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From Intention to Sharing: A Qualitative Study of Barriers to Knowledge Sharing Practices

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1. Introduction

Previously, we have published a quantitative study (Kuo & Young, 2008) that reported an intention-action inconsistency in knowledge sharing practices on Internet-based knowledge management system (KMS), called SCTNet. The SCTNet has been put in place to facilitate teachers' knowledge sharing tasks in Taiwan since 1999. With the aid of the government, over 100,000 registered members, most of whom are teachers, joined SCTNet over a period of ten years. Still, even though most members have indicated their desire to create, store, distribute, and discuss their teaching knowledge, the observed actual activities on SCTNet have been lacking. The teachers undoubtedly possess knowledge potentially useful to others, and they do desire to learn from others in order to fulfill their ever-demanding daily teaching assignments, but they simply fail to enact their desires to conduct knowledge sharing tasks.

Our quantitative study, couched in the Theory of Planned Behavior (Ajzen & Fishbein, 1980; Ajzen, 1988, 1991, 2002), has investigated four types of volitional control (intention toward behavior, perceived self-efficacy, perceived controllability, action control) mechanisms that may impact people's knowledge sharing practices. Our results show that the perceived controllability of using a knowledge management platform is not critical, confirming many previous findings that perceived ease or difficulty related to IT usage does not play a central role in successful knowledge management implementations. However, perceived self-efficacy, i.e. one's conviction of his or her ability to conduct knowledge management tasks, is an important factor directly influencing knowledge sharing practice. In addition, one's action/state orientation moderates his or her enactment of subjective norms and self-efficacy beliefs into intentions, and his/her enactment of controllability into behaviors. Overall, the result indicates that people of high self-efficacy and action orientation are more likely to overcome the impediment in knowledge sharing. But, more important, the low R square value of 0.04 indicates that the overall explanatory power of the quantitative study is rather low. This weak R square value may be caused by the limitation of the quantitative approach to study a fundamentally social act such as knowledge sharing.

In this paper, we report the results of our follow-up qualitative study, in which more than 40 SCTNet members have been interviewed to further comprehend the intention-action

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inconsistency in knowledge sharing practices and explore the possible categories of barriers that impede SCTNet members' volitional control from knowledge sharing behaviors. In this paper, we first briefly report the case of SCTNet and the intention-action gap of knowledge sharing. Next, we elaborate on the phenomenological-based qualitative study and identify the barriers to knowledge sharing. Discussions and reflections from this investigation are also discussed.

2. The SCTNet and the intention-action gap

During the early 1990s in Taiwan, educational policies were dramatically changed, and teachers found themselves in a continuous struggle to grow in professional knowledge, to design teaching materials, and to develop flexible course measurements to evaluate students' learning. An Internet-based Knowledge Management System, named SCTNet was developed as a response to this need in 1999 along with government funding, university professors' leadership in systems development, and K-12 teachers' endorsement.

Smart Creative Teacher Network (SCTNet, <http://SCTNet.edu.tw>) is a KMS with features such as Discussion Board, Professional Workshop, Resource Sharing, and Coffee Shop for facilitating knowledge sharing among members. The Discussion Board enables teachers to raise and discuss educational issues. Typical issues revealed on the Discussion Board include educational policies and welfare matters. The Professional Workshop is a place for teachers who have similar interests to share their teaching experiences. Resource Sharing is intended for teachers to share their class designs; while Coffee Shops are for teachers to share news about placement service and career planning.

Teachers have to be registered to become SCTNet members in order to post work-related issues, participate in discussions, critique postings from other professionals, and to upload and download instruction materials. These shared knowledge units are verified and administered as "right" knowledge into SCTNet knowledgebase by knowledge managers who are selected from SCTNet members that possess in-depth knowledge in a certain teaching domain.

From the time of its implementation, various stakeholders, such as central and local governments, university professors, and the tactical team formed by primary/junior school teachers, have expended considerable effort in promoting SCTNet. These efforts include government-backed countrywide workshops, top-down formal policy reinforcements from education administrations, anniversary celebration meetings, and bottom-up informal verbal recommendations among teachers. By 2010 SCTNet had over 100,000 registered members and over 20,000 verified knowledge units were stored. However, despite this apparent success, the actual knowledge sharing activities on SCTNet are rather meagre. For example, according to the official log maintained by the system, only 2% of the total registered members access SCTNet each day, and 80% of the overall knowledge posted is contributed by less than 5% of those who access SCTNet.

3. Research methodology

The phenomenological research method provides a systematic exploration and description of the essence and meaning of lived-experience. Such a method is used in researching the "lived" world (Husserl, 1999; Schutz and Luckmann, 1973; Bergum, 1991) and addresses the question, "Why is a phenomenon like this?" (Van Manen, 1990, p. 9). In this approach, it is

asserted that “being is never isolated from the world but is always experienced as in-the-world” (Pollio et al. 1997, p. 15). For this reason, the social, cultural and historical traditions can help in capturing the whole sense of knowledge sharing for the teacher (Van Manen, 1990, p. 12).

In light of this, the goal of our interview was to discover the shared meanings of knowledge and knowledge sharing held by the teachers as they practiced knowledge sharing within the complex social setting of schools and Internet-based SCTNet. We took the position that people, things and objects that we experienced in our life could not be separated from the culture in which we lived and the language we spoke. Hence, our actions, language, and concepts could embed shared meanings within a social and linguistic frame of reference. Furthermore, as Geertz (1983) noted, detailed descriptions of microcosmic phenomena within a domain could reveal general forms of life by examining the vehicles of life in which those forms were meaningfully embedded. In this study, the microcosmic area of schools and the Internet-based SCTNet where teachers practiced their knowledge sharing was treated in detail and related back to the larger context of Taiwan’s culture and school system.

