

CHAPTER 3

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CHAPTER 3

The Heart of Teaching: Review of the Literature

The more one reads studies of teacher belief, the more strongly one suspects that this piebald form of personal knowledge lies at the very heart of teaching. (Kagan, 1992)

3.1 Introduction

The study of teachers' beliefs has the potential to provide significant and profound insight into many aspects of the teacher's professional world. Pajares (1992) notes that attention to teachers' beliefs can inform educational practice in ways that prevailing research has not and is essential to improving their professional preparation and teaching practices. Kagan (1992) affirms that the study of beliefs is critical to educational practice. She argues that beliefs may be "the clearest measure of a teacher's professional growth" and that understanding them is "instrumental in determining the quality of interaction one finds among teachers in a given school" (p.85). Rokeach (1968) concludes that beliefs are the best indicators of the decisions made by individuals in the course of their lifetime. In 1990, Pintrich posited that beliefs will eventually prove themselves to be the most valuable psychological construct for teacher education.

Ironically, in spite of the fact that beliefs play such an important role, they have not received much attention from researchers. Nespor (1987) has remarked that we know very little about how beliefs come into being, how they are supported or weakened, how people are converted to them. He notes:

However, in spite of arguments that people's beliefs are important influences on the ways they conceptualize tasks and learn from experience, relatively little attention has been accorded to the structures and functions of teachers' beliefs about their roles, their students, the subject matter areas they teach, and the schools they work in. (p. 317)

The lack of attention to the study of this important area may be due, as Pajares (1992) explains, to the fact that the construct does not lend itself easily to empirical investigation and is difficult to define. More specifically, Pajares argues that "the difficulty on studying teachers' beliefs has been caused by definitional problems, poor conceptualizations, and differing understandings of beliefs and belief structures" (p.307). Current literature on teachers' beliefs is heterogenous and widely focused with separate research agendas (Kagan, 1992). The research on the topic tends to be categorized into domain areas such as teachers' beliefs about teaching math or teachers' beliefs about teaching reading.

The purpose of this study is to profile the beliefs of teachers of FSFL about teaching and learning in online learning environments. No studies were found by this review on this topic specifically. However, Chapter 2 provided a review of some of the literature on the evolution of the use of

technology in second- language teaching. Included in that review was a discussion of teaching and learning FSFL in online learning environments. The review of the literature in this chapter will focus on the following areas:

1. beliefs about teaching and learning;
2. beliefs about use of technology in teaching and learning;
3. beliefs about teaching and learning FSFL.

In order to appreciate the place and role of teacher beliefs in the teaching of FSFL, it will be necessary to consider the nature of beliefs themselves, their definition and relation to other constructs such as that of knowledge. This review will begin therefore by describing the nature of beliefs and building a definition which will be used in the context of this study. Related to the nature of beliefs is their openness or resistance to change. Following the review of the literature on the nature of beliefs, will be a section related to beliefs and change. Prior to the review of teachers' beliefs about use of technology in teaching and learning and about teaching and learning FSFL, we will explore teachers' beliefs about teaching and learning in general.

While there is no section in this review specifically devoted to teacher's beliefs and learning theories, an important aim of this review and of the entire study is to understand the relationship between teachers beliefs and personal theories and the "official" theories of constructivism and behaviorism. As the review will show, teachers' beliefs relate to such fundamental issues as what constitutes knowledge, what learning is, and what the role of the teacher is. The emphasis in Chapter 2 of this study was on tracing the evolution of approaches and the use of technology in the teaching of FSFL. The chapter provided insight into how theories of learning have impacted on practices throughout the past one hundred years. No doubt, these theories have had an impact on teachers' beliefs as well. This review provides an opportunity to better understand the tacit, invisible beliefs and implicit theories that drive teachers' practices and how these compare and contrast to the "official" theories of constructivism and behaviourism.

3.2 The Nature of Beliefs

While beliefs have been described as the most valuable psychological construct to teacher education (Pintrich, 1990), they also are one of the more difficult to define. Pajares (1992), in his review of the research on the topic, refers to beliefs as a "messy construct", one that has not always been accorded much precision and which "travels under the alias" of: "attitudes, values, judgements, axioms, opinions, ideology, perceptions, conceptions, conceptual systems, preconceptions, dispositions, implicit theories, personal theories, internal mental processes, action strategies, rules of practice, practical principles, perspectives, repertoires of understanding, and social strategy, to name but a few that can be found in the literature" (p.309).

Pajares explains that confusion with the concept centres around the distinction between knowledge and belief. However, as many researchers have found, it is not so much that knowledge differs from beliefs, but that beliefs themselves constitute a form of knowledge. In his attempts to characterize beliefs, Nespor (1987) provides some distinctions between the two. He

singles out four features of the construct previously identified by Abelson (1979) and considers them in relation to teachers:

1. Existential presumptions or personal truths are generally unaffected by persuasion and are perceived by the teacher as being beyond his/her control or influence. These types of beliefs would include a teacher's beliefs about students' innate abilities or characteristics.
2. Alternativity is a feature of beliefs that would include situations such as when teachers attempt to establish an instructional format of which they have no direct experience but which they might consider ideal. Nespor theorizes that it is in this respect that beliefs "serve as a means of defining goals and tasks, whereas knowledge systems come into play where goals and the paths to their attainment are well defined". (p.310)
3. Belief systems can be said to rely much more heavily on affective and evaluative components than knowledge systems. For this reason, knowledge of a domain can be distinguished from feelings about a domain such as a subject area taught by a teacher. Teachers' values and feelings often affect what and how they teach and may conflict with their knowledge.
4. Belief systems are composed mainly of episodically stored material which is derived from personal experience, episodes or events which continue to influence the comprehension of events at a later time. Whereas beliefs reside in episodic memory, knowledge is semantically stored.

