FROM DEWEY’S LEGACY TO SCHON’S EPISTEMOLOGY OF PRACTICE: RECONCEPTUALIZING REFLECTIVE TEACHER EDUCATION

by

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ABSTRACT

It has been suggested that "the ultimate justification for curricular decision making in professional education is normative: a conception of a set of desirable understandings, skills, and dispositions" (Tom and Valli, 1990, p. 389). But, normative considerations alone are not sufficient as a rational ground for programmatic deliberations. Teacher education program development needs also the support of some adequate understanding of professional knowledge for teaching (PKT), or professional knowing, and learning to teach. As Soltis (1981) persuades us, "the more adequate of our grasp of what we understand as 'knowledge', the more we can consciously, responsibly, and morally play the role of an educator" (p. 104).

Program development in teacher education has traditionally been guided by fragmented thinking that takes PKT as something external to those who are learning to teach. The task of teacher education is to pass on or provide access to research findings and academic scholarship and/or intellectual skills, including the what and how of reflective practice/teaching/inquiry in the current Reflective Teacher Education (RTE) movement. It is argued in this study that an adequate epistemological grounding should be indispensable to any (alternative) orientation towards teacher education.

The widespread interest in RTE is often attributed to Dewey's theory of reflective inquiry and/or Schön's epistemology of practice. But it is waiting to be explored whether the theses advanced by Schön and Dewey, respectively, could provide adequate theoretical underpinnings for establishing RTE as an alternative
orientation towards teacher education.

This study finds Schön’s epistemology of practice to be inadequate for providing an epistemological foundation for professional education programs. The model is inconsequential to teacher education program development due to its internal conceptual difficulties, its dichotomous tendency towards the relationship between theory and practice, and its narrow focus on the world of practice.

Dewey’s thesis is pertinent to teacher education today not because it might entail a prescription of reflective practice. Rather, it offers theoretical implications that help to bring the issues of knowledge (PKT), inquiry (learning to teach), and action (teaching) intimately together. In light of Dewey’s thesis, the problem of knowledge in teacher education should be seen as a problem of prospective teachers constructing their PKT through an on-going inquiry into teaching so as to be able to act in an intelligent manner in the classroom. Teacher education programs should be designed to assist prospective teachers in taking better control and direction of their inquiry.

To guide their own practice, program developers and teacher educators should ask themselves: What is professional knowledge for teaching? How are professional knowing and learning accounted for? What is the role of theoretical studies and practical experience in learning to teach? What should and can be done to ensure that the learning opportunities provided in a pre-service teacher education program will contribute to, not hinder or block, prospective teachers’ professional growth?
## CONTENTS

Abstract ii  
Table of Contents iv  
Acknowledgement vi  

### INTRODUCTION

1

### CHAPTER I THE PURSUIT OF PROFESSIONAL KNOWLEDGE FOR TEACHING: AN HISTORICAL OVERVIEW

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A General Framework</td>
<td>10</td>
</tr>
<tr>
<td>Normal School Teacher Training</td>
<td>12</td>
</tr>
<tr>
<td>Moral Character Building</td>
<td>16</td>
</tr>
<tr>
<td>Acquisition of Subject Matter Knowledge</td>
<td>20</td>
</tr>
<tr>
<td>Growing Presence of Pedagogical Theory</td>
<td>24</td>
</tr>
<tr>
<td>Teacher Education on the University Campus</td>
<td>28</td>
</tr>
<tr>
<td>The Impulse of the Liberal Education Tradition</td>
<td>30</td>
</tr>
<tr>
<td>The Search for a Scientific basis of Teacher Education</td>
<td>32</td>
</tr>
<tr>
<td>Diffusion of Professional Knowledge for Teaching</td>
<td>36</td>
</tr>
<tr>
<td>Summary</td>
<td>42</td>
</tr>
</tbody>
</table>

### CHAPTER II REFLECTIVE TEACHER EDUCATION: REFRAMING THE PROBLEM

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Social and Intellectual Background</td>
<td>45</td>
</tr>
<tr>
<td>The Problem of Meaning</td>
<td>51</td>
</tr>
<tr>
<td>Reframe the Problem</td>
<td>57</td>
</tr>
<tr>
<td>The Concept of Reflection</td>
<td>65</td>
</tr>
<tr>
<td>Reflection as Retrospective Thinking</td>
<td>71</td>
</tr>
<tr>
<td>Reflection as Critical Analysis</td>
<td>81</td>
</tr>
<tr>
<td>Practical Difficulties of RTE</td>
<td>86</td>
</tr>
<tr>
<td>Summary</td>
<td>90</td>
</tr>
</tbody>
</table>

### CHAPTER III Schön’S EPISTEMOLOGY OF PRACTICE

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schön’s Epistemology of Practice</td>
<td>89</td>
</tr>
<tr>
<td>Schon’s Model of Professional Knowing</td>
<td>90</td>
</tr>
<tr>
<td>Critical Assessment of Schön’s Epistemology of Practice</td>
<td>97</td>
</tr>
<tr>
<td>Schon’s Conceptual Difficulties</td>
<td>103</td>
</tr>
<tr>
<td>Schon’s Disposition towards the Theory/Practice Relationship</td>
<td>112</td>
</tr>
<tr>
<td>Schon’s Narrow Focus on the World of Practice</td>
<td>120</td>
</tr>
<tr>
<td>A Schönean Model of Teacher Education?</td>
<td>131</td>
</tr>
<tr>
<td>Summary</td>
<td>137</td>
</tr>
</tbody>
</table>

### CHAPTER IV -- DEWEY’S THEORY OF REFLECTIVE INQUIRY

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dewey’s Approach Towards the Problem of Knowledge</td>
<td>139</td>
</tr>
<tr>
<td>Dewey’s Theory of Reflective Inquiry</td>
<td>143</td>
</tr>
<tr>
<td>Reception of Dewey’s Theory of Reflective Inquiry</td>
<td>147</td>
</tr>
<tr>
<td>Some Further Notes</td>
<td>153</td>
</tr>
<tr>
<td>What is &quot;an indeterminate/doubtful situation&quot;?</td>
<td>157</td>
</tr>
<tr>
<td>Prior Knowledge</td>
<td>160</td>
</tr>
</tbody>
</table>
Outcome or Ends-in-view of Reflective inquiry
The Knower and the Known
Method
Summary

CHAPTER V -- RECONCEPTUALIZING REFLECTIVE TEACHER EDUCATION

Understanding Learning to Teach
Developing a Harmonious, Unified Conceptual Map of Teaching
Subjectivity vs. Objectivity
Nagel Thomas's Position Modified
Programmatic Provision
Theoretical Studies
Practical Experience
Summary

CONCLUSION

BIBLIOGRAPHY
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INTRODUCTION

This study concerns the perplexing phenomenon of reflective teacher education (RTE). RTE is an interesting subject worth studying for several reasons. First, since the early 1980s, RTE has been promoted as an alternative approach towards teachers' initial preparation and in-service professional development (Calderhead and Gates, 1993; Clift, Houston, and Pugach, 1990; Valli, 1992a). Second, it enjoys great popularity within the teacher education community at both institutional and personal levels. It is said that nowadays "one can hardly read an article about teaching without mention of reflection" (Richardson, 1990, p. 3) and "there is not a single teacher educator who would say that he or she is not concerned about preparing teachers who are reflective" (Gore and Zeichner, 1991, p. 120). Third, the popularity of RTE has not been accompanied by a clear, shared sense of what counts as RTE. The conceptual status of RTE as an alternative orientation towards teacher education has been contested (Cohen, 1991; Feiman-Nemser, 1990; Munby and Russell, 1993). Can this alternative approach towards teacher education be sustained? Or, are teacher educators bound to be disillusioned with it sooner or later? To understand RTE and contemplate its prospects, teacher educators should be willing, as the poet says, to go back to "where we started and know the place for the first time."

This study takes the view that the fundamental purpose of teacher education institutions is to assist prospective teachers in their effort to develop their professional knowledge for
teaching (PKT). It follows that understanding of PKT in the context of prospective teachers learning to teach should be paramount to the development of teacher education programs, no matter what label the programs are given.

To understand PKT in the context of institutionalized teacher education, three basic questions should be considered. The first question concerns meaning. What is PKT? Is it represented in the form of observable behaviour patterns of the Master Teacher, or educational research findings and scholarship, or the stories teachers tell, or a combination of these three, or something else? The second question is more of a practical matter. What kind of pedagogical activities should pre- and in-service programs provide to assist prospective teachers and teachers on the job in their effort to develop PKT? The third question concerns the epistemological and moral understanding of professional knowing and learning that conjoins a particular conception of PKT. Are professional knowing and learning to teach a matter of a person receiving what is known and the program developer(s) thought to be necessary and/or useful for practice? Or is it a person developing his/her PKT through inquiry, with the help of others? By making explicit the hidden presumptions about PKT and learning to teach in teacher education program development, I believe, teacher educators shall be in a better position to consider the rational ground of their programmatic deliberations. These issues together help put the phenomenon of RTE into perspective.

In this study, PKT is viewed in direct connection to responsible and intelligent conduct of teaching at the personal
level. PKT stands for the kind of knowledge that teachers rely on in teaching and is understood as a comprehensive, holistic entity composed of many aspects or components, moral and ethical, social and cultural, political and ideological, cognitive and emotive, public and personal, theoretical and practical, generalized and context-dependent, linguistic and behavioral, formal and intuitive, subject matter and pedagogical, etc. Each of these aspects/components could be treated as if it constituted an independent entity. It is unthinkable, however, that teachers could be teaching in a professionally competent manner without knowing their moral and ethical commitment, for instance. Nor should anyone (be permitted to) teach in the classroom without knowing sufficiently well the subject matter involved.

The holistic notion of PKT is adopted in recognition that responsible and competent teaching practice exists. It leads us to contemplating how prospective teachers, and teachers on the job as well, come to know what they know so that they will be able to teach in a professionally competent manner. In teacher education program development, the holistic notion of PKT should also force teacher educators to rethink the role of those conventional forms of educational knowledge in learning to teach, namely, educational research findings, academic scholarship in the contributing disciplines of education, as well as the stories teachers tell.

With the historians' advice that "we cannot understand a situation in life without some perception of where it fits into a continuing process or whether it has happened before" (Tosh, 1991, p. 1), I place the phenomenon of RTE along the historical
continuum of program development in teacher education. The study starts in Chapter I with an excursion into the pursuit of PKT in program development in the brief history of institutionalized teacher education. This excursion is intended to highlight the fragmentation of PKT in program development within different historical times and to illuminate the conditions that led to the current widespread interest in RTE.

The sudden popularity of RTE since the early 1980s can be seen as a welcome sign of efforts for positive change in teacher education. However, the relevant literature indicates that there is a lack of conceptual clarity or rather a shared sense of what RTE is. This lack of conceptual clarity has in turn given rise to expressed concerns over the conceptual status of RTE as an alternative approach towards teachers' initial preparation and in-service professional development.

Analysis in Chapter II will show that beyond the multiple conceptions of RTE, what is actually being advocated are program goals with strong ideological and political implications. The epistemological issues concerning PKT and learning to teach that I believe to be fundamental to teacher education program development are largely missing and in their place, there is the idea of reflection serving as a desirable end and the means for achieving that end at the same time (Bullough, 1989a). The connection between reflective inquiry/exercises and prospective teachers' development of PKT has not been made clear.

The widespread interest in RTE has often been attributed to the systematic theorizing by two American scholars, John Dewey and Donald A. Schön, on "reflective thinking" and "reflective
practice," respectively. Both address the question of knowing in relation to human conduct, but from quite different angles, as my later discussions will show. My familiarity with the relevant literature suggests to me that the connection between the many different versions of RTE and these theoretical sources is rather superficial. It is waiting to be explored whether the theses advanced by Schön and Dewey respectively entail the kind of theoretical implications for sustaining RTE as an alternative orientation and engendering change in the current thinking as well as practice of teacher education.

With the publication of his two books on practitioners' reflective practice in the 1980s, Schön has been praised for his contribution to our understanding of professional knowing in and of practice. My reading of Schön’s work suggests, however, that Schön has at best renovated the problem-solving model of professional practice with the emphasis on problem framing that has been neglected in the Technical Rationality model. I argue in Chapter III that Schön’s epistemology of practice cannot provide the theoretical underpinnings for the development of teacher education programs.

Teacher education is fundamentally about a person developing knowledge for teaching or a person learning to become a competent teacher. It is reasonable to assert that RTE programs, or any other form of teacher education, need a theory that offers a plausible account of what is involved in a person developing PKT and becoming an experienced practitioner of teaching. Schön’s thesis gives an account of competent practitioners’ knowing in and of practice in terms of a process of reflection-in-action.
It does not explore how competent practitioners come to know what they know that enables them to act the way they do. Where does professional artistry come from? Besides, as a social practice, teaching is intentional and purposive, but human intentionality does not seem to have a prominent place in Schöns model of professional knowing.

John Dewey was a monumental figure in American history. It is said that in the works and life of Dewey that the American philosophy of pragmatism was brought to "its highest level of sophisticated articulation and engaged elaboration" (West, 1989, p. 69). The fact that generations of scholars since Dewey's time have devoted themselves to studying his writings and to defending or attacking his philosophical and educational ideas attests the significance and influence of Dewey's intellectual legacy. Dewey devoted a great part of his intellectual life to the problem of knowledge in relation to human conduct. The theory of reflective inquiry, a robust epistemological thesis, was the centrepiece of his intellectual legacy.

However, as Adler (1991) observes,

Although John Dewey's arguments for educating the reflective practitioners are cited by many educators today, Dewey's ideas have not consistently been a part of the dominant discourse on teacher education in the twentieth century. (p. 146)

I feel it rather odd that proponents of RTE should have been unable to find in Dewey's work anything more profound than a few frequently made references, for instance, the distinction between routine action and reflective practice, the requisite attitudes of reflective thinking, and the oft-quoted definition of reflective thought - "Active, persistent, and careful
consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends constitutes reflective thought" (Dewey, 1933, p. 9). It should be interesting to note that in explicating his thesis, Schön (1992) claims to have developed his own version of Dewey's "reflective thought." But he does not discuss how his version differs from Dewey's original ideas or if his version entails any significant theoretical advance from Dewey's theory of reflective inquiry. What would Richardson (1990) be alluding to when observing that "when Schön's Reflective Practitioner struck the consciousness of educationists in the mid-1980s, it was not always as a re-embracing of Dewey's notion, but as the discovery of a new concept" (p. 3)?

The fact that Dewey left behind a robust epistemological theory itself does not however speak of the pertinence of evoking and bringing the theory into the discourse of teacher education today. Broadly speaking, the significance of Dewey's theory of reflective inquiry to the present context of teacher education can be seen in that it is an important part of "a wealth of materials, insights, and analyses" the pragmatists (Pierce, James, Dewey) left behind them that are "pertinent to and often anticipating current advances in philosophy" (Thayer, 1982, p. 11).

