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An Innovative Framework Applied to Elementary Schools: A Case Study of the Gaps Knowledge Management

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Abstract

While school principals and directors are putting more emphasis on knowledge management activities, it is the right time for elementary schools to put knowledge management (KM) into practice. The school administrators hope to improve school effectiveness through the activities KM. However, when implementing KM, there are some obstacles leading to gaps that may influence school effectiveness. In view of such problems, this research proposed an innovative framework of ‘‘the gaps KM’’ to fully illustrate the management gaps that might occur during the process of KM. The content-analysis approach combined with the thematic analysis was implemented in the study. Through in-depth interviews with principals and directors of six schools, we explored the cause of these gaps and approaches to reducing these gaps.

This research identified a comprehensive set of factors according to the management point of view that could potentially impact the magnitude or direction of these gaps and the corrective action for enhancing the success of the process of KM. This framework is expected to provide a convenient way to verify gaps KM and, thus,

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schools can make corrections and adjustments accordingly to enhance the chances of success when implementing KM.

Keywords: knowledge management, the gaps of knowledge management, school effectiveness, case study

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應用於國民小學的創新架構：知識管理缺口之個案分析

陳建志、蘇琪婷、謝秉蓉、林清河

摘　要

目前國民小學正值大力推動知識管理之際，而且學校領導者也越來越注重知識管理活動的實行，期望透過知識管理活動來提升學校效能。然而，當執行知識管理時，卻會有一些類似缺口的障礙因素影響學校效能。因此，本研究提出「知識管理缺口」之創新性架構，詳細闡述執行知識管理時在管理上會遇到的缺口。運用主題之內容分析取徑來加以研究，透過訪談 6 所學校的校長或主任，發覺這些缺口的成因及消弭這些缺口的方式。

根據管理的觀點定義出可能會潛在影響這些缺口強度及方向之完整因子，並找出增加知識管理有效性的相關作爲。期許能提供學校定義知識管理缺口更便利的方式，使其執行知識管理時，能據此找出提升知識管理的有效方式及因應策略。

關鍵詞：知識管理、知識管理缺口、學校效能、個案研究

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1. Introduction

1.1 Research Background

Knowledge management (KM) has become an important strategy for improving organizational competitiveness and performance (Sharkie, 2003). Effectively organizing, storing, sharing, and leveraging a firm's knowledge can propel an organization towards becoming more adaptive, innovative, intelligent and sustainable. The key KM challenges facing organizations today are to determine how robust KM is to implement, which user friendly processes and practices.

Most previous studies show that knowledge can be classified as either tacit or explicit (Hedlund, 1994). Tacit knowledge is experience-based knowledge that resides within an individual, whereas explicit knowledge is formally articulated and documented. In organizations, knowledge is often embedded in repositories, documents, routines, operational processes, practices, and norms. It is generally accepted that knowledge also comes from the meaningfully organized accumulation of information through experience, communication or inference (Zack, 1999).

Explicit knowledge is clear, formally articulated and documented. Tacit knowledge is not easy to formalize, making it difficult to communicate or to share with others (Nonaka & Takeuchi, 1995). In response to issues arising from the uncertainty over identifying the enablers and barriers to implementing KM, a number of value studies have been published addressing this concern and introduced the idea of knowledge gap (Barney, 1995; Nonaka, 1991).

1.2 The Future of KM in Elementary School

For elementary schools in Taiwan, the practices of KM are particularly promising and appropriate (Wu & Huang, 2006). Teachers' professional development and the developing of schools' information infrastructure will be the most advantageous

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situations. The democratization of data and the sharing of information induces people at every level to contribute, to participate, to interact, to grow, and to learn, and they do all this while mastering higher order skill sets. Making sense of information is a crucial step for organizational success; imparting what one learns and knows to others is even more difficult and rewarding (Petrides & Nodine, 2003). Besides this, according to the research of Stevenson (2001), and Philip and Kamontip (2008), KM can be helpful for benchmarking progress, continuous quality improvement, improving students' learning performance and measuring performance as milestones in education. Therefore, KM can really benefit school effectiveness. Thus, this research aims to identify some obstacles leading to gaps which probably influence school effectiveness, and explore the causes of these gaps and approaches to reducing these gaps.

In response to issues arising from the uncertainty over identifying the enablers and barriers to implementing KM, a number of value studies have been published addressing this concern (Barney, 1995; Nonaka, 1991). Several studies have proposed the concept of "knowledge gap" to describe the difference between the organization's current capability and the capabilities required for KM.

Hall and Andriani (2002) identified gaps occurring between existing knowledge and knowledge requirements, particularly those that occur when an organization is trying to introduce new process or products. Wild, Griggs and Downing (2002) defined the knowledge gaps as the quantitative and qualitative differences between the knowledge needed the knowledge and available in the organization. Beyond the aforementioned knowledge gaps, there exist different perceptions of KM activities and implementation amongst staff of differing levels and positions.

The inability to identify and resolve any gap prior to implementation will greatly impact the implementation process. Thus, it would be beneficial for schools to build a framework that would analyze the corporate knowledge needs, evaluate the implementation activities of KM and identify any inhibitors to success. Therefore, we propose this framework to identify an organization's KM gaps that might occur during

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implementation. This study validates the construct of the proposed framework through data and information obtained from in-depth interviews with principals and directors. This is necessary to understand the impact of these knowledge gaps.

To the best of our knowledge, previous studies have explored the generic and holistic structure of knowledge gaps based on the aspect of management activities in elementary school. Thus, we propose a holistic and innovative framework for "KM gaps" to fully explain how they might occur during implementation. For years, schools have strived to manage knowledge more effectively, the primary motivation being improved school effectiveness (Stevenson, 2001). Therefore, it is valuable to investigate how principals and directors can eliminate KM gaps through KM activities in order to enhance school effectiveness.

2. KM Gaps

Based on the literature of Holsapple and Singh's (2001) knowledge value chain, extended research on KM gaps have been developed, including Nonaka's (1991) spiral of knowledge, Suba's (1997) quality of education and the researches about KM gaps in business management by Lin and Tseng (2005) and Lin, Yeh and Tseng (2005). From Holsapple and Singh (2001), KM activities are classified into knowledge acquisition, selection, generation, internalization and other supportive activities. Hence, KM activities can be seen as processes that manipulate knowledge in an organization to improve performance.

The spiral of knowledge is an influential concept in the KM field. Tacit and explicit knowledge consist in the organization. If the organization has an appropriate interaction, achieve innovative knowledge value will be much simpler. When there are more and more individuals participate in the process of interaction between tacit and explicit knowledge, the organization's knowledge repertoire will be built. Therefore, it may reduce the gap between individual and organization because of the knowledge

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sharing process (Nonaka, 1991).

Through these ideas, we can realize that knowledge is important in many sessions while implementing KM. As for quality of education, students, students' parents, communities, and the educational organs are included in this model to evaluate the effectiveness (Suba, 1997). This research proposes a holistic framework for the KM gaps to fully illustrate the management gaps that might occur during the implementation of KM in education.