3.1 Sampling and procedures

Theoretically, in phenomenological research, the sample size is approximately 6 participants (Morse 1991). However, in practice, the number of participants varies from 10 to 15 or more, depending on whether the data are considered to reach saturation. According to Glaser and Strauss (1967), data saturation means that

...no additional data are being found whereby the [researcher] can develop properties of the category. As he sees similar instances over and over again, the researcher becomes empirically confident that a category is saturated...when one category is saturated, nothing remains but to go on to new groups for data on other categories, and attempt to saturate these categories also.
(Glaser & Strauss 1967, p. 65)

In this study, data collections during a 6-month period of fieldwork were obtained through “snowball” effect as well as purposeful sampling. A total of 49 participants, consisting of 21 males and 28 females were interviewed in our study. The age of the informants ranged from 25 to 55 years old, with a mean of 35. Among these informants, 5 were school principals, 18 were school deans, and 26 were teachers. The length of time that informants had been using SCTNet for knowledge sharing ranged from 1 to 5 years, with a mean length of 3 years. The profile of participants is shown in Table 1.

All participants were given the research purpose and procedure of the interview prior to the start, and each signed the participation agreement describing both the duties of the researcher with regard to the research ethic and the informant’s rights in the context of participation in the research. To permit participants to structure and sequence their accounts of events with minimal instruction from the interviewer (White, 1980), Van Manen (1990) has suggested that interviews be designed to elicit narratives about the life histories and daily lives of the participants. Hence, each interview began with the question, “What is the knowledge-sharing experience like in school life and on SCTNet?” The length of the interview varied from two to three hours for each participant. Four participants required a second interview to clarify their narratives. Most of the interviews were conducted in the school setting, whereby the interview location was chosen by the informant. These locations included the classroom, conference room, library, or computer lab. A few interviews were held in cafes on the weekend. The interviews were recorded by a multifunction digital

recorder and were transcribed verbatim to maintain data integrity and to reduce perceptual bias. After the interview, the transcripts were shared with the participants for their approval.

County/City		Gender		Age (Seniority)			Title			Total Participants	
		Male	Female	<=30	31–40	>41	Director	Dean	Teacher	Count	Total
City	Kaohsiung	10	9	7	5	7	1	5	13	19	29
	Pingtung	1	1	1	0	1	0	2	0	2	
	Tainan	1	0	0	1	0	1	0	0	1	
	Taichung	3	3	1	5	0	0	4	2	6	
	Taipei	1	0	0	1	0	0	1	0	1	
	Count	16	13	9	12	8	2	12	15	29	
County	Kaohsiung	0	4	3	1	0	0	3	1	4	20
	Pingtung	2	3	4	1	0	0	3	2	5	
	Tainan	0	1	0	1	0	0	0	1	1	
	Yunlin	0	1	1	0	0	0	0	1	1	
	Miaoli	0	3	2	1	0	0	0	3	3	
	Taoyuan	0	1	1	0	0	0	0	1	1	
	Ilian	2	0	1	1	0	0	0	2	2	
	Taitung	0	1	0	1	0	1	0	0	1	
	Penghu	1	1	0	0	2	2	0	0	2	
	Count	5	15	12	6	2	3	6	11	20	
Total		21	28	21	18	10	5	18	26	49	49

Table 1. The Demographics Distribution and Profile of Interview Participants

3.2 Data analysis

The purpose of data analysis in phenomenological research is to organize the interviews to present a narrative that explains what happened or to provide a description of the norms and values that underlie cultural behavior (Rubin & Rubin, 1995). For this study, more than one million words of interview transcripts and field notes were collected for data analysis. To reduce possible bias introduced by the investigator (Mitchell 1986), three teachers who had elementary and junior high school teaching experience as well as one SCTNet administrator were asked to participate in the analysis process.

The analysis procedure began with the immersion phase, in which we read transcripts several times and immersed ourselves in these data. The aim of this immersion was to establish an orienting gestalt, which provided an initial interpretation of the data that would drive later coding of the data in subsequent phases of analysis. In this phase, we identified the essential characteristics in the data from each interview. Next, we eliminated digressions that were clearly off topic, abrupt changes in topics, and verbal ticks. After this phase, the data were ready for line-by-line coding. During the coding process, as an understanding of the overall text was obtained, phrases in the text were underlined and tentative concept names were written in the margins of the text. Transcripts were examined line by line, and all important phrases were labeled with these tentative concept names. We then extracted passages that had similar concepts that could be grouped together into themes. A sample of the data analysis process is shown in Figure 1.

As the coding was completed, the researchers compared what different people had said, what themes were discussed, and how concepts could be understood from Taiwan’s cultural arena. Finally, we constructed a textual-structural description of the meanings and essences

of informant’s experience (Kahn, 1993; Sandelowski, 1993, 1994; Moustakas, 1994). More than 200 concepts were identified from the text and constructed into 15 themes that related to the barriers of knowledge sharing.

4. Research results

The Taiwanese school system was administered by the Ministry of Education (MOE), which in turn supervised the Department of Education in each city/county where schools were located. Many decisions were centrally made by the MOE, and the school directors’ main responsibility was to ensure comprehensive execution of these decisions.