More specifically, the discussion in Chapter IV will help to show that by revisiting Dewey's theory of reflective inquiry, teacher educators can substantiate the simplistic connection already made between Dewey's ideas and bring their current effort to reform or improve teacher education to more fruitful results.
In Dewey's thesis, reflective inquiry signifies a deliberate, purposive human conduct to seek and acquire knowledge for intelligent human action. This understanding of knowledge, inquiry, and action in unison, I believe, can be brought to bear directly upon the issues of PKT and learning to teach, thereby providing the needed epistemological foundation for teacher education program development. An alternative orientation of teacher education informed by Dewey's theory of reflective inquiry will be discussed in Chapter V.

The phenomenon of RTE is a manifestation of major programmatic deliberations currently undertaken in teacher education. Since many different conceptions of RTE exist within specific institutional contexts, there is a need, perhaps, for a clearer sense of what RTE means. However, it is important to keep in mind that when trying to resolve the conceptual difficulty of RTE, we should not lose sight of the fact that the fundamental task for teacher education programs is to assist in prospective teachers' development of PKT. In other words, RTE must be built upon an adequate understanding of PKT and learning. As Soltis (1981) persuades us,

the more adequate our grasp of what we understand as "knowledge," the more we can consciously, responsibly, and morally play the role of educator. (p. 104)

I cannot foretell how the Deweyan orientation of teacher education outlined in this study may eventually be turned into practice at both institutional and personal levels. Teacher education is ultimately a practical endeavour carried out within specific institutional settings and by participants occupying different social and ideological positions. It is my hope that
this study will contribute (1) to the current discourse on teacher education reform; (2) to the general understanding of prospective teachers' development of PKT; and 3) to the reconstruction of a rational foundation upon which the legitimacy and necessity of teacher education can be firmly established.
Chapter I: THE PURSUIT OF PROFESSIONAL KNOWLEDGE FOR TEACHING: AN HISTORICAL OVERVIEW

Classroom teaching from kindergarten to advanced studies in university is a purposive, dynamic, and complex form of professional practice. The kind of knowledge that enables a teacher to teach in a professionally competent manner is likewise a very intricate and complex matter. As such, it defies attempts to give a precise definition of PKT from a single disciplinary perspective which would be appropriate for guiding program development in teacher education. Scheffler (1966) states that

The conclusion often drawn in educational theory is that we must first decide what the correct definition of 'man' is, and that then practical educational consequences will only need to be inferred by us through the application of pure logic. This picture is, however, wrong not only in postulating a simple deductive implication between definitions of human nature and practical educational consequences, but also in failing to take account of [the fact that] there are an indefinite number of alternative definitions of 'man,' indefinitely many ways of dimensionalizing his structure and capacities, all equally accurate. To choose one such dimensionalization on the basis of its accuracy and to proceed to read off curricular counterparts to each dimension, as is often done, is to beg the whole question. (pp. 33–34)

I take Scheffler's use of the term 'dimension' to mean, in the ordinary sense, 'aspect' or 'factors' (Greenbaum and Whitcut, 1988, p. 207). Like the notion of man, PKT also has many aspects or involves many factors. When we look at some selective aspects or factors, we get a fragmented view.

In talking about fragmented views of PKT, I refer to views that are considered to be legitimate, and debatable, within specific disciplinary boundaries of research and theorizing. There are philosophical, sociological, and psychological views of
PKT, for instance. From the vantage point of research and theorizing and also in consideration of the sub-divisions within the disciplines, fragmented views are inevitable. Educational research and theorizing are largely driven by those interests in the selection and emphasis of certain aspects of PKT.

However, when it comes to the development of teacher preparation programs, it should be obvious that fragmented views of PKT cannot provide adequate theoretical underpinnings without, as Scheffler suggests, begging the whole question. When fragmented views, those emphasizing moral standard, or subject matter, or behaviour, or research findings and scholarship, as I will discuss later on, are taken to underlie program development, teacher education will not be able to accomplish its essential task.

One single fragmented view leaves out too much. Having a number of fragmented views may destroy the coherence and cohesiveness of a program. Fragmented views from a variety of intellectual sources may not necessarily be complimentary to each other and contribute to a comprehensive, overarching view. They may conflict and in effect mitigate each other's potential influence on practice. In the worst scenario, a program built upon poorly conceived, unexamined views of PKT may even be detrimental rather than contributive to prospective teachers' professional growth. For developing a cohesive and coherent program of teacher education, a holistic view of PKT is needed. Fortunately, such a view has long been available, imbedded in Dewey's theory of reflective inquiry. It takes some effort to recover and introduce it into the current discourse on RTE and
teacher education reform.

Although the academic literature on teacher education abounds, conceptions of PKT and assumptions about prospective teachers that underlie program development do not usually get explicitly stated, let alone critically examined. Those implicit conceptions can nevertheless be discerned from the available literature on the various espoused ideals of teacher education as well as the concrete institutional arrangements and pedagogical practices at different historical times.

This chapter is devoted to a brief historical survey of the fragmented views of PKT that underlie program development in teacher education. I start this historical excursion with the assertion that a teacher education program necessarily presumes some conception(s) of PKT and assumption(s) about prospective teachers for whom the program is designed. Therefore, serious considerations of the epistemological understanding of PKT and learning to teach should always be a central component to programmatic deliberations.

By highlighting the shifting emphases on the different aspects of PKT in program development in the brief history of institutionalized teacher education, I try to illuminate the current RTE movement against that historical background and at the same time shed some light on the direction of present and future programmatic deliberations in this field.

A General Framework

Two familiar themes, the relationship between theory and practice and dominant views of teacher/teaching, will provide the main
focus for the excursion into the continuing pursuit of PKT in teacher education program development. The theory-practice relationship has been a central concern to institutionalized teacher education as long as it has existed. Recent discussions on PKT (e.g., Carter, 1990; Fenstermacher, 1994; Tom and Valli, 1990) make it amply clear that different understandings of and approaches towards the theory-practice relationship in teacher education are dependent upon the different meanings that are ascribed to PKT.

Tom and Valli (1990), for instance, have identified four epistemological traditions of PKT -- Positivist, Interpretive, Critical, and Craft. With the positivist tradition, PKT takes the form of propositional statements of generalizations, laws, principles, and rules governing human behaviour. The source of PKT is scientific research and academic theorizing. With the interpretive tradition, PKT is associated with the researcher's interpretive understanding of educational phenomena situated in historical, social, cultural, and political contexts, with the recognition that understanding is rooted in the researcher's own conceptual system. It is not clear though what form PKT takes in the interpretive tradition.

With the critical tradition, attention is focused on values embedded in educational practice. Efforts are made to put the conventional forms of educational knowledge into critical perspectives of the principles of democracy and of power relationships. Knowledge becomes the object of criticism in terms of its role in society. The craft tradition, on the other hand, associates PKT with common sense, folklore, experience, and
practical wisdom that practitioners of teaching rely on in their respective fields of practice. Practitioners' practical knowledge is said by some to take a narrative form. Furthermore, some argue that teachers' PKT is tacit and intuitive, embedded in their actions.

Tom and Valli do not discuss how conceptions of PKT rooted in different epistemological traditions may provide the rational ground for the construction of a teacher preparation program. They concede that "the ultimate justification for curricular decision making in professional education is normative: a conception of a set of desirable understandings, skills, and dispositions" (p. 389). It is doubtful, though, that normative considerations about program provision would not need to be informed by some kind of epistemological understanding of PKT and learning to teach. To be rational about programmatic deliberations, I believe, it is necessary to assess the implicit epistemological understanding in which a teacher education program is grounded.

As is well known, there are conflicting claims about the value of theory in teaching and learning to teach. But common sense tells us that the usefulness of a thing does not reside in the thing itself. A pen is useful for writing and it is useless for opening a lock. Atomic energy is useful in a variety of ways in modern life but extremely harmful when it is used as a weapon of massive destructive power. Likewise, the value of theoretical knowledge depends on the uses to which it is put. A proper relationship between theory and practice in teacher education cannot therefore be meaningfully established without considering
what use theoretical knowledge, with its nature properly understood, can be put to in helping prospective teachers to develop their PKT. Simply staking out a position on the putative value of theory or projecting different linkages between theory and practice will unlikely lead to the kind of practical educational consequences that we desire nor will it have much constructive effect on the current practice of teacher education.

My own observation suggests that three different factors may contribute to the persistence of the problematic theory-practice relationship in teacher education: (1) theory is studied for its own sake ignoring the questions and demands of practice; (2) theory is taken selectively, based on questionable criteria, to reside over practice, to dictate or guide or inform practice; and (3) theory is expected to provide ready-made solutions to problem situations arising in practice. What has been referred to as the "implicit/personal/practical/working theory" already imbedded in teaching and learning to teach is generally ignored (Carr and Kemmis, 1986; Clark, 1988; English, 1994; Eraut, 1994; Polanyi, 1958, 1966; Scheffler, 1991). If this observation is correct, it will be reasonable to suggest that a proper relationship between theory and practice in teacher education should be formed on the basis of a clear understanding of the nature as well as use of theory in the context of teaching and learning to teach. I will return to the theory-practice relationship in Chapter V.

The other theme is that the dominant mode of teacher education program development tends to be closely related to the mainstream conceptions of the teacher/teaching at a given historical time (Joyce, 1975). Conceptions of the teacher and
teaching are often manifest in the commonly accepted metaphors, such as the teacher as a guardian, moral agent, care-giver, gardener, disciplinarian, knowledge dispenser, decision-maker, facilitator, diagnostician, reflective practitioner, and even stranger, enemy, or what have you.

Most conceptions of the teacher and teaching, if not all, tend to project an ideal destination of a burdened, career-long intellectual journey of all teachers, of which initial preparation constitutes a crucial stage. Conceptions of learning to teach and views of prospective teachers, on the other hand, tell us the conditions of those who embark on the journey, where they begin, and what route they are taking. Then comes the question of what help they may need, which in turn helps to determine the role of the teacher educator. In other words, it is who prospective teachers are and what they already know rather than who they should become and what they ought to know that will actually underpin the provision of pedagogical activities in teacher preparation. But what does the history of teacher education tell us in these regards?

Normal School Teacher Training

Moral Character Building

When institutionalized teacher training came into existence in North America in the early 19th century, schooling was still very much a part of a communal life organized and controlled by different religious denominations in various local communities. Common Schools set up for the general public had several defined
purposes: to indoctrinate the minds of the pupils with the values of the dominant religion; to shape their moral character and civil behaviour; and to develop some rudimentary literacy skills. Schools were to provide the youngsters with "sufficient education to understand an order, and not so much to question it" (quoted in Ginsberg, 1988, p. 114). The teacher "was expected to embody the standard virtues and community values and, at the same time, to mete out stern discipline to the unruly and dull-witted" (Kliebard, 1986, p. 1).

There is clear historical evidence that in the early days of Normal School teacher training, PKT was conceived to a large extent on the basis of the religious and moral values cherished in the local communities, since school teaching was the means whereby those values were instilled into the younger generation (e.g., Altenbaugh and Underwood, 1990; Brubacher, 1966; Cole, 1959; De Landsheere, 1985; Dikshit, 1969; Goodlad, 1990; Herbst, 1989; Urban, 1990). As Goodlad (1990) observes in his Teachers for Our Schools,

[Normal schools] were aligned with the lower, common schools -- not with secondary, let alone higher education. Their mission had much more to do with fostering character and morality in line with religious orthodoxy than with fostering intellectual curiosity and independence. The extant knowledge of pedagogy, such as it was, embraced little more than helpful hints on controlling and managing children, handling classroom routines, and the like. (p. 71)

The rise of the modern State and growing urbanization as a result of rapid industrialization in 19th century North America brought a new form of social structure and governance. Education, for a long time the responsibility of the family and church, became a public affair. A nation-wide public school system took its shape
and, viewed from a critical perspective, functioned as a State apparatus for indoctrinating the "[young] people" with the ideology of "patriotism," "good life," and "a better society" which emphasized "harmony, law, and order" and for controlling as well as reforming "the unreasonable, savage, and disreputable at all social levels, but especially among the poor" (Prentice, 1977, p. 183). Teacher training, accordingly, had its mission "to implant in [the trainees] the habits, skills, and the character structure appropriate to the morally forceful teacher" (Curtis, 1988, p. 246). "Good moral character" served as a handy cover-up for political consciousness and comportment (Curtis, 1992; Prentice, 1977, 1983). The metaphor of the teacher as a moral agent seemed to be most fitting at that time.

The preoccupation with "moral character building" expressed itself most forcefully in the "hidden curriculum" of the early Normal School teacher training, in the harsh discipline and rigid regulations (entry requirements, rules of conduct, class schedule, sex segregation, reading of the Bible, attendance at Sunday church service, etc.) that the trainees must strictly follow without exception (in the Canadian context, see Fiorino, 1978; Fleming, 1971-72; LaZerte, 1950; Phillips, 1957; The Centennial Committee of Toronto Normal School, 1947). Phillips (1957), for instance, records a case in which a female student was expelled from her normal school training for witnessing but failing to report an incident of a male student poking his slate pencil at another female student sitting next to him to attract her attention.

Normal schools were of course not religious seminaries. PKT
in those days also had two other essential elements — rudimentary literacy skills and methods of teaching which were referred to as "schoolkeeping." A minimum level of literacy was a prerequisite for entry to teacher training and teaching methods were mostly learned, ostensibly, through observation and imitation of the Master Teacher's classroom behaviour. Teacher training programs were short and involved, on the pedagogical side, mainly a review of the subjects taught in the elementary school and some supervised teaching practice. There was little room in those programs for serious studies of educational and pedagogical theories advanced by generations of great thinkers since antiquity (see Curtis and Boultooood, 1965; Messenger, 1931; Meyer, 1975; Monroe, 1907). What might pass in those days for "schoolkeeping" or principles and art of teaching would seem more likely conventional wisdom grounded in the personal experience of the Normal School principal and his instructional assistants or teaching staff (e.g., Harper, 1935, Chapter VIII; Clifford and Guthrie, 1988, pp. 74-79).