These gaps initiate from lower degrees of fitness between a school's KM activities and the external as well as internal environments confronting the organization. Since a generic and holistic structure of the knowledge gap based on the aspect of management activities has never been explored in elementary schools, we propose a holistic and innovative framework for the "KM gaps" to fully explain the KM gaps that might occur during implementation. As shown in Figure 1, there are six KM gaps that can be viewed from four different aspects: strategic aspect, perception aspect, planning aspect, and implementation aspect. The conceptual framework of the proposed KM gaps and the detailed descriptions of the four aspects are stated as follows:

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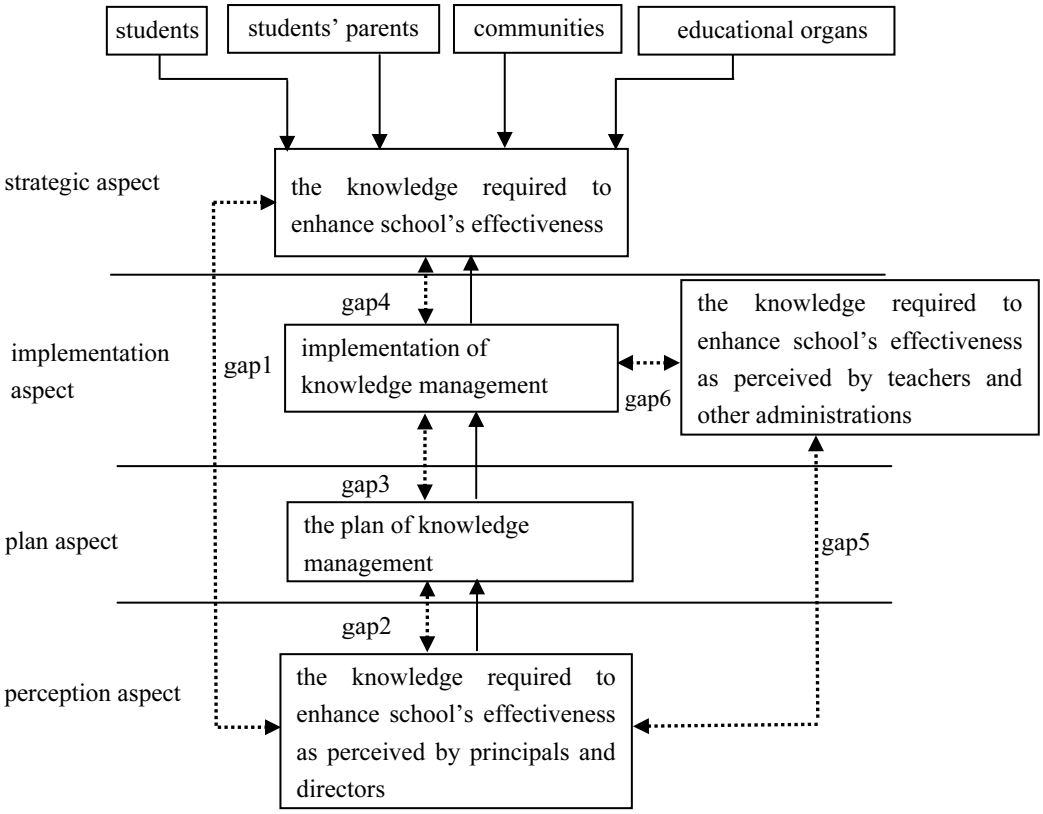

Figure 1 The KM Gaps Model Applied to Education

Resource: modified from Lin et al. (2005: 211).

2.1 The Strategic Aspect

Schools should review their internal and external environment to determine the knowledge required to enhance its effectiveness (Suba, 1997). Fail to do it may result in a gap between the knowledge required to enhance the effectiveness of a school as perceived by principals and directors and the knowledge actually required (i.e. gap1). The failure to evaluate the performance of KM or the ignorance to the influence from the stakeholders, such as students, students' parents, communities, and the educational

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organs may result in a gap between the results of implementation and the knowledge required to enhance school's effectiveness (i.e. gap4).

2.2 The Perception Aspect

Principals and directors may not be able to define clearly which knowledge they need. This may result in a gap between the perception of principals and directors and the enhancement of KM plan (i.e. gap2). Within a school there may be gaps between the perceptions of principals and directors and those of the teachers and staff due to the difference in positions, role, and professional knowledge (i.e. gap5). In school, we say that "staff" includes the principals, directors, teachers and other administrations.

2.3 The Planning Aspect

Understanding the school's internal and external environments may allow the principals and directors to implement a proper plan for KM implementation (Petrides & Guiney, 2002). If principals and directors cannot convey their knowledge into implementation phase, then gap2 may happen. Most school departments and offices maintain sources of data which rarely related to one another (Petrides & Guiney, 2002). This feature prevents from the clearly understanding of the use. If staff do not realize the KM plan while engaging in KM, then it may result in gap3.

2.4 The Implementation Aspect

Implementation should according to the plan, or Gap 3 will occur. Furthermore, during implementation the faculty should have the right perception with regards to the knowledge required in order effectively enhancing the schools, or gap4 will happen. Finally, a gap may exist between the knowledge implementation of KM and knowledge required to enhance school's effectiveness as perceived by staff (i.e. gap6). If the staff can not share their unique knowledge with each other, the implementation of KM will meet some obstacles (Lin et al., 2005).

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Thus, the definitions of the six KM gaps are stated as follows:

2.5 Gap1: The Gap of the Environment's Perception

It is the gap between the knowledge required to enhance the effectiveness of a school as perceived by the principals and directors as well as the knowledge actually required to enhance its effectiveness. In short, we can say it is the gap of environment's perception between principals and directors.

The role for the top managers in implementing KM is to review the internal and external environments of the organization in order to understand its strength, weakness, opportunities, and threats in conducting KM activities (Ndlela & Toit, 2001). Depending on the outcome of the analysis of the organization's current position and capability with regard to the aspect of KM, the organization can address opportunities and threats to formulate a suitable KM strategy. Each organization has its own unique knowledge domain to specific problems which it can be solved (Colleen & Leila, 2007). However, without a suitable and clear goal and a blueprint of the added value which can be fostered from the KM, the organization may not be able to launch its KM.

2.6 Gap2: The Gap of the KM Plan's Design

It is the gap between the knowledge required to enhance a school's effectiveness as perceived by the principals and directors as well as the plan to implement KM. In short, we can say it is the gap of the KM plan's design. Under the realization of the positions for the organization's internal and external environments, top managers are able to enact a proper plan for guiding the organizations in implementing KM (Rubenstein-Montano, Liebowitz, Buchwalter, McCaw, Newman, & Rebeck, 2001). Although top managers recognize the need for the acquisition of knowledge, they may not be able to define the knowledge clearly due to their inability to effectively describe what they need. This results in gap2, which is the obstacle between the perception of the top managers and the enactment of the plan for the KM system.