A further distinction between beliefs and knowledge, notes Nespor, is that, while knowledge often changes, beliefs are "static". As well, whereas knowledge can be evaluated or judged, such is not the case with beliefs as there is usually a lack of consensus about how they are to be evaluated. Furthermore, there do not appear to be any clear rules for determining the relevance of beliefs to real world events. While there are no doubt other distinctions that could be made between the two constructs, a better understanding may be gained by exploring the relationship between the two and by considering beliefs as a form of knowledge. This form of knowledge could be referred to as personal knowledge. Kagan (1992) refers to beliefs as a "particularly provocative form of personal knowledge" and argues that most of a teacher's professional knowledge can be regarded more accurately as belief.

According to Kagan, this knowledge grows richer and more coherent, as a teacher's experience in classrooms grows and thus forms a highly personalized pedagogy or belief system that actually constrains the teacher's perception, judgment, and behavior. In terms of beliefs as being personal knowledge, Kagan explains: "A teacher's knowledge of his or her profession is situated in three important ways: in context (it is related to specific groups of students), in content (it is related to particular academic material to be taught), and in person (it is embedded within the teacher's unique belief system)" (p.74).

Like Clark (1988) who equates 'implicit theories' with beliefs, Nespor (1987) explains how beliefs become personal pedagogies or theories to guide teachers' practices:

...teachers' beliefs play a major role in defining teaching tasks and organizing the knowledge and information relevant to those tasks. But why should this be so? Why wouldn't research-based knowledge or academic theory serve this purpose just as well? The answer suggested here is that the contexts and environments within which teachers work, and many of the problems they encounter, are ill-defined and deeply entangled, and that beliefs are peculiarly suited for making sense of such contexts. (p.324)

Rust (1994) describes beliefs as socially-constructed representational systems. These systems then are used to interpret and act upon the world. Since beliefs are generally contextualized and associated with a particular situation or circumstance (Kagan, 1992), it is not surprising that systems of beliefs may contradict each other (Ennis, 1994). Furthermore, wide variance can be found among the systems of beliefs of different teachers from within a similar group (Bussis, Chittenden, Armel, 1976). Wehling and Charters (1969) discuss beliefs in terms of complex organizations consisting of discrete sets of inter-related concepts. They include beliefs in the category of representations, or cognitive maps of the external world which serve as mediators for experiencing and responding to reality. This conception of beliefs fits with the notion of beliefs as personal knowledge, personal pedagogies and implicit theories.

Munby (1982) also equates implicit theories with teachers' beliefs. Clark and Peterson (1986) in their review of the literature on teachers' thought processes, argue that teachers' theories and beliefs represent a rich store of knowledge. Teachers make sense of their complex world and respond to it by forming a complex system of personal and professional knowledge and theories which, as Kagan (1992) describes, are often tacit and unconsciously held assumptions about students, classrooms and the material to be taught.

Pajares (1992) provides a synthesis of the findings on beliefs which he drew from his review of the literature on the topic:

1. Beliefs are formed early and tend to self-perpetuate, persevering even against contradiction caused by reason, time, schooling, or experience.
2. Individuals develop a belief system that houses all the beliefs acquired through the process of cultural transmission.
3. The belief system has an adaptive function in helping individual define and understand the world and themselves.
4. Knowledge and beliefs are inextricably intertwined, but the potent affective, evaluative, and episodic nature of beliefs makes them a filter through which new phenomenon are interpreted.
5. Thought processes may well be precursors to and creators of beliefs, but the filtering effect of belief structures ultimately screens, redefines, distorts, or reshapes subsequent thinking and information processing.
6. Epistemological beliefs play a key role in knowledge interpretation and cognitive monitoring.
7. Beliefs are prioritized according to their connections or relationship to other beliefs or other cognitive and affective structures. Apparent inconsistencies may be explained by exploring the functional connections and centrality of the beliefs.

8. Belief substructures, such as educational beliefs, must be understood in terms of their connections not only to each other but also to other, perhaps more central, beliefs in the system. Psychologists usually refer to these substructures as attitudes and values.
9. By their very nature and origin, some beliefs are more incontrovertible than others.
10. The earlier a belief is incorporated into the belief structure, the more difficult it is to alter. Newly acquired beliefs are most vulnerable to change.
11. Belief change during adulthood is a relatively rare phenomenon, the most common cause being a conversion from one authority to another or a gestalt shift. Individuals tend to hold on to beliefs based on incorrect or incomplete knowledge even after scientifically correct explanations are presented to them.
12. Beliefs are instrumental in defining tasks and selecting the cognitive tools with which to interpret, plan, and make decisions regarding such tasks; hence, they play a critical role in defining behaviour and organizing knowledge and information.
13. Beliefs strongly influence perception, but they can be an unreliable guide to the nature of reality.
14. Individuals' beliefs strongly affect their behavior.
15. Beliefs must be inferred and this inference must take into account the congruence among individuals' belief statements, the intentionality to behave in a predisposed manner, and the behavior related to the belief in question.
16. Beliefs about teaching are well established by the time a student gets to college. (Pajares, 1992, p.324)

For the purposes of this study, beliefs will be defined based on the common elements described in this review of the nature of beliefs. From these common elements, we can derive specific statements about beliefs as follows:

- Beliefs represent teachers' personal knowledge.
- Beliefs represent implicit theories.
- Beliefs serve as cognitive maps.
- Beliefs serve as mediators for experiencing and responding to the environment.
- Beliefs represent a complex inter-related system.
- Beliefs have a cognitive and an affective component.
- Beliefs are often tacit and unconsciously held.

From these statements, we can establish a definition of teachers' beliefs which will be used in this study:

Teachers' beliefs represent a complex and inter-related system of personal and professional knowledge that serves as implicit theories and cognitive maps for experiencing and responding to reality. Beliefs rely on cognitive and affective components and are often tacitly held.