Acquisition of Subject Matter Knowledge

The 19th century saw the rapid advancement of both natural and social sciences in the Western World. The impact of the ever accelerating science and technology development swept far and wide and penetrated every sphere of human life. In education, academic subjects and specialties proliferated (Clark, 1987). The pervasiveness of science was such that even philosophy, once the "crown of all disciplines," had to give way to science subjects in the school curriculum (Hare, 1975; Ringer, 1992). In
teaching, the overall concern with "moral character building" was replaced by a more immediate concern with "acquisition and transmission of content knowledge." The metaphor of the teacher as a knowledge dispenser came to overshadow the metaphor of the teacher as a moral agent. Towards the end of the 19th century, it was typical of a teacher training curriculum to consist of a wide range of academic subjects in consonance with what was taught in the Common School, such as, in the case of Toronto Normal School:

The Elements and Philosophy of Grammar, Orthography, Composition, Art of Reading, Rudiments of logic, Geography (Mathematical, Physical, and Political) with rudiments of the use of the Globes, Elements of General History, Linear Drawing, Mulhauser's system of Writing, Rudiments of Trigonometry, with a view to Land Surveying with the theodolite, Art of Teaching, with daily Teaching in the Model School, mode of teaching the National School Books, Science and Practice of Arithmetic, including the use of the Logarithm tables, Algebra as far as Quadratic Equations, the Progression, and the Binomial theorem, inclusive; Geometry, six books of Euclid; Heat, Electricity, Galvanism, and Magnetism; Mechanics, Hydro-statics, Pneumatics, Animal and Vegetable Physiology (with special reference to the laws of health, and practical observations on the Ventilation and Temperature of School Houses), Elements of Astronomy, Agricultural Chemistry, and Music. (Althouse, 1929, p. 29)

Although professional studies had been an established component in the teacher training program despite the fact that adequate and sufficient pedagogical materials on teaching were still wanting, overriding concerns with teacher trainees' inadequate preparation in academic subject matter knowledge nonetheless often defeated serious efforts in that regard. Althouse (1929) noted in the case of the Toronto Normal School that

The majority of the students, although they had actually been teaching school, were far below modern high school standards in general information, and the
first duty of the Normal Schools was to supply the background of a liberal education. That the training school undertook any strictly professional work at all is a tribute to the patience of the staff and to the energy of the students. (p. 29)

In the United States, Edwards, president of the Illinois State Normal University, had a more elaborate explanation for the emphasis on academic preparation in his institution,

Sometimes a theory has first been established as to what such an institution should be, and the great purpose therefore is to shape things in conformity to that theory. Perhaps the central point of the theory is that the purpose of the school is to prepare teachers. Hence it is logically inferred that it must teach nothing but the science of education. ... But every practical man knows that in all communities there are many ill-qualified teachers. They need instruction not only in the philosophy of Education, but also in the rudiments of arithmetic and the English language. They are employed by scores and hundreds in every state in the Union. When they are collected in any number in a normal school, what shall be done for them? ... The wise course of this Normal University is to receive these unfinished teachers and hold them as long as possible. Let help be given them wherever it is needed, whether in the knowledge of the subjects to be taught, or of the science and art of imparting instruction. It is wise to do this because they are teachers in fact, and will be, whether qualified or not. Every particle of culture imparted to them will be so much clear gain for the schools. This course, the Normal University has endeavoured to pursue. Not forgetting the high ideal of Normal instruction; it has nevertheless laboured to take hold of the actual problems about it. Its methods have been shaped to meet the necessities every-where apparent. It has endeavoured to stand at the nexus between the highest philosophy of Education and the daily needs of our common schools. (quoted in Harper, 1935, p. 118)

In some cases, Normal Schools even had little to do with their presumed professional goal of teacher training and were run rather for the purpose of providing publicly supported post-elementary education concentrating on academic studies (Agnew, 1924; Altenbaugh and Underwood, 1990; Herbst, 1980, 1989). Agnew (1924) argued in his doctoral dissertation on the administration
of professional schools for teachers,

That professional schools for teachers should be devoted strictly to their designated aim is a principle long accepted in theory but it has never been universally accepted in practice. Educators have yielded too easily to expediency. If at times in the past these schools were justified in serving educational needs other than that of training teachers, there are now no adequate grounds for continuing the practice. (p. 61)

Nevertheless, reality was clearly far more compelling than good argumentation. "The proper work of the Normal School cannot be performed unless the mastery of the subjects has first been obtained" (Edwards, 1965, p. 76).

Growing Presence of Pedagogical Theory

The most significant change in regard to PKT in teacher education could be said to have taken place in the early 20th century when education had eventually established itself as a multi-discipline field of academic inquiry and was brought under the influence of many great scholars of the time who shared a genuine concern, if not agreement in their views, about education and its role in modern society. With the development in human psychology and sociology, instruction in child psychology and pedagogical theory from sociological perspectives became a staple component of the teacher education curriculum. The emphasis in professional preparation for teaching began to lean towards the pedagogical aspects of teaching, especially "the importance of understanding the nature of children: their interests, their capacities for learning, their limitations, and the ways in which one child differed from others" (Woodring, 1983, p. 89).

Informed by various intellectual traditions, the booming
activity of disciplined inquiries of educational phenomena since the turn of the 20th century has been a mixed blessing for teacher education. While scholarly efforts carrying on the various intellectual traditions have helped enrich and diversify modern-day thinking about education, teaching, and learning, the development of knowledge about education and 'educational phenomena' began to have a dynamism of its own which could sustain momentum almost independent of the development of practice. The specialist fields were sufficiently advanced to pose their own intellectual problems and capable of keeping a growing army of researchers occupied. (Carr and Kemmis, 1986, pp. 11-12)

Herbst (1989) asserts that

this splintering of educational scholarship into small specialties was a result of professionalization among teacher educators rather than a response to the needs of the public schools and their teachers. (p. 182)

As theorists and educational researchers distance themselves from educational practice and develop more and more diversified and sophisticated ways of studying, in a detached manner, their chosen educational phenomena, PKT has become increasingly fragmented and infused with different, and often conflicting, views and ideas. Johnson (1987) makes an astute comparison between the medical practice in the 19th century and the practice of education today: "in medicine, sects were destroyed by science; in education, science has bred sects" (p. 233)(for more recent discussions on the divisiveness of educational inquiry see Clark, 1987, 1989; Gage, 1989). Take educational psychology for example.

By 1940 most of the authors of textbooks on educational psychology had become convinced that they must present a variety of psychological theories -- behaviouristic, association theories, Gestalt, and psychoanalytical interpretations including those of Jung and Adler as
well as of Freud. But educational psychologists, like other psychologists, found it impossible to integrate these conflicting points of view into a single system. As a result, textbooks in educational psychology became eclectic, presenting conflicting theories of child development, learning, motivation, and emotion, and leaving it to students to achieve an integration which the professors and the textbook writers had failed to achieve. (Woodring, 1975, p. 15)

The consequential effect of the fragmentation of PKT has been that different kinds of theory about education, schooling, teaching, and learning vie for inclusion in the teacher education curriculum, thereby intensifying the tension between theory and practice.

The emphasis on acquisition of academic subject matter knowledge and general or domain-specific teaching methods plus a period of practice teaching persisted with the customary program pattern of teacher preparation for several decades during which Normal Schools fulfilled their historical mission and gave way to teachers colleges. Teachers colleges enjoyed a short life span, allegedly due to their rigidity and ineffectiveness, but perhaps more to their lack of institutional prestige. The responsibility of teacher education was eventually conferred upon university Faculties/Schools/Departments of Education. The transition was by no means smooth and at least on the part of the university community the change was received with anguish and resistance rather than enthusiasm. The anguish persists to this day, though not necessarily as pronounced (Clark, 1987; Clifford and Guthrie, 1988; Herbst, 1989; Schneider, 1987; Stamp, 1982; Thomas, 1990).

Teacher Education on the University Campus

Teacher education on the university campus differs from its
predecessors with its discipline and research-based foundational approach (Clifford and Guthrie, 1988). This approach can be linked to two sets of different and yet closely related presumptions about PKT. One set of the presumptions associated PKT with the ideal of the liberal education tradition (see Borrowman, 1965; Hirst, 1972; and criticisms of Hirst’s position by Martin, 1985; Pearson, 1989) and the other with the enduring dream of grounding the art of teaching on a scientific basis.

The Impulse of the Liberal Education Tradition

Whereas Normal School teacher training was compelled to put an emphasis on the acquisition of content knowledge so as to meet the practical demands of teaching in the classroom, university-based teacher education is first and foremost immersed in the culture of the liberal education tradition. Although general education and subject matter specialization are still considered to be part of teacher education, PKT is no longer limited to subject matter content knowledge to be taught in elementary and secondary school classrooms plus some methods of teaching. The ascription of "education" instead of "training" to teacher preparation is highly suggestive of the liberal tradition. Scheffler’s (1968) personal conviction is representative of the liberal sentiment towards university-based teacher education,

The preparation of teachers in a university setting... offers the special opportunity to develop a broader conception. Beyond a teacher’s knowledge of his subject and his practice in the art of teaching under supervision, he needs to be helped, I am convinced, to relate his work in suitable manner to the family of scholarly and research disciplines represented by the university at large. (p. 2)
A Canadian teacher echoed this liberal education sentiment with the following statement,

The education of prospective teachers should take place on a university campus, so that even when the requirements for certification are of less than degree standard, young teachers are at least exposed to the excitement and the ferment of a university; so that they are working and learning in an atmosphere of books and inquiry; so that they are stimulated to go on with their formal education; so that they are aware of the existence of many disciplines; and so that they may rub off the edges of their inexperience against minds sharper and more tempered than their own. (Shack, 1965, p. 23)

Critics of Canadian teacher education, however, tersely retort that "the requirement of a university degree meant ... that teachers were now better educated, although not necessarily better trained" (Tomkins, 1986, p. 421).

Around the middle of this century, teacher education in North America came under severe attack, mostly from the liberal education camp. Convinced that "scholarship rather than pedagogy should have precedence in the education and certification of teachers" (Power, 1991, p. 293), Counts (1965), in the company of other able critics such as Bestor (1953), Conant (1963), and Koerner (1963), lamented the inadequacy of teacher education of the time that

The familiar curricular pattern of orientation courses, subject matter courses, observation courses, and practice teaching assignments is but a conglomeration of precepts and practices inherited from the more limited environment of a former day. No matter how much science in the way of statistical summaries, surveys by experts, and correlational studies is applied to this type of curriculum, the best result obtainable can be only a minor refinement added to something fundamentally inadequate. (Counts, 1965, pp. 221-222)

Today, there are still places around the world where the major concern of teacher education remains with prospective teachers’
general education and subject matter specialization. Many reform proposals and the latest scathing reports on the illiberal teacher education on the university campus in the United States are testimonial to the exacerbating concerns towards the declining influence of the liberal education tradition in North American teacher preparation (e.g., Buchmann, 1984; Ducharme, 1987; the Holmes Group, 1986; Kramer, 1990; Tom, 1991).

Few will doubt the desirability of requiring both secondary and elementary school teachers to obtain a solid background of general education and subject matter specialization through a four-year university liberal arts and science program. Buchmann (1984) puts the matter most straightforwardly that "while no degree of mastery of teaching skills can overcome lack of content knowledge, given content knowledge, we have something that we can teach" (p. 31). But, mandating the completion of a four-year undergraduate arts or science program as a prerequisite or integral component of teachers' professional preparation requires the political will on the part of the relevant educational authority and necessary social and economic conditions. It is not an issue that can be resolved by an intellectual debate amongst concerned teacher educators themselves. I will not further belabour this point.

It is generally accepted nowadays that liberal education and specialization in one or two teachable subject areas make up only part of PKT. It does no justice to teaching as a professional practice to equate liberal education with teachers' professional preparation. The point has long been made clear:

To argue for the best professional training is in no
sense to derogate the value of liberal education. Teachers should be liberally educated and well-grounded in the subjects they teach. It is equally necessary that they be well-acquainted with the accumulated knowledge and experience of the teaching profession and the disciplines on which it rests, sensitive to the historical and philosophical setting in which the school operates, and aware of the social and political significance of the educational establishment in which they serve. (quoted in MaCarthy, 1970, p. 9)

The Search for a Scientific Basis of Teacher Education

The difference between studying phenomena of classroom teaching scientifically and grounding teaching and teacher preparation on a scientific basis should not be difficult to see, if not already obvious. To me, scientific studies and academic theorizing of teaching are mainly concerned with understanding the various phenomena of interest to the person(s) who study them. Scientific studies in general are aimed at establishing a relational logical structure of the educational phenomena under investigation, to advance theoretical knowledge. Intellectual curiosity and disciplinary interests provide the major source of motivation for scientific studies of teaching. This is not to say that scientific studies of teaching cannot be undertaken with the intention of helping improve classroom teaching in some specific areas of concern, or finding something useful, if not immediately usable, for the teacher. Whether or not such a practical goal of educational research and theorizing can be fulfilled is a matter open to debate.

The idea of grounding teaching and teacher preparation on a broadly conceived scientific base, on the other hand, not only is dependent upon results of disciplinary inquiries and educational
research but also assumes that it is desirable and possible to do so. Teacher educators who ascribe to the scientific notion of PKT regard results of systematic inquiries in the disciplines of education and educational research as the most reliable and authentic intellectual sources. They believe that only these sources will supply the requisite and desirable dispositions, values, perspectives, knowledge and skills, concepts as well as valid factual information for building a rational foundation for the practice of teaching. One feels here what Borrowman (1965) refers to as "the liberal impulse in professional education."

Walton (1962) offered a very concise statement in this regard,

The knowledge and information that a teacher would derive from this part of professional education [theoretical studies] may or may not make him a more effective classroom teacher in any immediately obvious way. However, the teacher who has had this preparation may reasonably be expected to have more sophistication in identifying the problems of the schools, in the selection of subject matter for teaching, and in analyzing the current controversies about the aims and methods of education; and he should be a more effective and intelligent participant in policy decisions. (p. 22)

Teacher educators who have a strong conviction in the scientific knowledge derived from empirical research on teaching and learning appear to be more assertive than their colleagues working in the foundational disciplines. B.O. Smith (1983), for instance, argues that

teaching, like political and economic behaviour, is a natural phenomenon to be studied in its own right. This does not mean that academic pedagogy is irrelevant to the study of education, but it does mean that effective teaching behaviour does not consist of mere deductions from the concepts of philosophy and psychology. (p. 141)

It is stated unambiguously in the Report of The Bicentennial
The Commission asserts that effective teachers gain understanding and control of classroom events mainly through theoretical and empirical knowledge ... [and] proposes not that all teachers be researchers but that professional programs develop the teacher's capacity to understand and consult appropriate research before making instructional decisions. (p. 88)

The empirical research-based approach towards PKT found its most explicit expression in the Competence/Performance-Based Teacher Education (CBTE/PBTE) movement prevalent in the late 1960s and 1970s (see DeVault, Anderson, and Dickson, 1973; Gage and Winne, 1974; Haberman and Stinnett, 1973; Hall and Jones, 1976; Houston, 1974; Houston and Howsam, 1972). In response to the increasing social and political demands for institutional accountability in the aftermath of the Sputnik shock, CBTE/PBTE proponents asserted that "knowledge alone is inadequate; knowledge must be employed in overt action" (Houston, 1974, p. 7).

For both teacher evaluation and teacher preparation, PKT was represented in sets of pre-specified, observable, and measurable discrete teaching behaviours that were shown to correlate with student achievement on standardized tests. Effective teaching behaviours were identified by educational researchers employing a quantitative psycho-metric measurement methodology imported from behaviouristic psychology. Zumwalt (1982) summarizes the CBTE/PBTE research base as follows:

Process-product research yields information on what teacher behaviours correlate with student outcomes, usually defined as performance on standardized achievement tests. If improved performance on tests is one's goal, process-product research can indicate
behaviours that may contribute to achievement gains. The indicated behaviours are those the researcher decides to study, their specificity depends on how the investigator operationalized the independent variables (for example, teacher warmth, verbal praise), and the presence or absence of information about mediating variables (for example, student involvement) depends on the research design utilized. (p. 219)

If certain teacher behaviours were shown to be "causally" linked to student achievement, it would seem reasonable that teacher education should aim at helping prospective teachers to acquire such behaviours. At the core of CBTE/PBTE programs were a set of learning objectives that are stated so that their accomplishment can be observed in the form of specified learner behaviours or knowledge. Minimum levels of achievement of these objectives are established as a criterion of success. Learning activities are geared to assist each student in acquiring at least the minimum levels of competence. ... [CBTE/PBTE programs] frequently use "modules" as delivery systems for instruction. ... A module usually focuses on a single competency or discrete set of competencies, and the ability to demonstrate these competencies satisfies the requirements of the module, whether the learner performs the module's enabling activities or not. (Hall and Jones, 1976, pp. 10-11)

While cognitive and affective objectives were generally not missing from CBTE/PBTE programs, the insurmountable difficulty involved in stating such learning objectives in behavioral terms and in observing and measuring learning outcomes in these domains tended to detract serious attention and effort away from them (Houston, 1974).