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2.7 Gap3: The Gap of the KM Plan's Implementation

It is the gap between the plan to implement KM and the plan. In short, we can say it is the gap of the KM plan's implementation. Before an organization decides to introduce the KM, it should provide a reasonable and comprehensive plan for the entire organization (Ndlela & Toit, 2001). However, staff may be afraid that their personal value might be negatively affected after sharing their knowledge.

2.8 Gap4: The Gap of the School's Effectiveness after Implementing KM

It is the gap between the result of implementing KM and the knowledge required to enhance a school's effectiveness. In short, we can say it is the gap of the school's effectiveness after implementing KM. Effective implementation of KM strategies include a clear definition of what knowledge needs to be achieved and what motivations must be created (Campbell & Luchs, 1997). In addition, a complete measurement system needs to be developed well so as to evaluate the organization and it will reinforce the competitiveness of the organization after the implementation of KM activities.

Knowledge measurement involves the evaluation of knowledge resources and knowledge processors. This process consists of identifying and recognizing value-adding processors and resources, assessing and comparing the execution of KM activities, and evaluating the impact of an organization's KM conducted based on bottom-line performance, which must have taken place to completely understand the present position of the organization. The measurement approach includes students' parents, communities, and the educational organs (Suba, 1997). Thus, many companies fail to evaluate the results of KM to determine whether it meets the expectations or not (Tiwana, 2001); "how to evaluate knowledge" has always been an issue.

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2.9 Gap5: The Gap of the Faculty's Position

It is the gap between the knowledge required to enhance a school's effectiveness as perceived by the principals and directors as well as perceived by teachers and other administrations. In short, we can say it is the gap of the staff's position. Creating new knowledge is a common responsibility for each department or group of experts in a knowledge- creating organization. However, within an organization there may be gaps between perceptions of managers and that of members due to the difference of positions, roles, and professional knowledge (Nonaka, 1991; Paiva, 2003).

Hence, staff's perceptions of what type of knowledge which they need will be different and depend on their positions and roles. Therefore, to match the perceptions of all staff in different positions, the goals and the plan for all levels of the KM staff become critical in the implementation.

2.10 Gap6: The Gap of the School's Faculty

It is the gap between the knowledge required to enhance a school's effectiveness as perceived by staff as well as the knowledge actually obtained after implementing KM. In short, we can say it is the gap of the school's staff. Staff spend much time to accumulate their personal knowledge for enhancing their effectiveness in the school, and thus the school should foster an atmosphere that emphasizes sharing knowledge and innovation explicitly.

As a result, staff will be hindered from sharing information, and the necessary knowledge acquisition becomes difficult. Members are used to explaining knowledge by their own situation and perspective, and hence, the content of the knowledge can continuously be altered during the diffusion process (Nonaka, 1991). Moreover, knowledge workers usually do not want to share their intellectual property with others, and the competition between knowledge workers often obstructs the sharing of the knowledge. Based on the discussions gap6 above can easily occur in an organization.

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3. Research Methodology

The main objective of this research is to build a framework of KM gaps with emphasis on the "contextual" factors suitable for further exploration in qualitative research (Berg, 2000). The case study represents one of the most common research designs for qualitative research. Case analysis is a good starting point in the inductive process of theory building (Yin, 1994). Since literature regarding these issues is rare, this research is with exploratory and qualitative nature. In addition, case analysis is the method of choice for inductive or teleological studies since it permits the researcher to observe and gather information about new or never researched natural phenomenon. The purpose of our case study is to explore the causes for these gaps and provide several fundamental approaches to bridge these gaps.

3.1 In-depth Interview

Interview is one of the useful methods of data collection (Bryman & Burgess, 1999). A content analytical approach and a thematic analysis were used for qualitative data analysis. Essential themes were pre-determined by literature review, including: the gap of the environment's perception, the gap of the KM plan's design, the gap of the KM plan's implementation, the gap of the school's effectiveness after implementing KM, the gap of the staff's position, and the gap of the school's staff.

The in-depth interviews which we conducted are face-to-face and semi-structured nature (Linberg & Rosenqvist, 2003), which is one of the most common approaches to interviewing in qualitative research (Bryman & Burgess, 1999).

This type of interviews involves the implementation of a number of predetermined questions and/or special topics. These questions are typically asked of each interviewee in a systematic and consistent order, but the interviewers are allowed to digress. That is, by using open-ended questions and both planned and unplanned prompts, the

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interviewers are permitted to probe far beyond the answers to their prepared and standardized questions (Berg, 2000). Khera, Stroobant, Primhak, Gupta and Davies (2001) indicated that semi-structured interviews allow the respondents to determine the direction and content of the interview within a broader framework provided by the interviewer.

3.2 Data Collection

The primary data collection approach was collected by semi-structured interviews. The interviews covered individual elementary school's background and experiences. In six cases, key individuals involved with the deployment of the core modules were interviewed, and an attempted to capture perspectives.

Validity involves the use of multiple sources of evidence, the establishment of a chain of evidence, and having key informants review the draft case study reports (Yin, 1994). In particular, multiple respondents provided evidence about the phenomenon of KM gaps and the project documentation also provided evidence. A chain of evidence is established by linking the data, the analysis, and the results. Finally, case summaries were documented after data collection was completed of which is read and reviewed by key informants. After reading the summary of the KM process and requested a few minor changes to better disguise the school.

3.3 Data Analysis Method

First step, we categorize the data into various categories and concepts, and next is used to generate cross-subject comparison and develop the key themes. Besides, there are several analytical techniques for analyzing qualitative data suggested by Miles and Huberman (1994), inclusive of: 1) putting information into different arrays; 2) making a matrix of categories and placing the evidence within such categories; 3) creating data displays－flowcharts and other devices－for examining the data; 4) tabulating the frequency of different events; 5) examining the complexity of such tabulations and

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their relationships by calculating second-order numbers such as means and variances; 6) putting information in chronological order or using some other temporal scheme.

In the study, the content analytical approach with the thematic analysis was used for qualitative data analysis. Essential themes were pre-determined by a volume of literature review. By using thematic analysis, the interview data was parsed into information abundant quotations that were ultimately placed into thematic categories (Anderson & Felsenfeld, 2003).

3.4 Triangulation

Patton (1987) discussed four types of triangulation in doing evaluations. That is, the triangulation: 1) of data sources (data triangulation); 2) among different evaluators (investigator triangulation); 3) of perspectives on the same data set (theory triangulation); and 4) of methods (methodological triangulation).

To reduce the likelihood of misinterpretation, we choose various six elementary schools to be our samples and invite different evaluators to check our data, including redundancy of data gather in and procedural challenges to explanations. For qualitative case works, these procedures are called triangulation (Patton, 1987). With triangulation, the potential problems of construct validity also can be addressed, because the multiple sources of evidence essentially provide multiple measures of the same phenomenon (Yin, 1994).

Therefore, we tested our proposed KM gaps model with multiple cases by checking their school management goals and managerial actions for KM. If empirically supported, we may argue that the suggested KM gaps model would constitute a distinct context for managerial focuses and actions. These six case studies were chosen for theoretical sampling reasons (Eisenhardt, 1989) in that the requirements determination phenomenon is obvious and observable, facilitating this theory-building effort.