3.3 Beliefs and Change

One common theme or conclusion in the literature about teachers' beliefs is that changing them is a complex, perhaps even, mysterious, process. Contrary to the attempts of theorists and those involved in trying to promote teacher professional development, teachers' beliefs appear to be static (Nespor, 1987), resistant to change (Brousseau et al., 1988), and are generally not affected by reading and applying the findings of educational research (Hall Loucks, 1982). Pajares (1992) provides insight into how beliefs function and how this functioning actually contributes to their resistance to change:

[beliefs] provide personal meaning and assist in defining relevancy. They help individuals to identify with one another and form groups and social systems. On a social and cultural level, they provide elements of structure, order, direction and shared values. From both a personal and socio/cultural perspective, belief systems reduce dissonance and confusion, even when dissonance is logically justified by the inconsistent beliefs one holds. This is one reason why they acquire emotional dimensions and resist change. People grow comfortable with their beliefs, and these beliefs become their "self" so that individuals come to be identified and understood by the very nature of the beliefs, the habits they own. (p. 317)

A number of researchers have found that the more central a belief, the more it will resist change (Rokeach, 1968). Woods (1996) speculates that when teachers' beliefs are very tightly interconnected with other beliefs, they are more difficult to change. On the other hand, when the belief is less densely connected to other beliefs, change is a less complex operation. The implication is that, in order for change to occur, there must be some deconstruction of beliefs before another set can be constructed. This process, argues Woods, can "lead to periods of disorientation, frustration, even pain" (p. 293). Furthermore, he notes, because each belief is part of an interwoven network which includes many other beliefs, teachers cannot simply at will 'change' one belief by itself. Instead, teacher change can only be encouraged but not mandated.

Nespor (1987) argues that instructional change is not a matter of abandoning beliefs, but of gradually replacing them with more relevant beliefs. Dwyer et al. (1992) concur with Nespor when they argue that implementing change in education must include changing teachers' practices and beliefs by gradually replacing them with more relevant beliefs shaped by experiences in an altered context. They argue that it is this altered context that may make the difference in terms of impacting on the beliefs. The altered context in which their study was situated was that of a technology-based environment. Their research was conducted in the context of the Apple Classrooms of Tomorrow project (ACOT) and focused specifically on the evolution of teacher beliefs in high-access-to-technology classrooms. They found that "teachers' beliefs may be best modified while they are in the thick of change, taking risks and facing uncertainty" (Dwyer et al., 1991, p.52). Confronted with change, teachers are forced to reevaluate their beliefs about learning and instruction and only by changing these beliefs can instructional change take place.

Bracey (1993) considered three technology reports including the ACOT project to determine the influence of technology use on teaching. Bracey's interpretation suggests that technology use serves as a catalyst for change and that computers "appear to change teachers in ways that educational reformers have been calling for" (p.9). The resulting changes involved teachers adjusting their beliefs about effective teaching. He concluded that teachers were more willing to take risks, that they allowed for more independent student work, that they worked more as facilitators and that they provided for more dynamic learning experiences. A similar conclusion was reached by Schofield and Verban (1988) in an investigation of computer use on the teaching of mathematics. They remarked that introducing computers into the classroom, not only changes the teacher's role, but results in a shift from a didactic to a constructivist approach.

Nonetheless, this ability for beliefs to change in the altered context of a technology-based environment involves a process that is fraught with conflict. Even when innovative teachers try to alter their practices and beliefs, the cultural norms continue to support lecture-based instruction, subject-centered curriculum, and measurement-driven accountability (Dwyer et al. 1992, p.2). Whereas teachers may be committed to investigating the potential of modern technology, they are "held in check by the principals of 19th century instruction" (Dwyer et al. 1991, p.51). At the same time, the demands of the profession of teaching can also provide a certain resistance to change in beliefs. Teachers cope with the significant demands of their job by relying on their beliefs: "Teachers are, by nature of their work, pragmatists. They must survive the day; they must be ready for the next. Confronted by large numbers of computers or not, they arrive at their classrooms the very first day of their careers with a deeply-rooted belief about schooling that will help them weather the storm of the demands they face" (Dwyer et al. 1992, p.8).

Changing how teachers think about teaching and learning is a complex and challenging process. Mandating a change in the way people think about technology or about new ways of teaching and of learning is unlikely to be effective. Providing people with training and with new information and knowledge to help make them think differently may present significant challenges as well. As the literature on the subject tells us, people's beliefs are so ingrained and so interwoven with their life's experiences and with what they know, that they are immune to direct manipulation. Changing people's beliefs is tantamount to changing who they are as individuals. As Nespor (1987) explains: "...belief systems often include affective feelings and evaluations, vivid memories of personal experiences, and assumptions about the existence of entities and alternative worlds, all of which are simply not open to outside evaluation or critical examination..." (p.321).

3.4 Beliefs about Teaching and Learning

As the studies described in this section will illustrate, researchers often categorize the differences in beliefs of teachers as either behaviorist (transmissionist) or constructivist. It should be noted from the start however, that such a dichotomy, while useful in terms of being able to clearly categorize beliefs, may be simplistic and misleading. Theories of learning such as constructivism are so diverse (Ernest, 1995) that it is questionable whether we can possibly categorize sets of

beliefs in terms of a behaviorist/constructivist dichotomy. Not only are these theories of learning complex and open to a variety of interpretations, but teachers' beliefs themselves are complex, sometimes contradictory and therefore resist a concise classification.

Klien (1996), in his study of preservice teachers, argues that teachers' beliefs can be eclectic and contradictory and that teachers may hold both transmissionist as well as constructivist views. In his study of the learning and knowledge beliefs of 279 preservice faculty of education students, the majority endorsed a view of learning that included both constructivist and transmission-oriented themes. While the participants in the study may have agreed with the study's constructivist items, they did not simultaneously reject a transmissionist view of teaching. An interesting conclusion reached by Klein was that while "constructivism denotes a set of related beliefs for some educational theorists, these same beliefs appear independent of one another to many students" (p.369). He concludes that many preservice teachers may hold contradictory sets of beliefs depending on the context and that these beliefs may reflect, at the same time, a constructivist and transmissionist philosophy. Klein explains these findings by suggesting that beliefs "are not organized into a coherent body of knowledge" or that the preservice teachers in some way reconcile the different approaches, themes or philosophies (p.370).