Theme	Concept/Label	Case	Meaning Unit (Data)
Mistake free culture Face concern	Afraid of making mistake Not good enough Self-presentation	1	I am afraid ... afraid to say something wrong, to be laughed at, have not enough insight, or without being saturated with knowledge.
	Being a teacher Self-presentation	1	I am a teacher now, I should think carefully before I post my thought or make response to the inquiry on SCTNet. “Does my posting inspire any one? Or does it helpful? And am I professional enough?” are always in my mind while I perform sharing on SCTNet.....because I am a teacher now...
Face concern	Self-presentation Private setting	2	I will ask my friends about how to deal the problem with children and their parents only in private setting...

* Concepts are given for each meaning unit. The concepts essentially are labels placed on utterances or events. These identified concepts are then further grouped into the higher abstract level called themes.

Fig. 1. Sample of the data analysis process *

Meanwhile, the teachers also formed a large family that was rooted in the few colleges that specialized in teacher education. Students in these colleges not only knew each other within their schools but also learned about early graduates through the teacher family system. Furthermore, as they finished college, students were sent to different schools for their practical training, during which time they learned as apprentices from their mentors. These apprenticeships reinforced the teacher family system’s rigidity and tightness. It is in this background that SCTNet was introduced as a means to facilitate teachers to share their knowledge. Our qualitative analysis, presented in Figure 2, further shows that the barriers to SCTNet knowledge sharing practices can be classified into three main categories: the school system, the teacher community, and the SCTNet technology. In the following sections, the three main categories and their respective sub-categories are discussed in detail.

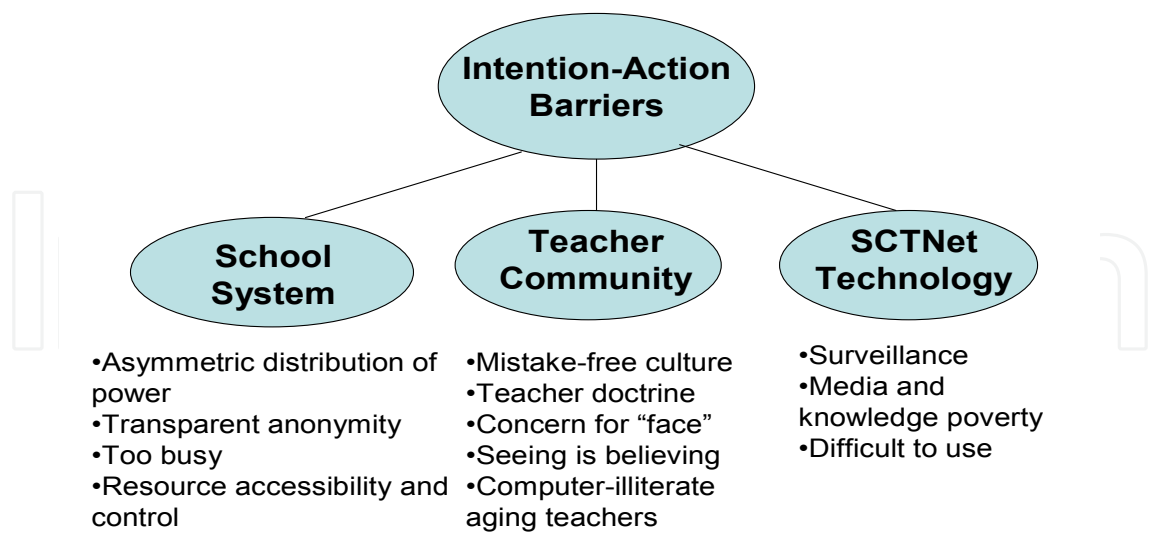


Fig. 2. The category-hierarchy regarding the barriers of Intention-Action Gap in knowledge sharing Practice on SCTNet

4.1 The school system

Asymmetric distribution of power. Situated in the hierarchically organized school system in which power asymmetry is the norm, teachers choose to be quiet both in the school setting and on the SCTNet. This is not surprising because teachers are those who possess the least power in the school system and are highly dominated and coerced. A typical statement depicting the scene of the school in terms of asymmetric power distribution and decision-making is:

“In fact, the school system is a top-down hierarchical structure. What the school principal says determines the way teachers do. Although school principals like to ask ‘Is there any question?’ yet teachers are always keeping quiet. They know their words are of no use.

In realizing that their words were useless, teachers choose to be quiet to prevent arousing the anger of the director. This appeared in the sharing practice both within the school and in the SCTNet. One teacher provided details on this:

“In the school setting, the hierarchical system and the asymmetric distribution of power form a tone of conflict between director and teachers. This makes teachers afraid of speaking out what they think. Even in the forum of SCTNet, teachers still choose being quiet in response to the director of the school or the Ministry of Education’s demands in avoiding the argument.

In fact, the exercise of power was both public and profound so that the teachers felt that they had no way of breaking out from the pressure from the central administration. Two typical statements depicted by informants were:

“Sometimes, the Education Administrator calls the roll of the schools’ deans on the SCTNet. If any dean doesn’t sign in on time on SCTNet, the Education Administrator would demand him to sign in again. Basically, we do not agree upon the administration power that penetrates into the sharing practice on SCTNet.”

“They forced all deans in schools to use SCTNet. I have had the experience of being deprived of my access right by the city’s Education Bureau because I did not follow its order to sign in on time ...”