Many proponents of CBTE/PBTE were well aware of the inherent theoretical and methodological weaknesses in the process-product research base. They pointed to the danger of single-minded dependence upon the findings of teaching effectiveness studies and cautioned against hasty or forced implementation of programs designed on the principles derived from the process-product research base.
research base. Some nevertheless expressed the optimism that they were
genuinely in sight of the theoretical principles, the operational measures, and even the developmental technology for moving into a performance-based method of appraising teaching.... The day is still quite a long way off, but it is no longer wishful thinking to foresee a performance-based system for the certification of teachers. (Peck and Tucker, 1973, p. 971)

When that day finally arrived, said Gage (1978), teaching and teacher education would no more be left "at the mercy of powerful and passionate writers who shift educational thinking ever more erratically with their manifestos" (p. 41). Gage professed the belief that

more solidly established bases for change in teacher education -- in the application of scientific knowledge about teaching -- can lead to a happier history. Teacher education should rise to a wholly new level as the scientific basis of the art of teaching becomes stronger. (pp. 43-44)

However, the dream of grounding the art of teaching on a scientific base has till this day proven to be much easier to imagine than to realize despite, and perhaps, ironically, also due to, the proliferation of academic theorizing and educational research (see Kaestle, 1993). The narrow conception of PKT as sets of pre-specified, overt teaching behaviours is now generally considered to be inadequate for teacher education (Broudy, 1984; Doyle, 1978, 1990; Fenstermacher, 1978, 1986; Goodlad, 1990; Goodlad, Soder, and Sirotink, 1990; Heath and Nielson, 1974; Liston and Zeichner, 1991; Nash, 1970; Richardson, 1990; Shulman, 1986a; Tom, 1984; Zumwalt, 1982). CBTE/PBTE eventually receded from the centre stage of teacher education after dominating the scene for about two decades.
Towards the late 1970s, concerns over the limitations of the behaviouristic model of educational research and the difficulties involved in transferring research findings into educational practice led research on teaching to a major shift away from the observational and correlational studies of teaching behaviour. Many educational researchers have turned to investigate the thinking processes involved in teaching and learning from the perspectives of cognitive science (Clark and Peterson, 1986; Clark and Yinger, 1977; Corno and Edlstein, 1987; Day, Pope, and Denicolo, 1990; Halkes and Olson, 1984; Mitchell and Marland, 1989; Ornstein, 1985; Peterson, 1988; Shavelson, 1983; Shavelson and Stern, 1981; Solas, 1992). Metaphors of the teacher as a clinical diagnostician, information processor, decision maker, planner, and problem solver have become very common in the educational literature.

In reporting on their research on teacher thinking or cognition, educational researchers, with a few exceptions (Bromme and Brophy, 1986; Floden and Klinzing, 1990), have however become less assertive about the connection between their research findings and the practice of teaching and teacher preparation (Clark, 1988; Clark and Lampert, 1986; Lampert and Clark, 1990; McNamara, 1990; Shavelson, 1988). Clark and Lampert (1986), for instance, state that

the role of research on teacher thinking is to help teachers understand practice, rather than to dictate practice to them. Therefore, we do not look to research on teacher thinking for prescriptions of how teachers ought to think or how novices ought to be trained. ... Research on teacher thinking does not provide particular answers or solutions to how teacher educators ought to address these issues [of teaching], but rather serves to point out where we had best put
It has been suggested that instead of prescribing rules of conduct, research findings on teacher thinking should enable teacher educators to ask the right questions about teacher preparation (Clark, 1988) and be used "in constructing, challenging, or changing the way policy makers and practitioners think about problems" (Shavelson, 1988, p. 4).

Diffusion of Professional Knowledge for Teaching

With the behaviouristic conception of PKT largely in disfavour and educational researchers in general disclaiming direct connections between research and the practice of teaching and teacher preparation, the question of PKT has become an urgent issue in the current discourse on teacher education reform. Calls for institutional accountability and educational reform intensify the sense of urgency in finding an adequate answer to the classic question of "what knowledge is of most worth" (Spencer, 1859) for teacher education. "If there is knowledge, our [teacher educators in higher education settings] role is secure. If there is not, our role is highly problematic," said Gideonse (1989, p. 17).

Various attempts have been made to address the question of PKT and to identify its content for teacher preparation (Dill and Associates, 1990; Feiman-Nemser, 1990; Gideonse, 1989; Reynolds, 1989; Schrag, 1992a; Shulman, 1986b, 1987a; D.C. Smith, 1983; Tom and Valli, 1990). On the one hand, several different categories have been advanced in which knowledge is linked with various intellectual traditions. Schrag (1992a) categorizes views about
educational knowledge into six traditions -- the apprenticeship, the philosophical, the rhetorical, the scientific, the mystical, and the psycho-therapeutic. Feiman-Nemser (1990) has identified five conceptual orientations of teacher education curricula -- the academic, the technical, the practical, the personal, and the critical/social. Tom and Valli (1990), already mentioned in the beginning of the chapter, have discussed four epistemological traditions -- positivist, interpretive, critical, and craft.

Smith (1983), Dill and associates (1990), and Reynolds (1989), on the other hand, have brought together expert views from different perspectives to identify and demonstrate an extant knowledge base which would provide "essential knowledge" for beginning educators. Whereas these authors convey a shared belief in the existence of a knowledge base of teaching, it is quite clear that they are not unanimous in regard to its content.

For Smith, the knowledge base of teaching consists mainly of "a substantial body of dependable clinical knowledge from process-product and experimental studies" (p. 141). In the case of Dill and associates, the knowledge base is expanded to include four general categories: (1) results of classroom instructional research; (2) psychological knowledge about human development (developmental psychology); (3) knowledge from particular disciplinary perspectives; and (4) the moral dimensions of teaching. According to Reynolds (1989), the knowledge base for the beginning teacher covers a much wider range of topical areas where, it is claimed, well-confirmed knowledge and standards for judging such knowledge have been made available by research.

Gideonse (1989), after making some brief notes on several
different ways of categorizing PKT, lists a number of intellectual sources pertinent to teacher education programs. These include "Experimental research; Authority; Observation; Personal experience; Collective experience or wisdom of practice; Logic; Second-order scholarship; Design; Imagination; Revelation; and Intuition" (pp. 10-11). Only three of these sources, namely, Scholarship, Research, and Practice (perhaps also confirmed by research), are chosen to provide the knowledge base for teacher education. Knowledge is to be used as instructional content, rationale for program development and curricular decisions at different levels, and guidance for pedagogical practices in teacher education.

In Shulman’s scheme, teachers’ professional knowledge consists of "content knowledge; general pedagogical knowledge; curriculum knowledge; pedagogical content knowledge; knowledge of learners and their characteristics; knowledge of educational contexts; and knowledge of educational ends, purposes, and values, and their philosophical and historical grounds." Formal scholarship, educational materials and structure, research, and the wisdom of practice are identified as the sources for the knowledge base.

What distinguishes Shulman’s scheme of PKT from others is its emphasis on the pedagogical reasoning that supports the teaching of content knowledge at the classroom level. Where understanding and transmission of content knowledge is of concern, PKT comes under three broad categories -- subject-matter knowledge, pedagogical content knowledge, and curriculum knowledge. These are in turn represented in the forms of
propositional knowledge (principles, maxims, and norms), case knowledge, and strategic knowledge.

Shulman (1987a) states that

Our current "blueprint" for the knowledge base of teaching has many cells or categories with only the most rudimentary place-holders, much like the chemist's periodic table of a century ago. (p. 12)

This analogy may sound assuring and stimulating to those who take it to be their task to discover or produce knowledge for teacher education. From a constructivist point of view, however, one is on a solid ground to object to the presumption lurking underneath Shulman's analogy that PKT is something waiting out there for researchers to discover, refine, disseminate, package, and eventually transmit to prospective teachers in their preparation programs for future application.

The different views, categories, and schemes of PKT entail different conceptual orientations and epistemological assumptions for teacher education program development. However, differences aside, these categories and schemes pertain to a Spectator's View of PKT, a view distanced from the hidden, enacted curriculum, where fundamental philosophical and conceptual questions are yet to be resolved (Geer and Gideonse, 1992; Kohli, 1995) and where claims about the impact of policy initiatives and practical endeavour in teacher education on individual prospective teachers' belief systems of teaching and teaching performance remain to be substantiated (Feiman-Nemser, 1990).

Transcending this conglomerate of scholarly views on "what knowledge is of most worth" for teacher education is the belief that "transmission of this knowledge base to teachers [and
prospective teachers] will increase the quality of teaching" (Koehler, 1983, p. 3). This belief poses an interesting contradistinction to one of the major tenets of the current RTE movement -- "make the relationship between theory and practice problematic" (Valli, 1993, p. 16).

The diffusion of PKT in teacher education indicates that the very notion of PKT is in need of clarification or rectification (see Fenstermacher, 1994 and Greene, 1994 for their contrastive philosophical discussions on knowledge and educational research). The positivist, the interpretivist, and the critical theorist each use the concept of knowledge to refer to something different and argue accordingly about what a proper relationship there is or ought to be between theory and practice. It is hard to see how each of the three will come to agree on "what knowledge is of most worth" to those who teach and those who are learning to teach (see Carr and Kemmis, 1986; Overgaard, 1994).

It is interesting to note that Gideonse's (1989) advocacy of knowledge-based teacher education has been accompanied by some cautious notes to draw teacher educators' attention to the dynamic and active process of knowing and the need to exercise judgment on what knowledge to use and how to use it in teacher education. Gideonse states that

The sources of knowledge... are also the sources of error. The views of leading researchers and scholars diverge or conflict. The images of teaching advocated by some scholars may be perceived as excessively narrow, hopelessly romantic, or professionally unwise. There are, in short, no neat, unassailable prescriptions forthcoming from the knowledge bases of teaching and teacher education. There are instead evidence, reasoned propositions, and alternative conceptualizations to be sifted, weighed, and selectively framed into coherent programs of study. (p.
Where contentions and controversies regarding PKT remain to be resolved, the literature indicates that teacher education is operationalized with a variety of innovative curricula within a universal pattern of disparate program components -- General Pedagogical Studies (e.g., Introduction to School and Teaching, Principles of Teaching, etc.); Foundational Studies; Curriculum and Instruction (generic and domain specific teaching methods); Special Studies (teaching-related areas of individual needs and interests); and Practice Teaching -- as a result of intra-institutional compromise (Cruickshank, 1985; DeVitis and Sola, 1990; Feiman-Nemser, 1990; Howey and Zimpfer, 1989).

Upon a closer look, these alternative models, approaches and orientations either suggest some general or specific way(s) of preparing teachers (Competence, Reflective Practice, or Micro-Teaching) or program orientations (liberal, analytical, artistry, etc.); social and political agendas (cultural pluralism and social change); personal growth (empowerment; role acquisition); or sources of intellectual guidance and instructional material for curriculum decisions (research-based or experience-based).

It is reasonable to expect that each and every one of the models, approaches, and orientations, whether in practice or still in blueprint, will be grounded on a more or less coherent conception of PKT with a compatible view of the persons learning to teach, a conception that entails an account of professional knowing and learning to teach which should be capable of guiding pedagogical activities across the program (Feiman-Nemser, 1990). Yet, presuppositions about PKT and about prospective teachers for
whom different kinds of preparation programs are designed tend to remain hidden rather than explicitly stated. Haberman and Stinnett (1973) observed twenty years ago that

In practice, we claim that the special interests of faculty add up to the programs listed in catalogues; in truth, the programs are disparate pieces consisting of whatever individual faculty choose to teach. Any college program is actually a conglomeration of talks by individual faculty on their favourite topics. In professional schools this dilemma cannot be ignored, since relevance to real socio-educational problems is an obvious public concern. (p. 140)

It seems to me that Haberman and Stinnett's observation is still pertinent today,

The various aspects of PKT emphasized in the university-based teacher education programs differ from those that featured prominently in the teacher training programs of earlier times. The obvious differences do not however affect the taken-for-granted notion of PKT as something codifiable and transportable that resides in sources external to those who are learning to teach, if not to those already teaching. It is to be discovered by researchers and theorists dwelling in the academic world. Practitioners of teaching and those aspiring to become teachers are consumers of received knowledge.

Guided by the taken-for-granted views of PKT, teacher educators have been burdened with the unyielding problems of identifying, codifying, selecting, and packaging "useful" or "essential" knowledge for the teacher education curriculum. They are also faced with the equally unyielding problems of transmission and transfer of the knowledge they prescribe. These problems are difficult to resolve because of the perceived irrelevance and inapplicability of prescribed knowledge to the
particular demands of practice as well as the pervasive influence of socialization in the schools.

University-based teacher education no doubt provides a unique institutional, communal setting (both on and off campus) for learning to teach, but by no means ideal. What needs to be made clear is what kinds of opportunities for intellectual growth are, and indeed should be, provided and how intellectual growth is secured in this very unique setting. A better understanding of how prospective teachers actually (are helped to) learn to teach within particular preparation programs is needed. The lack of it will continue to lend credence to general scepticism towards university-based teacher education (Haberman, 1971) and support to the call for a complete redesign of teacher education (Goodlad, 1991). We must not mistake the issue here to be merely a matter of empirical evidence showing the actual long and short term effectiveness of any particular teacher education programs. Nor is it a matter of which place would be better to house teacher education, the school or the university. It is more important to be clear about the rational ground upon which programmatic and pedagogical decisions are made.

University-based teacher education has been described as "a cult practice -- with wide differences among schools of education and professors, unable to evaluate or replicate specific practice" (Houston, Haberman, and Sikula, 1989, p. 22), which "muddles along with neither a clear sense of mission nor coherent program" (Goodlad, 1990, p. 269), and as "a conspicuous example of practice without theory" like "ships that have passed in the night for too long" (Sprinthall and Sprinthall, 1987, p. 36),
"faithfully but mindlessly following prescriptions about what and how to teach" (The Holmes Group, 1986).