Collinson (1996) conducted a case study on K-5 staff development and found differing beliefs about teaching and learning which "produced tensions between adherents of behaviorist and constructivist paradigms"(p.10). While some of the teachers were able to articulate the reasons behind their preference for a particular paradigm, others simply "did not have specific vocabulary to describe what they felt" (p.10). Nonetheless teachers' pedagogical beliefs surfaced in their group discussions through "noticeably different vocabularies". While some teachers talked about "integrating the curriculum" and "finding the kid's level", others referred to the need to "cover the curriculum" and "straight grades" (p.11). The teachers who adhered to the behaviorist paradigm believed in the effectiveness of teaching to the test, worried about being "able to cover everything" and about having their performance measured by their students' test scores.

In his review of the literature on teachers' beliefs and knowledge, Calderhead (1996) summarized beliefs related to teaching and learning. He categorizes teachers' beliefs in two categories by arguing that some teachers view teaching as a process of knowledge transmission, while others view it as a process of guiding children's learning or as a process of developing social relationships. He also distinguishes between beliefs of teachers based on their experience. Preservice teachers start with control-oriented belief systems that emphasize the importance of maintaining order and good discipline and guiding the activities of the children. During training, these attitudes become more liberal and child-centered. However, when teachers enter full-time teaching, they once again revert to a control-oriented belief system.

Teachers' beliefs about curriculum are also pivotal in terms of bringing about significant change in education. Taylor (1990) refers to the "determinist beliefs" of teachers that the curriculum is determined by the state and that teachers have little control or influence over it. Teachers may also perceive the curriculum as a real object instead of the subject of socially-negotiated knowledge (Ibid.). As a result of holding such beliefs, argues Taylor, teachers fail to adapt their role to suit local circumstances and, furthermore, adopt the role of manager who is concerned

with delivering the syllabus and controlling students interactions with it. Instead, he explains, they should assist students in "negotiating the nature of their learning activities". Prawat (1992) sees teachers' beliefs about teaching and learning as closely linked to their beliefs about curriculum. He describes teachers' "dichotomous view of the learner and of the curriculum" as one of the sets of beliefs that will impede the adoption of a constructivist view of teaching and learning. He argues that teachers need to adopt an "open-systems" view of curriculum whereby they begin to perceive the curriculum as a "a network of important ideas to be explored" rather than "a course to be run" (p.382).

Prawat (1992) argues that teachers' beliefs pose a major obstacle to educational reform "because of their adherence to outmoded forms of instruction that emphasize factual and procedural knowledge at the expense of deeper levels of understanding" (p. 354). Teachers' beliefs, claims Prawat, are inconsistent with constructivist approaches to teaching and learning. At the start of their professional training, many teachers view teaching as telling, and learning as remembering, a belief that presents difficulties in terms of moving teachers towards a more constructivist approach (Calderhead, 1988; Russel, 1988). Challenging teachers' fundamental beliefs about teaching and learning therefore represents an important step in any effort to bring about educational reform.

Constructivist theory requires a radical shift in thinking and in teachers' roles and places greater demands on teachers (Prawat, 1992). For teachers to shift their beliefs to accommodate a constructivist epistemology would require them to develop new practices and to abandon well-established and seemingly successful practices (Taylor, 1990). To accomplish this, teachers would first need to overcome some of the obstacles to changing their practices. Taylor observed that the teacher in his study was "limited by constraints which he associated with the inherent nature of both the curriculum and the students" (p.19). Beliefs about student expectations of a central role for the teacher as well as concerns about being accountable and progressing with the syllabus limited the teacher's development of a constructivist pedagogy. Taylor concluded that the teacher's positivist epistemology, along with constraints which the teacher associates with students and curriculum policies, limited the adoption of more constructivist beliefs. The teacher's reconstruction of beliefs requires, not only self-negotiation but, as well, social negotiation with teachers, students and the larger school community.

A further obstacle to teachers' adoption of constructivist teaching beliefs relates to the nature of constructivist theory itself. Constructivism is a new theory and many of its implications have not yet been made clear. While constructivist views of learning may be well developed, such is not the case with constructivist view of teaching (Prawat, 1992). Furthermore, notes Prawat, constructivism is open to many interpretations. Thus, while the major impediment to educational reform may well be teachers' beliefs, changing these beliefs to reflect constructivist philosophy may represent a formidable challenge. The following section will provide some insight into the curious and complex interplay between change, constructivism, technology use and teachers' beliefs.

3.5 Beliefs about Technology in Teaching and Learning

Honey and Moeller (1990) conducted an exploratory study of teachers' thinking related to how and why they use or do not use technology in their teaching. The authors of the study conducted interviews with twenty teachers to determine whether or not there were discernible patterns in teacher' pedagogical beliefs and practices which facilitate or detract from technology integration. They found that, while the high-tech teachers represented a fairly homogenous group in terms of their pedagogical beliefs, low-tech teachers tended to be more heterogenous as a group. Among the low-tech teachers, those teachers with student-centered beliefs were hesitant about using technology because of their personal fears and inhibitions. The teachers in this group who held more traditional classroom practices feared that technology might "alter their relationship of control and authority with their students" and they also believed they did not have the time for any additional activities (p.3). There was a further group of teachers whose practices were student-centered and who would have liked to use computers in their teaching but who did not because of either lack of equipment or scheduling problems in the computer lab.