Transparent anonymity. Transparent anonymity refers to the fact that teachers’ identities on SCTNet could be recognized despite the anonymity provided by the SCTNet. Informants

depicted their concerns that the rigid and tight network could expose who they were. Two typical statements were the following:

"I have some concerns that if I put my viewpoints in detail, unknown others can easily recognize who I am via the traceable content and context that I depict. The teacher community is rigid and tight... Even though on SCTNet with the anonymity protection via information technology, it still is easy to recognize."

"Through detailed description of the context, people can tell who I am and my identity would expose...then, the anonymous character of the IT is lost. The community of teachers is very tight. Any clue can be traced to find out who I am."

Consequently, although in theory SCTNet provided anonymity protection for teachers so that they could express themselves and discuss topics freely, teachers became ambivalent in their sharing. A typical statement was:

"To talk on SCTNet has to be very cautious in the school setting since the teacher community is so rigid and tight that my depiction might arouse someone. Thus, in terms of sharing, I need to take this into my concern while I express my idea on SCTNet."

Too busy. Repeatedly, our teacher informants stated that they were too busy to conduct knowledge sharing on SCTNet. They were busy because they were asked to play a large number of roles. For example, inside a typical classroom of a Taiwanese school, a teacher's roles included knowledge transmitter, agent of ideological apparatus of the Confucian tradition, and care provider. Outside the classroom but inside the school, a teacher could be an administrative clerk and a cultural worker.

"Normally, a 24 hours course instruction for students per week is the major work in our agenda. Also, we have to grade homework, join the routine meeting, consult student problems, and perform administration service ..."

"I teach first grade students. The kids always follow me while I go somewhere. They depend on me so much that they always come to me for help. Thus, I can't concern on doing other things but taking care of them."

"In school, there are many scheduled administrative works that need teachers' help in implementation. For example, arranging kids' teeth check and vision test, and following up the results of treatment. In addition, teachers are responsible for policy announcement and broadcasting to ensure kids and their parents are well informed."

If the school were located in a rural area that lacks resources, the teacher would then be responsible also for operational duties, such as repairing the fans and typing in purchasing orders.

"After each class, I need to open the school snack shop and serve as a clerk in selling the soft drinks, bread, and so on. In addition, I am also responsible to handle the purchase orders and dealing with the stock suppliers of school grocery store."

"I am so busy that I always get home late. Too many jobs which are not related to teaching. Later on, I need to fix fans, lamps, and so on. I always lose control over my time. "

Each of these roles demands responsibility and resources and teachers are expected to perform well in all of these roles between 8:00 am and 5:00 pm, from Monday to Friday. But there is more. When returning home, the teacher would still be responsible for affairs of his or her own children and, possibly, dealing with inquiries from the student's parents. Normally, it is late at night by the time the teachers' time is freed up to use SCTNet. Two typical statements show teachers' helplessness. They said:

"As a teacher, we have to respond to parents' phone calls during the school or handle the inquiry while parents come to school. Sometimes, as teachers return to home, they are hardly able to refuse to answer the kids' parents' inquiries."

"I need to wait until my kids fall asleep, then I can access to SCTNet. However, most of the cases I am burned-out and I can't use SCTNet."

Yet, knowledge sharing is another task that demands a great amount of time for understanding, reflecting, and organizing. Many teachers simply feel the loss of control over their time, hardly enough for knowledge sharing behavior on SCTNet. Three typical informants elaborated on this:

"Although I want to share what I know, yet it really bothers me in time management! I have to serve as an administrative clerk, teaching, care providing, and get on the homepage of the Ministry of Education to check some announcements. These tasks divide my time into pieces and cause me not to spend more time on SCTNet."

"Sometimes, I try to answer proposed questions on SCTNet and sometimes I ignore them. It all depends on whether I am free or not. My job takes up most of my time and I can hardly share what I know on SCTNet. Sharing knowledge on SCTNet demands a great amount of time, thus how long I will stay on SCTNet and how much I will share with others depend on the time I have."

"I can't even handle teaching well since it takes a lot of time to conduct the course design. Now I get on SCTNet only upon the administration demands."

Resource accessibility and control. In most schools, teachers are required to share computers that are centrally placed in a public area. This is especially common for teachers in rural schools. In the meantime, school administrators may not value the teachers' use of these computers to surf SCTNet, viewing these activities as non-productive or "playing," and subsequently expressing negative attitudes towards the teachers. As a result, teachers may feel that computers are inaccessible to them in the school unless they are doing administrative work. For instance, two teachers stated:

"Not every classroom has a PC. For shared PC, administration tasks always go first, personal stuff goes next..."

"In the school, when I use the computer to search on SCTNet, I always have pressure. I am afraid that my peers will interpret that I am not working hard since I have time to use computer to search and read the data. ...The principal and teachers are all in this office and share a few computers. If you use the computer, then others cannot perform their administrative work."

4.2 The teacher community

Mistake-free culture. The teacher community has a mistake-free culture. This can be understood from Taiwan's cultural tradition. In Taiwan, September 28 is National Teachers' Day, which was Confucius's birthday and is now the day for thanking teachers. As the teaching profession carries a high degree of respect within the society, teachers are expected to embody wisdom, excellence, knowledge, and perfection. Accordingly, "being free of error" becomes the belief of both the teacher community and the society. Being aware of this teacher's sacred role, teachers act cautiously on SCTNet, as shown by the following statements:

"I am afraid...afraid to say something wrong, to be laughed at, have not enough insight, or to be perceived as having inadequate knowledge."

"Before logging in SCTNet, I will consider all possible situations that can happen and prepare well to deal with them. ... Actually, I am afraid to fail...fail as a professional teacher. Thus, while I share my opinion on SCTNet, I go to great lengths to prevent any problems occurring in advance."