University-based teacher education has even been compared unfavourably with Normal School teacher training. It has been suggested that

Unlike modern-day schools of education, with their fragmented mission and defensive posture, normal schools knew that their major purpose was to serve the profession by educating practitioners. They "formed" their students more effectively than the large university schools and departments of education that replaced them.... The Normal-school curriculum gave explicit attention to pedagogical training and supervised practice, and practice schools, at least in the stronger normal schools, fostered close ties between theory and practice. (Feiman-Nemser, 1990, p. 214)

A loss much greater than "a clear sense of mission" and "a close relationship between preparation and teaching" has been underscored by Goodlad's (1990) observation that "[there is] much less attention to and agreement on the moral requisite" (p. 71) in teacher education today. Echoing earlier criticisms of Normal School teacher training, these charges should lead us to examine the implicit understanding of PKT and learning to teach that underlies teacher education program development. Gideonse (1989) argues that

...to the extent that we perceive of knowledge as substance, as a thing, as portable, we encourage an essentially static, acquisitive, even materialistic view of knowledge. This circumstance does an essential disservice to our purposes, to professional practice, and to the aim we seek to serve by engaging in teacher education's "professional project." (p. 13)

Summary

In this chapter, I have discussed the fragmentation of PKT in
program development in the brief history of teacher education. In the days of Normal School teacher training, there was a shift of focus from "moral character building" to "subject matter mastery" and rule-of-thumb procedures of classroom instruction. Since the university took up the responsibility of teacher education, the notion of PKT has become more and more fragmented and contentious as a result of the fragmentation of disciplinary inquiries grounded in different intellectual traditions.

The account presented in this chapter does not purport to be a thorough investigation of the history of teacher education program development. I do not suppose that the constant metamorphosis of teacher education program development within varying institutional contexts necessarily follows the kind of historical progression projected in this chapter. I hope, however, that this brief account does help to show in its own limited way the fragmentation of PKT as reflected in the prominent features of teacher education program development at different historical times and their practical consequences. I tend to think that the question of "what knowledge is of most worth" for teacher education has somehow misled programmatic deliberations about initial teacher preparation, for the question has been pursued outside the context of prospective teachers learning to teach.

Today, theories of education, schooling, teaching, and learning articulated in "a polyglot of educational languages" (Johnson, 1987) abound and metaphors of the teacher are numerous. The problems that teacher educators have to deal with are, at least in my view, not so much with how to derive from research
more and better theories of teaching and learning and find better metaphors of the teacher. What Dewey (1929) said in his *The Quest for Certainty* in regard to the problem of knowledge in relation to human conduct mirrors well the perplexity confronting teacher education today.

Man has never had such a varied body of knowledge in his possession before, and probably never before has he been so uncertain and so perplexed as to what his knowledge means, what it points to in action and in consequences. (pp. 296-97)

Since the early 1980s, there has been a general dissatisfaction with past efforts in finding authentic and/or useful knowledge for teaching and teacher education; teacher education program development has turned to the notion of "reflection" (Richardson, 1990; Valli, 1992). But what is RTE? And more importantly, as an alternative approach towards teacher preparation, how well is it theoretically grounded in terms of the issues concerning PKT and learning to teach? Haberman and Stinnett (1973) has made the point forcefully,

If we continue to act on unexamined assumptions, fantasy will continue to serve as program rationale. Our elaborate institutional mechanism (the university) helps us to make believe we are engaged in reasonable behaviour directed at socially useful ends. Such delusions are not all evil; they sustain us in a complex world of powerful forces. (p. 133)

I will now turn to the fuzzy phenomenon of RTE.
Chapter II: REFLECTIVE TEACHER EDUCATION: REFRAMING THE PROBLEM

Teacher education in North America has been in a state of ferment for change in the past several decades. In his Models for the Preparation of America's Teachers, Cruickshank (1985) introduces 22 curricular innovations from various sources. Also recorded in that book are several innovative instructional strategies, one of which is called the Reflective Teaching method developed at Ohio State University in the late 1970s. According to Cruickshank, the RT method is

a form of on-campus, laboratory-clinical experience that combined many features of other instructional alternatives but would offer a different outcome. In essence, RT is an effort to increase teacher wisdom by engaging preservice students in controlled, on-campus teaching where their behaviour is observable and measurable and where their teaching can be examined and thought about in ways that will enhance subsequent performance. (p. 97)

This particular instructional method had reportedly received positive evaluation from both prospective teachers and teacher educators who had had direct experience with it. Yet, like most of the innovative curricula introduced in Cruickshank's book, it did not seem to have much influence beyond its particular institutional setting. One wonders if it had ever occurred to those who developed the RT method that reflective teaching would soon become a household term of many different meanings and a popular theme of program development in teacher education.

Several years later, especially after the publication of Schön's (1983, 1987) two books on practitioners' reflective practice, the notion of reflective practice/teaching/inquiry has suddenly captured the imagination of many teacher education
program developers and teacher educators. Reflective practice/teaching/inquiry has become a very popular topic in the current discourse on teachers' initial preparation and continuing professional development at both the theoretical and practical as well as institutional and personal levels (e.g., Bullough, 1989a; Calderhead, 1989; Calderhead and Gates, 1993a; Clift et al., 1990; Cruickshank, 1987; Furlong and Maynard, 1995; Goodman, 1984; Gore, 1987; Grant, 1984; Grimmett and Erickson, 1988; Hatton and Smith, 1995; Laboskey, 1993, 1994; Russell and Munby, 1992; Schön, 1991; Stewart, 1994; Valli, 1992a; Waxman, 1988; Zeichner and Tabachnick, 1991).

The widespread enthusiasm for reflective teacher education (RTE) at both institutional programmatic and personal pedagogical levels has, however, not been accompanied by a clear, shared sense of what counts as RTE across the larger teacher education community. Tom (1985), for instance, observes that in the growing body of literature on inquiry-oriented teacher education, "the parameters for what counts as inquiry teacher education are fuzzy. The definition of this paradigm is less clear than are the definitions for other paradigms" (p. 36), such as the Normal School Apprenticeship model of teacher training and the behaviouristic model of Competence/Performance-Based teacher education dominant in the 1960s and 1970s.

Houston, Clift, and Sikula (1989) draw our attention to the lack of a common professional language in teacher education with the following observation that

The literature is filled with different terms for the same concept and the same term for different concepts. Reflective inquiry, the latest organizing concept in
teacher education, has many definitions. ... Two conclusions can be drawn from the variety of definitions. First, the nuances among different terms are often subtle. But subtle or not, the different names refer to different conceptions of what is meant by reflective inquiry, although these meanings are not always clearly distinguishable. (p. 21)

The lack of conceptual clarity or a shared sense of RTE can be viewed both positively and negatively. On the positive side, the fact that teacher educators have different views of RTE could be considered a good thing. As Tom (1992) puts it,

In this context of ferment and possible realignment of the intellectual traditions within teacher education, we should not be surprised that debate and discord surround the topic of reflective teaching and teacher education. On the contrary, the absence of confusion and contention would be cause for alarm, as such a development would suggest a lack of insight on our part of the massive changes which seem to be occurring in how we view the nature of teaching and teacher education. (ix)

The other side of the coin is when RTE comes to be taken to mean what one wishes, its proponents face the consequence of confusing themselves and others in articulating what it is that they as individuals located within particular institutions and as members of a larger collective enterprise are trying to accomplish. As Houston and Clift (1990) point out,

In education we tend to act like Humpty Dumpty, manufacturing new terms and defining other terms to meet our own specific conceptions. This leads to confusion about the meaning of certain terms and to inarticulateness and lack of precise communication among professional educators. It may also lead to confusion among our students, sending an unintended message that professional education is more interested in the rhetoric of quality than in the quality of practice. (p. 210)

The lack of conceptual clarity has given rise to expressed concerns over the prospect of using the reflective approach to guide present and future programmatic deliberations in teacher

In this chapter, I will first look at the meanings of RTE through a number of recent attempts of conceptual clarification in the literature (Grimmett, 1989; Grimmett, MacKinnon, Erickson and Riecken, 1990; Hatton and Smith, 1995; Louden, 1991, 1992; Sparks-Langer and Colton, 1991; Zeichner, 1983, 1992) and the key concept of reflection. I will argue that, if RTE is to be sustained as an alternative conceptual orientation towards teacher education, more needs to be done than clarifying what RTE means to different people. It will be necessary to probe the phenomenon along the epistemological line, linking the phenomenon with issues of PKT and learning to teach that are central to teacher education program development.

In their effort to clarify RTE, scholars employ different theoretical frameworks. Conceptual clarity is generally achieved by way of gathering and sorting out the extant meanings of RTE into a categorical scheme of one kind or another that the analyst chooses to use. Such analyses are beneficial in so far as they each in their own way help make the perplexing phenomenon easier to comprehend within a manageable number of meaning categories. Yet, conceptual clarification by way of sorting out the various meanings of RTE into different categories at best carves out the conceptual boundaries of one view from another.

If we allow that the various conceptions of RTE are the results of careful and well-meaning considerations supported by
ideological commitments as well as personal beliefs and interest, the question of what RTE means beyond specific institutional contexts will hardly ever dissipate. The recognition that there is the lack of a common professional language will unlikely be persuasive enough for the diverse teacher education community to adopt a shared notion of RTE.

The phenomenon may be looked at in a different way. We may take the term "reflective teacher education" to denote a general category of teacher education programs. Subsumed under this general category are particular cases built on the different meanings or conceptions of reflective teaching/practice/inquiry (for descriptions of different RTE programs, see Clift et al., 1988; Valli, 1992a; Zeichner and Liston, 1987). These particular cases are all subsumed under the same general category but cannot be reduced to one another. A parallel example is that under the general category of university students we have the subcategories of undergraduate students and graduate students. The subcategory of undergraduate students cannot be reduced to the subcategory of graduate students or vice versa, but both are subsumed under the category of university students.

What teacher educators need to do is to find some way to determine which programs that currently bear the title of RTE could be reasonably excluded from this general category. However, in order to exclude a particular program from the general category of RTE, proponents of RTE must find a way to draw the parameters of the category. They must, furthermore, convince their colleagues why this alternative orientation is preferable to others.
The parameters of RTE might be drawn in terms of value, since meaning and value are hardly ever separate from each other. As a matter of fact, the literature indicates that extant conceptions of RTE can often be identified with explicit value commitments. The trouble is that debate over value in general has a tendency to last with the participants arguing against one another at cross-purposes failing to reach a common ground.

In any form of social practice, the fact of life is that decisions have to be made as rising situations demand and they are always made within a particular social or institutional context and from a certain position and value commitment. The broader the context and the more diverse the participants, the more likely there will be differences in understanding and practice as well as disputes over what should be done and what would be a better way of doing it. Teacher educators in general profess to uphold the democratic principles of justice, equality, and freedom. It is hard to judge whether those who associate reflective teaching with the more or less technical matters of pedagogy abide by the democratic principles less firmly than those who focus on the social and cultural issues.

There is yet another way of thinking about the puzzling phenomenon of RTE, which I believe could help avoid ideological tangling. We should, a la Schöen, try to reframe the problem. Instead of wrestling with the question of meaning, let us probe the phenomenon in terms of its epistemological support. As RTE is taken by many to be an alternative approach towards teachers' initial preparation and in-service professional development, it is pertinent to raise questions about the epistemological
grounding of RTE: What kind of a conception of PKT is employed in the development of RTE programs? How are professional knowing and learning to teach accounted for in RTE? Furthermore, what kind of epistemological understanding of PKT and learning to teach would be required to sustain RTE as a viable alternative orientation towards teacher education?

The Social and Intellectual Background of Reflective Teacher Education

Before I survey the meanings of RTE, I will briefly outline the social and intellectual background against which RTE emerged. The following observation is based on two general accounts of the emergence of RTE provided by Richardson (1990) and Valli (1992b) as well as on my own reading of the relevant literature.

In the previous chapter, I have drawn from the literature a sketchy picture of teacher education on the contemporary North American scene. In short, in the institutional front of teacher education in the 1970s and 80s, general dissatisfaction with the behaviouristic model of Competence/Performance-Based teacher education compelled teacher educators to search for new approaches towards teachers' initial preparation and continuing professional development. At the same time, demands for institutional accountability and educational reform in the 1980s drew critical attention to the status quo of teacher education institutions. Fundamental changes had to take place in teacher education, even though, for many reasons, they are too slow to come by. The current widespread interest in RTE can be seen as a manifestation of the programmatic responses of the teacher
education community to the internal and external pressures for positive change within a broader context of educational reform over the last two decades.

In retrospect, the adoption of reflection and its derivative terms as an organizing theme in teacher education program development seems quite natural. Teacher education is generally considered to be a field of practical endeavour. It draws intellectual input from the contributing disciplines of philosophy, history, psychology, sociology of education, and other less entrenched fields of academic inquiry. Reflection, like many other ideas current or past, was not an indigenous invention of the teacher education community. Its popular acceptance in teacher education can be linked to the canonical scholarship of the contributing disciplines and the new developments in the various fields of educational inquiry.

In educational philosophy, one witnesses the declining influence of traditional epistemological positions on educational research and knowledge rooted in the philosophy of positivism, sometimes indiscriminately (Phillips, 1983; Schrag, 1992b). The ambitious project of building up the enterprise of social and educational research by emulating the model of physical sciences has now by and large been considered to be naive and ill-conceived from the very beginning. Smith (1989), among many others, asserts that "social and psychological laws are unavailable to us and what are presently 'passed off' as law-like statements are most often only thinly disguised tautologies" (p. 12). Brown (1987) puts it even more succinctly that "those earlier thinkers believed that both science and philosophy
provide certain knowledge of necessary truths. We must conclude that neither do" (p. 230).

In the various fields of social practice, there is widespread disillusionment in the instrumental value of scientific knowledge grounded in logical empiricism to bring forth handy solutions to social and educational problems and directives for policy and decision making in professional practice (Lindblom and Cohen, 1979; Schön, 1983, 1987). In debating against the positivist tradition of educational research and knowledge, many educational theorists and researchers emphasize the contextual nature of professional knowledge and the particularistic demands of problematic situations that call for and would give rise to the kind of knowledge by way of practical reasoning that could help meet such demands (Connelly and Clandinin, 1985; Grimmett and MacKinnon, 1992; Leinhardt, 1990; Schön, 1983, 1987; Schwab, 1970; van Manen, 1977).

Development in the philosophy of education has also led to new ways of thinking about the linkage between theoretical knowledge and educational practice. Fenstermacher (1986), for instance, contends that "when it is argued that research has benefit for practice, the criterion of benefit should be the improvement of practical arguments in the minds of teachers and other practitioners" (p. 44). This view recognizes that teaching is not a matter of teachers applying technical solutions derived from theoretical knowledge to pre-determined problems in the classroom. Pedagogical decision making depends on the teacher's practical reasoning.

