



TEACHERS' PERSONAL PRACTICAL KNOWLEDGE ON THE PROFESSIONAL KNOWLEDGE LANDSCAPE

F. MICHAEL CONNELLY

Centre for Teacher Development, Toronto, Ont., Canada

D. JEAN CLANDININ

Centre for Research for Teacher Education and Development, University of Alberta, Edmonton, Alta., Canada

MING FANG HE

Centre for Teacher Development, Toronto, Ont., Canada

Abstract—Though research on teaching has a long history, teacher knowledge research is relatively recent, mostly occurring in the 1980s and 1990s. Teacher knowledge research is part of a revolution in how educators think about classroom practice. In contrast to the concern for teacher characteristics and teaching/learning methods, the assumption in teacher knowledge research is that the most important area is what teachers know and how their knowing is expressed in teaching. There are several lines of such research. In this paper we describe one line of research focused on teachers' personal practical knowledge as it is developed and expressed on the professional knowledge landscape. In the paper we outline the methodology for undertaking this type of research. The methodology is illustrated by a case study of a teacher in China. © 1997 Elsevier Science Ltd

Since the turn of the century in North America there has been a thriving research tradition in education. One of the early markers in this was the establishment in the United States of the National Society for the Study of Education USA, (1902a, b) which published its first Yearbook in 1902. The purpose of the National Society for the Study of Education is to "provide a means by which the results of serious study of educational issues could become a basis for informed discussion of those issues". From this statement it is evident that educational research began in a climate of concern for educational improvement with research at its base. Clearly the idea is that it is not enough to teach students and it is not enough to teach teachers. There must, as well, be a research and inquiry tradition accompanying educational practices. This idea has mushroomed in North America. There are

institutions devoted almost exclusively to educational research and others with a blend of teacher education and research into teaching and teacher education. However, in virtually all major North American universities there is an educational research tradition. Professors' promotion and tenure is linked to their ability to engage in useful productive research. As well, there are national government offices of educational research and development and many private foundations which contribute funds to educational research. Research is an integral part of the North American educational landscape.

One of the most prolific areas of educational research is research on teaching. The American Educational Research Association, the largest educational research organization in the English speaking world, has published three Handbooks of Research on Teaching totaling

100 chapters and over 3600 densely packed pages (Wittrock, 1986; Travers, 1973; Gage, 1963). No other educational research field has been as thoroughly, and as repeatedly, summarized. The range of topics coming under the heading of research on teaching is immense. The Third Handbook (Wittrock, 1986) was composed of 35 chapters, organized into five major areas: theory and method of research on teaching; research on teaching and teachers; the social and institutional context of teaching; adapting teaching to differences among learners; and research on the teaching of subjects and grade levels. In the 1986 volume the only references to teacher knowledge research, the broad area within which our work falls, were comparatively minor citations in two chapters titled *Teachers' Thought Processes* (Clark & Peterson, 1986) and *The Culture of Teaching* (Feiman-Nemser & Floden, 1986). Since the 1986 publication of the Third Handbook, research on teacher knowledge has exploded. There are recent major reviews of this new area (e.g. Fenstermacher, 1994).

Teacher knowledge research is part of a revolution in how educators think about classroom practice. Traditionally, it was assumed that teacher characteristics (e.g. warmth, firmness, punctuality) and teaching/learning methods and processes (e.g. lecture, laboratory, seat work, drill) were the main teaching areas of importance to student learning. In contrast to the concern for teacher characteristics and teaching/learning methods, the assumption in teacher knowledge research is that the most important area is what teachers know and how their knowing is expressed in teaching. On this assumption, teacher knowledge and knowing affects every aspect of the teaching act. It affects teachers' relationships with students; teachers' interpretations of subject matter and its importance in students' lives; teachers' treatment of ideas whether as fixed textbook givens or as matters of inquiry and reflection; teachers' curriculum planning and evaluation of student progress; and so on. In short, it has only recently become commonplace to believe that what teachers know and how they express their knowledge is central to student learning. Returning to the National Society for the Study of Education USA, 1902 Yearbooks and their stated purpose this means that one of the

main ways to improve education through research is to study the construction and expression of teacher knowledge.

