.

5.2.1 Was knowledge development achieved by the participants?

As claimed in Section 2.4.2 (see Page 66), teachers' motivation is regarded as the drive to broaden and change their personal construction systems of teaching. Regarding to the research findings (see section 4.3.2.3, Page 200-201), the teachers' motivation affected the degree of their willingness to engage in the personal and

organisational knowledge creation initiatives. Such motivation was influenced by their personal aspiration and interests as well as teaching beliefs and demands which can be classified as intrinsic and social motives (Dörnyei, 2001; Downey and Kelly, 1986; Spaulding, 1992). For instance, T1's aspiration to broaden her knowledge made her intrinsically motivated to join the investigation (see Section 4.3.3, Page 206-207). Although the other participants were socially motivated to take part in the investigation, as the investigation progressed, most of them appeared to be intrinsically motivated to continue the action learning set for the pleasure and satisfaction of exploring and understanding others' knowledge and experiences (Dörnyei, 2001). That is to say, most of the participants were motivated to grow when achieving learning and experiencing success. Nevertheless, 'motivated to grow' does not necessary mean 'willing to change'. For example, T4 tended to believe that using the power of the teacher to control the pupils appeared to be the most effective way to manage her class. Consequently, although she identified that her manner of speaking to the pupils was too severe, she tended to ignore the issue and to not read the observational notes I provided to her (see Section 4.3.1, Page 185). Such a belief about the classroom context she belonged did have an impact on her motivation to change her current construction systems of teaching (Ford, 1992; also see Page 66). Besides, Downey and Kelly (1989) point out that social motivation relates to the studies of self-image, which support that teachers' personal and professional identities do to a certain extent influence their motivation to professional development. It was identified that all of the participants understood why they wished to be an elementary teacher and also were clear about their future plans (see Table 4.1). Accordingly, with this positive self-image, they may be more confident about themselves and optimistic about their future and therefore set clear and realistic objectives and accept praises and criticisms (Downey and Kelly, 1989).

As motivation drives teachers on to develop their knowledge, reflection is the other key in the process of knowledge development (see Section 2.4.2, Page 71-72), which is achieved by a *reflexive professional* teacher who reflects on not only his/her personal performance but also pupils' and other teachers' performance and theoreticians' works; subsequently, the teacher may put what s/he has learned into practice (Kirkham, 2003). It was identified that most of the participants reflected on their actions and intended to better actions through reviewing the observational notes I provided to them (see Section 4.3.1, Page 184-185). Moreover, some of them also attempted to obtain interested or relevant knowledge for specific issues through talking with other teachers informally, searching resources from the Internet or reading educational books and journals (see Section 4.3.2, Page 193-194), which required prior self-reflection. The evidence shows that some of the participants also reflected on others' experiences or works and to some extent learned from them. However, it was not possible to point out whether the participants put all developed knowledge into practice. As a result, I would argue that most of them were motivated to develop towards a *reflective professional* teacher and to some degree a *reflexive professional* teacher on condition that the development met their personal aspiration and did not conflict with their beliefs.

5.2.2 Were the organisational initiatives of knowledge creation effective?

The organisational initiatives of knowledge creation implemented by the school included the Wednesday seminars, the peer observations and the professional workshops. Firstly, even if the topics of the Wednesday seminars were chosen by the teachers from the ten topics provided by the Section Chief of Teaching and Learning beforehand, they were viewed as useless since the teachers expressed that the topics and contents did not meet their actual needs (see Section 4.3.2.2, Page 194-197). The

reasons to explain the happening of this issue are:

- The provided ten topics might not be the teachers' preferences.
- Some of the speakers did not update the contents of their presentation.

Secondly, the implementation of the peer observations is relatively similar as it of peer coaching (see Section 2.4.3, Page 74), aiming to demonstrate newly-acquired teaching approaches or strategies and also to encourage collaboration among the teachers. In this regard, I would argue that the peer observations were effective owing to the following reasons:

- As the teaching teams were required to design the instructions collectively, teachers' collaboration and knowledge creation might be carried out throughout the progress of discussing ideas, sharing experiences and thus integrating ideas to deliver a good practice of teaching. For instance, the Grade 1 teaching team delivered a form of collaborative teaching integrating the subjects included in Health and Physical Education (see Table 4.8).
- Some teachers identified the usefulness of certain teaching techniques such as teaching English pronunciation techniques and attempted to apply such techniques in their teaching (see Section 4.3.2.2, Page 199).
- Most of the demonstrators benefited from their presentation and also got relevant comments and suggestions from the appraisers (see Table 4.8).
- In terms of organisational knowledge storage and access, the process of each instruction together with its subsequent group discussion and the peer observational feedback forms was recorded in digital and written manners respectively so that teachers who were not available to attend the event were able to look at it any time (see Section 4.3.2.2, Page 197).

Thirdly, the professional workshops were also effective since they directly met the teachers' immediate needs. Additionally, the progress of the professional workshops carried out so-called knowledge transfer since the abilities to play diablo and traditional material art were partially moved from the seeded teacher to the teachers (see Page 41-42 for the definition of knowledge sharing and transfer).

The above explanations signify that the peer observations and the professional workshops were more effective than the Wednesday seminars since they directly solved the teachers' teaching problems or issues encountered. According to Grimmett and Crehan (1992: 70, also see Section 2.4.3, Page 76) so-called *bottom-up problem-solving approaches to school improvement*, it can be argued that the implementation of these two initiatives may not only meet the teachers' professional needs but also foster their collaboration. Nevertheless, the teachers' attitude of engaging in these initiatives was rather passive and perfunctory since these initiatives were designed under the school's administrative plan, which can be viewed as the negative result of contrived collegiality (see Section 2.4.3, Page 75) especially along with the discordant relationship between the teaching and administrative sides.

5.2.3 Was knowledge sharing achieved at the team and organisational levels?

The achievement of knowledge sharing in the school still remained at the team (or group) level formally and informally. This can be regarded as the disadvantage in the implementation of the Grade 1-9 Curriculum which emphasises the integration of not only different learning areas but also different levels (see Section 1.3.4.1). The teachers inclined to share their experiences, ideas and issues with their own teaching team members due to the frequent interaction among them (see Section 4.4.4.2, Page 250-251). Subsequently, if the sharing was directly related to practical issues

encountered, the teachers attempted to apply the newly-acquired knowledge to their teaching. Apart from the knowledge-sharing resulted from the frequent interaction of the teaching team members, the teachers also talked about their practices within a informal group they belonged to such as the informal group formed by T3, T4 and T6 (see Table 4.3). However, it was identified that such kinds of sharing did not take place at the organisational level because the teachers preferred to share their knowledge in private circumstances (see Section 4.4.4.2, Page 251-252). Furthermore, although the good practices of teaching shared through the peer observations were recorded for the storage and access of organisational knowledge, the school did not intend to extend them to be known at the organisational level. That is to say, the knowledge shared or created through such the organisational knowledge-creating initiative was merely obtained by the teachers participating in the events but not disseminated across all levels (means the teaching teams) of the school.

5.2.4 What were the most influential factors involved in the knowledge-creating process?

According to the discussion of Section 5.2.1, I would argue that the teachers' personal motivation to grow (involving the necessary to change), influenced mainly by their personal aspiration and interests as well as teaching beliefs and demands, was one of the keys to determine their attitude and willingness to improve knowledge. In addition, social relationship and interaction among the teachers (particular means trust and interactive atmosphere) are the other keys to determine the quantity and quality of knowledge creation through the teachers' dialogues and collaboration. Particularly, in the Taiwanese (or Chinese) culture, social relationships and trust are recognised as the most influential factors in the process of knowledge sharing (Wang and Ashleigh, 2005; Weir and Hutchings, 2005; also see Section 2.4.3, Page 80),

which is evidenced by the incidents observed. For example, T2, T3, T4, T5 and T6 got along well with each other as friends, which not only determined their decisions to participate in the investigation but also brought about harmonious atmosphere during the action learning set meetings (see Page 206-207 and 209-210). Moreover, T1 described her teaching team “*like a big family*” (see Page 242) and the team members met regularly to talk about everything and share their thoughts and ideas (see Page 242).

5.2.5 Conclusion

In the above sections, I have discussed the achievement of the teachers’ self-reflection, the effectiveness of the organisational knowledge-creating initiatives, the level of knowledge sharing taken place in the school and the most influential factors involved in these processes and subsequently come to the following conclusions:

- Teachers’ motivation, driven mainly from their personal aspiration, interests, teaching beliefs and demands (similar finding is found in Collinson and Cook’s (2004) research; see Page 80), and their social relationship and interaction with each other (similar finding is found in Wang and Ashleigh’s (2005) research; see Page 80) were the keys to promote teachers’ personal knowledge management in the school.
- All of the participants were to some degree intrinsically and socially motivated to develop towards *reflexive professional* teachers who reflected on not only their own practices but also other teachers’ practices and pupils’ learning and subsequently applied newly-obtained knowledge into their teaching on condition that the development met their personal aspiration and teaching demands and did not conflict with their beliefs in teaching and learning.

- The peer observations and the professional workshops were more effective than the Wednesday seminars in terms of not only fostering the teachers' collaboration and knowledge-sharing but also meeting their professional needs (similar finding is found in Chen's (2003) research; see Appendix 2, Page 357). However, the teachers' attitude towards the engagement in these initiatives was rather passive and perfunctory, which resulted from the employment of contrived collegiality (e.g. Harhreaves, 1991; Little, 1990).
- Knowledge sharing was achieved by the teachers only at the team (or group) level due to the frequent interaction among them and their preference of talking in private.

In the light of the above conclusions, a range of recommendations is drawn for the teachers and the school. Firstly, to stimulate the teachers' social motivation to achieve *person-environment goals*; that is, their responsibilities in the Taiwanese society (Dörnyei, 2001: 31), recommendations for the teachers include:

- To be aware of the necessity to break through the traditions and be creative in the implementation of the Grade 1-9 Curriculum (see Section 1.3.4, Page 22).
- To be aware of their role as being professional knowledge workers who have the mission of acquiring, sharing, creating and leveraging knowledge in order to increase the effectiveness of teaching and learning and therefore the competence and competitiveness of Taiwanese citizens (see Section 1.3.5, Page 23).
- To be aware of their responsibility to actively join educational research and professional developmental initiatives (Teacher Act amended in 2003).

Secondly, to carry out the process of knowledge creation by implementing *bottom-up problem-solving* oriented developmental initiatives (Grimmett and Crehan, 1992: 70, also see Section 2.4.3, Page 76), recommendations for the school are:

- To provide more relevant educational seminars by assembling the teachers' opinions and consequently communicating the teachers' wishes with the suitable speakers of seminars beforehand.
- To provide more relevant professional developmental initiatives by searching the good practices of those initiatives from other elementary schools and afterwards communicating the benefits of those initiatives with the teachers in order to get their approval for the implementation.

Thirdly, as the importance of extending knowledge sharing at the organisational level is suggested so that good practices of teaching and lessons learned can be understood, leveraged and therefore institutionalised by every member in the school (Collinson and Cook, 2004; Shaw and Perkins, 1992; also see Section 2.4.3, Page 72), a recommendation for the school is:

- To identify knowledge shared and created from the teaching teams and professional developmental initiatives and subsequently to disseminate the knowledge in morning meetings in order to make it known by everyone within the school.

5.3 To what extent did the school under study support an environment for the promotion of teachers' personal knowledge management?

In the following sections, I intend to evaluate whether the school has provided an appropriate environment for the promotion of teachers' personal knowledge management. Besides, in Section 5.3.8, I summarise the main conclusions drawn from the discussion and accordingly provide a set of recommendations.

5.3.1 Did the Principal's leadership style and the organisational structure of the school encourage teachers' professional empowerment?

The implementation of the Grade 1-9 Curriculum brings about impacts on both elementary schools and teachers such as: (1) involving every teacher in the development of a school-based curriculum, (2) adapting flexible and appropriate school-based leadership and management, (3) making good use of teachers as one kind of educational resources and (4) changing beliefs in teaching and learning (see Section 1.3.4.2 and 1.3.4.3, Page 19-22). As facing the necessity to change, transformational school leadership is suggested for school principals to inspire teachers' motivation to create and change by means of involving teachers in the decision-making process, building shared vision and educational goals or establishing a collaborative culture (Leithwood and Jantzi, 1997; Silins and Mulford, 2002; also see Section 2.5, Page 86-88). As a result, Taiwanese elementary school teachers should feel that they are professionally empowered and more likely have the higher level of motivation and also grasp more opportunities for mutual learning and professional exchange (Lam, 2005).

However, ideals may not sometimes come true in reality as the teachers were not professionally empowered in the school under study. The explanations for the issue are firstly the Principal of the school intended to build a hierarchy by demarcating the Division Directors', the Section Chiefs' and the teachers' duties clearly (see Table 4.10), which brought about the drawbacks of centralisation. For instance, by giving the hierarchical authority to the Division Directors and the Section Chiefs, most of the administrative and educational decisions were made by the administrators and the teachers needed to comply with the decisions. Some teachers were even used to such the hierarchical structure and therefore tended to not to engage in the development of the school-based curriculum by discussing and cooperating with others (see Section 4.4.1.2, Page 220-222). Consequently, since the teachers had their professional autonomy, such a hierarchical structure did result in the feud between the administrators and the teachers (see Section 4.4.4.1, Page 242-245). Another drawback related to communication within the school, which will be explained in the next section. Secondly, it is pointed out that a school principal's relationships with teachers and other members of the school is central to the fulfillment of the transformational leadership (Barnett and McCormick, 2002). Such perceptions of the principal, such as being seen as trustworthy and competent, influence the teachers' and other members' decisions to follow (Chemers, 2001). Accordingly, as the participants and the Section Chief of Teaching and Learning appeared to have more negative perceptions of the Principal (see Table 4.10; Page 247 and 257-258), it is assumed that the Principal might not intend to establish and maintain her leader legitimacy, which discouraged commitment and effort towards achieving shared vision and educational goals. Finally, a number of relevant literature on the transformational leadership (e.g. Bass and Avolio, 1997; Leithwood and Jantzi, 1997; Leithwood, *et al.*, 1999; Lin, 2004) addresses the importance of creating and communicating vision which reflects the needs, interests, values and beliefs of

individuals for encouraging higher levels of commitment and motivation to overcome difficulties associated with the challenges of restructuring.

However, it appeared that all of the six participants' perspectives on the school's current visions and educational goals were not explicit because of two reasons: firstly, in the vision planning process, the vision planner (means the Section Chief of Teaching and Learning) did not take every teachers' opinions into account; secondly, in the vision building process, the Principal and the administrative teams did not intend to disseminate and communicate the visions and educational goals with all members and also to put these visions and goals into the practice (see Section 4.4.3, Page 235-240). As a result, shared visions and educational goals could not be formed which might result in the culture that everyone moving towards different directions without consensus.

5.3.2 Was information disseminated and communicated efficiently and effectively across all levels of the school?

Information of the school was classified into various types; therefore, I firstly tend to look at how these different types of information were disseminated and whether those ways of information dissemination were efficient and effective. Administrative information such as the official announcements from the Tao-Yuan Bureau of Education and the Ministry of Education was disseminated effectively via the morning meetings, the bulletin board in the big office and the school website. Moreover, the administrative schedules of the coming semester were also disseminated effectively via the administrative affairs meetings at the beginning and end of each semester (see Section 4.4.1.3, Page 222 and Table 4.11). However, I would argue that these ways of management information dissemination were not efficient since these various types of information could also be disseminated

effectively as written documents. Thus, the time of the morning meetings and the administrative affairs meetings could have been used by the administrators and the teachers to share good practices observed from other elementary schools, knowledge gained from external educational seminars or knowledge created through the professional developmental initiatives such as the peer observations. Furthermore, information such as currently-discussed educational issues, school visions, educational goals and future plans was not disseminated across all levels of the school since the teachers were not able to indicate all the educational issues about which the school currently concerned (see Section 4.4.2, Page 234) and also to specify the school's visions, educational goals and future movements explicitly (see Section 4.4.3, Page 235-240). That is to say, a shared understanding of such information was not formed among individuals within the school and thus they might not be able to identify a basis for knowledge creation and also the direction towards the future.

As indicated in the previous section, the hierarchical structure of the school disadvantages the effectiveness and efficiency of communication within the school. Firstly, it was pointed out that the channels of communication from the teachers to the Principal (or other administrators) were not flowing, which brought about misunderstanding (see Table 4.10 for T2's opinion). Secondly, most of the educational decisions such as the use of the peer observational feedback forms or the means to prepare the school-based curriculum were still made by the administrators and were not communicated with the teachers in advance, which caused the passive and perfunctory attitude of the teachers in complying with those educational decisions (e.g. Harris, 2002; Law, 1999; Stoll, 1999; also see Page 199). This infers that communication appeared to be a serious problem in the school, which was one of reasons resulting in the conflicts between both the administrative and teaching

sides (see Page 244). For example, the educational affairs meetings were held by the Committee of School Curriculum Development (CSCD) to discuss any educational affairs in relation to the development of the school-based curriculum. However, it was identified that the process of these meetings was inefficient and ineffective owing to the speaking manner and attitude of the Section Chief of Teaching and Learning, who normally guided the educational affairs meetings, and also the attitudes and behaviours of the teachers (see Section 4.4.1.3, Page 223-226). For instance, the Section Chief of Teaching and Learning tended to persist in her opinions, have a preconceived perspective on the teachers and consequently have an imperative and incisive manner of speaking when expressing her ideas. As a result, most of the teachers tended to have a passive attitude in the course of the meetings since they thought the intention of group discussion did not exist in such meetings and there was no need to contribute ideas. Moreover, in response to the Section Chief of Teaching and Learning's speaking manner, some of the teachers meant to pay her back. Similar situations happened when some teachers deliberately intended to oppose against particular administrators or events in the morning meetings, such as the conflict between the Director of Counselling Division and the Preparatory Committee of the Teachers' Association (see Appendix 7). Accordingly, if the above situations are not improved, the same problems related to the effectiveness and efficiency of communication will take place repeatedly and the negative attitudes and behaviours of the teachers and the administrators will increase.

5.3.3 Were the appraisal and reward systems of the school effective?

The school did not employ a specific appraisal system to evaluate its teachers' current teaching and their progress of professional development (see Section 4.4.1.4, Page 228), which may be viewed as the disadvantage in the promotion of knowledge creation. For example, in the knowledge-creating progress, an appropriate appraisal system for the evaluation of teachers' professional development may facilitate a teacher to recognise what sorts of knowledge and capabilities s/he already has and more importantly what s/he is lacking (Leithwood and Jantzi, 1997; also see Section 4.4.1.4, Page 228-229). According to the evaluation, the teacher may be capable of identifying the direction and elements of his/her future development. Furthermore, similar as the purpose of implementing peer clinic supervision (see Section 2.4.3, Page 74), an appropriate appraisal system for the evaluation of teachers' teaching performance may provide an opportunity for an appraiser and a teacher to talk about teaching issues emerged from the observation of the teacher's instruction. Without it, such kind of knowledge sharing may not be carried out.

To encourage teachers' extrinsic motivation for knowledge creation, it is suggested that schools need to provide rewards for their teachers when they achieve certain levels of collaboration and knowledge-sharing (Davenport and Prusak, 1998; Louis, 1994; as see Section 2.5, Page 87). In regard to the reward system existed in the school, the 'selection of excellent teachers' and the 'prize for winning in educational contests' were the two types of rewards provided by the MOE and the Parents' Association respectively (see Section 4.4.1.4). However, they were not effective in terms of fostering the teachers' collaboration and knowledge-sharing since they merely concerned about the individuals' achievement in educational contests.

5.3.4 Did the atmosphere of the school increase the degree of willingness for knowledge sharing?

Referring to the discussion of how social relationship and interaction within a school influence the promotion of teachers' personal knowledge management (see Section 2.5, Page 89-90), it is indicated that social relationships among individuals determine the interactive atmosphere among them and also their willingness to share knowledge with each other (Huemer, *et al.*, 1998; Sallis and Edward, 2002; Von Krogh, *et al.*, 2001). Moreover, within a secure and positive environment, teachers are more motivated to learn and improve (Harris, 2002; Stoll, 1999; Stoll and Fink, 1996). Accordingly, I intend to examine whether the school atmosphere increased the degree of willingness for knowledge sharing, which was looked at from two different angles: the atmosphere among the teachers and the atmosphere between the teachers and the administrators. As specified in the Section 4.4.4.1 (see Page 242), the social relationship and interaction among the teachers shared some characteristics of caring families or friends in common. Thus, it is expected that the degree of love, care and trust among them was high, which determined the harmonious atmosphere while they were interacting with each other (see Table 4.15). Likewise, such the positive relationship and harmonious atmosphere did encourage the teachers' willingness to share teaching and life experiences and issues with each other in private circumstances informally (see Section 4.4.4.2, Page 250-252).

On the contrary, the atmosphere between the teachers and the administrators was discordant, which affected the degree of trust between them (see Section 4.4.4.1, Page 242-246). As concluded in Section 5.3.1 (see Page 281), the ultimate cause of this problem was the adoption of centralisation. Both administrative and educational decisions of the school were made by the administrators without prior

communication with the teachers. Once the decisions were made, the teachers needed to comply with them. However, with the teachers' professional autonomy, they tended to have unwilling and perfunctory attitudes when asked to do something they did not agree with. Or, some of them attempted to use drastic ways to directly attack against particular administrators and events (see Appendix 6 and 7). All these examples of fixed views and failing to compromise between the teachers and the administrators resulted in the conflicts and subsequently influenced the interactive atmosphere between them. Additionally, with such a negative social relationship with the administrators, the teachers tended to have passive and perfunctory attitudes and behaviours in the course of engaging in the developmental initiatives and the official meetings, which to a certain extent discouraged the formal knowledge-sharing process. That is to say, without the positive relationship between both sides, the endeavours for teachers' professional development and school improvement may hardly be fulfilled (Harris, 2002; Stoll, 1999).