In sociology of education, critical theorists focus their
critiques on the traditional conceptions of knowledge and pedagogy. Their analyses bring to the surface the political nature of educational knowledge and the power relations lying behind its selection, organization, and transmission in the schooling process (e.g., Apple, 1979; Aronowitz and Giroux, 1985; Bernstein, 1977; Young, 1971). Aronowitz and Giroux (1985) argue that

the discourse of educational theory can be understood as a form of knowledge that legitimates and reproduces forms of social life.... an eminently political discourse that emerges from and characterizes an expression of struggle over what forms of authority, orders of representation, forms of moral regulation, and versions of the past and future should be legitimated, passed on, and debated within specific pedagogical sites. All educational theories and discourse are ideologies that have an intimate relation to questions of power. (p. 32)

Where teachers are of concern, Aronowitz and Giroux argue that the rhetoric from both the left and right camps of educational reform treats teachers as "obedient civil servants dutifully carrying out the dictates of others" (pp. 26-27). But teachers, like any other intelligent human beings, draw upon their own intelligence, judgement, and experience in their practice. They are knowledgeable, active agents of educational change, and therefore must be treated as such in the broad program of social and educational reform. The current movement of teacher empowerment has no doubt been greatly fuelled by the radical critiques of the status quo of the educational enterprise.

The field of educational psychology itself can be said to have taken on a "paradigm shift" of its own in the past decades. The dominance of behaviourism in educational research and program development has given way to cognitive science after "the work of
Piaget, which had been well known to educators during the 1930s, was recovered" (Woodring, 1975, p. 7). Knowing and learning, for a long time described and explained in terms of behaviour modification through conditioning or controlled stimulus-and-response exercises, have now come to be accounted for in terms of the workings (and reconstruction) of schematic mental structures of the learner interacting with the environment (e.g., Anderson, 1977, 1984; Rumelhart, 1980; Vosniadou and Brewer, 1987).

Concurrent with the theoretical advances in the contributing disciplines, new research programs designed from a variety of philosophical, sociological, and psychological perspectives have been conducted to explore teachers' professional knowledge (e.g., Eisner, 1985; chapters 1, 3, 13, 17, 21 in Handbook of Research in Teacher Education edited by Houston, 1990; chapters I, II, III in Handbook of Research on Teaching edited by Wittrock, 1986).

The idea of a reflective approach appears to signify that new efforts are being made to meet the internal and external demands for positive change. It purports to have its intellectual roots in the contributing disciplines to teacher education, for it could be linked with the constructivist epistemology in philosophy, schema theory in cognitive psychology, feminist scholarship, critical theory in sociology, etc. It has also been linked to the political movement of teacher empowerment, to teachers' struggle for autonomy, improved professional status, and better working conditions against the trends of increasing bureaucratic control of education in Western countries (Calderhead and Gates, 1993b). It is thus not difficult to understand why reflection has been adopted in many
teacher education institutions as a guiding principle or organizing theme of teacher preparation programs. Neither is it difficult to understand why RTE has been promoted as a viable alternative approach towards teacher education. Valli (1992b) expresses the optimism about RTE in the following statement,

The convergence of interest in teacher thinking and reflectivity by scholars ranging from cognitive psychologists to critical theorists suggests a broad based and long-term commitment to understanding and fostering reflective practice.... reflective approaches to teacher preparation hold out the promise of a new cadre of teachers ready to be active partners in school renewal -- teachers who can make wise classroom decisions and who can help define the direction of schooling as we approach the start of a new century. (xiv)

My use of the words "appears," "purports," and "seems" in drawing the possible connection between RTE and the various intellectual sources is deliberate. They are suggestive that RTE is in fact not as well grounded epistemologically and conceptually as it should and can be. The following discussion will make it clear that its linkage to the various intellectual sources, more specifically, its linkage to the epistemological theses advanced by Schön and Dewey, respectively, is rather superficial. A number of analyses of RTE programs have raised serious misgivings about the dubious theoretical grounds upon which such programs are built (Calderhead, 1989, 1992; Cohen, 1991; Munby and Russell, 1993; Tom, 1991; Valli, 1992a; Zeichner, 1987a). Calderhead (1989), for instance, remarks that whether any of the proposed models of reflective teaching, however, offer very adequate conceptions of professional learning as it occurs in classrooms, or of how it might occur, is largely unassessed. Evidence cited in support of particular models is often anecdotal, and one can readily cite examples to refute as to support their applicability to real-life
A look at the recent attempts of conceptual clarification with regard to the meaning of RTE and the concept of reflection in use will help substantiate the critical appraisal of RTE.

The Problem of Meaning

McDiarmid and Ball (1988) once used the fairy tale Many Moons as an analogy to initiate their discussion on the issue of teacher knowledge. In that fairy tale, the sick little princess is asked what will make her well and she says, "the moon." The king then summons his royal advisors and each of these offers a different description of the moon in terms of shape, size, location, and substance. The court jester observes, "The moon must be just as large and far away as each person thinks it is." Finally, it is the court jester who has made a golden chain with a tiny golden moon shaped to the princess's own image of the moon, "a little smaller than my thumbnail ... and not as high as the big tree outside my window." The golden chain brings the princess back to health again.

This fairy tale also befits our discussion on the phenomenon of RTE. It has been repeatedly pointed out that RTE exists in a plethora of idiosyncratic conceptualizations of reflective practice/teaching/inquiry that one comes across in the relevant academic journal articles, conference papers, books, and program descriptions within particular institutional settings. The diverse perspectives in the current discourse on reflection in teacher education have been well captured in Hayon's (1990)
mapping syntax:

A reflection level of (analysis/synthesis/judgment) with an orientation of (theory/practice/values) and a style of (technical rationality/reflection in action) at a time of (post-active/intra-active) within a content knowledge (subject-matter/pedagogical content/curriculum) in a form of (proposition/case/strategy) used (intuitively/formally) will yield a reflection profile of type X. (p. 68)

But the relevant literature indicates that in most cases, conceptual clarification of the RTE phenomenon has often been attempted with analytical frameworks that are in close line with van Manen’s (1977) discussion on curriculum theorizing, which is largely based on the notion of "knowledge-constitutive interests" (Habermas, 1972). Reflection, according to van Manen, may take place at three different levels -- the practical/technical, the social/political, and the moral/ethical.

At the practical/technical level, reflection is mainly concerned with mastery and application of technical means in achieving given educational ends. At the next, social/political level, reflection is directed at an interpretive understanding of the meanings of educational experience and choices of action within a particular social and institutional context. At a still higher, moral/ethical level, reflection is manifest in the critical interrogation of the worthwhileness of educational ends on the basis of the democratic ideals of justice, equality, and freedom.

Louden (1991, 1992) employs in his analysis of RTE the distinctions Habermas (1972) makes between the interests of the empirical-analytic inquiry in natural sciences, the interests of the hermeneutic-historical inquiry in interpretive sciences, and
the interests of the emancipatory inquiry in critical sciences.

Habermas associates each of the forms of enquiry with a cognitive interest: empirical-analytic enquiry with technical control by discovering rule-like regulations in an objective world; historical-hermeneutic sciences with practical control through understanding and communication; and critical sciences with emancipation through critical reflection on the conditions of social life. (Louden, 1991, p. 150)

Louden makes a slight variation to the Habermasian framework by separating the practical, the hermeneutic-historical interpretive inquiry, into what he calls the personal interest and the problematic interest. This allows him to relate reflection to attaining "personal meaning of action situations" and to "problem-solving" in professional work respectively.

From a different angle, Grimmett (1989), Grimmett et al. (1990) have attempted to clarify "the confusing terrain" of RTE in view of the role of knowledge in the development of teacher education programs. They identify three distinctive perspectives in which reflective practice is understood as a) instrumental mediating action; b) deliberation of competing views of teaching; and c) reconstruction of experience.

As instrumental mediating action, reflection is concerned with teachers trying to bring research findings or theoretical knowledge to bear upon their practice, to direct or control practice. In this perspective, knowledge tends to be restricted to what is produced and prescribed by an external source of authority, with little consideration given to the particular classroom contexts in which teaching actually occurs.

As deliberation of competing views of teaching, reflection occurs in the specific contexts of educational events in the form
of teachers "deliberat[ing] between and among competing views of teaching and examines each in light of the consequences of the action it entails" (Grimmett et al., 1990, p. 26). Here, the notion of knowledge is no longer restricted to research findings and academic scholarship. Research and academic theorizing are considered to be among several sources of knowledge, and a source of competing views of teaching. Theoretical knowledge is said to inform, rather than direct, practice.

As reconstruction of experience, reflection leads teachers to a) reinterpret problematic situations they have experienced; b) transform their self images as a teacher and restructure their personal knowledge of teaching within the social and cultural context of their practice; and c) examine the taken-for-granted assumptions about teaching, about the social, political, and cultural conditions that distort and constrain educational goals and pedagogical practices. "In this view of the reflective process, knowledge is seen as emergent and often depicted as being metaphorical in nature" (Grimmett et al., 1990, p. 27).

Zeichner (1983, 1992) places his discussion of RTE against the background of educational reform in North America. Zeichner identifies four traditions of educational reform in the North American context -- the academic tradition, the social efficiency tradition, the developmentalist tradition, and the social-reconstructionist tradition (see also Liston and Zeichner, 1991).

The academic tradition emphasizes the intrinsic value of liberal education in teacher preparation and the importance of teachers mastering the subject matter knowledge they teach. Included also in the academic tradition is the recent advocacy on
teachers' pedagogical reasoning and the transformation of subject matter knowledge involved in the teaching of content knowledge (see Shulman, 1986b, 1987a; Wilson, Shulman, and Richert, 1987).

The social efficiency tradition, on the other hand, is mainly concerned with achieving instructional effectiveness by way of conforming teaching behaviour to standard teaching skills and competencies. Effective teaching skills and competencies are established through empirical research that measures particular teaching behaviours in relation to student achievements on standardized testing. This tradition may also be understood in the sense of teachers deliberating about and making choices among the available alternatives and drawing upon various sources of intelligence, research, personal experience, values, and intuition in teaching.

The developmentalist tradition presumes that human development follows its natural order, which should provide the basis for pedagogical decision making. When this tradition is translated into the practice of teacher preparation, the focus of attention may be given to helping prospective teachers to understand the principles and process of child and adolescent development in terms of cognition, social awareness, morality, language, and mental as well as physical well-being. With the knowledge of child and adolescent development in their mind as working principles, it is assumed, prospective teachers will be better able to make informed decisions in planning and carrying out teaching activities to produce the intended student learning outcomes.

As learning to teach is also believed by some to follow a
natural order (see Burden, 1986; Fuller and Bown, 1975), teacher preparation may also justifiably opt to focus on addressing the developmental needs of prospective teachers as they progress through various stages towards personal professional maturity. It is not clear, though, (a) how individual prospective teachers' developmental needs are to be identified and addressed at the programmatic level, (b) how prospective teachers may develop from one stage to the next of their professional growth, and (c) what teacher educators can do to help facilitate prospective teachers' transition from the initial stage to the next.

Finally, advocates of the social-reconstructionist tradition embody educational reform in a much broader project of social reconstruction, the building of a more just and humane society. To help achieve this broad social goal, teacher education should involve prospective teachers in interrogating their own personal beliefs, values and assumptions about teaching as well as the social conditions in which their future professional practice is situated. Teacher preparation in this tradition centres around substantive issues of gender, race, and class. It is focused on interrogating the extent to which the underlying societal and institutional norms/values get played out and how inequity is established and maintained. It involves a commitment to collaborative modes of learning, the development of communities of learning.

Not directly concerned with what differing ends RTE is intended to achieve, Sparks-Langer and Colton (1991) have highlighted three elements of reflection -- the cognitive, the critical, and teacher narratives. The cognitive element links
reflection to research on teachers’ professional knowledge and teacher thinking in terms of cognitive structures called schemata. Schemata are constructed through experience in the classroom world of teaching and learning. Schemata enable teachers to comprehend teaching situations and make appropriate pedagogical decisions where they are called for.

The critical element can be understood in two different ways. It can be linked to Schön’s conception of reflective practice, which focuses on the practitioner’s reflection-in-action in resolving problematic situations in professional practice. Reflective action may involve questioning the goals to be attained, alternate actions to be taken, and consequences that would ensue. This Schönean conception of reflective action is considered to be more inclined towards resolving problems of a technical nature, thereby neglecting those broad social and moral issues pervasive in professional practice.

The critical element can also associate reflection with critical theory that emphasizes the moral and ethical aspects of teaching and schooling. Critical reflection is directed at examining personally held, socially constructed beliefs about teaching and schooling, understanding the relationship between knowledge and power, and bringing about educational change as part of a broader political project of social reconstruction. The conception of critical reflection is consistent with the social reconstructionist tradition in Zeichner’s conceptual clarification scheme.

The narrative element of reflection speaks of teachers’ own interpretations of the complex teaching contexts in which they
make pedagogical decisions. As teachers tend to articulate their understanding and interpretation of teaching situations and events through narrative construction rather than in the form of propositional statements, teachers' narratives provide a unique access to their own professional reasoning. Teachers are said to gain deeper understandings of their educational experiences through reconstructing their narratives.

In promoting the idea of reflective practice/teaching/inquiry, teacher educators frequently refer to the distinction Dewey made between routine action and reflective action. The distinction, it seems to me, has somehow been stretched and twisted into the presupposition that reflective practice is something that only experienced practitioners are capable of, not neophytes and novices. It is believed that once the critical attributes of reflective practice are identified, we will then be better able to distinguish reflective teachers from their unreflective colleagues, and to prepare prospective teachers to be reflective practitioners.

For instance, Copeland, Birmingham, Cruz, and Lewin (1993) have identified twelve critical attributes of reflective practice in teaching, which are grouped into four clusters — problem, solution, testing solution, and learning. (1) Reflection is initiated with the reflective teacher identifying "a problem derived from a concrete situation," which is meaningful to the teacher "as one of import for successful teaching and learning in that context." (2) The reflective teacher then generates tentative solutions that are "grounded in theories, assumptions, or research findings explicitly held or understood by the
practitioner." In generating solutions to the identified problem, the reflective teacher critically examines "his/her own professional action and its link to target action in others" and anticipating the solutions "to have positive consequences in terms of student learning." (3) The reflective teacher then moves on to select and implement one solution among the several that have been generated and evaluate the solution against the actual outcome. (4) Finally, the reflective teacher not only solves problems but also, as a result, enhances his/her own understanding of the context in which problems occurred.

Reframe the Problem

The several conceptual analyses presented above in a summary fashion have in one way or another helped to make the perplexing phenomenon of RTE easier to comprehend by fitting the many different conceptions into a manageable number of meaning categories. However, when we look at the descriptions of RTE programs, a close fit is not that easy to find between the meaning categories and the programs. Take the seven RTE programs presented in Valli's Reflective Teacher Education: Cases and Critiques for instance.

The five-year teacher education program at the University of New Hampshire focuses on building "communities of inquiry and support" for the benefit of increasing common understanding and shared responsibility among all those involved in preparing prospective teachers to become reflective decision makers. The PROTEACH program at the University of Florida has reportedly been
developed around an evolving definition of reflection. The program puts an emphasis on enabling prospective teachers to critically examine their personal theories of teaching through narrative autobiographical writing and develop the ability to make rational and ethical choices and to assume responsibility for those choices.

Both the Masters Certification program at the University of Maryland and the Multiple Perspectives program at Michigan State University are designed to help prospective teachers develop a theoretical knowledge-base and a repertoire of effective teaching strategies and routine. Reflection is a necessary and important goal because it appropriates the theoretical knowledge-base and the repertoire into the complex environment of classroom teaching. The program at the Catholic University of America shares the same idea of a theoretical knowledge-base as a pre-condition for reflective teaching and of taking reflection as a means for bridging theory and practice. It also emphasizes the development of the ability to examine critically one's actions and the context of those actions in different areas of schooling at different levels of reflection.