The high-tech teachers in their study engaged in activities such as collaboration, project-oriented work and hands-on activities, inquiry-based and discovery-based learning. These teachers perceived themselves as learners and expressed a belief in the need for different learning styles and learning requirements for students. These teachers perceived technology as a facilitating tool and one that enhanced the curriculum. Honey and Moller noted that there was a widespread belief among this group of high-tech teachers that technology could expand students' horizons, make learning more fun and more meaningful, allow them more time to help individual students, and allow them to take a more process-oriented approach to teaching that involved small-group work and project-oriented activities. In general, this group of teachers used their student-centered pedagogical beliefs to facilitate the effective integration of technology into their curricula and made a conscious and deliberate effort to find applications that support the kinds of student-centered practices that prevail in their classrooms.

Of the twenty teachers in the study, there were three whose pedagogical beliefs appeared almost identical to those of the high-tech teachers but who expressed fears and "deep-seated personal ambivalence about the technology itself" (p.8). One of these three teachers described the experience of using computers as being like "a whole new language" and "new culture" and that many aspects seemed "strange and foreign". One of the other teachers in this group was reluctant to use computer technology because he felt he lacked the technological know-how and because his first experiences had been negative. Honey and Moeller described the beliefs of these teachers as "conservative". These teachers saw technology as a means to reinforce basic skills, as a motivator and an "add-on" to the curriculum. The authors made some recommendations about how teachers might be encouraged to effectively integrate technology. These recommendations suggest that changes may be required, not only in teachers' beliefs but, as well, in the educational system itself:

For teachers whose educational beliefs and practices are traditional, there exist different and much more complicated barriers for technology integration. In order to integrate

technology into their curricula as the high-tech teachers have done, the very nature of their practices would have to change. In order to bring about such change, however, different layers of the educational system would have to be effected, ranging from changing how assessment is done to helping teachers rethink how students learn and develop. (p. 16)

The Apple Classrooms of Tomorrow (ACOT) research project ran from 1986-89 and included 32 teachers and 650 students in four elementary and one high school classroom. The ACOT classrooms offered teachers and students constant access to interactive state-of-the art hardware and software in "true multi-media environments". The research focused on understanding the dynamics of teacher beliefs and practices in high-access-to-technology classrooms. The research demonstrated the need to take into account and recognize teachers' belief systems in order to implement significant change. At the same time, the research concluded that changing one's inner-most beliefs about teaching and learning involves entering into a process ridden with self-doubt, subject to external influence, exhausting, and never unidirectional (Dwyer et al., 1992).

The authors of the study summarized the five developmental phases through which their research subjects passed. The phases characterize the process of evolution of teachers' beliefs and practices from a traditional, text-based curriculum to more constructivist approach. In this model, teachers' "lecture-recitation-seatwork mode" is at first strengthened by use of technology and then gradually replaced by more dynamic learning experiences as teachers move through the phases. These phases are:

1. *Entry:*

This is the initial stage which involves rewiring and rearrangement of classrooms. The stage is characterized by problems related to discipline, resource management and personal frustration.

2. *Adoption:*

In this second stage, concerns shift from connecting computers to using them. Teachers begin to adopt technology to support traditional text-based drill and practice instruction, whole-group lectures and individualized seatwork.

3. *Adaption:*

This stage is characterized by thorough integration of the technology.

4. *Appropriation:*

In the appropriation stage, there is a shift in roles and new instructional patterns emerge. There is an increasing tendency of teachers to reflect on practice and to question old patterns.

5. *Invention:*

The authors describe this final stage as "a placeholder for further development by ACOT's teachers and for the new learning environments that they will create". (Dwyer et al., 1991, p.50)

All of these stages build what the authors refer to as a "readiness for purposeful change" (Dwyer et al., 1992, p.8). Whereas in the earliest stage, teachers were more inclined to use technology to replicate traditional learning practices, they gradually moved towards the realization that

technology could change their students' learning experiences. As the authors observed, during the appropriation stage:

When they reached this phase, teacher quotes communicated a working comfort with beliefs about teaching and learning that were not common among the staff at the project's outset. For the most part, ACOT teachers have become more disposed to view learning as an active, creative, and socially interactive process than they were when they entered the program. Knowledge tends to be viewed more as something children must construct and less like something that can be transferred. The nature of these teachers' classrooms, the permissions they have granted their students, and their own instructional behaviours demonstrate that shift in action. (Ibid., p.8)

In the initial stage, teachers were more preoccupied with the technology itself. As teachers progress in their use of technology, they begin to focus more on issues related to instruction and learning. It is at this stage that they begin to critically examine their beliefs. However, the study revealed that teachers frequently experienced intense inner conflict, vacillation in and struggles with these beliefs as they explore alternate approaches about classroom management, curriculum and collaborative learning:

The direction of change was towards child-centered rather than curriculum-centered instruction; towards collaborative rather than individual tasks; towards active rather than passive learning. Each of these dimensions brought deeply held beliefs about traditional schooling into conflict with what teachers witnessed in their classrooms. The conflict never transformed those beliefs outright; the process seemed more gradual: an erosion of the old, an accretion of the new. (Ibid., p.3)

The authors of another ACOT report focused more specifically on the role that the physical environment plays in bringing about change in teachers' practices. They noted that the traditional model of school organization emphasizes student control, teacher-centered didactic approaches to teaching and learning. They argue that the environment itself, which is based on an "eggcrate" model, actually perpetuates a traditional approach to learning. Furthermore, they found that teacher beliefs about the physical environment actually limit the number of possible options for change. Teacher beliefs appear to control the process of change and limit the number of possible options for change. Two of these beliefs in particular were that (1) all students need an assigned desk; and (2) primary grade teachers need to be able to see all the computer screens at the same time. They found that teacher beliefs of this nature tended to be contrary to a highly interactive and creative learning environment (Stuebing, Celsi Cousineau, 1994).