5.3.5 Did the culture of the school support collaboration and innovation?

Teachers' collaboration and innovation are identified as the crucial factors in the knowledge-creating process (see Section 2.5, Page 91-92), which can be induced through establishing a collaborative and innovative culture. Accordingly, I intended to examine whether the school culture encourage the teachers' collaboration and innovation. As pointed out in Table 4.17, the teachers were 'willing to share teaching experiences and knowledge' and also 'willing to give advice and help' owing to the positive relationship and harmonious atmosphere among them, which can be viewed as the fundamentals of the collaborative culture (Todd, 2001). Additionally, the Section Chief of Teaching and Learning encouraged the teaching teams to work collaboratively in delivering lessons for the peer observations (see Section 4.4.4.2,

Page 255). With reference to the process of those four peer observations observed (see Table 4.8), the intention of the SCTL was to some degree achieved. Conversely, it seemed difficult to give a successful example of the collaboration between the teachers and the administrators due to the social relationship and interaction between them. Based on the above explanations, I would argue that the school (particularly means the SCTL) did to a certain extent make an effort to establish a culture supporting the collaboration merely within the teaching teams.

In terms of the experimenting and innovative culture, it was found out that only one part of the teaching and administrative staff were 'willing to learn and experiment new ideas', 'open to any thoughts or suggestions' and 'welcoming challenges' (see Section 4.4.4.2, Page 254-259). The other part of them (including the Principal) tended to have a rather conservative attitude towards the need of innovation. However, it was pointed out that new thoughts, ideas or suggestions could be accepted as the positive benefits of them were indicated, communicated and approved by every individual of the school. With the conservative attitude, it may be difficult to introduce or implement changes within the school. Accordingly, I would argue that the school culture had not yet encouraged innovation.

5.3.6 Did the school organise its Organisational knowledge assets effectively?

According to the classification of knowledge assets of an organisation (Blacker, 1995; Collins, 1993; Leonard-Barton, 1995; also see Table 2.4), the organisational knowledge assets of the school included: (1) the teachers' knowledge and capabilities, (2) the school culture, policies, strategies and daily work processes, (3) collective and individual teaching experiences and (4) student portfolios (see Table 4.18). It is suggested that such knowledge assets need to be audited by means of not only

mapping the knowledge and abilities of the teachers but also understanding the knowledge assets to enable the school members to know what sorts of knowledge are available to them (Hargreaves, 1999).

Subsequently, the school is recommended to establish knowledge repositories or databases to organise and maintain the audited knowledge so that the teachers may be able to store and access relevant knowledge and also to find relevant people for help or advice (Alwert and Hoffmann, 2003; Davenport, *et al.*, 1997; Earl, 1997; also see Section 2.5, Page 92-93).

By examining how the school organised its knowledge assets (see Section 4.4.5, Page 261-265), it appeared that the school did not attempt to indicate its teachers' specific knowledge and capabilities and make them known publicly. However, the teachers knew where to find experienced teachers for help or advice. Furthermore, the school did not specially adopt a system such as knowledge repositories or databases for the storage, maintenance and access of intellectual information such as teaching resources, individual teacher's teaching portfolios and records of educational activities. In a similar vein, the teachers expressed that they knew where these forms of intellectual information were located and were able to access them freely; however, they rarely looked at these documents. Accordingly, it is difficult to conclude the level of effectiveness of the school's organisation of its knowledge assets since the teachers tended to not utilise them. The above explanations suggest a question: Does the school actually need to organise its knowledge asset through such a system? Notwithstanding, the school may benefit from the use of the system through appropriate training of its teaching and administrative staff.

5.3.7 Did the school provide various contexts for knowledge sharing?

Referring to the discussion of the contexts for knowledge sharing (see Section 2.4.3, Page 77-79), *ba* and 'communities of practice' are indicated as the spaces for teachers' knowledge sharing (Nonaka, *et al.*, 2002; Von Krogh, 2003). While *ba* activates in accordance with the teachers' needs and occurs in a more natural and flexible manner; CoP nurtures its members' relationships with others and also builds a shared repertoire of the community. In spite of the differences, the aspects of them illustrate how the sharing and creation of knowledge may be carried out through teachers' interaction with each other within the contexts (see Table 2.6). Accordingly, I intend to examine whether the school provided various spaces for the teachers' knowledge-sharing.

Except systematising *ba* (i.e. the context where teachers attempt to combine existing explicit forms of knowledge), three other types of *ba* were occurred through the media the school provided, as follows:

- Originating *ba* took place in the big office where individual teachers were able to talk about their teaching, experiences, feelings or emotions with other teachers.
- Dialoguing *ba* took place in the meetings held by the teaching teams or the Committee of School Curriculum Development where the teachers were able to share their thoughts and ideas and subsequently integrate those thoughts and ideas for the educational activities or the development of the school-based curriculum. Besides, it also occurred when the school attempted to implement certain initiatives for teachers' professional development. For instance, the teaching team members were required to work collaboratively to design and

deliver the instruction for the peer observations. Throughout the process of their collaboration and the subsequent group discussion of the lessons, the teachers were able to share, observe, analyse and discuss the newly-obtained teaching strategies and techniques demonstrated or issues related to teaching. Moreover, the professional workshops enabled the teachers to convert the observed skills from the seeded teacher into their performances.

- Exercising *ba* took place when the teachers searched supplementary teaching materials from the school library or good practices of teaching by using the school's computers and the Internet service.

The above examples illustrate that the school did provide multiple contexts for knowledge sharing. However, without the administrative supports, originating *ba* and exercising *ba* would take place in any other circumstances through the teachers' informal interaction. That is to say, dialoguing *ba* was the context where the teachers interacted with each other formally. Consequently, besides the above examples of dialoguing *ba*, the school could have made better use of the morning meetings and the administrative affairs meetings to create more opportunities to encourage dialoguing *ba*.

Additionally, although there was no professional community existed inside the school, it was identified that certain groups of the teachers, such as the Grade 1 teaching team, shared some features in common as CoP (see Section 4.4.6, Page 266-267). For example, the members of the Grade 1 teaching team taught the same level of subjects and age of pupils; therefore, they were more likely to possess similar subject knowledge and to experience similar issues related to teaching and learning. Such the *joint enterprise* and *shared repertoire* allowed them to know what are relevant to bring up and how to present their ideas or experiences in more

efficient and effective ways (Wenger, 2000: 208-215; also see Lave and Wenger, 1992; Wenger, 1998; Section 2.4.3, Page 78). Moreover, their *mutual engagement* in the team meeting on every Friday afternoon allowed them to know each other better and gradually build rapport and trust (see Page 251 and 252 for T1's opinions). Nevertheless, I do not intend to strongly suggest the school to form any professional communities because of the lack of time. For instance, Wednesday afternoon was the only time when every teacher could meet together for more than one hour and it was used for educational seminars. Moreover, as the teaching hours of the teachers from different grades were different, it seemed difficult to ask the teachers to find extra time to form such communities.

5.3.8 Conclusion

In the above sections, I have discussed the factors encouraging teachers' professional empowerment, the efficiency and effectiveness of information dissemination and communication as well as appraisal and reward systems in the school, the influences of the school's atmosphere and culture on knowledge-sharing, collaboration and innovation, the effectiveness of knowledge assets organisation and access and lastly the variety of knowledge-sharing channels, from which the following conclusions are drawn:

- The adoption of centralisation brought about the difficulties in encouraging teachers' professional empowerment, the lack of communication and its flow and the conflicts between the teachers and the administrators.
- The lack of communication in the decision-making process existed and consequently a shared understanding of the currently-concerned educational issues, the school's visions, educational goals, future plans and the newly-established policies was not formed.
- Administrative information was disseminated effectively but not efficiently

across all levels of the school.

- Meeting management skills including communication skills and time management skills were lacking and therefore most of the school meetings were inefficient and ineffective.
- The appraisal and reward systems of the school were insufficient for the formation of personal knowledge-creating directions as well as the teachers' collaboration and knowledge-sharing.
- The harmonious interactive atmosphere among the teachers increased their willingness to share knowledge and work together with each other. On the contrary, the discordant interactive atmosphere resulted in the conflicts between the teachers and the administrators decreased the teachers' willingness to operate in coordination with the administrators, which might impede teachers' professional development and thus school improvement.
- The culture of the school partially supported the collaboration among the teachers but not yet supported individuals' motivation to innovate.
- Even the organisational knowledge assets of the school were not organised into a knowledge repository or database, the teachers knew where to find resources (including relevant educational information and specific expertise of the teachers).
- The school provided multiple contexts such as originating *ba*, dialoguing *ba* and exercising *ba* for knowledge sharing through the convention of meetings; the implementation of the peer observations and the professional workshops; and the supply of the big office, the school library, the computers and the Internet service.

By relating the above conclusions with Senge's (1990; also see Senge, *et al.*, 2000) five disciplines of learning organisations discussed in Section 2.5 (see Page 93-95), I would further conclude that the school was not yet improving towards a learning organisation. Firstly, although the notion of personal mastery (see Section 2.5) was fulfilled by some of the participants through their development towards *reflexive professional* teachers, half part of the teachers had a rather conservative attitude towards innovation, which might impede them to develop personal knowledge visions and also inhibit a culture for system thinking; that is, understanding the complexities, necessary and influences of changes and being motivated to create and improve. Secondly, even the notion of mental models and team learning were to some extent fulfilled through the teachers' reflection and dialogue via the multiple channels of knowledge sharing, knowledge created from such sharing contexts was not disseminated across all levels of the school. Finally, the process of the vision building and planning (refers to the decision-making process) did not involved every teacher's needs, interests, values and beliefs and also newly-made decisions were not disseminated and communicated with them, in which the notion of shared vision was hardly fulfilled.

By analysing the above conclusions, I would argue that the ultimate disadvantage of the school to promote teachers' personal knowledge management is the Principal's leadership style, which discouraged not only the teachers' professional empowerment but also the positive social relationship and interaction between the teaching and administrative sides. Consequently, I would suggest the Principal consider the concepts of transformational leadership and employ certain practical strategies to overcome the difficulties in implementing changes (Leithwood and Jantzi, 1997; Silins and Mulford, 2002; also see Section 2.5, Page 86-88). Initially, the Principal needs to be aware of her role in leading the individuals of the school towards the

improvements. Thus, instead of being conservative, the Principal needs to provide a big picture of where she wishes to guide the school towards the future and simultaneously to preach the benefits of educational innovation to achieve the effectiveness of teaching and learning. At the same time, as the Principal's relationships with the teachers and the administrators is specified as the key influencing their decisions to follow her, it is essential for the Principal to establish and maintain positive relationships such as being seen as trustworthy and competent (Barnett and McCormick, 2002; Chemers, 2001; also see Section 5.3.1, Page 280-282). As a result, the innovative culture may be fostered and the teachers may more likely be inspired to grow. Secondly, as the importance of creating and communicating vision is addressed for encouraging higher levels of commitment and motivation to overcome difficulties associated with the challenges of restructuring (Bass and Avolio, 1997; Leithwood and Jantzi, 1997; Leithwood, *et al.*, 1999; Lin, 2004; also see Section 5.3.1, Page 280-282), the Principal is suggested to attempt to involve every individual's opinions in the decision-making of the educational goals and policies and subsequently to disseminate and communicate the educational goals and policies so that a shared perception of these goals and policies could be formed and everyone may tend to accomplish these goals and also move towards the same direction with consensus.

With regard to the knowledge-sharing opportunities at the organisational level, I would recommend the school to disseminate administrative information efficiently by announcing it through written documents so that morning meetings and administrative affairs meetings can be used more effectively for the communication and discussion of currently-concerned educational issues, school visions, educational goals, developmental plans and teachers' comments (see Section 5.3.7, Page 290-292). Moreover, to foster the effectiveness and the efficiency of communication,

the individuals need to be trained for communication and time management skills. Thirdly, the adoption of centralisation needs to be abandoned (TESEC, 2001; also see Section 1.3.4.2, Page 19-20). Since the establishment of the Committee of School Curriculum Development gives both the teachers and the administrators the same authority, they need to be aware that they ought to work cooperatively rather than separately. Such awareness of their equity and collaboration may eventually facilitate them to build trust and mutual respect and therefore develop more positive social relationships and harmonious interactive atmosphere, which is curial for increasing the teachers' willingness to comply with administrative policies and to actively engage in designed initiatives for teachers' professional development (Harris, 2002; Stoll, 1999; also see Section 2.5, Page 89-90).

5.4 To what extent did my intervention influence the participants?

In the following sections, I intend to evaluate the usefulness of employing the concepts of teaching diary, observational notes and action learning with reference to the participants' recognition of their benefits.

5.4.1 How effective were the utilisation of teaching diary and observational notes?

To improve the effectiveness of teaching and learning, teachers are required the capability to identify what they have been doing wrong repeatedly and to understand the teaching contexts they involve in order to seek possible solutions for the problems (Diamond, 1991). For this to be achieved, I intended to encourage the participants to compose teaching diaries aiming to increase their awareness of their current practices and teaching contexts by discovering meanings and relationships

emerged from daily events and subsequently elaborating or integrating those meanings and relationships (Francis, 1995; Kerka, 1996; also see Section 2.4.2, Page 70). However, only one participant (T1) composed such a diary for a short period of time and her composition remained rather a pure description of everyday happenings, which may not reach the fulfillment of self-reflection (see Section 4.3.1, Page 183-184). Furthermore, the observational notes of the participants' teaching were originally provided to each of them to gain their validation for my observation of their classroom teaching.

However, in terms of the improvement of teaching, the usefulness of these notes was identified by most of the participants. Through reviewing these notes, they were able to indicate and reflect on incidents happened in their classroom teaching and subsequently to seek for possible solutions to deal with them (see Section 4.3.1, Page 184-185). Based on the above evidence, the review of the observational notes tends to be the more effective means than the composition of a teaching diary to foster teachers' knowledge development. The main reason may be that most of the participants were able to recognise the immediate benefits of the observational notes in a short period of time; that is, identifying issues happened in the classroom and solving them instantly (regarded as demands), which determined the higher level of their motivation to improve. Comparatively, the composition of a teaching diary requires a long-term effort and also deep and critical thinking (Maloney and Campbell-Evans, 1997), which may not easily be achieved even by an experienced teacher (means T1). Therefore, the advantages of writing a teaching diary might not be recognised by most of the participants and, together with the insufficient time they had, they tended to have no motivation to write their teaching diaries.

5.4.2 How was the implementation of the self-facilitated action learning set distinct from the organisational knowledge-creating initiatives?

Constructionists assert that knowledge is not only constructed by an individual's interaction with his/her own world (or experiences) but also co-created by his/her interaction with other individuals within a specific social community (Franklin, 1998; Schwandt, 1994; 2003; also see Section 2.2.1, Page 36-37). This implies that both cognitive and social processes are involved in knowledge expansion. This is one of the reasons why I have chosen to implement action learning for the participants to experience and benefit from the process of self reflection and social interaction by think and talking about their own experiences and others' experiences or ideas with the set members for a concentrated period of time (e.g. McGill and Beaty, 1995; Revans, 1983; 1998; Weinstein, 1999). Besides, the application of action learning can be seen as the *bottom-up problem-solving* means to teachers' professional development, which facilitated the participants to seek for solutions to their immediate teaching problems, did not require pre-training for certain skills and also organised by the participants themselves so that they were not under pressure (see Section 2.4.3, Page 75-76). It was identified that this particular self-facilitated action learning set achieved the process of knowledge development, sharing and creation (see section 4.3.3, Page 205-213). For instance, by means of working on the issues and difficulties the participants encountered, they attempted to organise their thinking and past experiences, to talk about their ideas and personal experiences with other set members, to reflect on others' opinions and experiences and thus to modify their current practices if inappropriate. More importantly, the participants had recognised the values of such the action learning set for their professional development and were motivated to continue the set even when the investigation was

ended. By comparing the action learning set with the peer observations and professional workshops, it is identified that they all share some features in common, as follows:

- The processes fostered different forms of knowledge-sharing such as teaching about ideas, experiences and knowledge; observing newly acquired teaching approaches or strategies; and demonstrating specific expertise.
- The implementation of them might bring about knowledge creation (mainly socialisation) in some degree; namely, adapting newly-acquired knowledge into teaching.
- Issues, such as motivation, attitudes, time and opportunities, abilities, social relationships and interaction and administrative supports, emerged from the process of the organisational knowledge-creating initiatives were also involved in the process of the action learning (e.g. Bourner and Forst, 1996; Collinson and Cook, 2004; McGill and Beaty, 1995; Wang and Ashleigh, 2005; Weinstein, 1999; Weir and Hutchings, 2005; Zuber-Skerritt; also see Section 4.3.2.3, Page 200-203 and Section 4.3.3, Page 206-210).
- The teachers were aware of the usefulness of these initiatives such as meeting their actual needs and were motivated to participate in them.

Nevertheless, the implementation of the action learning did have certain distinct characteristics from it of the school's knowledge-creating initiatives. These characteristics include:

- The practice of the action learning supported originating *ba* and dialoguing *ba* where the participants shared not only their knowledge technically but also their feelings emotionally and thus the social relationship and interaction were cultivated throughout the practice. However, the practice of the peer observations and the professional workshops merely supported dialoguing *ba*.

- To some extent, how the self-facilitated action learning set progressed was similar as 'community of practice' where the members talked about specific educational topics they were interested in and learned from each other through their regular engagements in the set meetings informally. Conversely, the peer observations and the professional workshops were formally designed by the school and the interaction among the teachers might disappear as the initiatives were accomplished.
- The implementation of the peer observations and the professional workshops concentrated on the involvement of the teaching teams; whereas, the action learning set members included teachers from different grades in which the notion of integration might be achieved through the understanding of how other levels operated, which might be viewed as the advantage in the implementation of the Grade 1-9 Curriculum.

5.4.3 Conclusion

In the above sections, I have discussed the effectiveness of the composition of a teaching diary and the review of the observation notes in terms of fostering teachers' knowledge development and also compared the distinct features of implementing the self-facilitated action learning from the organisational knowledge-creating initiatives designed by the school. In the light of the discussion, I would conclude that the review of the observation notes appeared to be more effective than the composition of a teaching diary for the achievement of reflection on the teachers' teaching practice. Notwithstanding, it is difficult to suggest the school to employ such the means due to the reason that such the initiative requires a person like me to record a detailed description of incidents happened in individual teacher's classroom teaching, which may be viewed as a waste of time and human resources from the school's perspective. According to the comparison between the implementation of the action

learning and the school's knowledge-creating initiatives, certain characteristics of the action learning are specified such as the support of originating *ba* and dialoguing *ba* and the potential achievement of the notion of integration in the implementation of the Grade 1-9 Curriculum. Nevertheless, such action learning requires the teachers to make a long-term effort to actively engage in set meetings on a regular basis, which may be an issue in terms of the availability of the teachers' time. Consequently, I would suggest that the school identifies and cultivates the existing groups inside the school such as the Grade 1 teaching team and to enlighten the successful stories of such groups to the rest of the teachers, which may to some degree inspire the teachers' awareness of the values of forming such groups with their teaching team members or teachers they get along with. Simultaneously, the school needs to monitor the dynamics of such groups to avoid certain drawbacks such as the conflicts between the Director of Counselling Division and the Preparatory Committee of the Teachers' Association (see Section 4.4.1.3). In other words, such informal groups foster collaboration and knowledge-sharing among the teachers. On the other hand, they can also be viewed as a danger when they attempt to overuse their power to resist certain people or events, which influences the atmosphere of the school.

Chapter 6 Concluding Remarks

6.1 Overview of Chapter 6

In this chapter, I attempt to firstly discuss the quality of the research concerning with not only methodological but also theoretical and practical issues in Section 6.2. Besides, as the primary focus of the research is on personal knowledge management and its potential benefits for professional development, it is essential to specify how myself as an individual have carried out the processes of personal knowledge management individually and collectively throughout the research process. For that reason, in Section 6.3, I intend to reflect on the growth of my tacit knowledge, which has taken place during the research journey, and how such growth leads me towards the future.

6.2 Critical Reflection on the Research

In the following sections, I tend to discuss the achievement of the research aims and questions, the comprehensiveness of the investigation, the appropriateness of the employed research methods, the fulfillment of ethical considerations and goodness criteria as well as the relevance and originality of the research.

6.2.1 Fulfillment of the Research Aims and Questions

In this section, I discuss whether I have fulfilled the research aims and answered the research questions through the accomplishment of the research process. Therefore, I attempt to go back to the research aims stated clearly in Chapter 1 (see Page 1-2) and to specify the strategies I have carried out to achieve these aims throughout the research process.