This outline of educational research in North America and of the developing tradition of the study of teacher knowledge and its place in the improvement of education provides the context for our own work. In this paper we focus on the approach that we take to the study of teacher knowledge, work we pursue under the heading of the study of teachers' personal practical knowledge. Initially, we understood teacher knowledge as derived from personal experience, that is that knowledge is not something objective and independent of the teacher to be learned and transmitted but, rather, is the sum total of the teacher's experiences. For us, personal practical knowledge is:

a term designed to capture the idea of experience in a way that allows us to talk about teachers as knowledgeable and knowing persons. Personal practical knowledge is in the teacher's past experience, in the teacher's present mind and body, and in the future plans and actions. Personal practical knowledge is found in the teacher's practice. It is, for any one teacher, a particular way of reconstructing the past and the intentions of the future to deal with the exigencies of a present situation (Connelly & Clandinin, 1988, p. 25).

Studying Teachers' Personal Practical Knowledge

What are the terms and methods we use to understand and study teachers' personal practical knowledge? One of the first consequences of our experiential view of teachers' knowledge is that it is not productive to think about teachers by applying one or another favorite philosophy or theory. Rather, it is necessary to work directly with teachers in all aspects of the lives in classrooms, outside classrooms and in their personal lives. Ideally this is done collaboratively in such a way that teachers become research participants: teachers help define the purposes of the research, suggest interpretations, and comment on the final results. Teachers often co-author research papers because of their involvement in the research process. Furthermore, because of the ethical and legal agreements signed in setting up the research, teachers may, if they feel threatened or professionally maligned, withdraw from the

research. The intensity of teacher involvement is, therefore, high in genuinely participatory studies. One consequence is that research results have a strongly authentic, insider, feel to them. Such research makes clear that the research has been "real" and, as the anthropologist Geertz (1988) says, that the researcher has been there. In contrast most research studies appear as if the researcher saw the classroom through a mostly opaque veil.

There are a variety of steps in our methodology. The first is the collection of field texts. Field texts are the equivalent of quantitative empirical data. They are records made in the research field, for example, notes taken in a teacher's classroom. The following is a partial listing of kinds of field texts used by our students and ourselves: fieldnotes, interviews, conversations, journal writing, autobiographical writing, letters between teachers and researchers, oral histories, annals, chronicles, teacher stories, family stories, photographs, memory boxes and other personal/family artifacts. These are briefly defined below.

Fieldnotes: These are written notes made by a researcher while observing a teacher or following participation as a colleague with a teacher in his or her classroom. Field notes may also be written by teacher participants in collaborative studies.

Research interviews: Interviews can be more or less structured around questions that the researcher develops and which grow out of observed teacher practices. Interviews may also be more participant-oriented with the agenda being set through negotiation with teachers.

Conversations: Methodologically, interviews blend into conversations and are similar to unstructured interviews. In conversation, people are free to engage in an ongoing discussion of topics of interest. These topics and the transcripts of the conversations, become a subsequent basis for analysis.

Journals: Journals, written by teacher participants, are records of teacher practices and teacher reflections and thoughts on those practices. Journals are also frequently written by researchers as they reflect on the research

process. In addition, teacher participants and researchers often exchange journals as part of the research process. In journal writing participants weave together their accounts of the personal and the professional, capturing fragments of experiences in attempts to sort themselves out.

Autobiographical writing: In autobiographical writing, people write about their histories, their hopes, their ambitions, their personal and professional stories, and so on. Autobiographical themes are normally set by teacher participants.

Teacher stories: The important research framework for our work is narrative and story telling. We expand on this framework later in the paper. In the research process, participants tell, or write where appropriate, educational stories. These may be stories of their own education, stories of their teaching, stories of school or school stories.

Family stories: A related method is the telling and writing of family stories. Family stories are stories handed down from generation to generation. These stories are about family members and family events. Through family stories, people learn a family history and create a personal identity. Family stories often serve as observations and commentaries on social, economic and political developments in society.

Photographs, memory boxes, other personal artifacts: Teachers, no different than others, collect a variety of materials in their personal professional lives. These materials embody a memoric record of their experience. Teachers invest these records with educational meaning and, from that, the educational researcher extracts information and ideas about that teacher's knowledge. Even when a person has lost these artifacts, or has had artifacts taken from them, they have memories of them. These memories of things stand in for the things themselves.

Oral history: Oral histories are spoken accounts of teachers' personal and professional lives. Oral history is an adaptation of a tradition that developed in anthropology.