Teachers are also keenly aware that the intent of SCTNet is to provide a virtual forum for talented teachers from all over the country. They know that the first two letters of

SCTNet, SC, represented Smart and Creative, respectively. Consequently, they are constantly questioning if the quality of their input on SCTNet is “smart enough” or “creative enough” when viewed by the many “virtual grand masters” of the SCTNet teacher community. This was evidenced in many statements made in the interviews, such as “SCTNet is a professional forum” and “There are plenty of grand masters on SCTNet.” Thus, to share knowledge on SCTNet and to be free of error became a commonly expressed concern about professionalism when teachers attempted to use SCTNet. Two typical informants expanded on this:

“Is my posting helpful to others or can I impart rudimentary knowledge to beginners?” I have to think more before responding to the question. I am a teacher now!”

“There are so many grand masters on SCTNet! It always makes me sad that I don’t understand what they talking about... Keeping quiet seems the best choice for me while I am on SCTNet. I think I need more training to make myself be professional so that I can discuss with them. Yet, it takes long time to achieve that!”

The teacher doctrine. In Taiwan’s professional teacher community, there exists a set of rigorous doctrines: be kind, be honest, be reverential, be provident, and be modest. In practice, this means that teachers are expected to “respect seniority,” “love colleagues,” “not argue or fight against peers,” and “not show off.” As informants revealed, these doctrines regulated their behaviors both in school and on SCTNet. Anyone who violated these rules would receive a warning. Thus, although these doctrines helped to create a harmonious community, they unfortunately inhibited knowledge sharing. For example, two teachers depicted their experiences of sharing in school but were interpreted as “showing off”:

“I am enthusiastic about helping others via providing my opinion, yet it always being rejected. Other teachers tell me that as a junior teacher, I should not rush to present myself.”

“For professional teaching knowledge, I am afraid to share except with my best friend! I don’t want be criticized: ‘Who do you think you are? How do you dare to show me this?’ Thus, I would rather not share the professional knowledge with others.”

Another teacher depicted her experience of violating the doctrines as she questioned another teacher. Her behavior was viewed as bad manners:

“In a workshop, I found that the instructor didn’t prepare well and simply gave the same content from a previous workshop. Thus, I made some comments on his lack of preparation. This event was passed back to my school next day. Yet, the interpretation was that I was rude.”

As a result of these deeply rooted doctrines, teachers’ knowledge sharing behaviors on the anonymous SCTNet differed little from their real world life. The following two statements were typical examples of avoiding showing off on SCTNet:

“I always answer the questions passively on SCTNet. I am afraid that if I respond to the inquiry actively, people may think I am boasting about my knowledge.”

“While I post my idea on SCTNet, I will give my words carefully. Because I don’t want to offend anybody on SCTNet.”

Teachers might also play the role of a good listener on SCTNet to avoid fighting. One informant elaborated on this:

“‘May my statement arouse the anger of others?’ Instead of worrying about it, I would choose being a listener on SCTNet.”

Some teachers were actually cognizant of the fact that few teachers choose to act against the teacher doctrines while they conducted knowledge sharing on SCTNet. One informant said,

“We teach and encourage our kids to express what they think in public, yet, we, as an adult and teacher, are hesitating in public presenting [on SCTNet]! Can we discuss in the public forum? Can we fight for our thinking? Unfortunately, I saw little debate happened on SCTNet.”

The concern for "face." Our teacher informants expressed concern for failing to demonstrate that they are smart and creative, they might "lose their faces". Here, "face" is what others have recognized and extended to individuals (Ho, 1976). It is "something that is not lodged in or on individuals' body, but rather something that is diffusely located in the flow of events in the encounter and becomes manifest only when these events are read and interpreted for the appraisals expressed in them" (Goffman 1995, p. 214).

The "face" concern made teachers ambivalent in their presentations especially when they were situated in the mistake-free culture of the teacher community. Meanwhile, the desire to gain "face" from others also drives teachers to grasp any opportunity from which they can improve their image. It could be said that in a way teachers were trapped in a possible no-win situation: on any occasion when teachers did any kind of presentation, they had to tread the discourse carefully to ensure that they were neither under any risk of losing "face" nor that the presentation was not noticed. Consequently, sharing in private settings with good friends became the most comfortable place for teachers to conduct knowledge sharing. Typical statements are:

"I will ask my friends about how to deal the problem with children and their parents only in private setting..."

"I prefer to share my thinking and my experience with well-known friends privately. Because sharing actively with unfamiliar others may be perceived as abrupt behavior."

The concern for "face" was especially critical for teachers in unfamiliar, public settings such as SCTNet, where one's social position was well known and where there was an overriding public expectation of how one should behave. Two teachers expressed their concerns:

"I am afraid ...afraid to say something wrong, to be laughed at, have not enough insight, or to be perceived as having inadequate knowledge while I depict my idea on SCTNet."

"Some of my teaching experiences are successful, yet some of them are failed. Especially for those failed experiences, I would rather share them with my closest friend in the teaching domain rather than those strangers on SCTNet."

Impression management became a challenge to teachers due to the need to deal with possible negative repercussions from their SCTNet discussions. One teacher said:

"Writing my feelings or teaching experience in the virtual environment is just like making me naked in a public area. You know people pass by, yet you don't know how they look at you!"

Seeing is believing. For teachers in Taiwan, whether one has actually seen another is important in sharing behaviors. Teachers in Taiwan learned domain knowledge from their teachers through face-to-face, direct verbal instruction while they were in college and from their mentors during their practical training:

"When we were students, our teachers always transfer their knowledge via face-to-face, verbal class instruction."