To embark on the research, I drew out the research context by reviewing on the subject of the knowledge economy and its impact on Taiwanese developmental initiatives and teaching and learning in general (see Section 1.3.2, Page 4-10). Moreover, I also introduced Taiwanese education and indicated its current reforms regarding to the implementation of its new national curriculum to meet the challenges of the knowledge economy and its impact on Taiwanese elementary schools and teachers (see Section 1.3.3 and 1.3.4, Page 11-22). Consequently, I was able to develop my arguments for the timely significance of the research to contribute mainly to the national and economic growths of Taiwan through the potentials of implementing knowledge management for elementary schools' and teachers' improvements. Secondly, I developed the theoretical underpinning of teachers' personal knowledge management by: (1) reviewing so-called knowledge in philosophical paradigms and knowledge management literature and (2) comparing, connecting and integrating the concepts and practices of knowledge management in business and education in both Western and Taiwanese contexts, teachers' knowledge and their professional development (including Kelly's personal construct theory) and school improvement with particular reference to 'school as learning organisations' (see Chapter 2, Page 28-98). Along with my examination of the current studies of teachers' knowledge management in the Taiwanese elementary schools (see Section 2.3.2, Page 54-56), I was becoming clearer about the research direction and thus able to define the research aims, themes and questions. Retrospectively, I am confident that the choice and application of the research methods were appropriate and effective for answering the research questions. The application of interviews and observations were useful to answer the first research question: What are the current practices of teachers' personal knowledge management and issues involved in the practices in a Taiwanese elementary school? (see Section 3.2, Page 104) The use of interviews enabled me to gather information in relation to the processes and

components of teachers' personal knowledge management and the use of observations facilitated me to indicate the emerging issues and factors involved in these processes and components within the case school (see Section 3.8.1 and 3.8.2, Page 133-144). Furthermore, the implementation of certain development methods, such as autobiography, reflective journal and action learning, was practical for the six participants to experience the practices of self-reflection and knowledge-sharing (see Section 3.8.2, 142-144 and Section 3.8.3, Page 146-147). By means of making the participants engage in these developmental initiatives and asking their opinions on such experiences, I was able to answer the second research question: How can the application of autobiography, reflective journal and action learning foster teachers' self-reflection and knowledge-sharing in that particular elementary school? (see Section 3.2, Page 105) Accordingly, different sources of the collected data were presented under the themes in question as a case study reporting mode for analysis (see Chapter 4, Page 175-270). That is to say, I intended to provide the detailed description of the case school's and the six participants' backgrounds and to present the collected data by drawing out the storyline of the observed incidents accompanying with the interview respondents' opinions, which were classified and combined according to the research themes to which they belonged. As a result, I tended to add my personal commentaries on these relevant empirical data and to draw the research findings from the data analysis. Based on the research findings, I discussed the level of the teachers' effectiveness and the school's support for the promotion of teachers' personal knowledge management in the light of the literature review and consequently provided a set of practicable recommendations for the school and its teachers to foster teachers' professional development and school improvement (see Chapter 5, Page 271-301).

6.2.2 Goodness of the Research

In this section, I evaluate the quality of the conduct of the research by means of: (1) discussing whether the ethical considerations and guidelines proposed were achieved, (2) indicating whether the research findings are trustworthy in terms of approaching the methodological adequacy of the data collection and analysis methods and (3) specifying whether the conduct of the research fostered the authenticity criteria; that is, reconstructing the respondents' viewpoints in an equal manner and making a positive impact on the development of the participants.

To what extent was the research conducted ethically?

During the investigation, I have borne in mind the ethical principles and performed most of the ethical guidelines proposed since I was highly involved in various interpersonal circumstances (see Section 3.6, Page 126-130). Firstly, to obtain consent from the case school and the six participants, I explained the nature and scope of the research in detail and negotiated with them for any subsequent data collection actions (BERA, 2003). Secondly, I overcame the principle of deception and harm since all of the six participants gave me a positive answer when asking them whether they had encountered negative feelings by my methodological actions in the middle of the research. Moreover, when one of the participants (T4) criticised another participant (T1), I maintained a neutral position and did not express my personal opinions. Similar reaction was applied when the participants had criticised particular administrators or teachers. Besides, I was also concerned about my presence and image within the school and therefore tended to greet with and smile to every administrator and teacher. In the course of my time being in the school, I felt welcomed and the staff were friendly to me. At the end of the semester administrative affairs meeting, which was on the last day of the investigation, I prepared a small gift with a card for all the staff to show my appreciation for their

kindly assistance. By the end of the meeting, the Principal invited me publicly to the end of the semester dinner party. The above instances denote that I did not to any degree bring about negative feelings or cause problems to the school and the staff had become seeing me as a *relative* insider throughout the investigation. Thirdly, in terms of approaching the principle of anonymity and confidentiality, the observational notes and the interview transcripts were only shared with the relative respondents and the information provided by them was not mentioned in my interactions with the six participants. Additionally, I encoded the name of the school and the six participants when writing up the thesis to avoid negative effects resulted from external recognition (Punch, 1998). However, the only ethical guideline I did not follow was providing the final draft of the thesis to either the school or the participants to avoid negative effects resulted from internal recognition (Cohen, *et al.*, 2000). For example, the Principal may treat the respondents differently if she perceives criticisms from reading the thesis. Similarly, certain participants as T1 may realise that some participants as T4 has made negative judgments on her.

To what extent are the research findings trustworthy?

The trustworthiness of the research findings has been established by approaching the standard of credibility, transferability, dependability and confirmability throughout the research process (Lincoln and Guba, 1985: 290-301; also see Guba and Lincoln, 1989). The criterion of credibility is concerned with the truth value of the research findings within the respondents and the school context being investigated. To achieve such a standard, I adopted the techniques of prolonged engagement, persistent observation, referential adequacy materials, triangulation, member checking and peer debriefing proposed mainly by Erlandson and his co-writers (1993; also see Section 3.10, Page 165-168). Firstly, I made an effort to be in the school almost everyday from September 2004 to January 2005. Such an attempt enabled me to apprehend

what was going on within the site and also to build rapport and trust with the six participants, which enabled me to gather more in-depth data. Secondly, in the course of my immersion in the school, I observed the activities for teachers' professional development, the educational and administrative affairs meetings and the naturally-occurring incidents related to the themes in question with an open and sensitive mind, which fostered the notion of purposive sampling. Such persistent observation assisted me to catch and experience the culture, the atmosphere and the events happened within the school and therefore to get insights into the school culture, atmosphere and situations from an insider's perspective, which led me to deeper understanding of the collected data. Thirdly, along with the contextual materials such as the pictures of the school's physical environment and the participants' classrooms as well as the 'pupil journal', I was able to interpret the empirical evidence comprehensively and thus to develop my own constructions of the research themes (i.e. the research findings). Fourthly, triangulation of the data sources through the use of the numerous respondents and the application of the various research methods helped me to maintain a critical attitude towards the multiple realities of the phenomena being investigated and additionally to increase the degree of convergence by considering these different perspectives of the situations equally. Fifthly, the collected data such as the interview transcripts, the observational notes and the meeting minutes of the action learning set were checked by the relative respondents. However, the translated quotations from Mandarin into English were not provided for the respondents' validation since I was aware that they might get negative feelings if I asked them to check the English version of the transcripts. Furthermore, my immediate interpretations of the incidents being observed were also addressed in the informal conversational interviews with the six participants with the intention of increasing the degree of convergence by asking for opinions regarding to my own interpretations from the *complete* insiders of the

school setting. Lastly, throughout the research process, I have carried out formal and informal interactions with my supervisors and others who put forward pertinent advice, criticisms and questions, which supported me to minimise possible bias in the collection and analysis of the data. The above discussion is my justification of how I have made an effort to establish the truthfulness of the research outcomes. Notwithstanding, by embracing the epistemological perspectives of constructionism, I would argue that the findings of the research are tentative and merely valid within the school context during the research timeframe.

The criterion of transferability requires me to extend the applicability of the research findings from the site to other educational settings. As indicated clearly in Section 3.4.2 (see Page 116-117), I do not intend to produce abstract propositional generalisations from the research findings. Instead, I attempt to inspire readers by reconstructing the social phenomena of teachers' personal knowledge management within the specific school context. To enhance readers' judgement on the transferability of the research findings to other educational settings, I provided a full account of the research context, the backgrounds of the case school and the six participants, the detailed description of the observed incidents including their causal relationships. That is to say, readers may be able to: (1) apprehend and interpret such reconstructions, (2) draw their own conclusions and (3) determine the implications of their own constructions or my constructions in regard to the themes in question (Lincoln and Guba, 2000; Stenhouse, 1985).

To demonstrate the dependability of the research, I intended to specify the phenomenal- and design-induced changes in detail by providing a full account of how the research was conducted comprising the detailed description of the research process, why and how the case study approach was adopted, how the methodological

implications drawn from the theoretical perspectives of constructionism were applied during the investigation and how the chosen research methods were flexibly used. Furthermore, I critically examined the influences of my prior knowledge and my role as a *relative* outsider in the research process and also indicated how the emerging themes were taken into account in the process of data collection (see Section 3.5, Page 120-125). Such a reflexive account of the research process and myself as a researcher may assist readers to understand the unstable and unpredictable issues or factors as well as my knowledge, values and role involved in the investigation that had or might have effects on the research findings (Griffith, 1998; Henwood and Pidgeon, 1993; Robson, 2002; also see Section 3.10, Page 171-172).

To increase the degree of confirmability of the research findings which should be determined by the research respondents and the conditions of the investigation, I organised all records of the research products into printed and electronic files including the research instruments (the research proposals for the Principal and the six participants, ethical guidelines, questionnaire, interview schedules and questions, guidelines and form used for observations, guidelines for teaching and research diary, guidelines and timeframe for the action learning) and the full set of the raw data (the questionnaire responses, interview transcripts, observational notes and forms, documents and contextual materials). The English and Mandarin versions of the research instruments are provided as appendices in the thesis so that readers or other researchers are able to access these materials. Some of the raw data such as the direct quotations of the respondents and the description of incidents observed are also presented in Chapter 4 as the appendices of the thesis. By supplying such empirical evidence, readers may critically review the research and confirm the research findings; other researchers may take these materials as the references for further research.

To what extent did the investigation foster authenticity?

According to the nature of the research, the trustworthiness criteria were adopted to evaluate the methodological adequacy; whereas the criteria of authenticity were accepted to examine: (1) whether the research has reconstructed the multiple realities being inquired in a balanced and evenhanded manner and (2) whether the research has brought about positive influences on the participants (Guba and Lincoln, 1989: 245-250; Erlandson, et al., 1993; LeCompte and Preissle, 1993; also see Section 3.10, Page 169-171). These two distinct features denote particularly the goodness of such constructionist research from other anti-positivist research.

To achieve the criterion of fairness, I attempted to gather relevant information about the current initiatives and conditions provided by the case school to foster its teachers' personal knowledge management from the perspectives of different angles by means of interviewing the administrative staff (i.e. the Principal and the Section Chief of Teaching and Learning) and the teaching staff (i.e. the six participants). Secondly, I provided the interview transcripts for the individual respondents to make further modifications. Finally, I used direct quotations of the individual respondents and compared these two different standpoints to represent the multiple realities of the phenomena related to the research themes. The above subsequent actions exemplify how I have achieved the criterion of fairness.

In terms of the practical significance of the research, I would suggest that it is my intervention in the daily practices of the six participants and also their interaction with each other during the investigation. Such an intervention and interaction foster the other four criteria of authenticity to some degree. As discussed previously, my interaction with the participants, my supply of the observational notes and their engagement in the self-facilitated action learning set enabled the participants to

experience the processes of self-reflection and knowledge-sharing. Thus, the criteria of ontological, educative, catalytic and tactical authenticity have been demonstrated through the six participants' acknowledgements of the benefits of the observational notes and the self-facilitated action learning. As discussed in Section 5.4.1 (see Page 296-297), most of the participants identified that they were able to access and examine their teaching and consequently to find out better ways to improve their practices through the review of the observational notes. Moreover, in Section 5.4.2 (see Page 298-300), I specify that the participants recognised the value of the dialectic process carried out through the implementation of the action learning set and were motivated to continue the set. Such the knowledge-sharing process enabled the participants to access their own and others' past and current experiences, to expand and advance their tacit knowledge and subsequently to influence their professional decisions and actions. As the benefits of self-reflection and knowledge-sharing were recognised by the participants, it can be argued that my intervention might to some degree encourage their willingness to improve themselves professionally and thus the effectiveness of teaching and learning. Besides, in the matter of the educative authenticity, I assume that the participants might broaden and enhance their tacit knowledge by understanding my constructions outside the school context through our informal interaction. For example, they might to a certain extent apprehend the purposes of the research methods being adopted and how to apply them in school-based research as experiencing the whole process of the investigation. Moreover, some of them might obtain knowledge on the subject of knowledge management, learning organisations and the comparison between Taiwanese and English education in the course of talking about or exchanging books related to these subjects with me. Notwithstanding, I am not able to provide evidence to demonstrate the achievement of the educative authenticity since the above assumptions are only recognised and realised when I came to the stage of writing up

the thesis.

6.2.3 Uniqueness of the Research

In this section, I intend to specify the unique characteristics of the research by means of evaluating its relevance and originality (Denscombe, 2002; Sliverman, 2005). In other words, I attempt to discuss: (1) whether the research relates to existing knowledge and/or timely practical needs through the way it fits in with my interests and abilities and (2) whether the research is different from previous research in the choice of a topic, the application of research methodology and/or the analysis of data in the context of Taiwanese education.

To what extent does the research relate to existing knowledge and needs?

The research is particular significant in terms of: (1) its connection with the knowledge existing in some of the literature regarding to the research themes, (2) its intervention in bringing about changes for the effectiveness of teaching and learning within the specific Taiwanese elementary school context, (3) its timely relevance to current economic and educational concerns in Taiwan and (4) its potentials for my learning and continuous development. Here, I do not intend to specify Point (2) and (4) because they are discussed in Section 6.2.2 (see Page 310-311) and 6.3 (see Page 317-328) respectively.

Instead of building the developed knowledge upon the existing knowledge, I made an effort to offer alternative explanations for the research themes. Firstly, I have critically reviewed some of the literature on the subject of knowledge, knowledge management in general, personal knowledge management, knowledge management in education, teacher' knowledge management in the Taiwanese elementary educational context, teachers' knowledge, Kelly's personal construct theory, the

practices of teachers' professional development and school improvement with reference to 'schools as learning organisations'. Nevertheless, it was not possible in this thesis to broach all means of knowledge management specifically and exhaustively, such as how organisational culture makes an impact on the process of knowledge sharing, owing to the fact that each concept is complex enough to conduct another piece of Ph.D. study. Secondly, I drew out the implications for teachers' personal knowledge management from: (1) the comparison between knowledge management and personal knowledge management in the field of business and (2) the critiques in regard to the current concepts and practices of knowledge management in the Western and Taiwanese educational contexts. Finally, I developed building blocks as the processes and components of teachers' personal knowledge management by integrating some of the pertinent concepts of knowledge management in general with the practical initiatives of teachers' professional development and school improvement. Distinct from the arguments claimed by some of the educational knowledge management literature (see Section 2.3.1, Page 50-53), I based the framework of teachers' personal knowledge management on my apprehensions and interpretations of the existing theories and practices. Throughout the development of the framework of teachers' personal knowledge management, I also attempted to bring different elements in a new way. For example, I indicate various forms of knowledge discussed in some of the knowledge management literature and attempt to classify them according to different principles in Table 2.2 (see Page 37), which can be seen as a new way of looking at various forms of knowledge. Moreover, in Section 2.2.3 (see Page 41-46), I argue that many knowledge management practitioners classify knowledge management initiatives according to their focuses, such as Davenport and Prusak's (1998) four types of knowledge management projects: knowledge repositories, knowledge access, knowledge culture and knowledge assets. However, I attempt to classify various

knowledge management initiatives within the context of positivism and constructionism into the three dimensions of knowledge management, which is another example of how I integrate relevant theories in a new way.

Furthermore, since Taiwan is facing the challenge of the knowledge economy, its Government has recognised the importance of cultivating competent and creative citizens to foster its economic development partially through the implementation of the Grade 1-9 Curriculum (see Section 1.3.4, Page 17-22). Hence, elementary teachers in Taiwan have an essential task to ensure that the core learning competences of the new national curriculum are carried out, which is likely to be achieved through their active learning and continuous development. Since teachers' personal knowledge management is suggested in this thesis as the means to approach such the professional development, I would argue that the research is worthwhile to the extent that it may not only inspire Taiwanese educators and educational practitioners with the possibilities of the practices of teachers' personal knowledge management but also raise the Taiwanese educational administrative agencies' attention to the issues involved in the promotion of teachers' personal knowledge management. In other words, the research is conducted in the fullness of time to contribute to the improvements of Taiwanese education and partially its economy.

To what extent does the research contribute to new knowledge?

In the light of my critical review on eight studies in regard to teachers' knowledge management in Taiwanese elementary schools (see Section 2.3.2, Page 54-56), I drew out the implications from these studies for the conduct of the research (see Section 2.3.4, Page 59-60). Such implications influenced on my construction of the theoretical propositions and my determination of the methodological decisions, which makes the research distinct from the studies of teachers' knowledge

management in the Taiwanese elementary educational context. For instance, most of the studies aim to explore the status quo of teachers' knowledge management or to relate the practices of teachers' knowledge management with other educational subjects in elementary schools from different regions in Taiwan mainly by using quantitative questionnaire surveys. Such research methodology appears to generate the surface findings which do not attempt to specify the actual processes and initiatives of how teachers carry out their personal knowledge management and the necessary conditions Taiwanese elementary schools should provide to foster their teachers' professional development. Accordingly, I took the above concerns into account and intended to conduct in-depth research by adopting the case study approach with various qualitative research methods to generate comprehensive and context-specific information since I believe that teachers' personal knowledge management involves ongoing processes promoted through individual and organisational endeavours which cannot be fully understood and reflected by examining merely on the demographic and environmental variables of schools and the personal and educational variables of teachers. To represent the multiple realities and reconstruct the social phenomena of teachers' personal knowledge management within the specific context, I made an effort to put the empirical data into order, to use direct quotations, to provide detailed description of incidents and to add my personal commentaries. Being embracing the ontological perspectives of constructionism, I believe that such an effort not only facilitates readers to understand my own interpretations and constructions but also allows them to construct or create their own realities through the interaction with my thoughts, the research respondents' opinions and the stories happened on site (see Section 3.3.2, Page 108-110). Based on the above discussion, I would suggest that the research to a certain extent contributes to knowledge specifically in Taiwanese elementary education in the matter of its research methodology and methods.

Besides the above distinct characteristics regarding to the choice of the themes in question and the application of the research methodology and methods, I would further indicate that the research is unique in the matter of demonstrating incorporated perspectives of Eastern and Western cultures in teaching and learning, knowledge management, teachers' professional development and school improvement. As a Taiwanese student studying in the UK for almost six years, I have been influenced by its educational system and views as well as culture through the access of the Western literature and the exchange of views via my Ph.D. supervision and informal conversations with fellow students and critical friends (see Section 6.3.1). Along with my former education in Taiwan, my educational experiences bring about an advantageous position for me to comprehend Eastern and Western educational views and literature. Having such a favourable position facilitated me to gain insights from the comprehensive comparisons of: (1) the aspects of knowledge management and how they are applied in Western and Taiwanese educational contexts and (2) the practices of teachers' learning and continuous development. Consequently, such insights were employed in the process of analysing the collected data and discussing the research findings within the Taiwanese elementary school setting. Thus, the thesis involves the consideration of multiple perspectives, which makes the research distinct from other studies of teachers' knowledge management conducted in Taiwan.

6.3 Promotion of My Personal Knowledge Management

In the following two sections, I specify how I have carried out the process of knowledge construction, development, sharing and creation throughout the research journey and how the processes have brought out the growth of my knowledge, which to some degree makes an impact on my future development.

6.3.1 Processes of My Personal Knowledge Management

As claimed in Section 2.4 (see Figure 2.2, Page 61), the processes of teachers' personal knowledge management can be viewed as an interrelated cycle, which consist knowledge construction, development, sharing and creation. Consequently, in this section, I attempt: (1) to indicate how these processes relate to the research process, (2) to exemplify how they are interrelated with each other and (3) to illustrate how the fulfillment of them fosters the growth of my tacit knowledge.

Knowledge construction

In Section 2.4.1 (see Page 62-64), I adopt Kelly's personal construct theory to illustrate how teachers construct their knowledge and use his CPC cycle to demonstrate how teachers apply their knowledge when dealing with situations. The discussion is also transferable to explicate how I have constructed my theoretical and methodological knowledge continuously throughout the conduct of this research. Before proceeding to this research, I like other individuals had my own perspectives (personal constructs) on the world economy, business strategies, the Taiwanese education, teaching and learning, teachers' professional development and school improvement. Those perspectives are constructed through my previous education in Taiwan and in the UK as well as my life experiences such as reading interested books or journals and talking to my family and friends. My personal construction systems

of business and education lead me to the anticipation that the concepts of knowledge management in business may bring about potentials for the practices of education and subsequently lean me towards the interest in linking up the business management strategy with educational practices with particular reference to teachers' learning and incessant development. Nevertheless, subsequent to embarking on the contextual and literature reviews, some of the constructs within these two systems remained and others were revised as a result of my interaction with diverse writers and personal reflection. For instance, distinct from my previously-held ambiguous assumption of the feasibility of the transfer of the concepts of knowledge management from business to education, I now tend to believe that: (1) the aspects of knowledge management are not new and the notion of knowledge management can be regarded as the integration of various subjects such as management information systems, human resource development including individual continuous learning and organisational learning and organisation studies such as in learning organisations (e.g. Davenport and Prusak, 1998; Scarbrough and Carter, 2000; Wiig, 2000; also see Page 41-46), (2) the concepts and practices of knowledge management in business cannot entirely be applied to various educational settings since the nature of the purposes, strategies and circumstances involved in these two fields partially differ from each other (e.g. Hargreaves, 1999; Lin, 2002; Petrides and Nodine, 2003; also see Page 53) and (3) the promotion of knowledge management needs to be people-centred rather than organisation-centred since organisations do not learn and it is individuals within the organisations who learn, improve, create and innovate (see Page 53). Accordingly, I then therefore define the theoretical orientation of this research is mainly on the human resource development and organisation studies of knowledge management (see Page 59-60) because I am convinced that how teachers know what they know can be regarded as constructionist epistemology (see Page 58). Moreover, the practical orientation of this research is primarily on how teachers

construct, develop, share and creation knowledge and secondary how a school could support the processes by providing essential conditions (see Page 59-60). Such revised constructs result in the reconstruction of my construction systems of teachers' personal knowledge management by reviewing the subject of personal knowledge management and Kelly's personal construct theory and relating the existing practices of teachers' professional development and school improvement with reference to 'schools as learning organisations' to the concepts of knowledge management in general. Subsequently, I build the linkages of these reviews based on the theoretical and practical orientations of this research to develop the framework of teachers' personal knowledge management. The above illustration exemplifies not only the interrelationship among personal constructs but also Kelly's (1955; 1965) proposition of 'construction alternativism'.