Annals and chronicles: Annals and chronicles are closely connected to oral histories. Annals constitute a line schematic of an individual's life divided into segments by events, years, places or significant memories. Annals allow researchers and participants to get a sense of the whole of an individual's life from his or her point of view. Chronicles are narrated story lines that connect different sequences of events in people's lives. For instance, a teacher might write a chronicle of her teaching in elementary school prior to a certain major event in her life such as a marriage. In our own work we frequently use annals and chronicles as a way to have participants scaffold their oral histories.

Letters: Letters are written between researchers and teachers with the expectation that there is an ongoing written dialogue. Letters are particularly good for establishing interpersonal collaborative working relationships.

Conceptualizing Teachers' Personal Practical Knowledge

What do we do with this field text data? Analyzing field texts has led us to develop a number of conceptual terms which not only represent field text data but, in our view, constitute a new way of thinking about teacher knowledge. These terms are still under development in ongoing research. Nevertheless, the terms we have developed do help us, and our students, make sense of teacher knowledge. Our most important terms are image, rules, practical principles, personal philosophy, metaphor, cycles, rhythms and narrative unities. In recent years we tied these ideas together in terms of a theory of narrative and story telling.

In order to illustrate our narrative process, as well as to illustrate the terms of personal practical knowledge, we begin with a story constructed from conversations and interviews between one of the authors, Ming Fang He, and her teacher participants (He, 1997). This material was tape recorded, entered into the computer, analyzed, and subsequently discussed with participants. The story is partially represented here.

The main character in the story is a Chinese

teacher and teacher educator who returned to teach in Shanghai after a Canadian graduate studies education. She works in the Faculty of Music in a teachers' college, has a daughter and lives on campus. This is a modern contemporary story. We pick up the story as Shiao arrives home from a meeting, shortly before her afternoon teaching assignment is to begin.

It was 11:30 a.m. Shiao had to rush for her afternoon class. Today's theme was Genre and Ideology in Popular Music of the "New Era". Shiao had spent weeks and weeks in planning for this lesson. She had tried to incorporate her Ph.D. research in Chinese popular music into her lesson planning. In order to do her lesson planning she also refreshed her memory of the government's Music Curriculum Guideline. The purposes of this guideline were to educate students to adhere to the Chinese Communist Party; to adhere to the socialist road; to adhere to proletarian dictatorship; to adhere to Maoism and Marxism; to educate students to love the motherland; to serve for modernization and rapid economic development; and to educate students to compose modern songs and music to praise modern socialist countries. As Shiao thought about her lesson, she was a little worried since her research on popular music had a tendency to valorize uniform lifestyles according to required, or popular, styles in China at the time. However, she still thinks that her teaching theme might match the modernization criterion in the Music Curriculum Guideline. Shiao remembered that the last theme she taught was on the relationship between Western painting and Western music. Her students were quite interested in the class. But after class some students came up to her and said: Teacher, what you talked about in today's class was so interesting but it was not useful for our future. Students in fine arts are moving towards futures in interior design arts and advertisement because they can make better money in those areas. Also, classical music has little audience. People want popular music. This is the modern era, isn't it? The students began to hum a rock and roll tune. Shiao laughed as she reflected on the scene. This song, while done in rock and roll, had a revolutionary edge and was used to express a reform orientation, though done in indirect ways. As Shiao reflected on this last class she realized that something educational was going on in the humming. Shiao wondered "How can I tune up my class but not violate the rules?" As Shiao arrived at her apartment to prepare lunch for her daughter and herself, her daughter also arrived carrying a very heavy school bag. The bag was stuffed with her Grade 5 textbooks. She said "Mom, my teacher made a long speech today. She asked us to study hard to get good marks. She told us that every mark we earned is our Pa Pa and Ma Ma's money". Shiao responded "How can she say that!" Shiao was annoyed. Her daughter began to argue "My teacher is right. Everything she said is right." Shiao understood this. She understood that her daughter would listen to every utterance