"As an apprentice, I always sit at the end of the classroom watching the course instruction given by my mentor. Occasionally, I will sit by her and study the course material design."

Furthermore, when the participants graduated to become school teachers themselves, most of their own interactions have been face-to-face. SCTNet, although powerful, provides only a text-based setting that is inconsistent with the collective habit of face-to-face meetings. Our informants illustrated this point in the following remarks:

"While I have wonderful experience in my class, I would share with my friend directly through face-to-face, vocal interaction. Particularly, when I am excited, I won't sit in the front of computer to write my feeling..."

"In general, I prefer to interact via verbal and face-to-face contact that I get used to. It is more effectively in comparing with communication via writing on SCTNet as well."

It also appears that teachers rely on direct social contact to make judgments concerning competence, trustworthiness, and safety related to another teacher. This is not surprising in Taiwan, which has a very strong culture of direct human contact. "Saw or met you before" thus becomes a vehicle for either accepting or rejecting knowledge sharing. Our informants said:

"If we saw each other before provides the basis of judgment of how and what I shall share."

"It's our culture — I prefer to see you and you prefer to see me before. We can hardly accept the way to interact on the Internet. It is so strange to rely only on the interaction via screen...I can't go through that feeling without knowing who I interact with."

Another depiction of the uncomfortable feeling in interacting with unfamiliar others on SCTNet was,

"As I express my thinking in front of unfamiliar people, I feel I am gazed by these people. This kind of feeling is very like a monkey in the zoo gazed by the tourists outside the cage. It makes me so uncomfortable!"

One informant spoke about his decisions to keep quiet while he interacted with a group of unfamiliar others on SCTNet:

"I would rather choose to remain quiet in front of unknown others on SCTNet...I have experience of expressing my opinion in front of unfamiliar others [in SCTNet] and have borne their criticism. I felt so stupid that I should keep quiet in front of them."

Computer-illiterate aging teachers. In the past, there has been a lack of emphasis on computer and Internet literacy in Taiwan's teacher education program. As a result, the level of computer and Internet self-efficacy for Taiwanese teachers dwindles, especially for older teachers. As two teachers said:

"As I know that many of the elder teachers do not have enough computer literacy, they feel that using computer is troublesome. ... They would rather choose not to use SCTNet".

"About one third of the teachers who are elder can't even use e-mail. They resist using computer since they are afraid of it. Thus, most of the time, when they encounter computer problems, they always come over to me for help."

A similar phenomenon was also observed for female teachers. For example, one teacher said the following:

"In our school, female teachers are more than male teachers. They are not good at computer operation. Thus, whenever they run into the computer problem, they would come over to me."

Some young teachers were also insufficient in their computer skills, as one young informant indicated:

"In fact, many young teachers in our school possess little computer literacy as elder teachers do. They are about the same age as me, yet, they lack basic knowledge of using the computer."

4.3 Information technology: Smart, Creative, Teacher Network (SCTNet)

Surveillance. Today's information technology could be a powerful surveillance facility for social control (Lyon, 1994). SCTNet, as a technological knowledge management platform, is no exception. It is not only a place for teacher professionals to share knowledge but also a setting for institutional surveillance. For examples, two active SCTNet informants said:

"Some of the topics are not touchable! Here [SCTNet], everyone knows my ID... using ID is the same as using my name! In fact, I critiqued about the education policy of Education Administrator once, after that I was told to shut up ...via someone indirectly..."

"I use several IDs [on SCTNet] to secure the anonymity because I have the experience that my ID was identified and my opinions which I posted on SCTNet were distributed back to my school. This bothers me seriously..."

Another informant remarked that he viewed KMS as a "gazed place" and behaved cautiously:

"When I joined a discussion on SCTNet, I posted my opinion, yet, after I did that everyone stop discussing...I sensed a symbol of warning – 'Where is everybody?'...I got a big shock and realized that I was in a trouble..."

In fact, the anonymity of the IT function in KMS was rendered almost useless because of the tight teacher community, as discussed earlier. Several teachers discussed this phenomenon of transparent anonymity:

"It is easy to tell who proposed the message as I read the tone of speaking, the pattern of writing, and the content of the event description. It doesn't even need to write the name... Actually, the community is too tight that it is hard to retain the anonymity ..."

"Actually, from the text, it is easy to know who the author is...if you stay there [SCTNet] long enough. The community is tight...That's why I need to put an extra note after I depict my opinion to state 'this is only my personal perspective, it doesn't regard to my school's policy'..."

Thus, it seemed that the more powerful technology that the technical experts inject into the SCTNet, which ironically was necessary for knowledge management but easily became a tool of surveillance, the more insecure some teachers felt toward sharing their experiences on SCTNet. In this rigid and tight community, the perception of being "gazed" created a mental barrier to knowledge sharing among teachers, who were asked to be kind, honest, reverential, provident, and modest.

Media and knowledge poverty. Because SCTNet stripped away the social cues, teachers were unable to detect the shared social meaning from face-to-face-impeded knowledge sharing. Typical statements expand on this concern,

"In a face-to-face setting, even you say nothing; I still can tell if you agree upon my opinion or not from the cues of face. Yet, on SCTNet, I can't see your face and have no way to know your response."

"I can't see the partner's face since the interaction on SCTNet strips away many of the cues and signs that are part of face-to-face interaction. Thus, it is hard to tell what peers think about my sharing."