At Kent State University, the Academically Talented Teacher Education program aims at stimulating teacher candidates' conceptual development in increased levels of complexity and flexibility in the formation of a reflective style. Prospective teachers are provided with different views of knowledge and teaching and are encouraged to examine and challenge those views as well as their own from critical perspectives.

The discussions on the perplexing phenomenon of RTE in terms
of meaning do expose some common ground -- a) Reflective teaching/practice/inquiry is taken as a goal of different foci in different programs in different teacher education institutions; b) Reflective exercises in the programs commonly mean engaging in different forms of analysis; and c) the development of a theoretical knowledge-base is thought to be a prerequisite for reflective practice/teaching/inquiry.

For the sake of understanding the perplexing phenomenon of RTE, categorical distinctions such as technical interest, situational understanding, and critical interrogation of broader social and moral issues may be necessary and helpful. However, when we think of teaching and learning to teach, we make a serious mistake to treat the distinctions as each standing for an independent entity. Technical interest presupposes a value judgment of what is good and necessary and it has both practical and moral consequences. Selection and application of scientific knowledge in practice would involve an element of situational understanding and critical analysis. As a matter of fact, arguments against technical interest are often targeted at its narrow scope and the inability of scientific knowledge to offer ready-made solutions to emerging problems in practice. That technical interest represents too narrow a view of professional practice does not make situational understanding or social criticism a broader view.

It is unequivocal that social practice depends on situational understanding and criticism in determining what problems there are and how to resolve them. But it is doubtful that situational understanding and social criticism involved in
educational practice could be sustained without the input of scientific knowledge and scholarship on the one hand. On the other hand, it seems to me that resolution of problems will rely on available means, scientific and/or practical.

Teaching involves subject matter knowledge, pedagogical reasoning, understanding of the students, some level of technical proficiency (perhaps), personal meaning and self image, problem solving, personal growth, deliberation about alternative actions in view of their consequences, among other things. This is what makes teaching complex and a lengthy period of preparation for it necessary. It is not difficult to arrive at the conclusion that the different foci of reflection should be brought together into a cohesive and coherent program instead of separate programs each emphasizing something different. This synthesis is not only desirable but also achievable, as I will show later on from the perspective of Dewey's theory of reflective inquiry.

It has been asserted earlier that programmatic deliberations in teacher education require the support of a sound, defensible epistemological understanding of PKT and learning to teach. Whether teaching is reflective practice or something else, it has to be informed by some kind of knowledge. Talking about teaching as reflective practice does not make the issues concerning PKT and learning to teach irrelevant. But serious efforts to probe the epistemological understanding of PKT and learning to teach that informs the various kinds of programmatic deliberations in the RTE movement are not evident in the conceptual analyses and the program descriptions recounted above. It is difficult to discern from these analyses and program descriptions whether any
new understanding of PKT and learning to teach has been advanced
with the terms "reflective practice/reflective practitioners"
substituting "teaching/teachers."

When the notion of knowledge does get involved, in the case
of Grimmett (1989), Grimmett et al., (1990), its meaning shifts
with the different foci of reflection. The epistemological
understanding that supports the stated role of knowledge in the
development of teacher education programs in each of the three
perspectives they have identified is left unassessed. There is
no further discussion on questions such as: In what sense can
research findings and theoretical knowledge be acquired and
applied? On what ground(s) do teachers and prospective teachers
base their deliberations and choices among competing versions of
good teaching? What enables teachers and prospective teachers to
transform their experience? Does knowledge from external sources
have a role to play in the transformation of practice? In
contrast to the diverse foci of RTE, learning to teach remains
confined to acquiring what is thought to be necessary or useful
knowledge, including the what and how of reflection, for
directing or informing or transforming practice.

In their reviews of different models of RTE programs, Cohen
(1991), Munby and Russell (1993) have expressed their concern
over the tendency in teacher education to treat reflection as a
matter of pedagogical technique. Munby and Russell contend that
"the structure and successes of programs reported in Valli's book
are not necessarily to be attributed to the conceptual power of
reflection but to its political power" (p. 438). The seven RTE
programs presented in Valli's book are described in terms of
their structure, history of development, knowledge base, relevant pedagogical practices, and evaluation. There is little discussion on how reflection leads to prospective teachers' development of their PKT. Nor is there anything said about the epistemological understanding of PKT and learning to teach that underpins those programs. In Zeichner's (1987a) observation,

most inquiry-oriented teacher educators have sought to prepare more reflective teachers by altering specific courses or program components within an overall program context which remains unchanged. (p. 567)

In many cases, a program emphasis is put on developing a theoretical knowledge base for reflective thinking and practice. The idea of developing a theoretical knowledge base to enable prospective teachers to reflect on their experience is appealing. But the confidence in the sources from which theoretical knowledge can be drawn for developing the knowledge base has not been accompanied by a clear sense of the nature of theoretical knowledge and how that knowledge may be internalized and later applied in the practice of teaching. Ironically, according to Valli (1993), "what counts as quality of reflection is the ability to make the relationship between theory and practice problematic" (p. 16).

Feiman-Nemser (1990) suggests in her discussion on the structural and conceptual alternatives in teacher education that

An orientation refers to a set of ideas about the goals of teacher preparation and the means for achieving them. Ideally, a conceptual orientation includes a view of teaching and learning and a theory about learning to teach. Such ideas should give direction to the practical activities of teacher preparation such as program planning, course development, instruction, supervision, and evaluation. (p. 220)

On the observation that many programs of different conceptual
orientations endorse the goal of reflection, Feiman-Nemser concludes that "reflective teacher education is not a distinct programmatic emphasis but rather a generic professional disposition" (p. 221). A quick look at the concept of reflection in the literature on RTE will support Feiman-Nemser's conclusion.

The Concept of Reflection

With reflective practice/teaching/inquiry variously interpreted set as a desirable goal to achieve in teacher education, the next question in order would be: By what means can this goal be achieved? The answer to the question lies with the concept of reflection. Bullough (1989a) observes that in RTE,

at one and the same time [reflective practice] represents an end to be sought (the reflective teacher, professional, or practitioner -- someone who is disposed to and able to reflect) and a means for achieving the end (reflection). (p. 15)

But how can reflection help teacher educators and prospective teachers to achieve the goal of teacher education? Does the concept of reflection as it is used in RTE carry any significant epistemological implications?

Like RTE, the term reflection has been used in different ways. The following are a random sample of the many definitions of reflection I have come across in the literature on RTE:

Reflection: This is what a teacher does when he or she looks back at the teaching and learning that has occurred, and reconstructs, reenacts, and/or recaptures the events, the emotions, and the accomplishments. It is that set of processes through which a professional learns from experience. (Shulman, 1987a, p. 19)

Although there are several meanings associated with "reflective teaching" and "reflective thinking" current in educational literature, our work draws principally
Reflection is the practice or act of analyzing our actions, decisions, or products by focusing on our process of achieving them... a process that encompasses all time designations, past, present, and future simultaneously.... While examining our past actions and our present actions, we generate knowledge that will inform our future actions. (Killion and Todnen, 1991, p. 15)

Reflection is systematic enquiry into one's own practice to improve that practice and to deepen one's understanding of it. (McIntyre, 1993, p. 43)

Reflection in preservice teacher education [is] an effort to transform any naive or problematic conceptions about teaching and learning held by entering students into those more conducive to pedagogical thinking. (LaBoskey, 1993, p. 27)

Reflection in the context of learning is a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations. (quoted in LaBoskey, 1994, p. 5)

Critical reflection is not only practitioners' enquiry into practitioners' practices; it involves a form of critique which is also capable of analyzing and challenging the institutional structures in which practitioners work.... To speak of critical reflection is not merely to speak of 'critical thinking'. To reflect critically is to locate oneself in an action frame, to locate oneself in the history of a situation, to participate in a social activity, and to take sides on issues. (Kemmis, 1987, p. 75)

[University of Florida PROTEACH program] Reflection is defined ... as a way of thinking about educational matters that involves the ability to make rational and ethical choices and to assume responsibility for those choices. (Valli, 1992a, p. 28)

[University of Maryland Masters Certification Program] Operationalized [reflection] means: (1) taking action (sometimes routine); (2) reflecting (thinking back, analyzing) upon that action (what happened, why, what it meant); (3) if resolution is not reached, moving on to a higher level of reflective or critical thought
(multiple causes, conflicting goals, larger moral or ethical conflicts); and (4) coming up with alternative actions and thus continuing the cycle. (p. 51)

The Catholic University program is influenced by the work of Berlak and Berlak who define reflection as the ability to stand apart from the self in order to examine critically one’s actions and the context of those actions. (p. 100)

[University of Houston Reflective Inquiry Teacher Education program] Reflection is defined as the disposition and ability to consider education as the result of many social, political, and individual factors accompanied by an understanding of the need to base subsequent action on careful analysis of the results of such inquiry. (p. 127)

These definitions of reflection differ in their respective syntactic structures and in the images of reflection they each may help bring forth. The differences may be significant from a certain vantage-point but are of no immediate concern to me. I would like to draw attention to the common features that these academic definitions share.

First of all, some of the definitions of reflection refer either to a process or to an outcome in the context of teaching. To Shulman, reflection is "[a teacher] reconstructs, reenacts, and/or recaptures the events, the emotions, and the accomplishments." With MacKinnon and Erickson, reflection occurs when "a practitioner assigns new significance to events, or identifies and attends to features of a practice situation that were previously ignored."

Reflection may also be used to denote an ability and disposition for making critical judgment or a particular stance that should be taken in thinking about teaching events. In Kemmis' definition, "To reflect critically is to locate oneself in an action frame, to locate oneself in the history of a
situation, to participate in a social activity, and to take sides on issues."

In the context of learning to teach, reflection may mean "an effort to transform any naive or problematic conceptions about teaching and learning" or "intellectual and affective activities of transforming personal beliefs." It may denote an intended goal, "the disposition and ability to make sound educational choices" that a particular RTE program aims at developing in the prospective teachers.

When used in the verb sense, reflection appears to have two principle characterizations -- thinking in retrospect and critical analysis. Reflection is often associated with past events of teaching. Teachers reflect on some particular past events of teaching to give a new meaning to the events or arrive at a better understanding of them. Reflection means, literally, retrospective thinking. Reflection is also synonymous to the term analysis. To reflect on something is to analyze that something critically. What (and how it) is analyzed can vary from an individual person's preconceptions, beliefs, and values in connection to some particular teaching events or to the general or specific social and institutional contexts of teaching. It could also be focused on the classroom application of technical means derived from educational research.

These definitions do not make it clear though how reflection defined in one way or another fits into the overall picture of teaching as a professional practice or the process of learning to become a (competent) teacher, especially at the initial stage of professional development. Nor do these definitions indicate ways
in which evidence might be garnered to show that reflection
indeed leads to improved practice and that, where prospective
teachers are concerned, their reflection contributes to the
development of the disposition and ability to teach.

The many discussions, proposals, and descriptions of
reflective teacher education programs make it amply clear that
the guiding concept of reflection has been employed as a
seemingly neutral term in ways that "disguise a vast number of
conceptual variations, with a range of alternative implications
for the organization and design of teacher education courses"
(Calderhead, 1989, p. 43). "In the hands of some theorists, the
act of reflection is rife with political implications. For
others, its usefulness as a strategy derives from the very fact
of its value-neutrality" (Cohen, 1991, p. 573). We thus find
reflection among those mixed concepts (Wilson, 1963), which
do more than describe possible ways of acting. They
connote dispositions and actions seen as praiseworthy,
not in the sense of being noble or inspired but
sensible and down-to-earth.... [and] bind one
unwittingly to assumptions and entailments ... about
knowledge, the ends and nature of action, and sources
of value. (Buchmann, 1993, pp. 82-83)

These definitions suggest that reflection is a good thing either
as a goal to attain or a means for attaining goals. Teachers are
said to increase their understanding of teaching by reflecting on
their practice. It seems to follow that to develop their PKT,
prospective teachers must reflect on their experience. Learning
to teach therefore should require reflection, although it is not
clear (1) whether or not prospective teachers already have the
capacity for reflection, (2) what exactly they should reflect on,
(3) how they should reflect on it, and (4) whether reflection
leads to the fulfilment of the intended goal of learning to teach.

It should be obvious that taking reflection as a means to an end or an end in itself does not constitute a theoretical ground for program development. Perhaps, when trying to say something different about reflection, proponents of RTE could benefit from the advice that we should pay attention to the distinctions already made in ordinary language (Austin, 1961).

In its ordinary use, reflection is often used in the sense of projecting a mirror image, as in "we saw the reflection of the moon in the lake." Reflection can also be used to denote serious, purposive, and focused thinking. The second college edition of Webster's New World Dictionary of the American Language (Guralnik, 1972) has the following entry,

**Reflection** n. 4. a) the fixing of the mind on some subject; serious thought; contemplation  b) the result of such thought; ideas or conclusion, esp. if expressed in words. (p. 1193)

**reflective** adj. suggests an orderly, often analytical turning over in the mind with the aim of reaching some definite understanding. (p. 1053)

**reflect** vi. 4. to think seriously; contemplate (on or upon).

Reflection is not the random and aimless kind of thinking. Reflection is thinking a person engaged in with the aim of understanding what is being reflected upon. To reflect is to think about or contemplate on a subject seriously to reach some definite understanding. Academicians, teachers, and prospective teachers are all capable of thinking seriously about teaching. There is no doubt about that. The important question to be addressed at the programmatic level in teacher education is how
prospective teachers can, with the help of teacher educators, better control and direct their thinking in their effort to develop PKT.

Reflection as Retrospective Thinking

There is a tendency in the current discourse on RTE and in the academic literature elsewhere to treat reflection as thinking in retrospect. It is concerned with some past events. Something happens and you reflect on it so as to understand it better. In some sense, reflection as retrospective thinking does denote a way of getting to know things. Indeed, human learning often appears to follow the process neatly captured in the title of Dennison and Kirk's (1990) recent book on experiential learning, *Do, Review, Learn, Apply*. A teacher teaches a lesson, reflects on some aspects of it and, as a result, learns something from it. The teacher then applies the new knowledge to future lessons. The same would apply in learning to teach. Prospective teachers do some practice teaching and then reflect, either in solitude or with their supervising teachers or their peers, on some events or episodes of their practice teaching. By reflecting on their experience, prospective teachers develop their PKT.

The ordinary sense of reflection is suggestive, however, that we can think seriously not only about past events but also about what is happening at present and what we intend to make happen in the future. The fact is that teachers, and practitioners in any other fields of professional practice, do a lot of serious thinking before they go into their respective practice settings. Teachers plan their lessons for an entire
school year, for the coming month, for next week, for tomorrow. Lesson planning requires a lot of serious thinking that is not retrospective but rather prospective. Thinking about what I have done or has happened to me in the past may often get involved in thinking about what I am going to do, but thinking about what I am going to do requires much more than simply reflecting upon some prior experience. I think that the essence of professional preparation is really in thinking about what one intends to accomplish and how one would be able to accomplish it, not what has been done or has happened. Reflection as retrospective thinking has its pedagogical value but pales in significance when compared with the careful, responsible deliberations that precede intelligent action.