Niederhauser and Stoddart (1994) conducted a large-scale study involving a survey of the perspectives on computer-assisted instruction of 2,170 teachers. They divided their findings into two categories of beliefs: 1. Computers are tools for students to collect, analyze and present information. 2. Computers are machines for teachers to use in presenting information, giving immediate feedback and tracking student progress. They also concluded that teachers' beliefs about effective uses of computers are closely linked with their use of computers in the classroom. Teachers who used more open-ended, constructivist-type software with their students believed

that computers can be used more effectively as a tool for student construction of knowledge while teachers who used more traditional, behaviourist types of software believed that computers were effective as teaching machines. The findings revealed that, while elementary school teachers tend to favour a more transmission-oriented view of how computers can be effectively used in the education of their students, secondary teachers tend to favour a more constructivist view.

Hannafin and Freeman (1995) conducted an exploratory study of teachers' views of knowledge acquisition. Their aim was to understand how their views might influence their decisions of whether or not to use computers in the classroom. The authors worked from the premise that teachers' conceptions of knowledge acquisition range on a continuum from objectivism to constructivism and that the computer may be more suited to teachers who hold constructivist beliefs. They hypothesized that teachers who hold objectivist views will use the computer only for lower-order skills. Likewise, those with constructivist views would be expected to use computer programs that facilitate more open-ended and problem-solving approaches to curriculum. The study's findings revealed that experienced teachers held more objectivist perspectives on learning than did preservice teacher candidates and that the greater number of years of teaching, the more likely the teacher would hold an objectivist view of knowledge acquisition. The authors did not find any relationship between teachers' views of knowledge acquisition and the likelihood they would use computers in instruction. However, they questioned committing resources to develop constructivist-based software applications if teachers' views of knowledge acquisition are generally objectivist.

Olech's (1997) examination of the relationship between teachers' pedagogical beliefs and the level of instructional computer use bears some resemblance to that of Hannafin and Freeman in terms of the aim and the findings. Olech found that teachers demonstrated an eclectic pedagogical orientation. The researcher sampled 101 elementary teachers using a 57-item questionnaire. One of the scales used in Olech's study assessed teachers' pedagogical orientation and categorized them as having behaviorist, information processing or constructivist beliefs. Using a second scale, she measured their level of computer use along a continuum from utilization to integration. In general, she concluded that the more behaviorist the teachers were in pedagogical orientation, the less likely they were to use the computer instructionally. The negative correlations suggested that teachers with stronger behaviorist tendencies might benefit from inservice education that provides models for implementation in classroom situations closer to their own.

In the context of a study on Internet use in which approximately 2,250 teachers of 4th through 12th grade classes in U.S. public schools responded to a survey, Becker (1999) found that the third major predictor of teachers' Internet use is the teacher's pedagogical beliefs and practices. One of the important conclusions of the study is that "Teachers who regard education as primarily the distribution of facts and skills to students according to a fixed curriculum sequence are much less likely to exploit the Internet than more "constructivist" teachers." More specifically the author found that "the more constructivist the teacher the greater their average use and the more positively they viewed the Internet".

Becker (1991) has also explored issues related to the interaction between teachers' beliefs and systemic practices in an effort to heighten awareness of how "conventional beliefs" and "institutional constraints" can "impede even the best of intentions to improve schooling through technology" (p. 6). Becker argues that teaching practices are a result of teachers' "own schooling, training and experience as teachers". He also points out however that, teachers' teaching styles are influenced by their beliefs, on one hand and "the regularities in the social structure in which most of them work" (p.8). He posits that "The circumstances of teaching also intervene to affect teachers' proximate goals in ways that often distort their more conscious long-range goals" (p.8). An important circumstance of teaching to which he makes reference is that of time which he singles out as "the biggest impediment to better computer use". He explains:

For most teachers, the time required to plan even modest variations to the routine of direct instruction of specific facts and student practices is hardly present....The more complex the software and the more it offers student-centered discovery learning approaches, the more difficult teachers will find the task of getting some constructive benefits from its use-even if the potential for student accomplishment is that much greater. (p.9)

Like Olech (1997) and Becker (1999), Hannafin and Savenye (1993) explore the issue of how beliefs influence teachers' computer use. They summarize the literature on teacher's use of computers in order to determine reasons why teachers do not use computers and to examine the role of those teachers who do. From their review of the literature pertaining to why teachers resist micro-computers, the authors found the following:

- Frustration in learning how to use the computer causes some teachers to give up early;
- poorly-designed software;
- little faith in the computer's ability to improve learning outcomes;
- concern that the computer can become a mental crutch for some students;
- resentment of the computer. The computer is seen as a competitor for students' attention;
- computer use requires increased investment in time and effort;
- fear of losing control over students or of "looking stupid" in front of the class. (p.27)

The authors were interested in documenting not only teachers' resistance to use of microcomputers but, as well, their resistance to the "new roles" of micro-computer users. The authors explain that the teacher's role changes "only to the extent to which a shift of responsibility to the learner occurs". The role can be represented on a continuum from the traditional lecturer and imparter of knowledge (objectivist-based) to that of a coach or facilitator (constructivist-based). A change in the role of the teacher from that of lecturer to facilitator represents a corresponding shift in learning theory. Resistance to the role of facilitator may be symptomatic therefore of a resistance to the underlying learning theory. "It may be that the teacher is receptive to technology but resists the accompanying change in learning theory" (p.28). On an epistemological level, resistance to technology can relate to the teacher's view of knowledge:

Teaching with technology can help to bring about student responsibility for learning. Implicit in this shift is the subtle acknowledgment that knowledge does not exist in

discrete chunks that can be transplanted from the teacher's head to the learner's. Resistance to using computers for high-level student-centered activities may not be a resistance to "technology" at all. It may be an uneasiness with the change in the way knowledge and learning are defined: there is no 'absolute' knowledge and there may be more than one correct answer. (p.29)

Hannafin and Savenye emphasize the intricate, covert and complex nature of teachers' thinking and beliefs. As other authors and researchers in this review have shown, technology use is linked with issues of learner control, authority and with epistemological and theoretical issues. Hannafin and Savenye remind us that we cannot effectively consider teachers' beliefs about, understanding or use of technology without considering the underlying theoretical issues. As was pointed out in Chapter 2's review of the evolution of language learning and technology use in language teaching, how teachers view knowledge, the nature of learning, and their role are not only important in understanding how teachers use technology, but in understanding the approach that teachers take to language instruction in general. The following section of this review considers the issue of teachers' beliefs about teaching and learning second and foreign languages.