Furthermore, in terms of the construction of my methodological knowledge, I attempt to utilise Kelly's CPC cycle to examine how I apply such knowledge in the investigation. Based on my earlier experience of conducting research for my masters study, I have constructed my tacit knowledge of research methodology and methods, which was taken into account in the design of data collection; namely, predicting certain issues might emerge through the application of interviews in regard to research ethics and communication with the respondents. Moreover, the methodological decisions were also influenced by interacting with the experiences and thoughts of numerous writers of research methodology books. However, things will not always go as smoothly as they are planned especially when entering novel circumstances. As I made an effort to validate certain constructs in the course of the investigation, some of them appear to cause drawbacks. For example, before starting the investigation in the case school, I considered what sorts of relationship to build with the six participants such as 'an adviser-a collaborator' and

'researcher-participant relationship-friendship' (Circumspection phase). My previous experience of investigating English teaching in that particular school leaned me towards the choice of friendship (pre-emption phase) since my harmonious relationship with its English teacher had enabled me to gather vivid and in-depth information. Although the intention of building rapport with the six participants (control phase) enabled me to gain informed consent and their cooperation, such a relationship specifically between T4 and me generated personal perceptions of each other and therefore to some degree affected the application of certain activities, action learning and interviews. Accordingly, when confronted with similar situations again, I may be conscious of the distance between research participants and me.

Knowledge development

In Section 2.4.2 (see Page 65-72), I relate Kelly's creativity cycle to the process of teachers' knowledge development and highlight the importance of reflection in fostering the development of tacit knowledge. Here, I also attempt to use the creativity cycle to illustrate the development of my theoretical knowledge in relation to the practices of teachers' personal knowledge management. Firstly, I began to loosely think about my existing construction systems of: (1) knowledge management in business and in education, (2) Kelly's personal construct theory, (3) teachers' professional development, (4) school improvement and (5) learning organisations, which were created through the review of the literature (loosened construction phase). Subsequently, I tried to build the linkages among the personal construct theory, personal knowledge management, teachers' professional development, school improvement and learning organisations with the purpose of developing my arguments for the practices of teachers' personal knowledge management (tightened construction phase). Finally, as I came to the stage of making my tacit knowledge explicit, I tended to integrate my composition with supportive evidence from the

literature in order to clarify and verify my claims (test phase). The above example infers the importance of reflecting on not only my own perspectives on the research themes but also other practitioners' works.

Besides, in terms of the development of my methodological knowledge, throughout the research process, I kept the research journal which included the description of issues I had encountered and my opinions of why they had occurred and possible solutions or subsequent actions for the issues. Giving the example of 1st November 2004, I noted that certain relevant issues were not addressed in the semi-structured interview schedule and thus I decided to include those issues as a list of questions in the informal conversational interview with the six participants. In the light of the experience, I recognise that this type of interview is particular practical to adopt in constructionist research where research themes emerge and become clearer. Without such critical awareness, the deconstruction and reconstruction of my own construction systems may not be preceded. Moreover, without keeping such a reflexive journal, it may be hard for me to apprehend my own construction systems including my methodological practices and the context in which I involve and also to gain further access to the development of my tacit knowledge as a basis for future development.

Knowledge sharing

In the course of the research process, my knowledge construction and development were carried out mainly through my interior interaction with various writers of academic books and journals and my experience of undertaking the investigation in the case school, which are influenced by my previous educational and research experiences and fostered by my critical reflection on those readings and experiences. Nevertheless, to fulfill personal knowledge management, it is also crucial to consider

the process of interacting with other human beings within a social context. This denotes the importance of accessing, communicating and understanding others' tacit knowledge (i.e. experiences and opinions). In this regard, I specify the activities of and contexts for knowledge sharing in which I have had involved during the research process and also indicate the advantages brought about from such the knowledge-sharing process. To explain my experience of knowledge sharing more explicitly, I classify those sharing activities into three contexts they had taken place, as follows:

1) Community of practice

As pointed out in Table 3.1 (see Page 101), from January 2003 to June 2004, I have undertaken the research methodology course delivered by the Faculty of Education at the Nottingham Trent University (NTU). The course took place on Wednesdays nearly every two weeks and involved a group of Ph.D. students from different levels. During each session, 'student issues' were brought up by the students and subsequent discussion for the issues was arisen among the students to seek solutions. Afterwards, the leading teacher provided handouts of a methodological topic and shared their experiences in regard to the topic. In the light of the topic, individual students of each group talked about their thoughts or experiences, articulated them as concepts and shared those concepts with other groups. By participating in such sessions, I was able to not only share my difficulties in conducting research and opinions about a variety of methodological subjects but also access to and understand successful or failing stories of how other educational practitioners endeavour to do research. The context of such a course can be viewed as one kind of 'community of practice' owing to the following reasons (Lave and Wenger, 1991; Wenger, 1998; 2000; also see Section 2.4.3, Page 78):

- The members had a *joint enterprise* in relation to educational (or social) research methodology and methods so that we knew what were relevant to talk about.
- With our *mutual engagement* in the course, we were able to communicate explicit and tacit forms of knowledge with each other through joint discussion and problem-solving activities. Moreover, by interacting actively all the while, we to some degree built friendship with each other eventually.
- We had a *shared repertoire* of resources; that is, educational and methodological terms and concepts, which enabled the efficiency and effectiveness of communication.

2) Originating *ba*

According to the comparison between ‘*ba*’ and ‘CoP’ (see Table 2.6, Page 79), I tend to apprehend other kinds of knowledge-sharing activities taken place in the diverse contexts of *ba* (Nonaka, 1998; Nonaka, *et al.*, 2001; 2002; also see Section 2.4.3, Page 77). Originating *ba* had emerged from my face-to-face interaction with other individuals. The circumstances included: (1) talking about my research with educational or business practitioners in seminars or conferences, (2) discussing issues or emotions encountered during the research process with fellow research students or critical friends, (3) seeking advice on the conduct of the investigation from the three pilot participants and (4) exchanging my perspectives and books in relation to ‘knowledge management’ and ‘learning organisations’ with two of the six participants (see Section 3.5.2, Page 124). Consequently, I was able to get valuable feedback from professionals related to the fields, suggestions from my peers who partially experienced similar situations, encouragements to overcome negative feelings and relevant advice and perspectives on some research themes from people involving in the research

context.

3) Dialoguing *ba*

Dialoguing *ba* had emerged from my regular face-to-face interaction with my two supervisors collectively who had facilitated me to clarify the research aims, emphases and questions, brought up critical questions to challenge the arguments I had developed, advised on the design of the research methodology and methods to ensure the progress of the investigation, assisted me with the structure and contents of the thesis when I came to the stage of writing up and supported me when I felt uncertain. The nature of dialoguing *ba* and originating *ba* is similar to some degree; that is, fostering tacit knowledge sharing and subsequently creating more advanced knowledge. However, dialoguing *ba* brings about the conversion of my personal knowledge from tacit to explicit, which enables me to explicate my understanding of existing theoretical knowledge, my articulation of the theoretical knowledge as the rather new propositions for teachers' personal knowledge management and my application of methodological knowledge to the conduct of the research comprising the planning, implementation and evaluation of the investigation.

Knowledge creation

Following on the above discussion, I would argue that my own construction systems, established through the deconstruction and reconstruction of my personal constructs, were regarded as the basis for knowledge creation. Moreover, the practices of my knowledge construction, development and sharing to a certain extent brought about knowledge creation. That is to say, these four processes of personal knowledge management were interrelated. The instances are demonstrated in the following table by using Nonaka and Takeuchi's (1995) SECI model:

Table 6.1 Activities of my knowledge creation.

Socialisation (from tacit to tacit)	Externalisation (from tacit to explicit)
<ul style="list-style-type: none"> • Participated in the methodology course. • Joined educational and business seminars and conferences. • Discussed issues related to my research with my supervisors on a regular basis. • Discussed issues with fellow research students and my critical friends on an occasional basis. • Exchanged ideas or books with two of the six participants. • Conducted the pilot study of the semi-structured interview schedule. • Applied my methodological knowledge in the investigation such as (1) putting the design of research ethics and methods for data collection and analysis into practice and (2) being aware of my emergent thoughts and putting them into the data collection process. 	<ul style="list-style-type: none"> • Synthesised my perspectives on the context and themes in which the research involved and subsequently clarified research aims, emphases and questions. • Put my methodological knowledge into the design of research methods in a written form. • Reflected on the research process and subsequently composed my reflections as the methodology chapter of the thesis. • Interpreted the multiple realities gathered and the incidents observed and subsequently composed my interpretations as the research findings. • Kept records (i.e. supervision forms and emails) of the discussions with my supervisors. • Kept writing the research journal as a reflexive journal during the research process.
Internalisation (from explicit to tacit)	Combination (from explicit to explicit)
<ul style="list-style-type: none"> • Searched relevant resources from the libraries and the Internet. • Read the literature on the subject of research methodology and methods and subsequently synthesised my understanding of those readings. 	<ul style="list-style-type: none"> • Organised my reflections on the readings into files. • Composed the contextual and literature review chapters of the thesis. • Organised the printed raw data into files. • Discussed the research findings in the light of the literature. • Developed applicable suggestions for the case school and its teachers according to the research findings.

Source: adapted from Nonaka and Takeuchi (1995).

The various knowledge creation activities pointed out in Table 6.1 denote their interrelated and ongoing relationship among socialisation, externalisation, combination and internalisation. Giving the creation of my methodological knowledge as an example, I firstly internalised concepts obtained from the reading of some of the relevant methodological literature and externalised my understanding as the design of the research approach, ethics, data collection and analysis methods and quality criteria. During the investigation, I attempted to put the design of the investigation into practice and to reflect on my practice and emergent thoughts critically and continuously. Such reflections and thoughts were noted down in my research diary. Consequently, my synthesis of pertinent methodological concepts, my application of these concepts to the design, the implementation and evaluation of the

investigation and the written reflections on the research progress were combined and composed as the research methodology and methods chapter of the thesis.

Key issues involved in my personal knowledge management

In retrospect, I am conscious that I have to a certain extent become a *reflexive professional* research student (Kirkham, 2003), who has been inspired and applied newly-developed knowledge throughout the research. My improvement from a research student who had limited theoretical and methodological knowledge towards such a *reflexive professional* research student could not come about in a short period of time, it has happened as an ongoing learning process facilitated by certain crucial factors which are specified as below.

1) Motivation

My motivation can be viewed as the drive to embark on the Ph.D. study, which is influenced by my career demand, research interests and personal aspiration. Firstly, being able to teach at any Taiwanese higher educational institutions requires a Ph.D. degree. That is to say, it is essential for me to obtain a Ph.D. degree with the purpose of approaching my personal career planning. Secondly, my personal interest in reading books with respect to business and educational management promotes my willingness to learn and research in the field of knowledge management, learning organisations, personnel development and school improvement. Thirdly, my personal aspiration to make a contribution towards the improvement of Taiwanese elementary education encourages me to conduct the research in such the context. The above three factors made an impact on my decision to undertake the research. Hence, they determined the active and open attitude towards new ideas, challenges, criticisms and feedback as well as the high degree of my willingness to create knowledge and accomplish the study.

2) Learning environment

Without a supportive learning environment, it would be difficult for me to achieve my career demand, research interests and personal aspiration alone. Such supportive conditions within the environment are provided mainly by my supervisors, the fellow research students, the case school and the NTU. The harmonious interaction with my supervisors and the fellow research students bring about mutual trust and friendship, which encourages me to propose difficulties, ask questions and talk about ideas without being afraid that they may look down on me. The welcoming and friendly atmosphere was experienced when carrying out the investigation in the case school so that I felt comfortable to talk with the people and observe any incidents. Besides, studying at the NTU offers me the opportunities to engage in the activities of collaborative learning throughout the research methodology sessions, to participate in business and educational seminars and conferences and to access easily academic books and journals.

6.3.2 Implications for Future Development

In the previous section, I explicate my recognition of the significance of engaging in the processes and activities of personal knowledge management as the practice of my personal and professional development. The discussion inspires me with a question to be considered for my further self-development; that is, how I should make use of the knowledge constructed and created through the conduct of the research, which is answered in this section. Firstly, I intend to disseminate the constructed and created knowledge by means of using it in my teaching, publishing the thesis and publishing research papers through relevant seminars and conferences. Such dissemination may: (1) allow me to share new knowledge with students, other researchers and practitioners who are interested in teachers' personal knowledge management and (2) enable me to gain valuable comments or insights through the interactions.

Furthermore, based on the theoretical and methodological knowledge constructed in my own construction systems, I shall attempt to carry out further research to: (1) inquire into the practices of teachers' personal knowledge management in different Taiwanese educational contexts by utilising rather similar research design and (2) employ other developmental methods and examine the effectiveness of them to fulfill the processes of teachers' personal knowledge management in my future job context.

In sum, the completion of the thesis not only demonstrates what I have learnt through my Ph.D. journey such as the existing knowledge related to the fields, how to do research to the Ph.D. standard and my English language ability but also guides me towards the future. Besides, by accomplishing the research, I have proved to myself that I am capable of doing educational research and have become more confident of working in academia.

6.4 Summary of Concluding Remarks

In this chapter, I have reflected on the conduct of the research considering its quality issues and specified the fulfillment of my own personal knowledge management throughout the research process. In Section 6.2, I have examined whether I answered the research questions through the accomplishment of the research aims, evaluated the achievement of the ethical, trustworthy and authenticity criteria and indicated the relevance and originality of the research considering its contribution to knowledge. In Section 6.2, I have explained how the construction, development, sharing and creation of my personal knowledge were carried out during the research process and how these processes have fostered the growth of my tacit knowledge. Moreover, I have also pointed out the most influential factors engaging in the processes of my personal knowledge management and drawn the implications for my future professional development according to my critical reflection on my current growth.

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Appendices

Appendix 1: The Development and Reforms of Taiwanese Education in Accordance With its Economic Development

Economic Development	Year	Educational Development
<i>Export Expansion</i>	1965-1968	<ul style="list-style-type: none"> • Extended compulsory education from six to nine years. • Increased the number of industry-oriented senior vocational high schools and five-year junior colleges.
	1969-1972	<ul style="list-style-type: none"> • Added more vocational schools and five-year junior colleges. • Set a student ratio of 1:1 for senior vocational high schools and senior high schools with the goal of raising this ratio to 3:2 by 1977. • Set a goal of attaining a ratio among graduates from senior vocational high schools, junior colleges and universities of 3:2:2 in 1972 and 2:2:1 in 1977.
<i>Public Construction and the Development of Private Sector</i>	1973-1976	<ul style="list-style-type: none"> • Established Taiwan Institute of Technology. • Limited the increase in the number of senior high schools. • Set a student ratio goal of 7:3 for senior vocational high schools and senior high schools to be achieved within ten years. • Set the university student ratio of 11:9 for science and technology departments as opposed to humanities and social science department.
	1976-1981	<ul style="list-style-type: none"> • Set a student ratio goal of 7:3 for senior vocational high schools and senior high schools. • Improved faculty quality and curriculum design in senior vocational high schools.
<i>Economic Liberalisation and Technology-oriented Development</i>	1980-1989	<ul style="list-style-type: none"> • Increased the number of postgraduate schools. • Limited the expansion of senior high schools. • Increased the focus on engineering, agriculture, shipbuilding and electronic information in industry-oriented junior colleges.
	1982-1985	<ul style="list-style-type: none"> • Extended compulsory education to 12 years for those who follow the vocational education track.
	1986-1989	<ul style="list-style-type: none"> • Enhanced educational quality. • Adjusted senior high school education for both college preparation and vocational training. • Improved the quality of education for private senior vocational high schools.
<i>Towards Being an Asia-Pacific Operation Centre</i>	1990-1993	<ul style="list-style-type: none"> • Expanded higher education. • Adjusted the curriculum in senior high schools and senior vocational high schools to establish specialised high schools. • Established technology-oriented four-year colleges.
	1991-1996	<ul style="list-style-type: none"> • Improved educational equality in different regions. • Developed programmes focusing on service industries in vocational schools and colleges.

Source: adapted from Tien (1996).

Appendix 2: Research on Teachers' Knowledge Management (KM) in the Taiwanese Elementary Educational Context

Research Title	Research Purpose(s)	Research Method(s)	Research Findings
Teachers' knowledge management in elementary schools – analyses at individual and organisational levels (Chin, 2002).	<ul style="list-style-type: none"> To analyse the relationships between teachers and schools' characteristics and the promotion of teachers' KM. To analyse the relationship between teachers' KM and learning organisations. 	Ten elementary classroom teachers were interviewed and questionnaire survey was conducted including 795 classroom teachers from Taipei elementary schools.	<ul style="list-style-type: none"> The implementation of teachers' KM is diverse. Generally, teachers' capability for knowledge application is above the average; however, their capabilities for knowledge storage and creation are insufficient. Experienced teachers, teachers with postgraduate degree and teachers in medium-sized schools are more capable to promote KM than novice teachers, teachers with bachelor degree and teachers in small- and large-sized schools. Teachers' KM and learning organisations are interrelated.
The study of teachers' knowledge management and their professional growth in elementary schools (Yu, 2002).	<ul style="list-style-type: none"> To explore the relationship between teachers' KM and their professional growth in elementary schools. To analyse how the status quo of teachers' KM and their professional growth vary according to the variables of teachers' backgrounds. 	Questionnaire survey was conducted and the subjects included 614 classroom teachers randomly drawn from 78 elementary schools in the central counties of Taiwan.	<ul style="list-style-type: none"> In teachers' KM, knowledge creation and sharing are more significant than knowledge attainment and storage. In their professional growth, their understanding and capability of teaching beliefs and attitudes, communication, pupil counselling and management and teaching effectiveness are better than those of action research. Teachers in the 13-24 class-sized schools and schools in big cities promote KM better than those in schools in small towns. Teachers about 46 year-old and having 6-15 teaching experiences promote their professional growth better. The better knowledge management the teachers do, the better professional growth the teachers will be.
The study of teachers' knowledge management performance and classroom management effectiveness in Taipei elementary schools (Chang, 2003).	<ul style="list-style-type: none"> To explore the status quo of and the relationship between teachers' KM performance and classroom management effectiveness. To analyse the effects of teachers' demographic variables and classes' environmental variables in 	Questionnaire survey was conducted and the subjects included 451 classroom teachers randomly drawn from 44 elementary schools in Taipei City.	<ul style="list-style-type: none"> Both KM performance and classroom management effectiveness are excellent in Taipei city. Teachers below 30 years-old, with postgraduate degree and having less than 5 years' teaching experiences promote KM better. Teachers between 41-50 years-old, females, with bachelor degree, having 21-30 years' teaching experiences promote classroom management effectiveness better.

<p>A study on feasible strategies and impeditive factors for elementary teachers' application of knowledge management in Tainan County (Chen, 2003).</p>	<p>KM performance and classroom management effectiveness.</p> <ul style="list-style-type: none"> To indicate the feasible strategies and the impeditive factors for elementary teachers to promote KM. 	<p>Four elementary classroom teachers were interviewed and questionnaire survey was conducted including 669 classroom teachers from Tainan elementary schools.</p>	<ul style="list-style-type: none"> • KM performance was the intermediate predictors for classroom management effectiveness in Taipei elementary schools. • In terms of knowledge obtainment, the feasible strategies are participating in seminars, getting human resources assistance from outside the school, participating in professional societies, observing and chatting with others, reading useful information, and surfing the Internet. The impeditive factors are seminars do not meet the teachers' requirement, worries from being interfered by human resources outside the school, insufficient motives for learning, inability to choose related knowledge, inadequate ICT equipment and skills and insufficient time. • In terms of knowledge sharing, the feasible strategies are participating in a co-ordination group, observing others, exchanging teaching portfolios, proceeding co-ordinative teaching, being a lecturer at a seminar, participating in intellectual societies, applying information technology, discussing with others and chatting. The impeditive factors are unwillingness to be a lecturer at a seminar, malfunction in operating teaching coordination group, difficulties in coordinating and practicing coordinative teaching, insufficient time and occasion for peer gathering, different knowledge backgrounds, self-defensive state of mind and inadequate capacities for applying information technology. • In terms of knowledge application, the feasible strategies are engaging in teaching activity, interacting with people, participating in an intellectual society and solving problems. The impeditive factors are inability to absorb knowledge for information receiver, bad abilities of expression, difficulties in formatting some knowledge and malfunction in operating intellectual society. • In terms of knowledge creation, the feasible strategies are enriching new knowledge, benchmarking, discussing, brainstorming, teaching research and experimental teaching, developing abilities to be agile and flexible, and supplying enough
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<p>A study on the promotion of teachers' personal knowledge management in Hsinchu elementary schools (Chou, 2003).</p>	<ul style="list-style-type: none"> To analyse the status quo of elementary teachers' KM in Hsinchu County 	<p>Six elementary classroom teachers were interviewed and questionnaire survey was conducted including 451 classroom teachers from both public and private elementary schools in Hsinchu County.</p>	<p>motives from school. The impeditive factors are few learning opportunities, an unwillingness to be innovative, low learning motivation, inability to adjust to changing circumstances, and differences among knowledge.</p> <ul style="list-style-type: none"> Constructive strategies for personal KM system contain 6 items - 1) establishing the framework of personal knowledge system, 2) building the information networks to get knowledge, 3) making the most of digital techniques, 4) constructing personal database, 5) putting systematic processes of knowledge management into practice and 6) evaluating KM effectiveness. Teachers promote their own KM adopting extensive and diverse strategies. The degree of teachers' knowledge application and obtaining are both higher than knowledge sharing. The variables of teachers' backgrounds partially influence the promotion of teachers' personal KM: teachers who are males, involve in administrative affairs, have less than 3-year teaching experience and are in large-sized schools promote their KM better. The status quo of elementary school teachers' KM was above average, with a high level in knowledge application and a low level in knowledge sharing. Teachers with a higher education background, school administrators and teachers who are frequent computer users have stronger cognition of KM than others. KM and teaching effectiveness of elementary school teachers are above average. Teacher's KM is not influenced by the background of teachers; however, knowledge storage is influenced by gender, age, educational background, seniority and position. Teaching effectiveness is influenced by gender, age, and seniority. If elementary school teachers promote KM better, their
<p>A study on elementary school teachers' knowledge management in Kaohsiung City (Huang, 2003).</p>	<ul style="list-style-type: none"> To explore the status quo of elementary school teachers' KM in Kaohsiung city. To compare background and environmental variables influencing elementary school teachers' cognition of KM. 	<p>Questionnaire survey was conducted and the subjects included 585 classroom teachers randomly drawn from 34 elementary schools in Kaohsiung City.</p>	<ul style="list-style-type: none"> The status quo of elementary school teachers' KM was above average, with a high level in knowledge application and a low level in knowledge sharing. Teachers with a higher education background, school administrators and teachers who are frequent computer users have stronger cognition of KM than others.
<p>A study on the relationship between elementary teachers' knowledge management and teaching effectiveness (Wang, 2003).</p>	<ul style="list-style-type: none"> To explore the relationship between teacher's KM and teaching effectiveness. To analyse the background variables of teachers' KM and teaching effectiveness 	<p>Questionnaire survey was conducted and the subjects included 570 classroom teachers from public elementary schools in Changhua County.</p>	<ul style="list-style-type: none"> KM and teaching effectiveness of elementary school teachers are above average. Teacher's KM is not influenced by the background of teachers; however, knowledge storage is influenced by gender, age, educational background, seniority and position. Teaching effectiveness is influenced by gender, age, and seniority. If elementary school teachers promote KM better, their

<p>A study on the relationship between elementary school teachers' personal knowledge management and their professional performance (Yang, 2004).</p>	<ul style="list-style-type: none"> • To explore the status quo of teachers' personal KM and their professional performance • To analyse the relationship between teachers' personal knowledge management and professional performance 	<p>Questionnaire survey was conducted and the subjects included 864 classroom teachers randomly drawn from 112 elementary schools in Kaohsiung and Tainan.</p>	<p>teaching effectiveness is better.</p> <ul style="list-style-type: none"> • Knowledge creation plays the most important role in KM and teaching effectiveness. • Elementary school teachers' personal KM and their professional performance are above the average. • Teachers who are males, have a Masters degree, with administrative duties and working in cities and remote areas generally promote their KM better. • Teachers who are males, have a Masters degree, older than 50 year-old, with over 21 years teaching experience, with administrative duties and working in remote areas generally promote their professional performance better. • The better teachers' personal KM is promoted the better professional performance will be improved.
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Source: elaborated by the researcher.