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3.5 Case Study

The case study represents one qualitative research designs. It investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 1994). A case study involves systematically gathering enough information about a particular person, social setting, event or group to permit the researcher to effectively understand how it operates or functions. It is not actually a data-gathering technique, but a methodological approach that incorporates a number of data-gathering measures (Hamel, Dufour, & Fortin, 1993).

According to the governmental statistical data, there were 206 elementary schools in Kaohsiung (including City & County, Public & Private). KM in the elementary school has been carried out in Kaohsiung for several years. However, between small towns and big cities, there were still great differences caused by the unbalanced education resources, such as the quality and quantity of teachers or schools' information infrastructure, etc. Therefore, the KM implementation process in different areas deserves further investigation. The reasons are: 1) these schools can offer abundant information of diverse principals and directors' beliefs; and 2) to some extent, they can represent all kinds of school KM situations. Hence, we choose six elementary schools, including Public and Private, City, Village and Back County. The researchers tried to identify all kinds of schools that could offer distinguishing and valuable information to the investigation.

Stake (1998) suggested that the case should be selected from which the researcher feels that he can learn most, and which the researcher can spend the most time in. On the other hand, Patton (1990) suggested that a case which would provide the most abundant information is the priority for selection.

Following Stake's (1998) and Patton's (1990) suggestions, we selected school A to F as the cases. The case is selected based on several reasons. Firstly, these principals

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and directors in school A to F are willing and able to implement KM. Secondly, these schools contains the most variety of characteristics (instruction with technology, international school, geography and history teaching, teaching students in accordance with their aptitude, and community serving) and different kinds of elementary schools (public and private), and are expected to provide sufficient information toward our research goals. Third, these principals and directors in school A to F are willing to share their knowledge and having quite a few opinions after implementing KM.

Next, these schools have already put KM into practice, but they lacked the ideas of how to evaluate the performance of KM, so it is right time for us to instill the ideas to them. Finally and the most importantly, these schools show high interests toward our research and are willing to facilitate the study. Therefore, six schools were chosen, and we interviewed the principal or the director in each school because they tend to play key roles in school's activities (Mangin, 2007). As total, we interviewed 3 principals and 3 directors in these schools. Table 1 shows the general descriptive features of the participants. In the following, we provide background and a profile for the six schools.

Table 1　General Descriptive Features of the Participants

	The participant we interviewed	Gender	The years of his/her service in education (up to 2009)
school A	Director of Counseling	Male	12
school B	Director of Student Affairs Office	Male	15
school C	Principal	Male	29
school D	Director of General Affairs	Male	11
school E	Principal	Female	25
school F	Principal	Female	22

The history of school A presents an interesting story, dating back more than 60 years. The school initiated the implementation of KM in 2005. School A should be very clear on one fact; pupils are always at the center of all teaching concerns. So this

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school had to keep asking itself where it was actually leading its pupils. Due to the low homogeneity of the core knowledge owned by different office units, the school separated the units into different clusters based on the possibility of core knowledge sharing.

School B's temporary headquarters were established on June 1, 1981. The school buildings were completed on January 30, 1983. The school is one of the Kaohsiung's leading providers of instruction with technology. It has a strong culture, which unites everyone in the organization with an emphasis on respecting humanity, encouraging dedication, and enabling involvement and team work. The school has put "document management" into practice since 1999, but it initiated the implementation of KM in 2005.

School C was founded in 1920. The school initiated the implementation of KM in 2005. Its goal is to provide an instructional program that fosters the intellectual, emotional, social and physical development of each child. By providing teaching that informs, inspires and challenges, School C hopes to instill a love of learning that continues throughout child's life. The staff are confident that by working together to build a positive collaboration between home and school, we can offer quality educational experiences in the future.

School D was established in 2004. In 1997, President Lin decided to establish a primary-to-middle school. In this school, education is the foundation of social progress and national strength, with the primary-to-middle school program being the basis of education. With passion and love for our people in mind, School D aims to make substantial contributions to experimental curriculum and educational reform.

School D initiated the implementation of KM in 2003 during its preparatory period. Its vision is to become a school that is characterized by its educational insights. It translates this vision into the creation of its curriculum. Moreover, it also consults the professionals, experts, and principals and chiefs in other schools, and follows the five directions of "education modernization" to construct its curriculum.

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School E was founded in 1977. The school initiated the implementation of KM in 2002. It is characterized by “geography and history teaching.” In order to implement the activities of geography and history teaching in the course standards in 1993, the education bureau of Kaohsiung city started compiling teaching materials in these fields and established the Center of Geography and History in 1992. The center used to belong to the seminar center of social studies of City Kaohsiung Advisory committee before 2000, which was located in Primary School F in Nan Zi District. After that, the center of local geography and history was established independently.

School F was established in 1953. The school initiated the implementation of KM in 2004. Because of its joint venture with the Department of Elementary education, National Pingtung University of Education, School F is one of the public schools to have normal subjects associated with KM for staff. Its mission is to educate all students by building self-confidence in a safe, enthusiastic and respectful environment.

4. Case Findings I – School Aspect

In the following we provide a description of our findings and describe the main theoretical constructs and related variables associated with the six schools and KM gaps. The results of interviews with these six schools are summarized in Table 2 and are used to develop a form that shows the demographic characteristics and summary of school’s KM gaps in Table 3.

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Table 2 The Summary with the Semi-structured Interview to Principals and Directors (Excerpted from Complete Table)

Item	Comment and source	Conceptual label	Category
School A	"Sometimes, we can not ensure the consistency between the school goal and knowledge strategy which made us feel troubled in the designing of the KM plan." by Director of Counseling.	The gap of the KM plan's design.	Gap2
	"Our school's purpose was to generate and engender closer links between staff to encourage knowledge to be shared more informally, particularly between the administration and teaching. However, it is a little difficult to connect administration and teaching because we can not offer an atmosphere providing a friendly and effectively environment." by Director of Counseling.	The gap of the KM plan's implementation.	Gap3
	"There were some great ideas in our school proposed, which were helped by the fact that staff were from different offices in the school and we were just trying to share as much knowledge as possible and bouncing off each other. But in fact, we can not let staff share their knowledge with honest." by Director of Counseling.	The gap of the school's staff.	Gap6
School B	"The school had established a workshop in SCTNet (http://sctnet.edu.tw), the teachers didn't like it and had no willingness to take part in it." by Director of Student Affairs Office.	The gap of the KM plan's implementation.	Gap3

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Table 2　(continued)

Item	Comment and source	Conceptual label	Category
	"Sometimes the educational organs' policies were too precipitant, and they wanted to check the quantitative data immediately. In this time, the school's effectiveness after implementing KM can not be measured correctly" by Director of Student Affairs Office.	The gap of the school's effectiveness after implementing KM.	Gap4
	"The school administration and the teaching system blamed each other if the 'KM goal' that imposed by the school was not achieved. Each held on to information that might have been of benefit to the other because they did not trust each other. Staff had no willing to share and apply new knowledge with others." by Director of Student Affairs Office.	The gap of the school's faculty.	Gap6
School C	"The principal expressed that staff did not build up the broader, more generalist understanding of the required to make more strategic decisions because they were narrowly focused." by Principal.	The gap of the environment's perception.	Gap1
	"The principal indicated that there was limited database usability for staff in the initial stages of KM. Because it was not difficult for the staff to find useful knowledge in its website, the staff was not interested in searching for knowledge over the interest." by Principal.	The gap of the staff's position.	Gap5