3.6 Beliefs about Language Learning

Johnson (1994) argues that the field of second-language education lags behind mainstream educational research in that it has neglected to focus adequate attention to the affective dimensions of second-language learning. Only since the late eighties and early nineties have researchers begun to shift from studying effective teaching behaviours, positive learner outcomes, and teacher-student interactions to consideration of the influence of teachers' thoughts, decisions and judgements on second-language instruction. Such research is necessary to understand why teachers make the decisions they do and why they choose certain instructional materials over others or why they prefer certain practices over others.

Johnson conducted a qualitative study of the preservice beliefs of four English as a second-language teachers. Beliefs were inferred from teachers' narratives, intentions and instructional practices. One of the more important implications of the findings of this study was that the teachers' beliefs were largely based on images from their formal language learning experiences and that these beliefs may have been responsible for the teachers ineffectual teaching practices. The four teachers in the study criticized their own teacher-directed instructional practices. At the same time, "they described feeling powerless to alter their instructional practices because they had few, if any, alternative images of teachers and teaching to act as a model of action" (p.449). Feelings of being overwhelmed by classroom restraints and issues related to classroom management led to more teacher-centered instruction in spite of the desire to want to have more student-centered teaching. Freeman's (1991) findings of a study of the evolution of perceptions and understandings of four foreign language teachers are similar in many ways to Johnson's findings. Issues of classroom management led to tension in teachers' thinking. As foreign-language teachers, the study's participants understood the need for genuine and spontaneous interaction in order to promote language development. Yet, with class sizes of 20-30 adolescents,

spontaneous interaction resulted in discipline problems and required teachers to provide more control and discipline.

Williams and Burden (1997) affirm that teacher beliefs play an important role in the language learning process and that, for this reason, teachers must understand their own beliefs, theories or philosophy. They argue that teachers must maintain a continuous process of personal reflection and that it is by becoming aware of their beliefs that they come to understand their own "implicit educational theories and the ways in which such theories influence their professional practice". The authors also posit that, although a syllabus or curriculum may be set down precisely for teachers, it is personally shaped by the teachers' own belief systems. The authors explain:

Teachers' beliefs about what learning is will affect everything they do in the classroom, whether these beliefs are implicit or explicit. Even if a teacher acts spontaneously, or from habit without thinking about the action, such actions are nevertheless prompted by a deep-rooted belief that may never have been articulated or made explicit. If the teacher-as-educator is one who is constantly re-evaluating in the light of new knowledge his or her beliefs about language, or about how language is learned, or about education as a whole, then it is crucial that teachers first understand and articulate their own theoretical perspectives. (p. 56)

A similar argument is put forth by LeLoup (1995) in her longitudinal study of the evolution of beliefs of preservice language teachers. LeLoup's study is premised on the argument that students who enrol in foreign-language methods' courses already have a set of beliefs about language learning. These beliefs are formed by their "internalization of how they were taught and their perceptions of how they learned" (p. 137). These beliefs often result in teachers having misconceptions about language learning which could not only negatively impact on their understanding of the course content, but which could, as well, impinge on their success as FL teachers.

For this reason, argues LeLoup, it is important that these beliefs be identified and examined and that erroneous concepts and myths be replaced by "sound language learning theory". The study on language learning beliefs combined a Likert-type questionnaire with a more descriptive, open-ended questionnaire. LeLoup concluded that while some of the beliefs held by preservice teachers represent "accurate appraisals of the knowledge base in language learning", others represent "FL learning myths" that need to be informed and revised according to second language acquisition research. Many of the beliefs held by the preservice teachers underwent revision by the end of their FL methods' course.

Woods (1996) considers how teachers' beliefs, assumptions and knowledge shape their understanding of teaching and their decisions. Through interviews, teachers' stories and video-recordings of their lessons, Woods contributes to the knowledge of second- language teaching by clarifying how teachers' beliefs, attitudes and experiences influence classroom practices. His perspective contrasts somewhat with LeLoup's in that he argues strongly in favour of recognition and acceptance of teachers' personal pedagogies and multiple interpretations of theory and top-

down curriculum. He further argues that there is insufficient research "on what the second language teacher brings to the process of second language learning" (p.2).

Woods found that, given a new curriculum and two different teachers, two very different interpretations result in the course to be taught. Teachers' underlying beliefs, assumptions and knowledge (BAK) about "what language is, how it is learned, and how it should be taught" resulted in differing classroom experiences for the learners. Given a new curriculum, the two teachers in his study experienced conflict between interpreting the curriculum in a way which would be consistent with his BAK as opposed to interpreting it in a way that would be more consistent with the "institutional system". Woods found that, not only do teachers interpret curriculum innovations in light of their BAK, they also interpret theoretical and pedagogical concepts related to second-language learning.