from her teachers. Teachers have always been considered the source of knowledge in Chinese classrooms. Shiao remembered that she felt the same way when she was a child. She also realized that there was truth in her daughter's comments. It was true that a single mark made a difference on their entrance exams and that this mark would translate into an added cost for tuition. As Shiao's daughter left the room, Shiao snatched up her teaching bag for the walk to her office and her class. It was almost 12:30 p.m. The class started at 1:00 p.m. Everyone was in a hurry: students to different classes, teachers to theirs. As Shiao walked across the campus she came across a group of students singing. Shiao recognized the song from the film *Red Sorghum*, which has been directed by Zhang Yi Mo, starring Gong Li. In Shiao's view this film questioned the nature of Chinese cultural identity. In Shiao's view, the mixture of folk opera form, a plodding disco rhythm, and a north-western instrument *souna*, both reflected the struggle between modern China and its primitive nature as well as the blending of Western culture with Chinese culture. As Shiao hurried past the students she murmured to herself, "That could be a very good start for my lesson today". Shiao arrived at her class, told them about the song, and began the lesson by having students brainstorm their critiques of *Red Sorghum's* theme song. In their critiques some students focused on the song's popularity, some on the lyrics, some on the theme, some on the social significance, some on the political meaning, some on the storylines, and some on the melodies. After the students' critiques, Shiao led the discussion to focus on her view of trends in Chinese music and what these trends meant for Chinese culture. For Shiao, each popular music piece tended to represent the collective emotional and political life of the nation. Popular music pieces served as covert political and cultural ideology. This discussion became the lesson. She totally threw away what she had planned to teach that day.

Field Texts in the Construction of Shiao's Story

Where did the story come from? What is its place in the research process? We begin by describing how a story such as Shiao's is normally constructed in our research. We follow this with a description of how Shiao's story was developed by Ming Fang He (1995) as a theoretical adaptation of our more general method.

In collaborative work, where the researcher and participant become intimately involved in a joint inquiry, this story would have emerged from field notes made by a researcher as she accompanied Shiao through her daily life. The record might have been complemented by an additional set of interviews. For instance, the

scene in the kitchen between Shiao and her daughter might not have been witnessed by the researcher but instead, described to the researcher either in conversation or in an interview. It is also possible that this particular scene might have unfolded in letters between Shiao and her researcher or, possibly, in personal journal entries made by Shiao and shared with the researcher. Still another possibility is that Shiao, the participant, and He, the researcher, were joint authors of the story. In such a case, any number of possibilities might account for the concrete way in which the story was constructed and ultimately appeared on the page: Shiao and the researcher may have written pieces and met to discuss them; they may have constructed this story out of a conversation; it may have come out of letter writing where they shared their knowledge and interpretations of events; and so on. In all of these cases the story relies heavily on empirical evidence and on the support of the teacher participant, Shiao, for overall accuracy and validity.

The methodological adaptation at work in this story is that He is developing a methodology of composite biography. In composite biography, events and stories, from a number of participants, are collected. Stories are constructed and made up of bits and pieces of the lives of multiple participants. In this case, therefore, there is no Shiao as such, though the story is truthful and has meaning vis a vis a teacher's situation.

It is important to notice, as well, that the story is a construction and, therefore, is a step in the movement from field texts (data) to interpretation and research knowledge. Accordingly, the story is neither factual, in the sense that empirical quantitative data are often thought of as factual, nor is it arbitrary and fanciful. It is something which has an empirical base, is an interpretive construction, and is told for a larger research purpose. That purpose will unfold as we work our way through the remainder of the paper.

Research Purpose and Understanding

The very brief story excerpt does not make it possible to fully explore aspects of Shiao's personal practical knowledge. But by illus-

trating how these ideas about knowledge work in this excerpt with Shiao we hope that some idea of our larger research agenda might become clear.

Image: One of the first research tasks in such work is to ask what we know of the person through the field texts and subsequent stories. Who is Shiao? How does she know her teaching and her life? What, to return to our basic theoretical framework, is her personal practical knowledge?

The most telling quality is captured in the term image. How do we construct Shiao's image? The story reveals that Shiao knows her situation in mixed, complex, ways. We think of her as living with an image of tension. She knows her world in terms of tensions: tensions between modern China and historical China; tensions between her Western educational beliefs and modern Chinese education; and generational tensions between her students and the educational authorities who make the curriculum and who govern society. There are also tensions in her personal life that are parallel with, and give meaning to, these other more educational tensions. There are tensions between her sense of her education in China and her education abroad; between her daughter's current education and what Shiao believes is educational; and the overall tension of knowing that the issues are not resolvable and that she must live with these tensions. This overall tension is seen most clearly with her daughter where Shiao is upset at her daughter's acceptance of what her teachers are telling her, yet, Shiao knows that what her daughter says is true. There are other unresolved tensions, as the story is told, in Shiao's teaching. She plans lessons that more or less coincide with curriculum policy, yet, she is willing to deviate as student interests throw up issues that, to her, invite new and more important learnings.