Appendix 3: Research Proposal to the Principal of the School

Dear Principal,

My name is Yu-Hao Lin. I am a Taiwanese Ph.D. student in education at the Nottingham Trent University in England. My research interests are 'Educational Leadership and Management' and 'Teachers' Professional Development'. My Ph.D. research title is 'Teachers' personal knowledge management: a case study in a Taiwanese elementary school context.' The research attempts to utilise the aspects of knowledge management to explore Taiwanese elementary school teachers' professional development and its relationship to school improvement and focuses on the following issues:

1. The components of teachers' knowledge and their characteristics;
2. How teachers construct their knowledge;
3. Influential factors engaged in the process of knowledge sharing among teachers;
4. How teachers synthesise and interpret new knowledge;
5. How a school could support the promotion of teachers' personal knowledge management; and
6. How the school support relates to school improvement towards learning organisation.

The research is based on a case study approach and the research methods employed are interview, observation, teaching diary and action learning. Moreover, how these methods will be employed through the actual investigation of the research is explained in detail in the attached appendices.

The timeframe of the investigation is from September 2004 to January 2005 (the first semester of the Academic Year 2004). Through the process of the investigation, I have a role as an "observer-as-participant" and will not give any personal opinions in any research activities. Furthermore, the research activities will be conducted after class in order to not interrupt teachers' daily teaching.

Mandarin Version of the Research Proposal to the Principal of the School

敬愛的校長，您好：

我的名字叫林宇濤，目前為英國 Nottingham Trent University 教育研究所博士班學生，致力於研究「教師專業發展」與「教育領導和管理」此兩個領域，並將進行「教師個人知識管理與學校之進步過程」博士論文研究，希望能運用知識管理的理論架構與實際策略探討台灣國小教師之專業成長與其和學校進步之關係。

此論文之研究重點如下：

1. 何謂教師專業知識及其特點？
2. 教師如何建構專業知識？
3. 教師如何與其他教師分享他們的專業知識？
4. 教師如何在教學時應用新的專業知識？
5. 學校應如何在教師發展他們個人知識管理（以上的過程）給予幫助與支援？
6. 教師個人知識管理的內化與發展與學校進步之關係為何？

此研究根據個案研究法並應用深度訪談、教學觀察、教學札記與行動學習之研究方法。此外，附錄中詳盡說明了研究者如何操作這些研究方法，還請參照。

此研究將於民國九十三年上半學期（九月至隔年一月）開始進行，在整個研究過程中，研究者將擔任觀察者的角色，研究者並不會給予任何個人意見，另外，在不影響教師的教學，研究活動將利用課餘時間進行。

Appendix 4: Official Permission from the School

茲證明

林宇浩 同學 在九十三學年度第一學期 (2004年9月至2005年1月止) 在桃園縣 [redacted] 國民小學進行博士論文研究計畫。

特此證明

校長： [redacted] 教務主任： [redacted] 教學組長： [redacted]

中華民國 [redacted] 年 [redacted] 月 [redacted] 日

校址： [redacted]

網址： [redacted]



Appendix 5: Self-Completion Questionnaire

Dear Teachers,

Winter vacation is coming. Wish all of you a nice holiday! I am a PhD student studying at the Nottingham Trent University in the UK and interested in the field of teachers' professional development and school improvement. The title of my PhD research is 'Teachers' personal knowledge management: a case study in a Taiwanese elementary school context'. This questionnaire aims to provide the researcher a better understanding of teachers' thoughts about their teaching and therefore there is no right/wrong answer for each question. Please answer the questions in accordance with your actual thoughts while you are reading through them. In order to protect teachers' privacy, the results of this questionnaire are only used for this research and will not be promulgated for any other purposes. Please put the questionnaire into the attached envelope and return it to your teaching team the leader after you complete it. Many thanks for your kindly help and support.

Best regards,

Yu-Hao Lin

1. Do you think about issues related to your teaching?
 Never, because: _____ (To Question 3)
 Always, because: _____
 Sometimes, because: _____

2. When do you normally think about those issues regarding to your teaching? (can choose more than one answer)
 At home After class On the way to school or home While sharing teaching experiences or problems with other teachers Others:

3. Do you think there are fixed procedures and steps for teaching each subject?
 Yes, because: _____
 No, because: _____
 Others, because: _____

4. Do you usually try to make changes in your teaching?
 Yes, because: _____
 No, because: _____
 Others, because: _____

5. Do you reflect on your teaching in terms of its strengths and weaknesses after school?
- Never, because: _____
- Always, because: _____
- Sometimes, because: _____
6. When you meet difficulties in your teaching, how would you deal with those difficulties and look for solutions?
- For example: _____
7. Are you willing to share your teaching experiences and issues with other teachers?
- Yes, because: _____
- No, because: _____
- Others, because: _____
8. Do you mind to be observed and recorded while you are teaching?
- Yes, because: _____
- No, because: _____
- Others, because: _____
9. If there is an opportunity, would you like to join teachers' collaborative action learning set after class?
- Yes, because: _____
- No, because: _____
- Others, because: _____
10. How long have you been teaching? _____ year(s)
11. You are teaching in: _____ Grade _____ Class
12. Would you like to know this research in detail?
- Yes, because: _____
- And please leave your contact ways.
- Telephone number: _____
- E-mail address: _____
- No, because: _____
- Others, because: _____

Many thanks for your time to complete this questionnaire!

Mandarin Version of the Self-Completion Questionnaire

敬愛的老師您好!

寒假要來臨了，首先祝您有個愉快的假期。身為英國 Nottingham Trent University 教育研究所博士班學生，本人僅致力於研究教師專業發展與教育領導此兩個領域，並將進行‘教師個人知識管理與學校教學進步之過程’博士論文之研究。這是一份教育學術的研究問卷，目的是為了更瞭解教師對其教學工作的想法。此問卷各題目選項沒有優劣對錯之差別，請您看過題目後，依據您的實際想法填答。為了保護老師的隱私，此問卷之內容僅供研究者參考並不對外公佈，請您填答完畢後，將此問卷封於附上之信封袋內並交給各年級之學年主任。謝謝您的支持與協助!

林宇濤 鞠躬

1. 您平常會不會思考您的教學現況與問題?

- 不會，因為：_____ (請跳至第3題)
- 常常會，因為：_____
- 偶爾會，因為：_____

2. 您通常利用什麼時間思考教學上之課題? (可複選)

- 家裡 學校課餘時間 上下學途中 與其他同事分享經驗與問題中
- 其他：_____

3. 您覺得各科教學是不是大致有一定的程序與步驟?

- 是，因為：_____
- 不是，因為：_____
- 其他，因為：_____

4. 您是否常常會嘗試作教學上的改變?

- 是，因為：_____
- 不是，因為：_____
- 其他，因為：_____

5. 在一節課或一天的教學生活結束後，您是否會回想教學上之得失?

- 不會，因為：_____
- 常常會，因為：_____
- 偶爾會，因為：_____

6. 若您遇到教學上的困難時，您會透過哪些管道尋求解決方法？

請例舉：

7. 您是否願意與其他同事分享您在教學上之經驗與問題？

是，因為：_____

不是，因為：_____

其他，因為：_____

8. 您是否願意被觀察及紀錄您的教學情況？

是，因為：_____

不是，因為：_____

其他，因為：_____

9. 若有機會，您是否願意利用課餘時間參與教師共同合作之行動學習？

是，因為：_____

不是，因為：_____

其他，因為：_____

10. 您的教學總年資：_____年

11. 您目前任教於：_____年_____班

12. 您是否願意更深入地瞭解此研究之內容？

是，因為：_____

並請您留下您的聯絡方式。電話：_____

電子郵件信箱：_____

不是，因為：_____

其他，因為：_____

再次謝謝您抽出您寶貴的時間填答此問卷！

Appendix 6: Research Proposal to the Six Participants

Dear Teachers,

My name is Yu-Hao Lin. I am a Taiwanese Ph.D. student in education at the Nottingham Trent University in England. My research interests are 'Educational Leadership and Management' and 'Teachers' Professional Development'. My Ph.D. research title is 'Teachers' personal knowledge management: a case study in a Taiwanese elementary school context.' The research attempts to utilise the aspects of knowledge management to explore Taiwanese elementary school teachers' professional development and its relationship to school improvement and focuses on the following issues:

1. The components of teachers' knowledge and their characteristics;
2. How teachers construct their knowledge;
3. Influential factors engaged in the process of knowledge sharing among teachers;
4. How teachers synthesise and interpret new knowledge;
5. How a school could support the promotion of teachers' personal knowledge management; and
6. How the school support relates to school improvement towards learning organisation.

The research will be based on a case study approach and the research methods used are interview, observation, teaching diary and action learning. Moreover, how these methods will be employed through the actual investigation of the research is explained in detail in the attached appendices.

The timeframe of the investigation is from September 2004 to January 2005 (the first semester of the Academic Year 2004). Through the process of the investigation, I have a role as an "observer-as-participant" and will not give any personal opinions in any research activities. Furthermore, the research activities will be conducted after class in order to not interrupt teachers' daily teaching.

A list of proposed ethical guidelines for the research is provided in the attached appendix and these guidelines can be negotiated prior to the actual investigation.

Ethical guidelines

- A. The participant will be involved in the process of interview, observation, self-reflection and group discussion and understand how the research activities will be employed.
- B. All information will be recorded under the preferred way of the participant such as tape-recording, video-taping or note-taking.
- C. All information will be stored in confidential files and destroyed after the submission of the research thesis.
- D. All information will be used only for the publication of the research thesis and will not in any circumstances be given to any other people or discussed in any conversations with other administrative or teaching staff.
- E. The participant will receive a copy of the final research thesis if s/he wishes.
- F. The participant will be protected under the adoption strict of anonymity and confidentiality rules.
- G. The participant has the right to withdraw from the research for any or no reason at any time during the investigation.

I am willing to participate in the research and agree to the above guidelines being applied.

Signature:

Date:

Mandarin Version of the Research Proposal to the Six Participants

親愛的老師，您好：

我的名字叫林宇濤，目前為英國 Nottingham Trent University 教育研究所博士班學生，致力於研究「教師專業發展」與「教育領導和管理」此兩個領域，並將進行「教師個人知識管理與學校之進步過程」博士論文研究，希望能運用知識管理的理論架構與實際策略探討台灣國小教師之專業成長與其和學校進步之關係。

此論文之研究重點如下：

1. 何謂教師專業知識及其特點？
2. 教師如何建構專業知識？
3. 教師如何與其他教師分享他們的專業知識？
4. 教師如何在教學時應用新的專業知識？
5. 學校應如何在教師發展他們個人知識管理（以上的過程）給予幫助與支援？
6. 教師個人知識管理的內化與發展與學校進步之關係為何？

此研究根據個案研究法並應用深度訪談、教學觀察、教學札記與行動學習之研究方法。此外，附錄中詳盡說明了研究者如何操作這些研究方法，還請參照。

此研究將於民國九十三年上半學期（九月至隔年一月）開始進行，在整個研究過程中，研究者將擔任觀察者的角色，研究者並不會給予任何個人意見，另外，在不影響教師的教學，研究活動將利用課餘時間進行。

研究倫理方針

- A. 參與者將參與一系列的深度訪談、教學觀察、自我反思、小組討論之活動並瞭解這些活動之目的與意義。
- B. 研究資料與過程將會依參與者喜歡的方式紀錄，例如錄音、錄影或筆記。
- C. 研究資料將被存儲於機密檔案內，並於研究論文完成後摧毀。
- D. 研究資料將僅用於此研究論文。
- E. 參與者將依其意願收到已完成之研究論文的拷貝。
- F. 對於參與者之保護採用最嚴格之匿名與隱私之原則。
- G. 在任何情況或任何理由下，參與者有權力退出此研究。

我願意參與此研究並同意上述方針之應用。

簽名：

日期：

Appendix 7: Semi-Structured Interview Schedule A (Six Participants)

The purpose of the interview is to explore your opinions and thoughts about the school's awareness of the enterprises of the external world, its current visions and educational goals, its administrative system, its awareness of its strengths and weaknesses as well as its supports for the development of individuals and communities. The information collected through this interview will be integrated with other teachers' opinions and thoughts and only used for this research. The use of the information will be shared and agreed with you prior to its publication as a research thesis. Your name will not be mentioned in any circumstances. For convenience and accuracy, the interview will be recorded under your preferred way.

Interviewee:

Date:

Place:

Time:

♦ Awareness

1. What are the current educational issues about which your school concerns?
2. In relation to these issues, how does your school react/respond to these issues?
Prompt Implications/challenges/opportunities
Who is responsible for this activity?
How does this activity impact on you?
3. What do you understand the term 'Knowledge Management'?
Prompt How do your school activities/practical strategies relate to your understanding of knowledge management?
4. How does your school keep aware of and understand the developmental initiatives implemented by other elementary schools in Yung-Mei?
Prompt Do these initiatives have an influence on your school, your practice and you?
5. How does your school actively connect with external networks?
Prompt How does this influence you?

♦ Vision and Mission

1. What is your school mission?
2. What is your school's belief in teaching and learning?
Prompt How about yours?
3. What is the future plan of your school?
4. What are the current developmental initiatives of your school?

Prompt How do these initiatives influence you?
Who has been involved in the design of the developmental initiatives?
How are the developmental initiatives translated into measurable objectives?
How are the developmental initiatives monitored and evaluated?

◆ **School Culture**

1. How would you describe the atmosphere of your school among teachers?

Prompt Willing to share experiences and knowledge.

Willing to give advice and help.

Willing to learn new things.

Willing to experiment new ideas.

The degree of trust.

What are the factors influencing the school atmosphere?

2. Is your school open to any thoughts or suggestions?
3. Does your school welcome challenges?
4. Does your school encourage and support creativity?

◆ **Leadership and Management**

1. How would you describe the leadership style of your school?

Prompt Strengths/weaknesses

2. How would you describe the organisational structure of your school?

Prompt How do people access, disseminate and communicate information within your school?

Does the structure affect the access, dissemination and communication of information within your school? If so, how?

3. How would you describe the appraisal system in your school?

Prompt Purposes/applications/strengths/weaknesses

Is it supportive and helpful for you?

4. Can you describe the reward system in your school?

Prompt Strengths/weaknesses

Does it encourage/discourage you?

◆ **Intellectual Capital**

1. What are your school's strengths which make your school so different/distinct from others?
2. Are there any areas which you feel the school needs to develop?
3. How does your school organise its intellectual capital such as individual or collective teaching experiences and knowledge, school daily work processes,

school policies and strategies, student portfolio, etc?

Prompt Is there any one person responsible for the task?

What are activities involved?

4. How does your school process, store and use management information?

◆ **Training and Development**

1. What are the professional developmental activities you engage in currently?
2. How does your school support you in your professional development?
3. If teachers encounter professional and personal problems, how does your school provide support?

◆ **Communities of Practice**

1. How do you share your knowledge or teaching experiences with other teachers?
2. Do you join any formal/informal communities exist within your school?

Prompt Why do you join it?

What is your opinion of the school support for the development of the community?

How is the knowledge created by the community disseminated across your school?

- ◆ **Are there any other issues you would like to tell me which would help my research?**

Mandarin Version of the Semi-Structured Interview Schedule A

深度訪談的目的在於幫助研究者瞭解貴校對於現行教育相關議題之重視與瞭解、學校未來發展方向與藍圖、校園文化、教師或學校社群發展等諸多議題的認識與態度。所有受訪者之意見將經過統整之後整體呈現。資料的使用會在所有受訪者的同意下使用。整個訪談過程將會以錄音的方式紀錄，以方便日後的資料歸納與分析。

受訪者：

日期：

地點：

時間：

學校對於教育相關議題的瞭解

1. 當前與貴校相關的教育議題為何？

2. 對於這些議題，你們學校的處理方式與態度如何？

提示 你們學校如何回應這些議題？（涵義、挑戰、機會）
誰負責這類的活動？
這類的活動對您具有何種影響？

3. 請問您對「知識管理」一詞的理解為何？

提示 你們學校是否有與「知識管理」相關之教學活動或政策？

4. 你們學校如何看待揚梅地區其他國民小學的發展活動與計劃？

提示 這些活動與計劃對你們學校、您與您的教學具有何種影響？

5. 你們學校如何與任何校外之專業社群聯繫？

提示 此種對外聯繫對您具有何種影響？

學校的願景與未來發展方向

1. 你們學校的願景為何？

2. 你們學校的辦學理念為何？

提示 您對學校教育有什麼想法？應該怎麼做？

3. 你們學校未來的規劃為何？

4. 你們學校目前的發展活動與計劃為何？

提示 這些發展活動與計劃對您具有何種影響？
誰負責規劃學校的發展方向與活動？
有沒有可以據以量度的目標？
你們學校如何判斷目標是否達成？

學校文化

1. 您覺得你們學校教職員之間的相處氣氛怎樣？

提示

願意分享教學經驗與知識

願意提供忠告與幫助

願意學習新的事物

願意試驗新的教學點子

對彼此的信任程度

影響你們學校教職員之間的相處氣氛因素為何

2. 你們學校對新思想或建議的態度是開放的嗎？

3. 你們學校歡迎挑戰嗎？

4. 你們學校鼓勵與支持員工或學生發揮創造力嗎？

學校領導與管理

1. 你們學校高層的領導風格為何？

提示

長處 / 短處

請問您在你們學校有職掌除了教學已外的工作嗎？若有，為何？

2. 你們學校的組織架構為何？

提示

學校內的資訊如何讓所有教職員知道？

你們學校的組織架構與資訊的傳播與交流有什麼關係？

3. 你們學校對教師們的評量系統為何？

提示

目的 / 應用 / 長處 / 短處

此評量系統對您有何種幫助？

4. 你們學校對教師們的獎勵系統為何？

提示

長處 / 短處

您覺得這種獎勵系統對您是一種鼓勵或阻礙？

學校智慧財產

1. 你們學校與其他國小不同的長處在哪？

2. 請問您覺得你們學校在哪些地方需要加強？

3. 你們學校對於資料或智慧財產，例如：個體或集體的教學經驗、行政的流程、學校的政策與策略、學生資料等這些東西的處理方式為何？

提示

有專門的職員負責此項工作嗎？

其工作項目為何？

4. 你們學校如何處理、儲存與使用這些管理資訊？

教師訓練與發展

1. 您目前的專業發展活動為何？

2. 你們學校是否支持您的專業發展？如果有，如何？

3. 如果教師們面臨專業或個人的問題，你們學校是否提供協助？如果是，是怎

麼做的？

學校專業社群

1. 您如何與其他教師分享您的教學經驗與知識？
2. 您是否參與你們學校任何正式或非正式的社團？

提示

為何參與此社團？

您覺得你們學校是否鼓勵這些社團的發展？

這些社團所創造的知識如何在你們學校流通？

請問您是否有對於研究者的任何批評指教或建議？

Appendix 8: Semi-Structured Interview Schedule B (School Principal & Section Chief of Teaching and Learning)

The purpose of the interview is to explore your opinions and thoughts about the school's awareness of the enterprises of the external world, its current visions and educational goals, its administrative system, its awareness of its strengths and weaknesses as well as its supports for the development of individuals and communities. The information collected through this interview will be integrated with other teachers' opinions and thoughts and only used for this research. The use of the information will be shared and agreed with you prior to its publication as a research thesis. Your name will not be mentioned in any circumstances. For convenience and accuracy, the interview will be recorded under your preferred way.

Interviewee:

Date:

Place:

Time:

♦ Awareness

1. What are the current educational issues about which your school concerns?
2. In relation to these issues, how does your school react/respond to these issues?

Prompt Implications/challenges/opportunities

Who is responsible for this activity?