The study suggests that "each teacher has an individual system of interwoven beliefs, assumptions and knowledge, a system which has evolved in an individual and organic fashion when aspects of that teacher's BAK have interacted with experience, especially experiences that resulted in a conflict with the BAK's current state" (p. 248). Woods affirms as a result of his investigation that while teachers' BAK influences their interpretation of the curriculum in the case of a curricular evolution, the curriculum itself influences the evolution of a teacher's BAK. The overall role of a teacher's beliefs assumptions and knowledge is emphasized by Woods as he comments on their "pervasiveness":

It was not as if teachers' networks of beliefs, assumptions and knowledge were activated in particular cases in order to resolve ambiguous cases or deal with conflicting situations. Rather it seemed to underlie everything that the teachers did and said: as if it was through their individual BAK systems that the teachers structured their perceptions of the curriculum and their decisions as to how to implement that curriculum, from overall organization of the units down to the specific classroom activities and verbalizations. (p.282)

3.7 The Contribution of this Study

This review of the literature has drawn attention to the importance of beliefs in the teaching process. The present study provides a definition of beliefs which emphasizes the importance and value of teachers' personal knowledge, pedagogies and theories as a means of gaining insight into the complex world of teaching and learning. A significant body of research has focused on the area of beliefs and change. Nespor's (1987) work as well as that of Rokeach (1968) has emphasized the ability of beliefs to resist change. The conclusions of the Apple Classrooms of Tomorrow Project also address the issue of change in beliefs. The ACOT conclusions relate more specifically to the focus of the present study. The project's notion of the "altered context" as a catalyst for change parallels the premise of this thesis. It is the "altered context", the new territory or new environment, that challenges traditional beliefs. This study takes an ecological perspective in its attempts to understand the relation of teachers' beliefs to traditional and online learning environments. The important contribution of this study is the emphasis placed on

understanding teachers' beliefs in relation to online environments or an altered context. Unlike the ACOT study, the present study does not focus solely on teachers who are working presently with technology. The present study was interested in capturing a range of beliefs about teaching and learning FSFL in online environments and therefore included them in this study. No doubt there are teachers who, while they are familiar with online environments, have chosen not work in them because of their beliefs. This study aims to capture the beliefs of these teachers as well as those who are familiar and experienced with working in online environments.

A further contribution to the understanding of teachers' beliefs made by this study is the attempt to relate teachers' beliefs about teaching FSFL to a historical and conceptual framework, or context of approaches to language teaching and to use of technology in teaching FSFL. Rather than simply categorizing teachers' beliefs as being either constructivist or behaviourist as some studies might do, this study will aim to understand teachers' beliefs in relation to a larger, more complex framework that encompasses the entire context for language learning throughout the century with and without technology. Included in this framework is an outline of a vision of learning FSFL in the 21st century which is based on a constructivist approach and which is facilitated by online learning.

While there is a significant amount of research and literature that seeks to explain the role of constructivism in teaching and learning, there is little research that considers constructivism in relation to FSFL learning. The present study's focus on constructivism in relation to language learning represents therefore one of the few attempts at understanding the relationship of this theory of learning with second-language learning. This study recognizes that constructivism is a sufficiently broad theory to allow it to encompass a wide variety of domains beyond those of science and mathematics.

A further contribution of this study is its attempt to understand teachers' beliefs about using technology in relation to a particular content area or domain. Many studies will focus on teachers' beliefs about computer or technology use. This study recognizes that teachers use technology generally to deliver a particular content or focus on a specific content area. While the inclusion of the content area makes the study more complex, it parallels more closely the complexity inherent in teaching and learning. The present review of the literature uncovered no such studies. The present study is very broad and has a large scope. Such an approach was deemed necessary and important in order to gain a first insight into this complex and new area.

A final but significant contribution of this study to our knowledge about teachers' beliefs relates to the focus of the study. Studies on teachers' beliefs often tend to focus specifically on the teachers themselves profiling for example the system of beliefs held by individual teachers. Such studies are important and necessary in order to understand systems of beliefs and how beliefs affect practice. This study focused on individual beliefs while still recognizing the fact that individuals possess belief systems which house all the beliefs of that individual and that these systems represent complex organizations consisting of discrete sets of inter-related concepts (Wehling Charters, 1969).

While it might appear beneficial to study entire systems of beliefs, such a focus may provide

ambiguous results. As Klien (1996) observed, teachers' beliefs can be eclectic which means that teachers may hold contradictory sets of beliefs. For example, they may hold beliefs which reflect, at the same time, a constructivist and a transmissionist philosophy. This should not be surprising since teachers' beliefs or implicit theories are unlike official theories in that they are not organized into a coherent body of knowledge or an interrelated set of propositions or principles. Identifying particular, individual beliefs may assist in better understanding belief systems in general and the contradictions often inherent in them. Understanding individual beliefs can help to identify those beliefs which may be more central to a particular learning theory. On a practical level, an understanding of individual beliefs can assist in the design of professional development sessions.

3.8 Conclusion

The literature considered in this review reminds us of the importance of beliefs in understanding the behind-the-scenes realities of what happens in the classroom. More importantly, the review provides us with a preliminary perspective on how teachers respond to new ideas, knowledge, new theories and technologies. Many of these studies will no doubt serve as useful points of comparison and as a means of understanding some of the beliefs in the present study.

Along with the literature which was reviewed in this chapter, we have a conceptual and historical framework on which we can draw in order to interpret teachers' beliefs about teaching and learning FSFL in OLEs. This framework draws on existing knowledge about methodological approaches used throughout the last 100 years in language teaching. It also draws on our current knowledge about use of technology in second-language instruction. The role of the theories of behaviourism and constructivism in technology use and in second-language instruction is also highlighted. Such background knowledge about "official theories" will assist in our understanding of teachers' "implicit theories", personal knowledge or cognitive maps which they use to respond to reality.

One important contribution which this study makes to the literature on teachers' beliefs about teaching and learning FSFL in OLEs is the use of technology to collect data. Through one-to-one, one-to-many, and many-to-many conversations and discussions, teachers are given the opportunity to reflect on, share and articulate their beliefs. The methodology used in this study is unique, not only because it has not been used in other studies to gather beliefs but because of the way in which the methodology suits the topic. Using online environments to gather beliefs about online environments seems a logical approach to adopt. Not only is it logical, it is also innovative and effective. The following chapter explains in detail how the techniques of multiloguing, dialoguing and monologuing are combined in order to state what would otherwise be tacit, to make explicit the implicit, to make known what would otherwise be unknown, to reveal that which is hidden.