We say that Shiao lives an image of tension, one in which she is always on balance between contending forces, contending views, and contending personal impressions. It is this tension that is essential to understanding Shiao as a teacher, as a parent, and as an educated person.

Though we speak of Shiao as holding and expressing an image of tension, there are other aspects of her personal practical knowledge

important for constructing an understanding of her as a teacher. The ones we briefly describe here are rules, principles, personal philosophy, metaphor, cycles, and rhythms and narrative unity.

Rules, principles, and personal philosophy: One of Shiao's rules, it would appear, is to listen intently to students' spoken concerns and interests. She could, for example, have easily dismissed her daughter's comments in the kitchen and she could have ignored her students' objections to her lesson on Western painting and Western music. Even more striking is the fact that on her way to class, she paid attention to a group of students singing Red Sorghum's theme song. The rule, it seems, is "listen closely to student voices".

In behind this rule appears to be a general principle, perhaps embedded more generally in a personal philosophy of teaching. Shiao wants education to be meaningful for her students. She engages them in conversation and is anxious not to pursue merely rote learning. She wants her students to think, converse, and understand themselves and their place in modern China. The principle at work might be stated in many ways. Here is one, "Students learn most when they pursue their own interests." That particular statement may be too strong for the situation and one might modify the statement, if one knew Shiao better, to read "Shiao believes that good education is built out of public government policy adapted by intuitive, spontaneous, teaching which encourages student initiative."

The rules and principles that we imagine to be at work in Shiao's personal knowledge might be embedded in a broader more comprehensive *personal philosophy* of education. She may, for instance, have read and studied John Dewey's theories of experience Dewey (1938) or she may have read the works of modern educators working in a Deweyan tradition. The network of concerns built into a theory of experientially based education might constitute a kind of personal philosophy that Shiao holds about life and about education.

Metaphor: Metaphor, though similar to image as a component of personal practical knowledge, differs from it in having a more

linguistic, less bodily, aspect to it. Thus, a person may say that for her, teaching is like a garden. Nevertheless, metaphors give imaginative expression to personal practical knowledge making it possible for a person to explore hidden intellectual avenues contained in a metaphor's frame. As told, Shiao's story does not reveal much about the metaphors at work in her life. In He's separate conversations with Shiao, it appears that Shiao may hold what she calls a push-pull metaphor: pushed by a traditional Chinese metaphor of the teacher as a mirror of society and pulled by a creativity metaphor where the teacher urges students to develop a critical edge towards society. This rendition of Shiao's metaphor, of course, begins to sound like the image of tension described earlier. Without further narrative inquiry, we, as researchers, must simply treat metaphor, and its relationship to Shiao's personal practical knowledge, as an area of mystery; the topic of further research.

Cycles and rhythms: We believe that a great deal of teachers' knowledge of their teaching is connected to life cycles and to rhythms that accompany those cycles. We have only the slightest hints of this in Shiao's story. By pointing to those hints we hope the larger picture will more clearly come into focus for our readers. Shiao's teaching takes place in the afternoon, following time spent with her daughter at lunch. We are told that she has a small room in her apartment with a personal computer where she does her research analysis and writing. Her cycle of activity appears to be composed of domestic/parenting activities, teaching, and writing in which her home, the university campus, and her classroom all play a part. As in everyone's life, we assume that as the year progresses, a more or less fixed-cycle of activities develops and that she develops bodily rhythms attached to those cycles. It is well known that the flow of one's life, its rhythm, is connected to the cycles of daily living: the morning rising, eating, going to work, resting, sleeping, the opening and closing of the teaching day and of the teaching year, the cycle of holidays, and, in the end, an overall life cycle of birth, growth, education, work life, retirement, and death. As everyone knows, the rhythms experienced by a new

teacher entering the profession, as we may imagine Shiao to be doing shortly after her return to China, are vastly different than the rhythms experienced by a teacher reaching the end of her teaching career. These cycles and rhythms are not incidental to the work that people do. They are central to the knowledge teachers have of their teaching. We do not imply that the young teacher beginning a career is a better teacher than the teacher at the end of a career. What we do say is that their position in that life cycle, and the rhythms that they have established in their overall life, make a difference to how they shape their teaching, to how they respond to their students and, in turn, to how students learn from them, how they respond to curriculum guidelines, how they interpret cultural history and social directions, and so on. In this respect, imagine the differences between Shiao and Shiao's daughter's teacher.