3. What do you understand the term 'Knowledge Management'?

Prompt How do your school activities/practical strategies relate to your understanding of knowledge management?

4. How does your school keep aware of and understand the developmental initiatives implemented by other elementary schools in Yung-Mei?

Prompt Do these initiatives have an influence on your school?

5. How does your school actively connect with external networks?

♦ Vision and Mission

1. What is your school's mission?
2. What is your school's belief in teaching and learning?
3. What is the future plan of your school?
4. What are the current developmental initiatives of your school?

Prompt How do these initiatives influence you?

Who has been involved in the design of the developmental initiatives?

How are the developmental initiatives translated into measurable

objectives?

How are the developmental initiatives monitored and evaluated?

♦ **School Culture**

1. How would you describe the atmosphere of your school among teaching staff?

Prompt Willing to share experiences and knowledge.

Willing to give advice and help.

Willing to learn new things.

Willing to experiment new ideas.

The degree of trust.

2. Is your school open to any thoughts or suggestions?
3. Does your school welcome challenges?
4. Does your school encourage and support creativity?

♦ **Leadership and Management**

1. How would you describe the leadership style of your school?

Prompt Strengths/weaknesses

What are your responsibilities in the school?

2. How would you describe the organisational structure of your school?

Prompt How do people access, disseminate and communicate information within your school?

Does the structure affect the access, dissemination and communication of information within your school? If so, how?

3. How would you describe the appraisal system for teachers in your school?

Prompt Purposes/applications/strengths/ weaknesses

4. Please describe the reward system for teachers in your school?

Prompt Strengths/weaknesses

♦ **Intellectual Capital**

1. What are your school's strengths which make your school so different/distinct from others?

2. Are there any areas which you feel the school needs to develop?

3. How does your school organise its intellectual capital such as individual or collective teaching experiences and knowledge, school daily work processes, school policies and strategies, student portfolios, etc?

Prompt Is there any one person responsible for the task?

What are activities involved?

4. How does your school process, store and use management information?

♦ **Training and Development**

1. What are the professional developmental activities you engage in currently?
2. How does your school support its teachers in their professional development?
3. If teachers encounter professional and personal problems, how does your school provide support?

♦ **Communities of Practice**

1. How do teachers share their knowledge or teaching experiences?
2. What formal/informal communities exist within your school?

Prompt Purposes and activities.

How does your school encourage the development of communities?

How is the knowledge created by the communities disseminated across your school?

- ♦ **Are there any other issues you would like to tell me which would help my research?**

Mandarin Version of the Semi-Structured Interview Schedule B

深度訪談的目的在於幫助研究者瞭解貴校對於現行教育相關議題之重視與瞭解、學校未來發展方向與藍圖、校園文化、教師或學校社群發展等諸多議題的認識與態度。所有受訪者之意見將經過統整之後整體呈現。資料的使用會在所有受訪者的同意下使用。整個訪談過程將會以錄音的方式紀錄，以方便日後的資料歸納與分析。

受訪者：

日期：

地點：

時間：

學校對於教育相關議題的瞭解

1. 當前與貴校相關的教育議題為何？
2. 對於這些議題，貴校的處理方式與態度如何？
提示 貴校如何回應這些議題？（涵義、挑戰、機會）
誰負責這類的活動？
3. 請問您對「知識管理」一詞的理解為何？
提示 貴校是否有與「知識管理」相關之教學活動或政策？
4. 貴校如何看待楊梅地區其他國民小學的發展活動與計劃？
提示 這些活動與計劃對貴校具有何種影響？
5. 貴校如何與任何校外之專業社群聯繫？

學校的願景與未來發展方向

1. 貴校的願景為何？
2. 貴校的辦學理念為何？
3. 貴校對未來的規劃為何？
4. 貴校目前的發展活動與計劃為何？
提示 這些發展活動與計劃對您具有何種影響？
誰負責規劃學校的發展方向與活動？
有沒有可以據以量度的目標？
貴校如何判斷目標是否達成？

學校文化

1. 您覺得貴校教職員之間的相處氣氛怎樣？
提示 願意分享教學經驗與知識
願意提供忠告與幫助
願意學習新的事物
願意試驗新的教學點子
對彼此的信任程度

2. 貴校對新思想或建議的態度是開放的嗎？
3. 貴校歡迎挑戰嗎？
4. 貴校鼓勵與支持員工或學生發揮創造力嗎？

學校領導與管理

1. 貴校高層的領導風格為何？
提示 長處 / 短處
請問您在貴校的職掌為何？
2. 貴校的組織架構為何？
提示 學校內的資訊如何讓所有教職員知道？
貴校的組織架構與資訊的傳播與交流有什麼關係？
3. 貴校對教師們的評量系統為何？
提示 目的 / 應用 / 長處 / 短處
4. 貴校對教師們的獎勵系統為何？
提示 長處 / 短處

學校智慧財產

1. 貴校與其他國小不同的長處在哪？
2. 請問您覺得貴校在哪些地方需要加強？
3. 貴校對於資料或智慧財產，例如：個體或集體的教學經驗、行政的流程、學校的政策與策略、學生資料等這些東西的處理方式為何？
提示 有專門的職員負責此項工作嗎？
其工作項目為何？
4. 貴校如何處理、儲存與使用這些管理資訊？

教師訓練與發展

1. 您目前的專業發展活動為何？
2. 貴校是否支持教師們的專業發展？如果有，如何？
3. 如果教師們面臨專業或個人的問題，貴校是否提供協助？如果是，是怎麼做的？

學校專業社群

1. 貴校的教師們如何分享他們的教學經驗與知識？
2. 有哪些正式或非正式的社群存在於貴校？
提示 目的與活動
貴校如何鼓勵這些社團的發展？
這些社團所創造的知識如何在貴校流通？

請問您是否有對於研究者的任何批評指教或建議？

Appendix 9: Informal Conversational Interview Questions (Six Participants)

Interviewee:

Date:

Place:

Time:

Questions:

1. Until now, have you had any negative feelings about the ways I collect data?
2. How do you organise your teaching files and resources?
3. Will you reread and utilise these different kinds of information?
4. Do you transfer your teaching experiences into words and subsequently organise them into files?
5. Is there any 'Teaching and Learning Resources Centre' for teachers to utilise in the school?
6. Are there any professionals within the school you can ask for advice or help?
7. Do you often read any educational journals and books or search any information from the Internet?
8. How do you make use of ICT to communicate with other teachers?
9. How do you make use of teachers' handbooks?
10. How do you think about the effectiveness and efficiency of school meetings?
11. How do you think about the formation of the teachers' association?

Mandarin Version of the Informal Conversational Interview Questions

1. 研究至今，是否對研究者收集資料的方式有任何不舒服的感覺？
2. 你如何整理自己的教學檔案和資料？
3. 你會重新看依次或利用這些資訊嗎？
4. 你自己會把個人的教學經驗轉化成文字歸檔嗎？
5. 瑞梅有所謂的學習資源中心讓老師們利用嗎？
6. 學校有專家可供諮詢嗎？
7. 你有閱讀教育類期刊書籍或上網找資料的習慣嗎？
8. 你怎麼善用資訊和溝通科技與其他老師交流呢？
9. 你如何使用教師手冊呢？
10. 對學校會議的效率和速率的看法與意見為何？
11. 對此次成立教師會的看法與意見？是否會參加？為何？

Appendix 10: Focus Group Interview Questions (Six Participants)

Interviewee:

Date:

Place:

Time:

Questions:

- 1) What are the components of your professional knowledge and their characteristics?
- 1) How do you develop and construct your professional knowledge in three stages: prior to teacher education, in the process of teacher training and after actual teaching?
 - How does the observation of your teaching affect you?
 - How do you make use of the observational notes the researcher has provided?
 - How does the composition of your teaching diary assist you?
- 1) How do you share your teaching experiences and issues with other teaching staff?
 - Does the process of the interviews bring you any new thoughts?
 - Have you participated any peer observations the school has held this semester? Why? Do the activities bring you any new teaching ideas?
 - How do you regard this group?
 - How does the retrospection of your past experiences affect you and your teaching?
 - Are there any different thoughts raised through the collaborative discussion of your autobiography?
 - Do others' autobiographies bring your any new thoughts?
 - How does the process of brainstorming assist you in your daily teaching?
 - What are the influential factors engaged in the process of teachers' sharing?
4. How do you apply newly-gained ideas or knowledge into your teaching?
5. How could the school support the promotion of your personal knowledge management (the above processes)?
6. How would the internalisation of your personal knowledge management affect you and your daily practice?
7. Finally, please share your thoughts about being as one of the participants in this research.

Mandarin Version of the Focus Group Interview Questions

1. 你的專業知識包含哪些要點及其特色為何？
 2. 你如何發展與建構自己的專業知識（三個時期：求學階段、師資養成教育、正式任教後）？
 - 研究者觀察你的教學是否為你帶來任何影響？
 - 你如何善用研究者所提供的教學觀察筆記？
 - 教學札記的撰寫如何帶給你具體的幫助？
 3. 你如何與其他教師分享教學經驗與議題？
 - 訪談過程是否帶給你任何新刺激或想法？
 - 這學期學校所舉辦的教學觀摩你是否有參與呢？為什麼？是否為你的教學帶來任何新刺激或想法？
 - 你如何看待我們這個團隊？
 - 過去經驗的回顧如何影響你與你的教學？
 - 透由其他五位老師共同討論你的自傳，是否為你帶來任何不一樣的想法？
 - 傾聽其他五位老師敘述他們的自傳又為你帶來些什麼呢？
 - 腦力激盪的部份是否為你每日的教學生活帶來任何具體的幫助？
 - 影響教師之間分享過程的要素為何？
 4. 你如何在教學時應用新的專業知識？
 5. 學校應如何在你發展你個人的知識管理（以上的過程）給予幫助與支援？
 6. 你覺得個人知識管理的內化與發展將會如何影響你與你的教學？
- 最後，請你與大家分享這半學期參與整個研究的心得。

Appendix 11: Guidelines of Classroom Teaching Observation

Observation - Guidelines

The purpose of observing your teaching is to explore how you synthesise and interpret your knowledge into classroom instruction. It is also beneficial for me to gain a better understanding of your teaching circumstances. I would like to observe you once a week for two hours from September 2004 to January 2005. I will take notes while observing you and the observational notes of each lesson will be made available for you at the beginning of the following week, which can also be used as the reference for 'Action Learning' if you wish to discuss your teaching issues/problems with other teachers. I attempt to not influence your teaching as being in your classroom. Therefore, my standing position in your classroom will be negotiated with you. The data recorded from the observation will be confidential and only used for this research. The interpretation and use of the information will be shared and agreed with you prior to it is published as a research thesis. Your name will not be mentioned in any circumstances and also in any conversations with other teachers.

Mandarin Version of the Guidelines of Classroom Teaching Observation

教學觀察方針

- 一、教學觀察的目的在於瞭解老師之整體教學狀況。
- 二、研究者將自 2004 年九月至 2005 年一月每星期一次（每次兩個小時）參與且記錄您的教學情形。研究者會在隔週提供您一份紀錄筆記。如果您願意與其他老師在行動學習活動中分享並討論您的教學情況與問題，此教學筆記可作為活動之參考資料。
- 三、在不影響教師教學與學生學習的原則下，研究者會事先跟教師商量研究者所在位置。
- 四、此教學觀察資料將僅用於此研究並儲存於機密檔案內。在研究論文發表前，資料的解讀與使用必定事先取得該教師之同意。在所有情況中，教學觀察內容與教師的名字將不會被提及。

Appendix 12: Observational Form

Observation of Classroom Teaching (Week 1)

Teacher:

Date:

Time:

Subject:

Time	Description of Incidents	Reflection

Appendix 13: Guidelines of Self-Facilitation Action Learning

Self-Facilitated Action Learning – Guidelines

The purpose of adapting the aspects of action learning is to assist the researcher to explore how you as an individual teacher share your teaching experiences, issues or ideas with other teachers. I also attempt to evaluate whether the implementation of action learning carries out possible benefits for individual set members. Furthermore, I would also like to identify factors/issues engaged in the process of teachers' knowledge sharing. It is proposed that 6 teachers will be involved in the process of this self-facilitated action learning once every two weeks for 12 times (1.5-2 hours) from September 2004 to January 2005. The process of this action learning is divided into two phases: collaborative autobiography (first 5 meetings) and brainstorming (last 4 meetings).

Collaborative autobiography

◆ *The narration of autobiography*

In this stage, an individual teacher thinks about the following aspects prior to each meeting.

- Personal background and learning experiences.
- Current professional life in the present professional context.
- Teaching methodology and beliefs related to teaching and learning.
- Reflection on how crucial life episodes form teaching and learning beliefs and how these beliefs dominate professional behaviours.
- Scenarios for future professional life.

◆ *The collaborative analysis of autobiography*

In this stage, the teacher describes his/her autobiography either by oral or written manner and tries to generalise essential aspects according to the autobiography. These aspects will be the bases/focuses for subsequent set discussion.

◆ *The plan for future professional development*

In this stage, the teacher may be able to sketch the contours of his/her personal professional knowledge and the processes of his/her own knowledge construction in accordance with the discussion. By means of self realisation and peer reflection, the teacher may be able to gain a better understanding of his/her self and teaching and accordingly develop his/her personal plan for future professional development.

Brainstorming

In this phase, the six teachers bring up issues/problems they wish to share and discuss for each meeting. I will collect the issues/problems from you and give it to the rest of the teachers previous to the meeting.

My role in the implementation of this action learning can be seen as a facilitator in the way that I arrange the time and collect issues to be shared for each meeting. However, I will be an outsider in the process of the set discussion of the teachers. The whole progress of this action learning will be recorded by video-taping or tape-recording. The contents of each activity will be generalised and also be made available for you on the next meeting date. The interpretation and use of the information will be shared and agreed with you prior to it is published as a research thesis. Your name will not be mentioned in any circumstances and also in any conversations with other teachers.

Mandarin Version of the Guidelines of Self-Facilitation Action Learning Set

行動學習方針

我們採用行動學習的目的在於協助研究者瞭解教師們如何分享他們的教學經驗與想法。研究者試圖瞭解行動學習方案會為教師們帶來什麼影響。另外，研究者也希望找出影響教師進行合作活動之要素。六位教師預計將自 2004 年九月至 2005 年一月進行每兩星期一次（每次約一至兩小時）的活動，總計約十次。這次行動學習包含兩個部份：自傳與腦力激盪。

1. 自傳

自傳的敘述

在每次聚會前，請個別教師回想與思索下列要素：

- 個人家庭背景與求學歷程；
- 目前的專業生活與教學現況；
- 教學方法與信念；
- 重要的生命或生活經驗對於教學信念與教學方法的影響；
- 對未來的計劃。

自傳的合作分析

在此階段，教師可以口述或以筆述之方式描述上列要素，然後歸納出自傳之要點並進行小組討論。

2. 腦力激盪

在此部份，教師們分享他們在教學上所面臨的問題，小組成員依個人親身經驗進行討論。

在每次聚會前，研究者會先匯集當次討論主題。

在行動學習過程中，研究者會從旁協助行政事物的進行，例如：安排聚會時間與地點和匯集討論之問題要點。除此之外，研究者不介入任何小組對實質內容的討論。研究者將會以錄音的方式，紀錄整個活動過程，歸納出討論要旨與方向，並於下一次聚會時發放。在研究論文發表前，行動學習活動資料的解讀與使用，會先取得教師們的同意。在所有的情況下，活動內容與教師們的名字將不會被提及。

Appendix 14: Guidelines of Research Diary

Research Diary – Guidelines

The purpose of keeping a research diary is to help the researcher to monitor the development of ideas and insights at the various stages of the research process. The components of the research diary include (1) supervision forms, (2) emails with supervisors and (3) issues/problems encountered during the research. The researcher will focus on the following questions in relation to research experience when composing the research diary:

- ◆ What happened?
- ◆ Why did the event happen?
- ◆ What/how/why did I do?
- ◆ How did I feel about the event?
- ◆ What does the event mean?
- ◆ What have I learned from the event?
- ◆ What am I going to do?
- ◆ How am I going to interpret the data?

Research experience encompasses all aspects of the research (during preparation and planning processes, the interaction/relationship with teaching and administrative staff and pupils, issues and difficulties while implementing the research methodology, etc). Furthermore, the research diary is written as the researcher wishes before September 2004. However, it will be composed once a day while the researcher is engaging in the actual investigation of the research in Taiwan (From September 2004 to January 2005).

Appendix 15: Guidelines of Teaching Diary

Teaching diary is used to explore how specific events in relation to your daily teaching influence your thoughts, beliefs, attitudes and actions. The composition of a teaching diary not only makes your experiences explicit but also enables you to connect and consequently integrate old and new experiences effectively through a systematic cycle of description, analysis and reflection.

Guidelines of Teaching Diary

- ◆ Format of your teaching diary is not stipulated as long as it includes date.
- ◆ Your teaching diary is composed as many times as you wish.
- ◆ Teaching experience could encompass all aspects of instruction (preparing, planning, teaching, etc), all relationships within the school (with other teachers, staff, students, parents, etc) and all thoughts of being involved in the research (during interviewing, the interaction with the researcher, as a member of the action learning set, etc).
- ◆ The components of your teaching diary need to involve the description, analysis and reflection of those specific events. According to the previous processes, decisions, conclusions or actions also need to be drawn. The following questions can be seen as references when writing your teaching diary.
 - What happened?
 - Why did the event happen?
 - What/how/why did I do?
 - How did I feel about the event?
 - What does the event mean?
 - How does the event relate to my previous experiences?
 - What have I learned from the event?
- ◆ You do not need to write down what happens every day rather to write down specific events or issues which are meaningful and relevant to you.
- ◆ Your teaching diary can also be used as the reference for 'Action Learning' if you wish to discuss those specific events or issues with other teachers.

Mandarin Version of the Guidelines of Research Diary

教學札記方針

教學札記主要是紀錄日常教學中之特定事件如何影響教師的教學想法、信念、態度與行為。撰寫教學札記能夠幫助教師整理整體教學經驗。

教學札記可依照個人的偏好來撰寫，主要記錄教學上發生的重要大事與相關的處理情形。

所謂的教學經驗可以包含下列要點：

1. 教學準備、計劃、教學活動等等之過程所遇到的問題；
2. 與其他老師、學校職員、學生、父母等等之互動關係；
3. 參與此研究之相關心得，例如：與研究者之間的互動或各研究活動之參與心得。

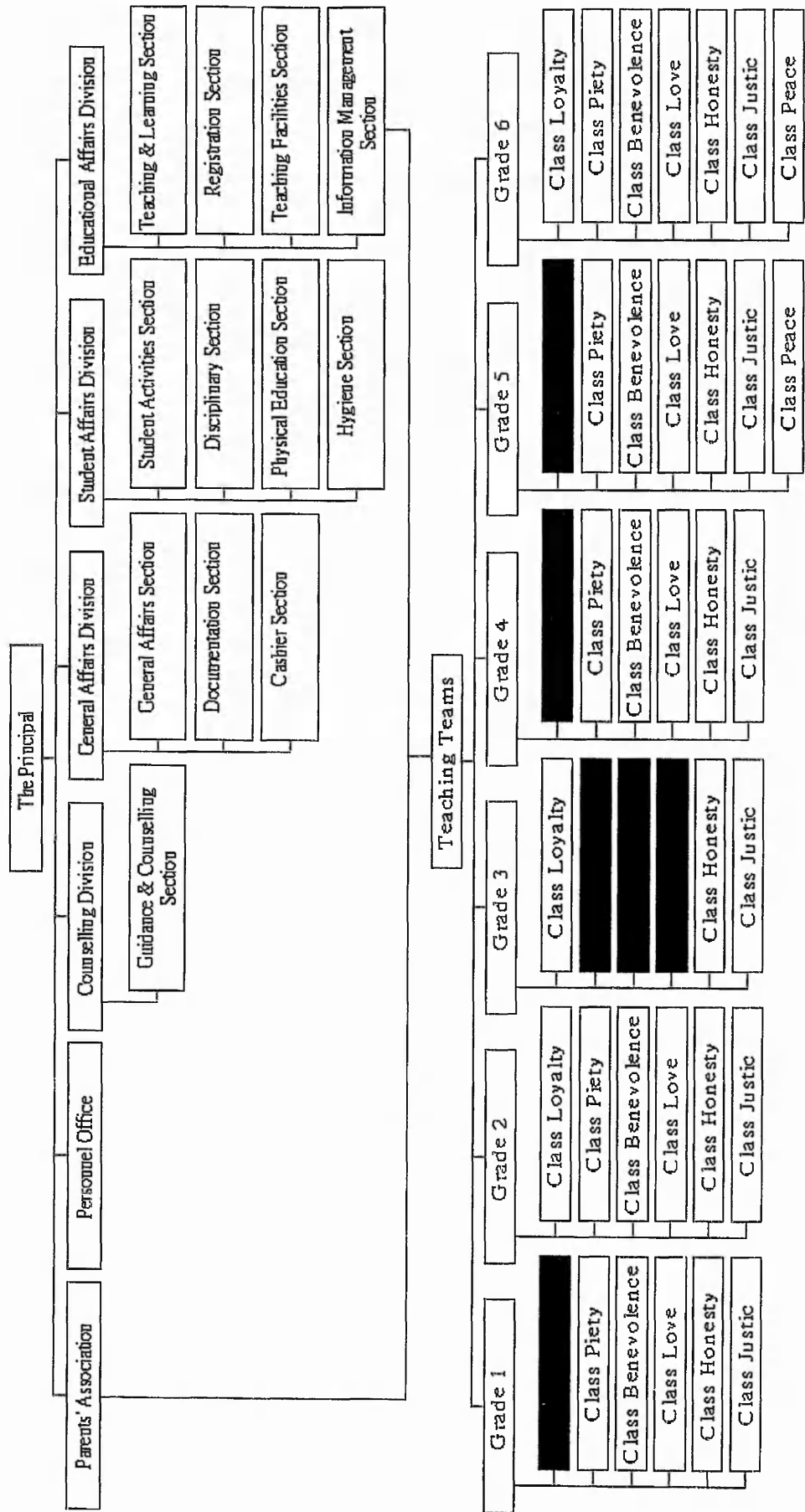
教學札記撰寫內容最好包含上列這些方面，並對相關之決策、行動與結果作為完整的紀錄。