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Table 2 (continued)

Item	Comment and source	Conceptual label	Category
School D	"Because students' tuition is the primary source to maintain school's operation. Sometimes we must try to earn the trust of students' parents and make them believe in our ideas on education. Maybe KM goal is not relevant to the school's objectives; and difficulty in transferring the necessary knowledge to the KM plan due to non-standardization." by Director of General Affairs.	The gap of the KM plan's design.	Gap2
	"The main purpose of our school was to furnish students with an open mind and a global vision through bilingual education and the accompanying educational activities. We hoped to become benchmark in educational industry, but we are just a private school." by Director of General Affairs.	The gap of the school's effectiveness after implementing KM.	Gap4
School E	"There is so much that we need to do to improve our KM activities. Because our school can not provide an achievable and convenient repository to store knowledge." by Principal.	The gap of the KM plan's Design.	Gap2
	"Teachers participated in courses to gain more knowledge about KM, and learned how to use a convenient repository to store knowledge. However, the school can not provide sufficient courses." by Principal.	The gap of the KM plan's implementation.	Gap3

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Table 2 (continued)

Item	Comment and source	Conceptual label	Category
	"If teachers comprehended the benefit of KM but could not implement it, they sometimes felt disappointed. Because they lack knowledge measurement systems to evaluate KM activities." "There was not existing measurement system available for us to evaluate the improvement of school effectiveness after implementing KM." by Principal.	The gap of the school's effectiveness after implementing KM.	Gap4
School F	"Alignment of the strategy with core school needs and the school's objectives: We need to keep focus on who are the main stakeholders. Because our school locates in back country, so it is difficult to get enough information as city's and village's schools." by Principal.	The gap of the environment's perception.	Gap1
	"Developing a system to evaluate KM activities is hard for us." by Principal.	The gap of the school's effectiveness after implementing KM.	Gap4
	"Staff's efforts can make the implementation of KM smoothly. Because the environment prevented our teachers pursuing further education, their teachers lacked opportunities to share their professional knowledge and teaching philosophy with the principal and directors after attending some research and study courses." "If a principal wanted to push an innovative strategy and implement it, but no one can realize the benefits of this strategy, the staff might ignore it." by Principal.	The gap of the staff's position.	Gap5

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Table 3 Demographic Characteristics and Summary of School's KM Gaps

	Location	Sector	Gap1	Gap2	Gap3	Gap4	Gap5	Gap6
School A	City （Ling-Ya District）	Public		◎	◎			◎
School B	City （Cian-Jhen）	Public			◎	◎		◎
School C	City （Hsiao-Kang）	Public	◎				◎	
School D	Village （Da-She）	Private		◎		◎		
School E	City （Nan-Zih）	Public		◎	◎	◎		
School F	Back County （Mei-Nong）	Public	◎			◎	◎	

4.1 School A

School A experienced a gap in the KM plan's design and implementation, and a gap concerning the school's staff. The KM plan in this school was designed by principal and the Counseling Office. This led to two problems in the school: 1) the principal and the director of Counseling designed the plan of KM in 2005, but sometimes they could not fully comprehend the situation of the school; 2) the staff of other offices could not approve their ideas. Its KM plan focused on four parts: 1) knowledge collecting; 2) knowledge applying; 3) knowledge sharing; and 4) knowledge dissemination and applying.

In knowledge sharing, this school had unexpected results. After teachers attended research and study courses, they did not tend to share their knowledge with each other. According to the director, there were at least two reasons for this: 1) the school did not provide a friendly environment to encourage effective sharing; 2) the staff did not share their knowledge with honesty. The director proposed to ensure consistency between the

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school goal and knowledge strategy, establishing an atmosphere that provided a friendly and effective sharing environment. In addition, the school student management system in this school could not share data with the health office system or with the system to collate enrichment services for children. This also made the staff lose interest in the implementation of KM.

4.2 School B

School B experienced a gap in the KM plan implementation, a gap in the school's effectiveness after implementing KM, and a gap concerning the school's staff. Why did this school experience these gaps? It was because sometimes the educational organs' policies were too precipitant, and they wanted to check the quantitative data immediately. For the performance to be observed clearly, it needed time to prepare and perform. The other problem was the constructing of staff's knowledge communities. Although the school had established a workshop in SCTNet1 (http://sctnet.edu.tw), the teachers did not like it and had no willingness to take part in it.

The director indicated that the performance of KM activities could improve through staff's cooperation in SCTNet. Therefore, the director tried to encourage teachers through welfare inducements if they attended the workshop and interacted well with others. The school administration and the teaching system blamed each other if the 'KM goal' imposed by the school was not achieved. In some departments or offices of this school, individuals were able to work together, share knowledge, and mutually further their professional development, whereas in others they had more trouble in doing so. Each held on to information that might have been of benefit to the other because they did not trust each other

[1] SCTNet is a website for teachers to connect teacher professional social networks, it can help teachers to establish education forum, bulletin board, special interest group.

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4.3 School C

School C experienced a gap in environment perception and a gap in the staff's position. The principal indicated that there was limited database usability for staff in the initial stages of KM. Because it was not difficult for the staff to find useful knowledge in its website, the staff was not interested in searching for knowledge over the internet. To solve the problem, the staff developed alternative ways to communicate their ideas with each other faster, and to find knowledge more easily.

The principal requested the Information Executive Secretary to collect information after each semester. Next, the school developed a KM system that contained all the information about the activities in each semester. All data were then stored and serviced by the provider and were accessible to secure users via an Internet browser by using appropriate passwords. Teachers could use the KM system established by the Information Executive Secretary. By doing so, they could obtain knowledge more quickly. Overcoming these gaps, the principal indicated these innovations were useful communication tools and could help strengthen teamwork in the staff.

4.4 School D

School D experienced a gap in the KM plan design and a gap in the school's effectiveness after implementing KM. The cause was that School D is a private school from Kaohsiung County which is not funded by the county's Educational Bureau. Therefore, students' tuition is the primary source to maintain school's operation. Hence, School D must earn the trust of students' parents and make them believe in its ideas on education. Through this process, its student numbers and popularity can increase.

The main purpose of this school was to furnish students with an open mind and a global vision through bilingual education and the accompanying educational activities. This school promised ongoing educational reform with multiplicity. By doing so, the

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size of gaps 2 and 4 should be carefully handled. The director indicated his goals were diagnosing crucially and knowing what the value will be, learning to be a benchmark in Kaohsiung, and interacting well with their stakeholders.