Narrative unity: We speak of narrative unities as threads in people's lives that help account for the way in which they construct the stories that they live both in their personal lives and in their teaching. For Shiao, these various threads, if we were to construct them, would have a personal educational component, a parenting component, a teaching component, a social component, and a cultural component. Each of these threads would need to be told over a temporal time span, for instance, the unities would need to be explored in Shiao's own education as a child in China, the moves she made that took her to North America and back, what held all of this together and lets her continue to practice as an educator.

So far we have said little about the issue of narrative and story telling at a theoretical level. We wish now to give a brief overview of this prior to showing how these ideas function not only in a general theoretical capacity to bind the terms of personal practical knowledge together but, also, are part of teachers' personal practical knowledge.

The idea of cycles and rhythms leads, we believe, quite naturally to a broader understanding that it is the life that a teacher is leading, overall, that is the most important framework, the practical-theoretical context,

for understanding what it is that a teacher knows and does. In a rough and ready way, a reader who follows through the implications of the notions of cycles and rhythms in the above section will see this to be the case. Much of our own work in recent years has been devoted to trying to understand this broader life context and to use it to think through the issue of teachers' knowledge in the improvement of practice.

Broadly speaking, we refer to this general area as narrative theory and we refer to the specific narrative constructions within a life as story. In short, the story of Shiao presented earlier is an embodiment of more general narrative theory. To state this in its most direct way, we believe that we all live inside stories. We mean this quite strongly. We believe that there is more of a sense of a person living inside a story than there is of a person living inside a theory or living inside an ideology. Indeed, to live inside a theory or to live inside an ideology is to live inside a story of oneself. Think of the students who objected in Shiao's class. These are students who are living inside an ideology of change. They speak about growth, finances, wealth, advertising and so forth. This is clearly an ideological setting. But when we think about these students more generally we realize that this ideology is part of an overall story of who they are in their lives: they are living out a story of themselves as people on the edge of a new era, with a past that looked one way and a future that looks another. The marks of a story are that a story has a past, a future, a present, and a plot-line. The past, the present and the future are all clear in the students' story. Their story's plotline is one of development and change from the old to the new, from one form of government to another, from one ideology of social and personal life to another.

In our telling, Shiao's story appears much richer and more complex than that of her students. She sees and understands their story of growing up in modern China. As a mother, she lives this story in relation to her daughter. She is both in the story and beyond the story. We know very little about the students' stories. As told, and without further narrative inquiry, we imagine, following their statements about the economic future orientation of China, that

the students subscribe to an economic ideology of growth. There is nothing in the story to indicate that they have reservations and doubts about their story. From this it appears that their story tends to be one of certainty about the best education and about how to proceed towards the future. But Shiao has doubts. In a sense her story is one of more uncertainty. She lives tensions which, it would appear, are not felt as directly by her students who appear to be living more comfortably and less reflectively within the ideological story. The ideological story, as we understand it, gives them certainty. Shiao's story of tension leaves her with doubts.

A Transition

So far we have provided a sketch of our work in personal practical knowledge. We showed that our work is lodged within a long North American tradition of educational research, specifically, research on teaching. We showed how we are positioned relative to that research and we have, using Shiao's story, illustrated the key terms and elements in our theoretical approach to the study of teacher knowledge. While only the sketchiest notes have been possible, we are hopeful that a sense of the importance of understanding teacher knowledge is clear.

But this work is only half the story as far as our own work is concerned. Our research for 15 years focused on the details of the outline presented above. For those 15 years, we were aware that, as is stated in quite a well known North American saying, "no person is an island." Everyone works in a context. No one is only individually responsible for their actions, for their knowledge, for the consequences of their actions on others. In recent research, we turned our attention to the relationship of teachers to their professional environments. We are concerned with understanding how teachers' personal practical knowledge develops in the context of, and influences, the environment in which they work. In the following, we give a broad sketch of what we are currently working on. We would need yet another paper to do justice to nuances of the ideas that we are developing.