下列問題可以做為撰寫教學札記的參考問題：

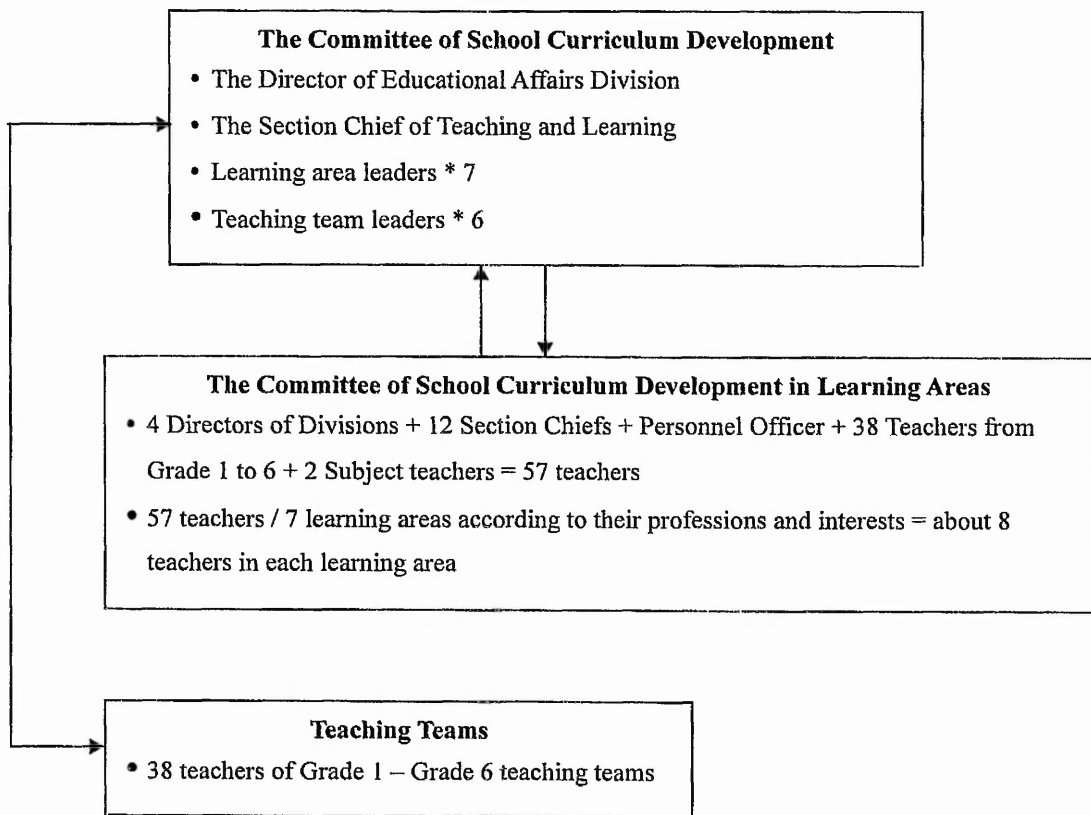
- 發生什麼事情？
- 為何發生？
- 我當時採取了什麼樣的行動？
- 該事件的代表意義為何？
- 有沒有發生過類似的事情？
- 我對這件事的想法？

研究者將不閱讀您的教學札記。如果您願意與其他老師在行動學習活動中分並討論您的教學情況與問題，此教學札記可作為活動之參考資料。此項教學札記方針僅做為教師個人教學記錄之建議事項。

Appendix 16: Organisational Structure in School Administration



Appendix 17: Organisational Structure in School Curriculum



Appendix 18: Action Learning Set Meetings

* 1st Action Learning Set Meeting

Date	17/09/2004	Time	3:30 p.m. began at 3:40 p.m. lasted for 1 hour.	Place	Grade 3, COL
Participants	T1, T2, T3, T4, T5, T6		Set Meeting Leader(s)	T1	
Topic(s)	<ul style="list-style-type: none"> • Autobiography of T1. • Brainstorming. 				
Pre-Meeting	<ul style="list-style-type: none"> • The researcher prepared tea and snacks as well as a printed outline of self-facilitated action learning. 				
In-Meeting	<ul style="list-style-type: none"> • The researcher introduced the aspects of action learning and the schedule of this action learning set. 				
After-Meeting	•				

* 2nd Action Learning Set Meeting

Date	01/10/2004	Time	3:30 p.m. began at 3:40 a.m. lasted for 1 hour.	Place	Grade 3, COL
Participants	T1, T2, T3, T4, T5, T6		Set Meeting Leader(s)	T2	
Topic(s)	<ul style="list-style-type: none"> • Autobiography of T2. • Brainstorming. 				
Pre-Meeting	<ul style="list-style-type: none"> • The researcher prepared tea and snacks. • T3 brought some pomelos. 				
In-Meeting	<ul style="list-style-type: none"> • T4 reminded the researcher it was 4:30 p.m. 				
After-Meeting	<ul style="list-style-type: none"> • After the set meeting, T4 told the researcher that she felt T1 was affectedly when talked about her experiences. 				

* 3rd Action Learning Set Meeting

Date	15/10/2004	Time	3:30 p.m. began at 3:45 p.m. last for 1.5 hours.	Place	Grade 3, COL
Participants	T2, T3, T5, T6		Set Meeting Leader(s)	T3	
Topic(s)	<ul style="list-style-type: none"> • Autobiography of T3. • Brainstorming. 				
Pre-Meeting	<ul style="list-style-type: none"> • Two days before the set meeting, the researcher reminded T3 to try 1) to focus on experiences affected the construction of his professional knowledge and educational beliefs when described his autobiography, 2) to generalise essential aspects according to his autobiography and 3) to lead the process of the set meeting including moving on the stage of brainstorming. • The researcher prepared tea and snacks. • T3 prepared a written autobiography of T3. • T5 brought some CDs related to Moral Education to share with other teachers. 				
In-Meeting	<ul style="list-style-type: none"> • T1 and T4 were not available to join the meeting. • The researcher reminded the participants to try 1) to focus on experiences affected the construction of their professional knowledge and educational beliefs when described their autobiographies, 2) to generalise essential aspects according to their autobiographies and 3) to lead the process of the set meeting including moving on the stage of brainstorming. • In the course of the meeting, an administrator came and talked to T2 for one hour. 				
After-Meeting	•				

* 4th Action Learning Set Meeting

Date	29/10/2004	Time	3:30 p.m. began at 3:45 p.m. lasted for 2 hours.	Place	Grade 3, COL
Participants	T1, T2, T3, T5, T6		Set Meeting Leader(s)	T6	
Topic(s)	<ul style="list-style-type: none"> • Autobiography of T6. • Brainstorming. 				
Pre-Meeting	<ul style="list-style-type: none"> • The researcher prepared tea and snacks. • T6 prepared a written autobiography. 				
In-Meeting	<ul style="list-style-type: none"> • T4 was not available to join in the meeting. • T6 did not intend to start the brainstorming activity after he finished describing his autobiography. 				
After-Meeting	<ul style="list-style-type: none"> • 				

* 5th Action Learning Set Meeting

Date	11/11/2004	Time	3:30 p.m. began at 3:40 p.m. lasted for 2 hours.	Place	Grade 3, COL
Participants	T1, T2, T3, T4, T5, T6		Set Meeting Leader(s)	T5	
Topic(s)	<ul style="list-style-type: none"> • Autobiography of T5. • Brainstorming. 				
Pre-Meeting	<ul style="list-style-type: none"> • T1 forgot the set meeting data so the researcher went to her classroom to find her. She arrived around 4 p.m. • T2 was talking to a parent so she arrived late. • The researcher prepared tea and snacks. • T5 brought some books related to Moral Education to share with other teachers. 				
In-Meeting	<ul style="list-style-type: none"> • During the meeting, an administrator came and talked to T1. • T4 talked with others while T5 was describing her autobiography. 				
After-Meeting	<ul style="list-style-type: none"> • The researcher arranged a data for the 6th meeting with the participants since the previously set data was a holiday. 				

* 6th Action Learning Set Meeting

Date	03/12/2004	Time	3:30 p.m. began at 3:40 p.m. lasted for 1.25 hours.	Place	Grade 3, COL
Participants	T1, T2, T3, T4, T5, T6		Set Meeting Leader(s)	T4	
Topic(s)	<ul style="list-style-type: none"> • Autobiography of T2. • Brainstorming. 				
Pre-Meeting	<ul style="list-style-type: none"> • The researcher prepared tea and snacks. • T4 said to everyone that she would only need 20 minutes to finish her talk. 				
In-Meeting	<ul style="list-style-type: none"> • It appeared that the participants tended to not ask questions while T4 was describing her autobiography and also T4 tended to ignore the questions T1 asked her. • T4 did not intend to start the brainstorming activity after she finished describing her autobiography. 				
After-Meeting	<ul style="list-style-type: none"> • The researcher reminded the participants the focus of the next three meetings would be on the brainstorming activities and asked them to think about issues they would like to talk about while the researcher was away for a week. • The researcher arranged a date for the Christmas party with the participants. 				

* 7th Action Learning Set Meeting

Date	17/12/2004	Time	3:30 p.m. began at 3:50 p.m. lasted for 2 hours.	Place	Grade 3, COL
Participants	T1, T2, T3, T4, T5, T6		Set Meeting Leader(s)	T1 & T5	
Topic(s)	<p>T1: 1) How to organise pupils' background details to which assists administrators and teachers to access easily? 2) Which is the best way to divide pupils into classes? 3) How to assist low achievement or special pupils? 4) Which is the best way to arrange seats? 5) Which is the best way to arrange classroom equipments? 6) How does the school benefit from the alternation between administration and teaching staff? 7) How do parental volunteers assist a class?</p> <p>T2: 1) If you were not a teacher now, what would you like to be?</p> <p>T3: 1) What are the initial intentions and realistic circumstances of curriculum preparation?</p> <p>T4: 1) Is there a complete set of retirement system which is more humanistic?</p> <p>T5: 1) In the course of your teaching years, are there any experiences which bring about frustrations? 2) Do you like being a teacher? Why?</p>				
Pre-Meeting	<ul style="list-style-type: none"> • Three days before the set meeting, the researcher asked the participants issues they wished to discuss in the meeting; however, all of them seemed not to understand what was going which the researcher had reminded them what to prepare before the meeting for two times. • When T4 saw T1's issues, she criticised them as commonplaces in front of the researcher. • The researcher prepared tea and snacks as well as a list of issues collected from the participants. • T1 arrived late since she was talking to a parent. • T4 arrived at 5 p.m. 				
In-Meeting	•				
After-Meeting	•				

* 8th Action Learning Set Meeting

Date	31/12/2004	Time	3:30 p.m. began at 4 p.m. lasted for 1.75 hours.	Place	Grade 3, COL
Participants	T1, T2, T3, T4, T5, T6		Set Meeting Leader(s)	T2 & T4	
Topic(s)	<p>T1: 1) How to prepare curriculum in order to increase the effectiveness and efficiency? 2) How to implement performance achievements which provide a stage for pupils and also integrate teaching? 3) How to create a harmonious atmosphere between administrators and teachers?</p> <p>T3: 1) What are the intentions and current conditions of integrating Information Technology into teaching?</p> <p>T5: 1) In the course of your teaching years, are there any experiences which bring about frustrations? 2) Do you like being a teacher? Why?</p> <p>T6: 1) How could administrators and teachers complement each other?</p>				
Pre-Meeting	<ul style="list-style-type: none"> • The researcher prepared tea and snacks as well as a list of issues collected from the participants. • T4 was late because she was preparing exam papers. 				
In-Meeting	<ul style="list-style-type: none"> • 				
After-Meeting	<ul style="list-style-type: none"> • The researcher arranged a data for the last meeting with the participants. 				

* 9th Action Learning Set Meeting

Date	14/01/2005	Time	3:30 p.m. began at 4 p.m. lasted for 1 hour.	Place	Grade 3, COL
Participants	T1, T2, T3, T4, T5, T6		Set Meeting Leader(s)	T3 & T6	
Topic(s)	<p>T1: 1) What are your viewpoints on examination? 2) How do you guide pupils to make good use of summer and winter holidays?</p> <p>T2: 1) Good books sharing.</p> <p>T3: 1) What are the importance and ways to learn others' experiences and knowledge efficiently?</p> <p>T4: 1) How to set exam papers? Does it focus on the test of pupils' academic achievement or the preferred design of teachers?</p> <p>T6: 1) Can we choose our teaching team members?</p>				
Pre-Meeting	<ul style="list-style-type: none"> • The researcher prepared tea and snacks as well as a list of issues collected from the participants. • T3 and T4 were complaining about their teaching team leaders while waiting for others. 				
In-Meeting	<ul style="list-style-type: none"> • 				
After-Meeting	<ul style="list-style-type: none"> • 				

*** 10th Action Learning Set Meeting**

Date	20/01/2005	Time	10 a.m. began at 11 a.m. lasted for 1 hour.	Place	Grade 3, COL
Participants	T1, T2, T3, T4, T5		Set Meeting Leader(s)	The researcher	
Topic(s)	<p>The researcher:</p> <ol style="list-style-type: none"> 1) What are the components of your professional knowledge and their characteristics? 2) How do you develop and construct your professional knowledge in three stages: prior to teacher education, in the process of teacher training and after actual teaching? <ul style="list-style-type: none"> • How does the observation of your teaching affect you? • How do you make use of the observational notes the researcher has provided? • How does the composition of your teaching diary assist you? 3) How do you share your teaching experiences and issues with other teaching staff? <ul style="list-style-type: none"> • Does the process if interviews bring you any new thoughts? • Have you participated any peer observations the school has held this semester? Why? Do the activities bring you any new teaching ideas? • How do you regard this group? • How does the retrospection of your past experiences affect you and your teaching? • Are there any different thought raised through the collaborative discussion of your autobiography? • Do others' autobiographies bring your any new thoughts? • How does the process of brainstorming assist you in your daily teaching life? • What are the influential factors engaged in the process of teachers' sharing? 4) Ho do you apply newly gained ideas or knowledge into your teaching? 5) How could the school support the promotion of your personal knowledge management (the above processes)? 6) How would the internalisation of your personal knowledge management affect you and your teaching practice? 7) Finally, please share your thoughts about being as one of the participants in this research. 				
Pre-Meeting	<ul style="list-style-type: none"> • The researcher prepared tea and snacks as well as a list of questions to be discussed. 				
In-Meeting	<ul style="list-style-type: none"> • The researcher talked about her learning experiences asked by some participants. • T4 was talking to an administrator in front of the others loudly while they were discussing the questions. Finally, T3 asked the administrator to be quieter. After they finished their talk, T4 asked others to discuss quicker because she was hungry. • In the course of the discussion, T4 was making the pupils' achievement results. • T2 and T3 were away since there was a problem about the preparation of curriculum for the next semester. 				
After-Meeting	<ul style="list-style-type: none"> • The researcher and the participants except T2 had lunch together. 				

Appendix 19: Examples of Knowledge Sharing in the Action Learning Set Meetings

Example 1:

T4: T1, how did you deal with Eric's (a fictitious name of the pupil) situations?

T1: He is an innocent child.

T4: But he is enthusiastic.

T1: Yes, so you need to use this personality to instruct him.

T4: But he cannot keep up with other pupils.

T1: That is true.

T4: So I ask other pupils to help him with the school works.

T1: His situations in Grade 1 and 2 were like this. His mother is not a Taiwanese so she cannot help him as well. I knew he was enthusiastic so I used this feature to encourage him and made him feel he was capable. For example, I told him Eric you needed to write faster in the exam or you would not finish it on time. Sometimes, I even allowed him to continue the exam paper in the break. He is able to achieve the goal but his action and reaction are slower than others.

Example 2:

T5: T1, how do you give household jobs as one kind of homework?

T1: If the pupils do some household jobs at home, I ask the parents to write down what they have done in their Parental Contact Book and I will stamp 'Good Job!' in the book. By the end of the semester, I give the score of Moral Education according to how many 'Good Job!' stamps the pupil has. When it is about the pupils' score, the parents always take it seriously. Sometimes, the pupils compare with each other saying why others' 'Good Job!' stamps are more than theirs. I will explain why some have more stamps because they help me to arrange classroom tables or pick up trash. I always tell my pupils every wastepaper is luck so they pick up wastepaper actively. Now, if I ask them to pick up luck, they will start to pick up wastepaper.

T5: I teach my pupils a 'good sentence' – Picking up luck others do not want and then you will have the luck.

T2: So the implementation of 'good sentences' is useful.

T4: Yes, I always start from the simple ones.

T1: Yes, it is useful. I firstly write down a good sentence in the blackboard and ask them to memorise it. Subsequently, I tell them a story about the meaning of the sentence and ask them to tell others the story on the next day.

T4: I intend to integrate 'good sentences' into the pupils' daily life by asking them to

put a 'good sentence' into an incident. If they have arguments with others, they could use the 'good sentence' to interpret the situation and therefore try to think the reason why this is happening and forgive others.

T1: Yes, the implementation must be put into practice.

T4: Like my class, if someone does something wrong, others will use a 'good sentence' to attack the person. For example, when a person says something offends his/her eyes, the whole class say to the person 'Everything pleases the eyes if the heart is beauty' and the person will not have anything more to say. Sometimes, I repeat giving them the same 'good sentences' and they remind me I have taught them the sentences. I will tell them that is because I think you guys do not do it good enough so I want you guys to learn it again. But in fact, I do not have 'good sentences' anymore.

Example 3:

T4 had an argument with the Grade 3 teaching team leader since the team leader criticised the words used and level of the exam paper T4 set were inappropriate and difficult. T4 was upset about the teaching team leader's criticism since the paper was approved by all the teaching team members of Grade 3 before the exam; consequently, she brought up the issues in the ninth set meeting.

T4: How to set exam papers? Does it focus on the test of pupils' academic achievement or the preferred design of teachers?

T1: I think both. That is the reason why all exam papers need to be approved by all teaching team members one week before the exam. Unlike previously, we did not need to ask others' opinions as long as papers were set on time.

T4: True, but I think we need to consider the percentage of a paper. For example, pupils' academic achievement is accounted for 80% and teachers' preference is accounted for 20% when setting a paper. I also think teaching team members should respect the teacher who set the paper unless it does not focus on the direction and the contents.

T1: That is why I say we need one week to approve exam papers. Everyone should do the papers first and subsequently point out issues. One cannot criticise the papers without doing them. We must know it is difficult to set a paper.

T5: Yes, criticising is always easier.

T4: Right!

T5: If a paper is approved by all of the teaching team members and the exam is

finished, does a teacher still have the right to criticise the teacher who set the paper?

T1: In this case, you do not need to be bothered by the criticism. It is the person's problem. We do not need to be responsible for such criticism.

T4: She [means the Grade 3 teaching team leader] even required me to change the words of a question.

T3: That is not reasonable.

T1: Did you ask her why and how to change?

T4: Yes, but she couldn't give me an example.

T5: What is the point to bring up that issue when the exam is finished?

T4: I did not argue with her that the paper was approved by her before the exam and how come she said the words used were inappropriate and the paper was too difficult. I think it is not right.

T1: You need to let it go. You cannot control other people's mouth.

T5: Is she emotionally?

T3: It is because her pupils have got bad scores on that paper.

T1: So she expressed the paper was too difficult.

T2: I think it is necessary to give pupils some frustrations sometimes.

T1, T4 and T5: True.

T1: I think it should work in this way. Like my teaching team, as we receive an exam paper, we firstly do it and therefore discuss it together. Once the paper is approved, we do not change it or complain the teacher who set the paper after the exam. We need to consider a teacher put lots of effort and time to set a paper.

T3 and T4: True.

Appendix 20: Quotations of the Participants' Opinions on Their Engagement in the Self-Facilitated Action Learning Set

"I think we should continue this action learning set. It brings lots of benefits to me because everyone is sincere and positive. Some groups, when they meet together, they start to complain. However, in this group, when we confront with issues or difficulties, we are able to find out solutions immediately. For example, last time I talked about the trouble maker in my class and everyone provided me ideas. I have applied these ideas to the pupil. Although some did not work but at least I have tried and known these ideas did not apply to him. However, I think this set should work in private because I am worried this would hurt the Principal. She may think her team is intervened." (T1)

"It brings lots of impacts. Everybody has shared our experiences and listened to others' opinions. I always do not have time to organise and integrate my thinking and experiences after school; however, I am able to accomplish this task through talking with the set members. We encourage each other in order to improve." (T2)

"I like the group because we intend to encourage and assist each other in order to improve." (T3)

"It brings impacts on my thinking as we share our experiences in how to deal with issues or situations previously. Although we complain sometimes, my mood calms down." (T4)

"It brings lots of benefits to me. I always feel alone when facing the pupils in the classroom which requires me 'to give' continuously but not 'to get' good things back. Through this set, I am able to know how others think, integrate others' strengths into my beliefs and consequently modify my weaknesses continuously, which enables me to apply good staff to the pupils." (T5)

Appendix 21: Educational Affairs Meetings

Scenario 1 - Meeting of the Committee of School Curriculum Development (CSCD) in the End of the Semester

Time: 22/12/2004 at 1:30 p.m.

Place: Audiovisual centre

Participants: Members of the CSCD

Purposes of the meeting:

1. To discuss the time for graduation exams,
2. To discuss performance achievements in reading, music and traditional sports,
3. To discuss topics for Wednesday seminars, and
4. To discuss the preparation of curriculum for the next semester.

Before the meeting, the Section Chief of Teaching and Learning (SCTL) prepared documents on the table including the schedule for the next semester, an outline of the meeting and a form to use for pupils' achievement results. The meeting started at 1:40 p.m. The SCTL told the members that they needed to make decisions today; otherwise, they could not leave. Moreover, she stipulated the teaching team leaders to give her at least 3 topics for Wednesday seminars at a later time.