4.5 School E

School E experienced a gap in the KM plan design and implementation and a gap in the school's effectiveness after implementing KM. It began its KM implementation on the examination papers created by computer. Is not the difficulty in implementing KM was teachers hoped that KM can bring more convenience to them, not just creating examination papers by computer, so they anticipated attending as many research and study courses as they could. Teachers participated in courses to gain more knowledge about KM, and learned how to use a convenient repository to store knowledge. However, the school could not provide sufficient courses, and thus gap 3 occurred.

If teachers comprehended the benefit of KM but could not implement it, they sometimes felt disappointed. Because they lack knowledge measurement systems to evaluate KM activities, schools and educational organs should develop a knowledge measurement system to evaluate KM activities. The principal pointed out that there had been some issues with the measurement systems. If the school wanted to gain full support from the staff, it is necessary for the principal or director to communicate to the staff the added value of implementing KM activities. However, there was no existing measurement system available for us to evaluate the improvement of school effectiveness after implementing KM.

4.6 School F

School F was located in the country, so it was difficult to get the same amount of information as in city and village schools. In this situation, it experienced a gap in environment perception, a gap in the school's effectiveness after implementing KM, and a gap in the staff's position. Its location was far from the city, and the environment

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prevented their teachers pursuing further education. Therefore, their teachers lacked opportunities to share their professional knowledge and teaching philosophy with the principal and directors after attending research and study courses.

If a principal wanted to push an innovative strategy and implement it, but no-one realized the benefits of this strategy, the staff might ignore it. This reveals that some types of innovation cannot be achieved by individuals, but only by a team. The principal indicated her goals were trying to understand its orientation and finding comparisons with other schools, developing a system to evaluate KM activities, and making sure the staff's efforts could translate into successful implementation of KM.

5. Case Findings II – Gap Aspect

5.1 Gap1

The interviewees indicated that schools usually import a substantial part of their knowledge from outside sources. Relationships with students' parents, communities and educational organs have considerable potential for providing knowledge. Interviewees find it difficult to gain a clear understanding of what knowledge is relevant for success, and how this knowledge should be distributed across the school and its staff. A concise summary of the causes for gap1 from the thematic analysis of the review is briefly described as follows:

1) fail to realize the school's position;

2) lack of awareness on what core knowledge that the school possesses.

Based on these findings, principals and directors need to comprehend the school's internal, external environments and make a SWOT analysis to successfully adopt KM by enacting proper implementation strategies. Schools need to adapt to external competitive demands (i.e. statewide assessment), and responding to a client base, such as local taxpayers who wish to see a yield on their investment, is crucial in a

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competitive global education market. Following concise issues may be a good reference to eliminate gap 1:

1) useful communication. Staff in the school need to have useful communication, so that the principals and directors can have the latest and useful information about the environment;

2) core orientation. The school needs to understand its orientation and compare itself with other schools. The knowledge map is useful for the distribution of knowledge concerning the organization's core capability. By doing so, school can find its diversity and strength with others.

5.2 Gap2

Interviewees indicated that all attempts to manage knowledge must start with an honest self-diagnosis. The results of this assessment can be checked by consultants, customers or stakeholders. The principals and directors must translate concretely their core knowledge into the KM implementation plan due to the non-standardization problem of knowledge. To speed up access to the required information, a standard code should be provided. A concise summary of the causes for gap2 is described as follows:

1) inability by the school to describe or recognize its core knowledge required for competitiveness;

2) KM goal is not relevant to the school's objectives, and there is difficulty in transferring the necessary knowledge to the KM plan due to non-standardization;

3) difficulty in transferring the necessary knowledge to the KM plan.

The principals and directors may be unable to recognize the core knowledge that the school needs, or even if they do, they may not be able to gain this knowledge due to an inability to describe what they need. In conclusion, the level of gap2 will depend on how effectively the following activities are conducted:

1) self-diagnosis. In establishing a KM plan, it is crucial to diagnose and understand the plan's value and how suitable the plan is for building KM for the

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school.

2) goal setting. The ultimate goal of KM is to create value through knowledge usage. A strong emphasis on KM in the organization's development plan indicates the importance of well-developed strategies for establishing a program to achieve the school's overall objective.

3) knowledge standardization. The effective translation of tacit knowledge into explicit knowledge depends on the degree to which knowledge can be made standard or routine (Desouza, 2003).

5.3 Gap3

The interviewees recognized that schools must create the right staff management conditions and culture essential to enabling large-scale change initiatives. To gain full support from the principals and directors, it is vital for knowledge managers to communicate to them the added value and necessity of KM implementation efforts. A concise summary of the primary causes for gap3 is described as follows:

1) lack of awareness, comprehension or willingness by the staff to share their knowledge. In other words, we can say that the school does not offer a friendly and effectively environment for the staff to share their knowledge;

2) lack of commitment to KM. If one of the staff feels that KM can not bring any benefit to them and has no willing to implement KM. It could lead to gap3.

The results reveal that staff may not fully understand the value of the KM or are concerned that their personal value in the school might be negatively affected after sharing their knowledge. As a result they are unwilling to share their knowledge. Principals and directors must encourage teachers and staff to accept this new culture. Thus, the size of gap3 in any school will determined by research and study course and sharing purpose, and the two following key issues should be carefully considered for bridging the gap:

1) research and study course. Schools will be aided in this process by a

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combination of factors, such as increased familiarity with technology, technological enhancements that ease of use of technology, and expanded interactions with others in both the private and public sector through technology (Petrides & Guiney, 2002);

2) sharing purpose. The school should establishes an atmosphere providing a friendly and effective sharing environment. If there is an absence of total management commitment, then KM cannot be implemented successful.

5.4 Gap4

Interviewees indicated that there is limited database usability for staff in the initial stages of KM. Besides this, sometimes the school neglects the importance of stakeholders, and this caused another obstacle of KM. In the internal environment of a school, students are the most important stakeholders. In the external environment, students' parents, communities and educational organs play important roles (Suba, 1997).

Due to the tacit and dynamic nature of knowledge, it is difficult to measure knowledge assets with existing educational systems. Many schools fail to evaluate the results of KM to determine whether or not it meets expectations. Therefore, a complete measurement system should be developed to evaluate whether the KM activities will enhance or decrease the school's effectiveness after implementation. Based on the results of the analysis, three key reasons for the occurrence of gap4 are as follows:

1) educational industry doesn't provide a benchmark for schools to learn;

2) schools lack interactions with their stakeholders;

3) there is a failure to evaluate the results of KM to determine whether or not it meets the expectations. Moreover, existing educational systems are not appropriate for measuring knowledge assets.

Several studies argue that a robust set of metrics that evaluates the value of the KM must be developed before the initial database is built for an effective knowledge repository (Tiwana, 2001). It can be inferred that gap4 will occur if schools either

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unable to have suitable interaction with environment, or build a suitable knowledge repository and knowledge measurement system:

1) environment interacting. School has essential interactions with their stakeholders;

2) benchmark. Learn how to become a benchmark in educational industry;

3) knowledge measurement system. A comprehensive measurement system needs to be developed in order to evaluate KM activities.