However, the broad concept is simple. We are concerned with the environment in which teachers work. We refer to this environment as a landscape. We use this metaphor in our recent book, *Teachers' Professional Knowledge Landscapes* (Connelly & Clandinin, 1995). The landscape metaphor is important to us because it captures the exceedingly complex intellectual, personal and physical environment for teachers' work.

In most of the research on teaching literature, work reported in the three Handbooks of Research on Teaching, noted above, it is assumed that teachers spend their time in classrooms. To this we add our interest in teachers' work outside their classrooms, as well as taking into account the landscape of their personal lives. This idea applies to Shiao's story as we see her in a classroom, on the campus as she walks up to a classroom, in the kitchen with her daughter, and as she plans her curriculum for her students. As we work on understanding Shiao's personal practical knowledge, we are concerned with it all, not only with what she says and does within the classroom. We believe that it is this total setting that helps make sense out of her teaching. Likewise, her sense of herself in the classroom influences her personal life. They are interrelated. It is difficult, for example, to sort out with any certainty which comes first in her exchange with her daughter: her ideas and theories of child rearing and of Chinese culture, her experiences as a student in China and abroad, or her classroom experiences of teaching students to think and to build on their interests.

To develop this just a little further, let us explore aspects of each of these dimensions of a landscape. To begin with, in her personal life we see how Shiao has been shaped: by her education as a child; by her educational experiences in Canada; by her experiences with her daughter; by her experience of a rapidly changing Chinese culture; and by the curriculum guidelines and her sense of how they are related to both the past and present culture. All of these aspects are interwoven with all other aspects of the landscape. Nothing is clearly separated. Everything makes a difference to understanding her as a teacher.

In a related way, we can see how her experiences outside the classroom, on the campus when she encounters the students singing the Red Sorghum song, shape what she eventually does in the classroom. However, there is not a one-to-one relationship between her observations on her campus walk and her classroom teaching because what she does in her teaching as a result of that is connected with everything else that has taken place in her education. We need to understand her personal landscape, as noted above, to help make sense out of the fact that she turns the Red Sorghum song into a classroom lesson.

In the classroom, the situation is equally important, and equally filled with tension. Shiao is governed by government guidelines, with which she plans her teaching. But she finds her students objecting because of their personal lives. In effect, the students' personal lives, their landscapes outside the classroom, reach in and modify the interpretation of government guidelines in Shiao's classroom teaching. Shiao has doubts about this but, nevertheless, proceeds to yet another lesson where she adapts her teaching to the students' interests as seen in the Red Sorghum song. This complex situation, clearly not worked through in Shiao's own mind, interacts strongly with her reflections on Chinese culture, on its history, on her own education, and on the education of her daughter. All three landscape aspects, the personal, the in-classroom, and the out-of-classroom, that we have described are important to understanding Shiao's teaching. It is impossible, as traditional research would suggest, to understand Shiao's teaching by only observing her classroom. A rich, deeper, more narrative understanding evolves from studying what we term the professional knowledge landscape. To understand teaching, we need to understand it in a complex environment.

Summary

Where does this leave us relative to the purpose of educational research which, to remind readers, is, after all, aimed at

improving student learning? From the point of view of those interested in improving learning, the lessons are easily seen. Educational reformers everywhere, North America and China alike, are inclined to introduce changes in policy and changes in curriculum guidelines and to impose them on practice. In so doing, they assume that the theories, philosophies, and ideologies embodied in those policies and guidelines automatically translate into classroom teaching practices and, thereby, into student learning. Our research clearly shows that to more closely relate ideas about teaching and learning with the practice of teaching and learning, we need to be concerned with what it is that teachers know and with the knowledge environment in which they work. In a simple and obvious way it is clear how Shiao's personal practical knowledge, and the knowledge environment in which she works, give her permission, she believes, to dramatically modify the policy guidelines given to her. Clearly, the lessons, and the learning from them, are not what policy makers might have had in mind in the construction of those guidelines. This simple story is, we know from our Canadian studies, the common story. Teachers do make a difference. They do know their situations. They are not mere screens who translate others' intentions and ideologies into practice. Teachers' knowledge is an essential component in improving educational practice. Those concerned with improving education need to be concerned not only with what it is they wish to happen in learning but also with teachers' knowledge and the professional knowledge landscapes in which teachers work.

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