In addition, the textual expressions of SCTNet are structured sequentially according to the temporal order of verbal conversations. Thus, any participants who are unfamiliar with the history of the interactions have to go through a sea of background information of the community to become familiar with it before they can start sharing. Meanwhile, learning this history is no trivial task for any teacher. Many participants have to stay in this platform long enough to know the discourse so they can trace the text depictions, which are dispersed across various conversation sections. Two typical comments on this situation were:

"The content of our conversation is dispersed across many dialogue sections. It is difficult for SCTNet new members to obtain the whole picture. They have to trace back all of our conversation to know the detail. As a result, they always show their anxiety in participating the sharing without having the background knowledge of our conversation."

"It's hard for me to understand what they talk about ... I need to stay there [SCTNet] long enough to understand the context of the dialogue ..."

Furthermore, in-depth semantic knowledge is often required for one to find the proper content. For example, a certain community might invent its own specific buzzwords that

outsiders would not know. Without a comprehensive understanding of this local invention, teachers feel detached from the group on the SCTNet and rarely access SCTNet. Two relevant statements were:

"Usually, I am silent while I am on SCTNet. I need to know the context of their sharing; yet, it is difficult for me since most of the depictions are short. If I don't know more about the background of the depiction, I can hardly catch the point of the discussion."

"They have their own writing patterns and symbols on SCTNet. I can hardly use their language since I don't understand their shared meaning. Therefore, I do not get on SCTNet gradually."

Difficult to use. The difficulty in using SCTNet is a key factor that impedes teachers' access to SCTNet. For instance, many teachers expressed their loss of control over the SCTNet operation functions. Two informants said:

"The enrollment and search procedure are so complex that many of the teachers hesitate to use it. They fully lost their control in operating and using SCTNet."

"For example, while I try to upload my posting, I need to go through several processes to identify which category and what type my posting is; yet, at the end I still receive the result of failed uploading! While I try several times, I give up finally!"

In fact, the more that advanced technological features were added to SCTNet, the more loss some teachers felt. As the old saying "beauty is in the eyes of the beholder" has indicated, what is perceived by the IT experts as superb achievements often become the barriers hindering teachers from using SCTNet. Teachers expressed:

"I know there are many functions on SCTNet, but it is too complex for me that I am afraid of losing control in using SCTNet. Therefore, I choose not to touch it."

"The SCTNet is a good forum for sharing our teaching experience, but too complex in its functions. Some of my friends give up after several tries."

Especially, for older teachers, the difficulty in use is usually the most important factor preventing them from using SCTNet. A typical statement made by an older teacher was:

"I am not familiar with SCTNet. I try several times then I realize that registering is one step and getting into the forum is another step. After I get into the forum, I still don't know how to search the material that I want. Usually, I give up after several trials. I know many of my colleagues can't even get into the first door of the SCTNet. Finally, they stop trying to get into SCTNet."

For younger teachers, the need to continuously help older teachers resolve the technical problems also becomes burdensome. One stated that:

"The function of SCTNet is so complex that many of my friends can't get access to it. They always ask me to register for them ..."

5. Discussion and conclusions

5.1 Teachers, not teaching robots

Many theorists have seen the implementation of knowledge management systems as a matter of extracting the right knowledge from people's memory and storing it in networked computers for later distribution (Tiwana, 2001). This is also the focus of SCTNet, which is intended to become the platform that stores and distributes teaching materials and experiences. "Build a KMS, and the knowledge will be delivered" has become the belief of the IT architects of SCTNet. Yet, teachers are humans, situated in an environment that is rich in Confucian culture. In this tradition, teachers can easily know each other via their social networks, which in turn shape teachers' knowledge sharing in public; for example, they would not like to be seen as behaving inappropriately. Therefore, knowledge sharing has

many different facets, such as seniority and face, which are far more subtle and difficult to manage than the exchange of one another's materials and experience in a mechanical fashion. The IT experts have failed to appreciate this rich tradition and have placed too much emphasis on technology. Sadly, for them, teachers have become SCTNet robots who would simply retrieve and deposit their knowledge. Thus, despite the fact that teachers are aware of the importance of advancing their knowledge through SCTNet, they do not enact their intention by using SCTNet.

5.2 Old habits die hard, even with information technology

In Taiwan, teachers are taught and trained to respect their own teachers and love their school classmates like brothers and sisters. Be kind, be honest, be reverential, be provident, and be modest engender the five values that every teacher must learn. These future prospective teachers always listen and take notes quietly in classrooms. Vicarious observation is praised, and open discussion or confrontation is discouraged. After graduation, these teachers step into schools and find that the same values are still instituted in their everyday lives. The school principal may be the classmate of a former teacher whom they must respect and accommodate. The colleagues are friends of classmates with whom they should be gentle. Teaching, as a social system, is composed of various habitual routines. Teachers must change those routines if they wish to adopt technology effectively. Yet, the force of the old habits is so enormous that teachers follow the same habitual patterns on SCTNet, where they feel that they must maintain the image of a gentle, kind, respectful, prudent, and compliant teacher. They do not risk being seen as rude or showing anything that violates the norms of their community. The architects of the SCTNet have failed to understand the significance of those habits and have designed a one-size-fits-all public knowledge management platform. But even advanced information technology is no match for old habits.