5.5 Gap5

The interviewees indicated that there was daily sharing of experiences within their group in which the staff behaved interdependently, and this can only be explained in terms of group interactions. This suggests that some types of innovation and creativity cannot be achieved by individuals, but only by a team. Furthermore, school structures are not generally formed to suit the needs of KM. This analysis reveals the following concise summary to describe the reasons why gap5 occurs:

1) different perceptions of KM between the staff due to difference in position, role, and professional knowledge;

2) the staff at different levels have distinct attitudes toward planning, responsibility, and authority.

It is easy to see that there are gaps between the perception of the staff due to differences in position, role, and professional knowledge in an organization (Nonaka, 1991). Hence, the staff's perceptions of what type of knowledge they need will be different and will depend on their positions and roles. To reduce the probability of gap5 occurring, briefly speaking, we have to avoid breakdowns in teamwork and staff's support:

1) teamwork. In general, implementing a KM system usually requires the combination of many individuals' specialist knowledge. If the school wants to achieve effective integration while knowledge transferring, staff must have teamwork concept

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and a cross-learning idea;

2) staff's support. Staff's efforts can make the implementation of KM smoothly.

5.6 Gap6

The interviewees indicated that the KM activities could be facilitated by cooperation and collaboration between staff. If sharing the knowledge with others would impair benefit, efficient sharing of knowledge is usually impossible. Principals and directors should convey simple and definite messages to all teachers and staff, demonstrating that sharing knowledge is a critical requirement in day-to-day jobs as well as for obtaining rewards. The following summarized issues may provide a good reference for eliminating gap 6:

1) staff do not feel that they are encouraged to share the existing knowledge;

2) staff are not encouraged to organize communities.

The power of knowledge for each staff comes from what one knows. So the knowledge workers usually do not want to share their intellectual assets with each other. The interview reveals that gap6 will happen if a school cannot build a suitable knowledge communities and sharing system, which are described as follows:

1) knowledge sharing. Staff can share their knowledge without self-interest;

2) knowledge communities. The organization should establish an atmosphere providing a friendly and effective communication channel.

As candidates for "something" to be managed, various components have been identified in the knowledge management gap literature. The most commonly mentioned components are as follows:

First, the gap between the knowledge required to enhance the effectiveness of a school as perceived by the principals and directors, and the knowledge actually required to enhance its effectiveness (Ndlela et al., 2001);

Second, the gap between the knowledge required to enhance a school's effectiveness as perceived by the principals and directors, and the plan to implement

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KM (Rubenstein-Montano et al., 2001);

Third, the gap between the plan to implement KM and the plan itself, the gap between the knowledge obtained after implementing KM and the knowledge required to enhance a school's effectiveness (Campbell et al., 1997);

Fourth, the gap between the knowledge required to enhance a school's effectiveness as perceived by the principals and directors and that perceived by teachers and staff (Nonaka, 1991; Paive, 2003);

Finally, the gap between the knowledge required to enhance a school's effectiveness as perceived by staff and the knowledge actually obtained after implementing KM (Nonaka, 1991).

We propose that there are six KM gaps. Those are the gaps about environment perception, the gap about KM plan design, the gap about the KM plan implementation, the gap about the school's effectiveness after implementing KM, the gap about the staff's position and the gap about the school's staff (see Table 4).

Table 4 Summary of KM Gaps

Item	Cause	Propositions
Gap1	1.Failure to realize the school's position. 2.Lack of awareness on what core knowledge the school possesses.	1.Useful communication. Staff in the school need to have useful communication. 2.Core orientation. The school needs to understand its orientation and compare itself to other schools.
Gap2	1. Inability by the school to describe or recognize its core knowledge required for competitiveness. 2.Difficulty in standardizing knowledge. 3.Difficulty in transferring the necessary knowledge to the KM plan.	1.Self-diagnosis. Be crucial to diagnose and know what the value will be. 2.Goal setting. The ultimate goal of KM is to create value through knowledge usage. 3.Knowledge standardization. Using information technology to provide a convenient repository to store knowledge.

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Table 4 Summary of KM Gaps

Item	Cause	Propositions
Gap3	1.Lack of awareness, comprehension or willingness by staff to share their knowledge. 2.Lack of commitment to KM.	1.Research and study course. School provides enough courses to teachers so that they can learn knowledge about KM. 2.Sharing purpose. School establishes an atmosphere providing a friendly and effectively environment.
Gap4	1.Educational industry does not provide a benchmark for schools to learn. 2.Schools lack interactions with their stakeholders. 3.Knowledge assets lack targets to measure.	1.Environment interacting. School has essential interactions with their stakeholders. 2.Benchmark. Learn how to become a benchmark in educational industry. 3.Knowledge measurement system. Developing a system to evaluate KM activities.
Gap5	1.Staff in the school can not communicate and work together well. 2.The staff members at different levels have distinct attitudes.	1.In general, implementing a KM system usually requires the combination of many individuals' specialist knowledge. If the school wants to achieve effective integration while knowledge transferring, staff must have teamwork concept and a cross-learning idea. 2.Staff's support. Staff's efforts can make the implementation of KM smoothly.
Gap6	1.Staff do not feel that they are encouraged to share existing knowledge. 2.Staff are not encouraged to organize communities.	1.Knowledge sharing. Staff can share their knowledge without self-interest. 2.Knowledge communities. The organization should establish an atmosphere providing a friendly and effective communication channel.

The purpose of this research was to propose a management-oriented conceptual framework to describe the problems that may occur in implementing KM. Our research includes theoretical and practical implications. The framework provides a fully holistic framework of the KM activities to illustrate the management gaps that might occur when implementing KM. Furthermore, we collect the propositions from the principals and directors and connect these propositions with KM gaps to increase the possibility

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when schools implement KM (Figure 2).

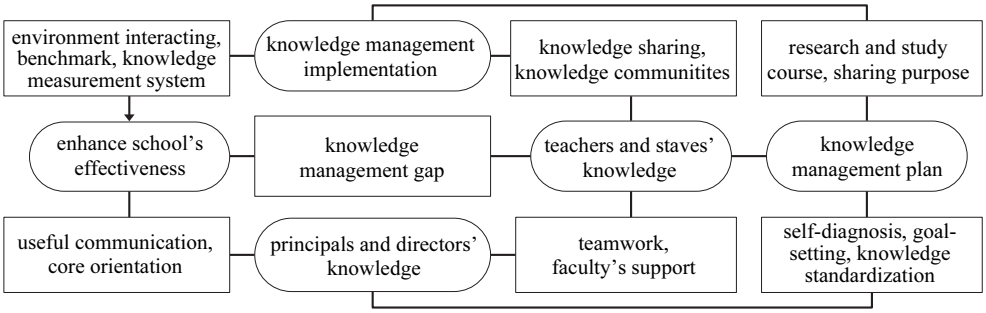

Figure 2 KM Gaps and School Approaches

6. Conclusion

From the aspects of strategy, perception, planning and implementation, we have derived six management gaps in implementing KM. After interviews with principals and directors, a clear picture was obtained. We identified the major theoretical constructs and their relevant problems associated with these six KM gaps.Through the conclusion, the model can be confirmed. The results reveal that:

6.1 From the Strategic Aspect

To reduce gap1 and gap4, the principals and directors should address the school's strength, weakness, opportunities, and threats, and then develop a suitable KM strategy. Furthermore, they should be equipped with information about the KM activities and school effectiveness.