Firstly, the SCTL asked each teaching team leader topics for Wednesday seminars. Each teaching team leader gave her topics they were interested in. When asked the teaching team leader of Grade 5 and 6, they said they did not have any opinions. Subsequently, the SCTL said, *"You guys [the Grade 5 and 6 teaching team leaders] always participate in seminars held by other schools. It seems that you like to join in this kind of events. Why now you do not have any opinions? Does it mean that you do not care? This is so-called irresponsible."* The teaching team leader of Grade 6 said angrily and privately, *"What is so-called irresponsible? I cannot believe it!"* After that, the Director of Educational Affairs talked about the purpose of Wednesday seminars for the Principal.

Secondly, the Grade 6 teaching team leader expressed that the team did not want to make the decision of the graduation exam time by their own. Therefore, the Principal postponed this issue till the meeting of administrative affairs which was in the last week of the semester. Following on, the Section Chief of Physical Education and the Grade 6 teaching team leader talked about the graduation exam time privately but loudly.

Thirdly, the SCTL showed forms which she saw in other schools and required the

members to prepare the syllabuses of learning areas for the next semester in compliance with those forms. The teachers did not give any responses to this requirement.

Fourthly, the SCTL talked about the time for the performance achievements. She explained why she wished the events could be implemented in the end of the next semester, saying *"I am afraid that once the performance achievements are done, the teachers will not work hard and I will never let it happen."* The members were saying something grumblingly and angrily. Then, the Principal said, *"Do not worry about it. Our teachers are always conscientious and work hard."* Prior to getting into the next topic, the SCTL said, *"It seems that I do not respect all of you if I do not ask whether you guys have any opinions. Does anyone have any opinions?"* No members responded but the Principal said, *"Ok! I represent the teachers. Move on the next topic."*

Fifthly, the SCTL asked the members the form to use for pupils' achievement results. One of the members from the Grade 3 teaching team said, *"We [the Grade 3 teaching team] have designed a form to use already. It is troublesome if you want us to change."* No one said a word and the SCTL paused for a moment. Suddenly, the teacher from the Grade 3 teaching team stood up and said loudly, *"Or I am going to get it and show you [the SCTL] now."* The SCTL said, *"No need."* and explained why she provided this form was because some other teachers asked for this kind of form last semester. She also told the members they could use whatever forms they liked. The Principal said, *"Thank you the SCTL. I know you always work hard."* The SCTL explained why she provided this form today and stated that she did not intend to ask every teaching team to use this form. Following on, the leader of learning areas in IT (Information Technology) Education suggested that the school could adopt kind of software related to pupils' achievement results but on one responded. Then, the SCTL said, *"I know Grade 3 has one. Could your grade share with us?"* Two of the teachers from Grade 3 said, *"No!"* The SCTL ended the meeting at 3:20 p.m.

Scenario 2 – Informal Follow- Up Meeting of the CSCD

A week after the meeting of the CSCD (22nd December 2004), an informal meeting was formed by the six teaching team leaders. The purpose of this meeting was to discuss the preparation of curriculum for the next semester. The teaching team leaders decided not to integrate syllabuses for seven learning areas and also not to include a detailed lesson plan for every lesson, which was required by the SCTL in the meeting on the 22nd, due to the fact that they all thought this was not the teachers' duty but the duty of Teaching and Learning Section. Consequently, all of the teaching team leaders intended to put down this agreement made in the minutes of teaching team meetings which would be viewed by the Principal and Directors of Divisions.

Scenario 3 – Conflict in the Morning Meeting

Two days later (30th December 2004) in the morning meeting, the SCTL asked everyone in the meeting to give her some time to express her feelings and thoughts. Some teachers booed. At the beginning of her talk, she said she would try to control her temperament and use positive tone to speak. She then further indicated why kind of mission the teachers had as the country was implementing its educational reforms as well as the proper attitudes and roles the teachers should have. At the moment, a teacher in the back of the room said scornfully, *"Everything is your own words."* The SCTL continued her speaking and her voice became louder and louder. At the end of her talk, she expressed that she was disheartened and unwilling to be in the position anymore. Following on, three of the members of the CSCD explained issues the SCTL previously brought up and asked the teachers to judge whether they were right or wrong in turn. As three of the members finished their sentences, the teachers were clapping which did not happen when the SCTL finished her words. Afterwards, the SCTL came to the stage and said, *"I did not want to explain again since I have decided to quit. However, I hope you guys do not turn my words around and compass them in parts"* At the end of the meeting, the Director of Educational Affairs Division wished all teachers could understand the endeavours and motives of the SCTL and consequently hoped that the teachers not to accumulate rancor. Moreover, the Principal concluded that the school was as a lovely family and therefore everyone was able to express any thoughts. She also hoped that the teachers could cherish the luck which brought them together.

Scenario 4 – Conflict in the Big Office

Three days later (3rd January 2005), T1 led the other five teaching team leaders to talk to the SCTL about the preparation of curriculum in the big office. The SCTL explained indignantly why she wanted every teaching team to integrate the syllabuses of seven learning areas together with detailed lesson plans. T1, T6 and the Grade 6 teaching team leader explained their views and also pointed out that they were here to solve the problem but not to argue. The SCTL started to cry and questioned the teachers why they did not raise this issue immediately in the meeting. Subsequently, she judged the teachers' attitude of unwillingness to do the job she required them to do. Concurrently, the Director of Educational Affairs Division also questioned the teachers why they did not say a word in the meeting but resisted afterwards. T1 and the Grade 6 teaching team leader explained that they could not respond immediately because everything was proposed and decided in a sudden. The bell rang and the teachers left. T1 stayed in the big office and consoled the SCTL.

Scenario 5 – Provisional Meeting of the CSCD

On the next day (4th January 2005), T1 convened a provisional meeting to solve the problem about the preparation of curriculum for the next semester.

Before the provisional meeting, T1 asked the Director of Educational Affairs to attend the meeting. The Director said, "OK!" When asked the SCTL to participate in the meeting, she was unwilling to join and said, "*You guys can decide anything without me.*" Following on, when asked the Principal to attend the meeting, she said, "*This is the business between the teachers and the SCTL and I think I do not need to be there.*" T1 explained to the Principal that her appearance in the meeting could make the teachers feel they were being supported. As a result, the Principal agreed to join and asked the SCTL to also join for her face. Finally, the SCTL promised she would be there.

Once the agreement from the Principal, the Director of Educational Affairs Division and the SCTL received, T1 informed the rest of the members of the CSCD to participate in the provisional meeting after class and additionally told them the purpose and meaning of this meeting.

After class of the day, every member of the CSCD came to the classroom of Grade 1 Class Loyalty. Firstly, T1 praised the endeavours and contributions the SCTL had carried out and then asked the teachers to applaud for the SCTL if they agreed what

she just said. Everyone applauded. Following on, T1 gave everyone one minute to propose questions. Simultaneously, T1 told every member to solve the problem today and not to bring any negative feelings out of the classroom if there was any occurred. In the light of the questions proposed, T1 answered the questions first and afterwards asked the Principal, the Director of Educational Affairs Division and the SCTL whether she was right or wrong. When met the issues T1 could not answer, T1 then asked the SCTL to explain. During the discussion, everyone was calm. Of course, there were times when people thought back what happened in the past which caused negative emotions. T1 reminded everyone to throw away the prejudices and to only focus on the central issues of today. Afterwards, T1 gave everybody one minute to determine their thoughts and therefore to decide and vote for the results. The meeting lasted for one hour and the issues were solved by the members of the CSCD.

Appendix 22: Teachers' Comments Pointed Out in Morning Meetings

Scenario Background

Prior to the introduction of scenarios in the morning meetings, it is essential to explain the personal relationship between the Director of Counselling Division and T2. In the Academic Year 2003, T2 was the Section Chief of Guidance and Counselling Section who worked under the Counselling Division. However, the Director used T2's signet for the approval of certain expenses without notification. The event was discovered by T2 and therefore her group, known as the Preparatory Committee of Teachers' Association (PCTA), helped T2 to start a feud with the Director in order to prove that she did not use her signet to approve such expenses. Since then, this group of the teachers had a personal feud with the Director of Counselling Division.

Scenario 1 – 20/12/2004 Morning Meeting

The Director of Counselling Division announced that she wished to integrate pupils' musical concert, which was held by T2 for five years, into the activities for the parental education day. The Director provided a list of schemes for the teaching teams to discuss which one was their preference. One of the teachers from the PCTA asked the Director to explain each schemes and the Director explained. One of the teachers from the PCTA asked the Director whether the musical concert was for all teachers and pupils and the Director gave a positive answer. Suddenly, another teacher from the PCTA went to the stage and questioned the Director it was difficult and impossible to make everybody participate in the musical concert. The Director explained this musical concert was not held for specific people but for the whole school. The other teacher from the PCTA said to the Director, "*You still have not explained the schemes. Could you please give everyone the list so that we know what you are talking about.*" Following on, the Principal said she did not tend to negate the results and quality of previous musical concerts and shared her experiences of holding such activities. After the meeting, the PCTA talked about the integration of the parental education day and musical concert.

Scenario 2 – 23/12/2004 Morning Meeting

The Director of Counselling Division explained again that she intended to plan a musical concert which every pupil could join. Following on, T2 played a song which was played in the musical concert of last year and subsequently expressed why she had held such the musical concerts for five years. During T2's talk, she choked with sobs and some teachers took their tissues out. Another teacher from the PCTA controverted the Director's words and asked every teacher to think in another way. Consequently, the Director indicated that she had inquired relevant administrators for their comments. Moreover, she expressed that everybody had their own perspectives on certain things; therefore, she would respect others' opinions. After that, the Principal indicated and applauded T2's previous endeavours to hold a number of musical concerts. Moreover, she illustrated the Director of Counselling Division's standpoints and intentions and therefore she wished every teacher could use a healthy attitude to view this event but not be directed against certain people or things which destroyed everybody's sentiments. Finally, the Principal asked every teacher to clap for T2 and said that she would give T2 opportunities if T2 wished to hold another musical concert.

Scenario 3 – 07/01/2005 Morning Meeting

The Director of Counselling Division announced a decided plan for the integration of the parental education day and musical concert. After that, the Director and the members of the PCTA argued with each other angrily and agitatedly. One of the teachers from the PCTA even shouted and jumped. The Principal saw the situation and stopped them to talk more in a strong manner questioning, *"If this activity is not held by the Director of Counselling Division, will you still be against?"* The Principal also explained what the Director was trying to do was to respect everybody and listen to various comments. She also added that, in fact, the Director did not need to plan things in this way since she had the authority to make the decision.

Scenario 4 – 07/01/2005 Provisional meeting held by T1

T1 expressed that every teacher knew what the PCTA was intending to do was to be directed against the person but not the event. Accordingly, T1 convened a provisional meeting to discuss the integration of the parental education day and musical concert. The participants of the meeting included the Director of Counselling Division and the six teaching team leaders. First of all, the Director explained that the decided plan announced in the morning meeting. Subsequently, the Grade 6 teaching team leader pointed out the plan was well thought which took the teachers' standpoints into account and therefore there was no reason for the teachers to oppose. In the end, the teaching team leaders approved the plan and brought it back to discuss in detail with their teams.

Scenario 5 – 13/01/2005 Morning Meeting

The Director of Counselling Division announced an official document saying the features of the school-based curriculum needed to be integrated into parental education day. As a result, the Director pointed out she was not wrong. One teacher from the PCTA asked the Director whether that official document was stuck on the bulletin board in the big office; subsequently, the Principal said it would be stuck on the board.

Another Example of Teachers' Comments Specified in the Morning Meetings

Scenario 6 – 17/01/05 Morning Meeting

As it was the Director of General Affairs Division's turn, he asked the teachers' thoughts on whether there was a need for compensation if a pupil broke a window glass by means of asking the teachers to raise their hands. He also emphasised pupils should be responsible for their behaviours even they did not intend to make mistakes on purpose. In the end of the meeting, the Grade 3 teaching team leader described the whole process of the event and how she dealt with the issue. The teaching team leader questioned the Director to define 'not intend to make mistakes on purpose' and 'the result of not being cautious'. She also indicated that the pupil's parents would come later on to ask for an explanation. The Principal said, "*Different people view the same things differently. If the parents are coming, everybody could talk about the issue clearly.*"

Appendix 23: Quotations of the Participants' Opinions on their Interaction with the Administrators

"The Section Chief of Teaching and Learning is too busy so sometimes she cannot adjust her emotions. Moreover, I think there is something wrong with our [the teachers and the administrators] communication. Like last time [refer to Appendix 3], she required us to write detailed lesson plans so that any substitute teachers were able to take over lessons. However, we [the teachers] thought it was kind of wasting our time since the characteristics of teachers and pupils were different and therefore teaching would be adjusted according to situations." (T1)

"In many circumstances, we [the teachers] are in a disadvantaged position. Our suggestions or comments are sometimes rejected. Additionally, the Principal's leadership style does affect on the relationship between the teachers and the administrators. For example, a Section Chief will gain pressure just because of one sentence from the Principal and then pass the pressure on the teachers without considering our side." (T2)

"I feel that when we [the teachers] raise our difficulties in doing certain tasks required by the Tao-Yuan Bureau of Education, they [the administrators] always think the difficulties are not difficulties. We [the teachers and the administrators] have conflicts mainly because our ways of viewing the same things are different. In addition, I feel that the channels for communication are not flowing as before since we [the school] have changed a new Principal, which brings about misunderstanding." (T3)

"The angles we [the teachers and the administrators] stand are different so we have different ways of viewing things. For instance, the teachers will consider whether pupils are able to absorb and assimilate when we carry out activities. If not, what is the point of doing for the matter of formality? However, the administrators do not have the same perception. As a result, they sometimes interfere in the teachers' teaching when implementing tasks and think the teachers do not understand their situations. This is not right. Initially, an administrative system should support the teachers' teaching but not shirk responsibility when we ask for assistance. For example, last time a teacher asked the Director of Counseling Division to help her with a pupil, she replied the teacher it was the job of Student Affairs Division." (T4)

"In our school's situation, the administrators always require us [the teachers] to do lots of things and think we will not have any problems at all. However, I do feel there are problems. My teaching team members express that they are tired and have difficulties in operating coordination with them" (T5)

T5 also added, *"They [the administrators] seem so enjoyable and relaxed, which makes us [the teachers] have inequitable feelings. Therefore, we [the teachers] sometimes feel unwilling when they request us to do things. We start to be busy at eight in the morning and it is the time they buy their breakfast"*

"Most of the time, the administrators [particular means the SCTL] are too overbearing and cling obstinately to their course. I feel that the Section Chief of Teaching and Learning has a perceived perception about the teachers. When we express our opinions, she will view our opinions as excuses of being lazy and unwilling to do things. Sometimes, our starting point to raise is to solve problems and make tasks be implemented smoothly; however, they [the administrators] think we bring troubles to them on purpose. I really think there is something wrong with our communication." (T6)

Appendix 24: Formation of Teachers' Association

Blasting Fuse: Working hours event on 18th October 2004 which was described by the Section Chief of Teaching and Learning:

"I do not like the current atmosphere. To be honest, since we [the school] have changed the Principal, there is a group starting to rise up against. They [the group] are directed against people but not affairs. The story was happened few weeks ago. Originally, our working hours started at 8 a.m. The personnel officer showed everyone an official announcement which suggested schools to change their working hours from 7:40 a.m. since it was the time for pupils to clean schoolyards. Therefore, it is safer if teachers could look after pupils during the time. The personnel officer passed this information to us in the morning meeting and asked us to vote between 8 a.m. or 7:40 a.m. The final result was 7:40 a.m. which was different from the wish of that group. They started to pity saying the voting process did not follow the regulations and subsequently to ask other teachers sign to against the result. When some teachers insisted that they wanted the result of 7:40 a.m. and refused to sign, the group said those teachers were muddled behind their backs. I felt uncomfortable with what they [the group] did and the atmosphere was stalemated. In the end, they had enough signatures from the teachers so the Principal allowed us to vote again and of course they got what they wanted. I know that they are now happy with the result but I cannot understand where can be seen as the cause for happiness. I think the whole story is very preposterous. Even some teachers expressed that they did not want to offend them so they signed unwillingly. Our leader and directors know the power of this group so they over tolerate them on purpose. For the school, this is kind of crisis. However, I do not want to say anything more because I can see our leader does not have wisdom, daring and resolution to solve this crisis and what can people under her do?"

On 20th October 2004 in the morning meeting, five teachers announced they were going to form the Teachers' Association of the school and gave everyone an announcement as below:

Dear Teachers,

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The purpose of us to form a Teachers' Association is to express the school's teachers' opinions in an appropriate time and also to react to unreasonable things directly in an appropriate way but not to be against specific people in the school.

We always see the teachers are upset about certain announcements made by the school in meetings and listen to the teachers' complaints about those announcements. However, there is no appropriate channel for the teachers to express their own thoughts and comments. Even if those thoughts and comments are indicated, the school will not necessarily respond to the issues. Additionally, the whole process and contents of administrative affairs meetings of each semester are not allowed enough time for the teachers to discuss and reflect on the school's administrative affairs. Year after year, the teachers are becoming unhappy.

The school had a cheerful and harmonious environment. The teachers considered and helped each other. Not long after, the teachers are unwilling to participate in meetings, do not know who are responsible for certain jobs, feel difficult in holding activities and have no alternative.

We wish to change some things, including our working atmosphere, teaching quality, being respected, being listened by the school and the teaching and administration complementing each other.

Consequently, we have decided not to be silent. We wish to help everybody and also ourselves to strive for the opportunities to give off our voices. We hope everybody can join us.....

The Preparatory Committee of the Teachers' Association

From 23rd December 2004 to 12th January 2005, the members of the Preparatory Committee of the Teachers' Association were asking individual teachers and also administrative staff their willingness to join the association. T4 expressed that she would join the association if many people joined. If there were only a few people, she would not join. Moreover, T6 expressed that the members of the committee had tried to persuade him to join the association even if he was unwilling "*to be used as a piece*". In the end, there were forty-eight teaching and administrative staff joined except the Principal and Director of Counselling Division.

On 12th January 2005, an inaugural meeting was hold to form the Teachers' Association. According to the regulation of the formation of a teachers' association, thirty people were required to attend in the inaugural meeting. When there were thirty-one teachers appeared, the meeting began. The purposes of this meeting were 1) to establish the constitution of the Teachers' Association, 2) to elect executives and supervisors of the Committee and 3) to propose draft resolutions which would be proposed in the end-of-semester administrative affairs meeting. Throughout establishing the constitution collaboratively, the Section Chief of Physical Education was seen as a troublemaker since he interjected others' talks using loud voice and impolite words about five times. In the fifth time, the chairwoman of the meeting stopped him, saying jokingly, "*You. Do not speak again.*" Everybody was laughing. When electing executives and supervisors, T4 told me that she would nominate certain teachers to be supervisors in order to avoid the Preparatory Committee avenging a personal wrong in the name of public. Finally, two draft resolutions were proposed and agreed; subsequently, the chairwoman ended the meeting which lasted for two hours.

On 14th January 2005, a meeting was hold for the elected executives (mainly the members of the preparatory committee) and supervisors with the purpose of electing the president of the association. During the nomination, some teachers complained the behaviours of the Section Chief of Physical Education in the inaugural meeting. One of the members of the preparatory committee of the Association was elected and subsequently an assistant was needed to help the president. However, it was realised that the Section Chief of Physical Education was the first alternate executive and therefore the members of the preparatory committee tried to avoid him to be elected by means of searching and designating another alternative executive from the list. Following on, issues about the address of the site of the association, membership fee, the organisation of official documentation and the proposition of draft resolutions in the end-of-semester administrative affairs were discussed till the end of the meeting which lasted for 30 minutes.

Appendix 25: Quotations of the Participants' Opinions on the Formation of the Teachers' Association.

"I agree with the formation of the Teachers' Association and I do believe our school needs such an association. However, I am aware of the real intention of the formation. Is it for the striving of teachers' rights? for the creation of a better teaching and learning environment? or for the obtainment of more resources for teaching using the name of the Association? Those are the good intentions; however, if the purpose is to resist certain people or things, I will not agree with them [the PCTA]. I remember I have invited a speaker to present a seminar in relation to the purpose and meaning of teachers' associations and encouraged the teachers to form a teachers' association. However, on one responded to this issue at the time. Now, they [the PCTA] wish to form the Teachers' Association because of the working hours event. I feel uncomfortable with this and would like to ask them [the PCTA] their real intention. I did not oppose to the formation; however, I will join the Teachers' Association and express my admonitions if they do something inappropriately."
(SCTL)

"Yes, I agree to have such an association. However, I think when the teachers are trying to strive for their own rights, they should not think themselves are in a weaker position and therefore try to get anything they think they deserve to have. Sometimes they should not overstep the authority. Teachers are in their own stratum and how come they ask for the same rights and duties as the stratum of Principals or Directors. Additionally, a teachers' association should not interfere in and criticise principals' or directors' integrities and moralities since there is an organisation will inspect them. However, the practices of some teachers' associations have gone off. Whenever they hear something unpleasant to the ear, they will use the name of the association to be against its school." (T4)

"Yes, I will join the Association. However, I hope they [the preparatory committee] do not intend to use the name of the Association to against the school. Otherwise, the school atmosphere will be becoming worst." (T6)

"The purpose of forming the Teachers' Association is to strive for the teachers' rights and express our thoughts and comments to the school. However, up to now, the practices of our Teachers' Association do not follow the original intentions and regulations. I am worried whether there will be confrontation caused between the teachers and administrative staff." (T3)

"I think these five teachers are conscientious. However, they do not like the Principal's leadership style so they always express opposing views against the Principal and Director of Counselling Division. In this time, I will expostulate them. Therefore, some people may think this group is not good and do not want to be affected by them. However, I will see this is a chance to influence them." (T1)