5.3 More technology... May be harmful for knowledge sharing

Throughout the design of SCTNet, new search engines, new security features, and new reports have been continuously added. The architects of SCTNet have seen the addition of new features as an enhancement of SCTNet to help teachers. Yet, for teachers to share knowledge on SCTNet, nothing comes easy. As stated previously, teachers on average are assigned 24 hours of course instruction per week. Also, they have to grade homework, perform administrative service, and counsel students who have problems. Many teachers are parents of their own school-age children and have their hands full with their own family routines. In addition, teachers are expected to internalize, socialize, combine, and externalize their knowledge (Nonaka 1994; Nonaka & Takeuchi 1995) on SCTNet, which requires great skill and time. They are, in essence, expected to become supermen or superwomen above their capacity. The architects of SCTNet have somehow forgotten the golden rule of information management: "Keep it Simple, Stupid" (KISS), and have overwhelmed the teachers with the best and most advanced technology.

5.4 For knowledge management, success is a journey, not a set of numbers

The government holds a strong belief that as long as the knowledge stored in SCTNet grows, the knowledge of teachers who access the SCTNet would also grow. The central government, therefore, employs several indices, such as the number of teachers logging

onto SCTNet, the volume of stored knowledge in SCTNet, and so forth, as measures of success to evaluate the performance of school districts. Some districts, in turn, set up incentive programs to ensure good numbers, whereas others rely on administrative pressures. However, the result is not an overall increase in SCTNet usage by most teachers; rather, a small number of teachers carry the burden of meeting administrative expectations.

In addition, many districts often use SCTNet as an administrative tool for such purposes as policy announcements and data collection. Although the intent to facilitate the administration is good, the result is an SCTNet that is a one-way communication that eliminates the possibility of feedback from the teachers. Consequently, teachers feel increasingly detached from SCTNet. Knowledge and politics, after all, are not easily mixed.

The overemphasis on the set of numbers required by the government makes the artifact, SCTNet, become an invisible barrier that is counter to its initial purpose as a facilitator in knowledge sharing practices. Teachers thus perceive using SCTNet as an index of the policy coordinator or betrayer. Yet, being a policy betrayer is a serious mistake in conflict with the belief that being a teacher is to be gentle, be kind, be respectful, be prudent, and be compliant. As a result, choosing to be a policy coordinator to use SCTNet becomes a form of “show” but not knowledge growth.

6. Conclusions

In this paper, we reveal insights into how teachers’ enactment of their knowledge sharing practices may be impeded by the structure of the school system, the culture of the teacher community, and the information technology design.

We should caution that the result of our study should not be interpreted as saying that information technology is useless to facilitate knowledge management, but rather that the architects of knowledge management platforms should focus on the human agencies and the social and cultural forces that influence their sharing behaviors. Knowledge is not meant to be managed mechanically; rather, it should be viewed as inseparable from the people who possess it. The designers of the knowledge management system should therefore be aware that their role is not simply to put the technology to use but to bind together the network of people who identify with the community of practice in achieving learning and knowing.

Introducing information technology into a community to perform an activity can change the nature of that activity. SCTNet reifies a view of the activity of knowledge sharing, but it also changes how one goes about sharing. It can enable new social groups to form, develop, and maintain a sense of shared meaning and identity. The newly formed identity and language will elicit different actions in participation of the community. Thus, viewing information technology as a mere competing tool, without being bound in people’s minds, context, and culture, overlooks its social role and can lead to “an expensive and useless information junkyard” (McDermott 1999).

7. Reflection: Phenomenology, a new way for knowledge management research

Many advocates and theorists see KMS as a mechanism of extracting, storing, and distributing “codified knowledge” in which human beings are reduced to “nothing but” automatic behavior (Tiwana, 2001). Yet, knowledge sharing is a human act and is

inextricably bound up with human cognition (Thomas et al., 2001). The study of knowledge sharing is therefore difficult because the hypothesis-based, cognitive psychological approach is inadequate in exploring and elucidating the insights of the intention-action gap. To discover the insights of the knowledge sharing intention-action gap, we are therefore required to let the voices of individuals' experiences emerged. The phenomenological method allows us to treat knowledge as the accumulation of individuals' lived-experiences over time, and this lived-experience is "residing in the content of sense-giving act(s)" (Husserl 2001, p. 23) in the second phase of our study. With this, we are able to develop insights into how human subjects of knowledge sharing enact their sharing practices. Our study demonstrates the importance of phenomenology for knowledge management research and provides a new way of viewing knowledge sharing problems in terms of human consciousness.

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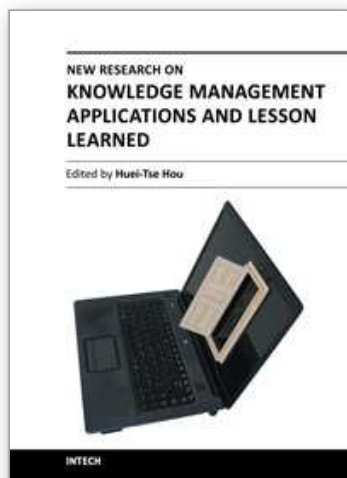
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Due to the development of mobile and Web 2.0 technology, knowledge transfer, storage and retrieval have become much more rapid. In recent years, there have been more and more new and interesting findings in the research field of knowledge management. This book aims to introduce readers to the recent research topics, it is titled "New Research on Knowledge Management Applications and Lesson Learned" and includes 14 chapters. This book focuses on introducing the applications of KM technologies and methods to various fields. It shares the practical experiences and limitations of those applications. It is expected that this book provides relevant information about new research trends in comprehensive and novel knowledge management studies, and that it serves as an important resource for researchers, teachers and students, and for the development of practices in the knowledge management field.

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