6.2 From the perception aspect

To reduce gap2 and gap5, the critical task of the principals and directors is to

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identify the core knowledge required to maintain a competitive advantage. Principals, directors, teachers, and staff work together for a common goal, thus, the staff can ensure a successful implementation of KM. Therefore, a school should provide suitable research and resources to the staff, and use information technology to provide a convenient repository to standardize and store knowledge. By doing so, the staff will realize the benefit of KM, and will the make an effort to support the implementation of KM.

6.3 From the planning aspect

The action plan should include a schedule, the people involved and the resources required, although it is difficult to transfer the necessary knowledge to the KM plan due to non-standardization. Members' orientation toward KM, including the awareness of the importance and benefits of KM and information technology skills for KM process, should be completely communicated. Then, gap2 and gap3 can be reduced. Knowledge-oriented staff assessments can also fail if they are not linked closely to existing incentive systems. The schools should take steps to build the trust of knowledge owners by associating knowledge sharing with pay and incentives.

6.4 From the Implementation Aspect

A robust set of metrics that evaluates the value of KM after implementation will need to be developed. It is essential that the principals and directors instill in the staff an awareness of the importance and benefits of KM. Staff often fear that if they pass on their knowledge to others, they will endanger their own position, authority, or even power in the school. Thus, organizations need to create the right circumstance around the organization, primarily in the areas of KM activities and culture. Then, gap3 and gap4 can be reduced and the implementation of KM can truly enhance the school's effectiveness. The school should also establish an atmosphere emphasizing knowledge sharing and innovation and encouraging staff to form such a culture through a reward system. Then, gap6 can be reduced.

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References

Anderson, T. K., & Felsenfeld, S. (2003). A thematic analysis of late recovery from stuttering. *American Journal of Speech-Language Pathology, 12*(2), 243-253.

Barney, J. (1995). Looking inside for competitive advantage. *Academy of Management Executive, 9*(4), 49-61.

Berg, B. L. (2000). *Qualitative research methods for the social science*. Boston, MA: Allyn & Bacon.

Bryman, A., & Burgess, R. G. (1999). *Qualitative research*. Thousand Oaks, CA: Sage.

Campbell, A., & Luchs, K. S. (1997). *Core competency-based strategy*. Boston, MA: International Thomson Business Press.

Colleen, A. W., & Leila, G. S. (2007). New learning: Constructing knowledge in leadership training programs. *Community College Review, 35*(2), 88-112.

Desouza, K. C. (2003). Strategic contributions of game rooms to knowledge management: Some preliminary insights. *Information and Management*, *41*, 63-74.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532-550.

Hall, R., & Andriani, P. (2002). Managing knowledge for innovation. *Long Range Planning, 35*, 29-48.

Hamel, J., Dufour, S., & Fortin, D. (1993). *Case study method*. Thousand Oaks, CA: Sage.

Hedlund, G. (1994). A model of knowledge management and the N-form corporation. *Strategic Management Journal*, *15*(Summer), 73-90.

Holsapple, C. W., & Singh, M. (2001). The knowledge chain model: Activities for competitiveness. *Expert Systems with Applications, 20*(2), 77-98.

Khera, N., Stroobant, T., Primhak, R. A., Gupta, R., & Davies, H. (2001). Training the ideal hospital doctor: The specialist registrars' perspective. *Medical Education, 35*, 957-966.

Lin, C. H., & Tseng, S. M. (2005). The implementation gaps for the knowledge management system. *Industrial Management and Data industry, 105*(2), 208-222.

Lin, C. H., Yeh, J. M., & Tseng, S. M. (2005). Case study of knowledge management. *Journal of Knowledge Management, 9*(3), 36-50.

Linberg, E., & Rosenqvist, U. (2003). The staff's views on what's the job the starting point for

期刊徵稿：http://www.edubook.com.tw/CallforPaper/BER/?f=oa
高等教育出版：http://www.edubook.com.tw/?f=oa
高等教育知識庫：http://www.ericdata.com/?f=oa

quality improvement in health care. *International Journal of Health Care Quality Assurance, 16*(1), 47-54.

Mangin, M. M. (2007). Facilitating elementary principals' support for instructional teacher leadership. *Educational Administration Quarterly, 43*(3), 319-357.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanding sourcebook*. London: Sage.

Ndlela, L. T., & Toit, A. S. A. (2001). Establishing a knowledge management programme for competitive advantage in an enterprise. *International Journal of Information Management, 21*(2), 151-165.

Nonaka, I. (1991). The knowledge-creating company. *Harvard Business Review, 69*(6), 96-104.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge creating company*. Oxford: Oxford University Press.

Paiva, E. L. (2003). Integrating different types of knowledge: An empirical investigation. *International Journal of Innovation and Learning, 1*(1), 45-55.

Patton, M. Q. (1987). *How to use qualitative methods in evaluation*. Newbury Park, CA: Sage.

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Newbury Park, CA: Sage.

Petrides, L. A., & Guiney, S. Z. (2002). Knowledge management for school leaders: An ecological framework for thinking schools. *Teachers College Record, 104*(8), 1702-1717.

Petrides, L. A., & Nodine, T. R. (2003). *Knowledge management in education: Defining the landscape*. Retrieve September 8, 2008, from http://www.iskme,org/

Philip, H., & Kamontip, S. (2008). Educating leaders: Is there anything to learn from business management? *Educational Management Administration Leadership, 36*(1), 9-31.

Rubenstein-Montano, B., Liebowitz, J., Buchwalter, J., McCaw, D., Newman, B., & Rebeck, K. (2001). A systems thinking framework for knowledge management. *Decision Support Systems, 31*(1), 5-16.

Sharkie, R. (2003). Knowledge creation and its place in the development of sustainable competitive advantage. *Journal of Knowledge Management, 7*, 20-31.

Stake, R. E. (1998). Case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), Strategies of qualitative inquiry (pp. 86-109). Thousand Oaks, CA: Sage.

Stevenson, J. M. (2001). The modern university provost. *Education, 121*(2), 347-349.

Suba, K. G. (1997). *School quality satisfaction survey: Assessing expectation for and satisfaction with quality of education provided by elementary schools*. Unpublished

期刊徵稿：http://www.edubook.com.tw/CallforPaper/BER/?f=oa
高等教育出版：http://www.edubook.com.tw/?f=oa
高等教育知識庫：http://www.ericdata.com/?f=oa

doctoral dissertation, The Pennsylvania State University, Pennsylvania.

Tiwana, A. (2001). The knowledge management toolkit: Practical techniques for building knowledge management systems. Englewood Cliffs, NJ: Prentice-Hall.

Wild, R. H., Griggs, K. A., & Downing, T. (2002). A framework for e-learning as a tool for knowledge management. *Industrial Management and Data industry, Automation in*