What is more, we cannot assume that thinking seriously about past experience will always contribute to the development of prospective teachers' PKT. In the final analysis, the development of PKT depends on what is being seriously thought about and how the serious thinking is done and for what purpose. What prompts teachers to reflect on past events of teaching? What enables teachers to reflect? How may teachers arrive at a new or better understanding of what they reflect on? How may the newly arrived understanding of past events contribute to the improvement of future practice? Neither the conceptual analyses nor the definitions of reflection can help us answer those questions.

Practically speaking, a teacher education program typically consists of four major components -- Foundational Studies, Curriculum and Instruction, Relevant Areas of Study, and the
Teaching Practicum. Each component is subdivided into different courses of study taught by individual faculty members who differ from one another in as many ways as we can think of. One major difficulty in program development in teacher education has been how to achieve thematic cohesion and coherence (Barnes, 1989).

Reflection understood as thinking in retrospect about some past events taking place in the context of practice teaching implies that teacher preparation would have to start with prospective teachers teaching in the classroom so that they could have something to reflect on. Program cohesion and coherence could be achieved by turning Foundational Studies, Curriculum Studies, and courses in other areas of study into a venue for prospective teachers to reflect on their practicum experience.

Many have, however, argued against sequencing teacher education in the manner of practice-theory-practice based upon the consideration that the powerful influence of socialization in the schools may have a negative impact on prospective teachers' professional growth (Buchmann and Schwille, 1983; Feiman-Nemser, 1983; Johnston, 1994; Zeichner and Gore, 1990). I would like to raise a different kind of concern here. I think that to be responsible for the welfare of the students who will be directly affected by prospective teachers' practice teaching and the welfare of prospective teachers themselves, some preparation should be required before practice teaching. I am not suggesting that the current practice of "theory first, and practice second" should be maintained, though. What is needed in teacher education is a better understanding of the role of theoretical knowledge and practical experience in learning to teach. I will
Reflection as Critical Analysis

Reflection is also often used in the sense of critical analysis. It has been suggested that current definitions of reflection are strongly influenced by the Western cultural heritage, which emphasizes analysis and problem-solving as opposed to negotiation, contemplation or enlightenment. ... an analytical method that stresses objectivity and emotional detachment. (Houston and Clift, 1990, p. 211)

Analysis may help save us from the paradox of preparation without reflection and practice teaching without preparation. In each and every program component, prospective teachers will be involved in reflecting about or analyzing, for instance, educational concepts, issues of gender, race, and class in education, their own educational experiences, values, beliefs, interests, and preconceptions about teaching and learning, the social and institutional conditions under which teachers teach and students learn, research findings on human development and effective means of instruction as well as what happens in the practicum setting.

We should be aware, though, that reflection here is treated as a pedagogical means, it is something for prospective teachers to do. There is nothing disputable about critical reflection guided by the democratic principles of justice, equity, and freedom. I believe it is necessary to have prospective teachers think about issues of gender, race, and class in education and the social and institutional conditions under which they will work. I also believe that there cannot be intelligent action
without an adequate understanding of the particular action context, even though I find the phrase "an action context" very hard to pin down since it has been used very liberally in the educational literature. If teaching could be legitimately considered to have a technical aspect, there should then be some room in the initial teacher preparation for prospective teachers to acquire minimum technical proficiency.

However, when we turn around to think about the development of a coherent and cohesive teacher education program, we know that it is not enough to assert the value of critical analysis, irrespective of what should get analyzed and how. A strong commitment to reflection from a particular value position alone does not provide a sufficient theoretical ground for RTE programs. A compromise between value positions will not be helpful either. We must, among other things, make sure that the underlying rationale of different levels or foci of reflection do not mitigate the influence of one another. We must also make sure that analysis in each and every component area of study will contribute to the overall goal of prospective teachers' development of PKT. But how? Analysis, like retrospective thinking, has its pedagogical value, but will not fare any better as an organizing theme for the development of RTE programs.

**Practical Difficulties of RTE**

Disagreement on what ends to achieve in teacher preparation aside, advocates of RTE seem to be quite unanimous in believing in the instrumental value of reflection. What complicates the matter is that in order for prospective teachers to realize the
instrumental value of reflection in achieving the chosen ends of their professional preparation, they must in the first place be capable of engaging in reflection. If reflection denotes the most important outcome of an RTE program and if prospective teachers already have the capability of reflection, teacher education would hardly be necessary. Or perhaps, reflection is just a matter of degree and perspective. In that case, RTE programs should aim at helping prospective teachers to become more reflective. But more reflective in terms of what?

The confusion between means and end seems to disappear when reflective practice is associated with what experienced practitioners are capable of doing when they are caught up in problematic situations. Common sense tells us that compared with experienced teachers, prospective teachers can be expected to lack the kind of PKT that competent teaching requires. Or to use some academic terminology, they will lack the meta-cognitive schematic structures, or "automaticity, spontaneity, immediacy," that enable experienced teachers to handle classroom situations effectively and with ease. Once reflection comes to be associated with experienced teachers' expertise, a program goal of developing prospective teachers' reflective capacity seems to be justified.

The development of prospective teachers' reflective capacity can also prove to be a difficult task, however. In developing a conceptual framework for reflection in preservice teacher education, LaBoskey (1993, 1994) places prospective teachers into the categories of Alert Novices and Common-sense Thinkers.

One of the distinctive qualities of Alert Novices seems
to be the desire to know. Driven by their 'passionate creeds' and 'why' questions, they appear to be internally motivated to engage in both spontaneous and structural reflection, sometimes despite their own misgivings. The Common-sense Thinkers may not only be without these personal purposes, they may also have interfering attitudes, emotions and values. (LaBoskey, 1993, p. 32)

Similarly, Korthagen (1985, 1988) differentiates prospective teachers in terms of an internal orientation (self-directed) vs an external orientation (preferring being told what to do).

LaBoskey suggests that Common-sense Thinkers have difficulty engaging in reflective exercise for the lack of either the necessary cognitive abilities or the requisite dispositions and attitudes. If the teacher education institution cannot simply keep Common-sense Thinkers from entering its door, it must take on the difficult task to design appropriate educational experiences that will induce desirable changes in prospective teachers' cognitive ability as well as dispositions and attitudes. But what experiences are conducive to the Common-Sense Thinkers' development of PKT? At the same time, one also wonders what kind of educational experiences should be provided to Alert Novices. I do not suppose that Alert Novices or those with an internal orientation towards learning to teach could be left on their own.

Teacher educators have created structural conditions and designed various strategies to support, encourage, initiate, and facilitate reflective practice among prospective teachers. Common among those conditions and strategies are action research, ethnography, journal writing, reflective coaching in supervision, curriculum analysis and development, and the methodology of
reflective teaching (Zeichner, 1987a). The effectiveness of these and possibly other strategies for achieving the end of developing prospective teachers’ reflective capacity of teaching remains an open question. Richert’s (1992) study suggests that prospective teachers choose to reflect on different things in different manners under different conditions. It gives little indication on what form of reflection is more conducive to the development of PKT and competent practice.

Although reflective practice is generally accepted as a desirable end and a means for achieving that end in RTE, some have expressed doubt about the desirability of having it as a central focus in preservice teacher education (Berliner, 1988; McIntyre, 1993). McIntyre (1993), for instance, suggests that "reflection is a much more central means of learning for experienced practitioners, than it can or need be for novices" (p. 43). McIntyre argues that learning to teach requires novice teachers to consciously deliberate about the nature of expertise to be developed, whereas experienced teachers need reflection to examine the hidden assumptions underlying their established aspects of classroom expertise. Besides, novice teachers do not have the kind of rich repertoire of exemplars to enable them to think creatively about their experience. They therefore have to draw ideas from external sources.

Hatton and Smith (1995), Zeichner and Liston (1987) have discussed several problems that may frustrate teacher educators' efforts to engage prospective teachers in the kind of reflective exercise designed to help them in achieving the intended outcome of their professional preparation. Reflective exercises may be
perceived to be an academic pursuit that focuses on analyzing abstract educational ideas from narrow disciplinary perspectives. Prospective teachers' prior knowledge may dispose them to reflect on some selective educational phenomena but resist others. Prospective teachers may not have an adequate knowledge base to inform their reflective exercise or they may not understand the concept of reflection itself. Often institutional structural constraints do not allow prospective teachers the time and opportunity to engage in reflective exercise. Besides, teacher preparation involves not only prospective teachers and teacher educators but also classroom teachers and school principles and others. People may react differently to demands for reflection, and even within programs, faculty members may take different ideological positions towards it.

These problems are not peculiar to RTE. They are the same kind of problems associated with traditional modes of teacher preparation. Prospective teachers bring with them their prior knowledge about teaching, on the basis of which they interact with the learning environment in their teacher education program. It can always be expected that prospective teachers will lack the background knowledge, understanding, skills, and dispositions for engaging in the kind of intellectual exercises designed for them in the program. Teacher education has never been conducted under ideal conditions. Time is always short and expectations differ. Everybody, including prospective teachers themselves, has an idea of what things are important and how things ought to be done. It may also be discerned that many of these practical problems are really contingent upon the hidden presumptions about professional
knowing and learning to teach inherited from times past.

Summary

In this chapter, I have looked at the perplexing phenomenon of RTE mirrored in the recent attempts to clarify its conceptual background. It is tempting to think that the conceptual difficulty with RTE originates in the multiple conceptions of reflective teaching/practice/inquiry due to the lack of a common professional language within the teacher education community. It does appear so, for teacher educators have been improvising RTE in many different ways and categorizing the many improvisations again with different analytical frameworks. But, the conceptual difficulty interpreted as a definitional issue could hardly be ever resolved. How could individual teacher educators be expected to give up their idiosyncratic conceptions of RTE on the ground that there are too many of them, granting that the conceptions were improvised out of well-meaning and well-reasoned considerations, firmly supported by ideological commitments as well as personal beliefs and interest?

However, when we reframe the problem of RTE and ask instead about the epistemological grounding of various programs under that attractive title, Feiman-Nemser's (1990) observation is vindicated that RTE does not constitute a conceptual orientation. Without its conceptual power, reflection becomes a slogan prone to meaninglessness where it may serve comfortably as an aim for any and all types of programs. The potential for the concept to make a genuine contribution to educational reform is thereby seriously weakened. (Bullough, 1989, p. 15)
I share the concern expressed by Cohen (1991), Munby and Russell (1993) over the tendency to orient the discourse on RTE away from a question of knowledge in relation to professional practice, reducing it to a matter of a pedagogical technique or an issue of ideological disputation. To establish RTE as an alternative approach towards teachers' initial preparation and continuing professional development, we should be clear about the kind of epistemological understanding of PKT and learning to teach that could inform programmatic deliberations under that umbrella term.

Thinking about RTE in terms of PKT and learning to teach, I believe, will enable us to deal with those apparent contradictions at the practical level of program organization. Examples of some of these contradictions include: building up a theoretical knowledge base versus learning from practical experience; rejecting the Technical Rationality model versus developing minimum technical competency; the need to reduce pressures on prospective teachers on the ground that they are learning versus the demand to give them full responsibility as a necessary condition for learning; the interest in the broad educational and social issues that seem to transcend the particular classroom contexts versus the compelling practical interest in meeting the particular demands of classroom teaching. Questions of PKT, professional knowing, and learning are important because, to quote Soltis again,

The point, again, is to see that the more adequate our grasp of what we understand as 'knowledge', the more we can consciously, responsibly, and morally play the role of educator.

Calderhead (1989) observes that "ideal models of reflection are
offered but little is known about how they might operate in practice, how they compare with other forms of reflection, or in which contexts they might be appropriate" (p. 46). I believe that it is highly advisable and morally responsible for teacher educators to assess the epistemological and conceptual grounding of their preferred models of RTE. The epistemological and conceptual question cannot be avoided even when it comes to seeking facts about the operation of different models of RTE in practice within specific institutional contexts. For facts to be meaningful, we must answer the questions of what the facts are claimed to be about and how they are supported.

Whereas the literature on RTE needs to be enriched by an adequate understanding of PKT, professional knowing, and learning to teach, it is replete with references to Schön’s works on practitioners’ reflective practice and Dewey’s idea of reflective inquiry. Munby and Russell (1993) insist that, in doing research on reflective teaching and developing RTE programs, we should pay attention to the epistemological significance of the concept of reflection in Schön’s work. But does Schön’s thesis entail the kind of epistemological understanding in which RTE could be secured as an alternative conceptual orientation towards teacher preparation?
Chapter III: Schöns Epistemology of Practice

The widespread interest in RTE is, as it has been noted, often attributed to Schöns work on professional knowing. With the publication of his two books The Reflective Practitioner in 1983 and Educating the Reflective Practitioner in 1987, Schöns has been recognized by many for his contribution to our understanding of professional knowing of and in practice. To be sure, Schöns is not the first person to use the term "reflection" in theorizing about the problem of knowledge in relation to practice, yet he could well be credited for making it a household term in the current discourse on teacher education.

Central to Schöns epistemology of practice is the idea of professional knowing described as a process which he calls "reflection-in-action." This notion of "reflection-in-action" has been adopted as an important theoretical construct for research on teachers' professional knowledge and has frequently appeared in discussions on RTE program development (Calderhead and Gates, 1993a; Clarke, 1992; MacKinnon, 1987; Grimmett and Erickson, 1988; LaBoskey, 1994; Russell and Munby, 1992; Valli, 1992a). Schöns himself, though, has not related his epistemology of practice systematically to the mundane issues concerning program development as well as the pedagogical practices in teacher education. No RTE programs, as far as I know, have actually been explicitly grounded in principle in Schöns epistemology of practice. The discussion in this chapter will address two questions: 1) What is Schöns epistemology of practice? and 2) does it offer an adequate and defensible
theoretical thesis on professional knowing that could provide a secured epistemological ground for developing RTE programs?

Schön's Epistemology of Practice

Schön's treatise on the epistemology of practice begins with the observation that in meeting our social and personal needs in life, we have come to depend more and more upon the services of professionals. This fact of modern life seems to be readily taken as given. What is of great concern to Schön (1983) is that the professions are in the midst of a crisis of confidence and legitimacy.... The long-standing professional claim to a monopoly of knowledge and social control is challenged -- first, because professionals do not live up to the values and norms which they espouse, and second, because they are ineffective. (p. 11)

When this crisis is considered along with the question of professional knowledge, some professionals see it as "a mismatch of traditional patterns of practice and knowledge to features of the practice situation -- complexity, uncertainty, instability, uniqueness, and value conflict" (p. 18). While regarding it as "a laudable exercise in self-criticism," Schön is not content with such a diagnosis. In his view, the crisis of confidence and legitimacy in the professions lies much deeper with the customary way of thinking about professional knowledge and practice, what he refers to as the model of Technical Rationality rooted in the philosophical doctrines of positivism pervasive in the institutional context of professional life.

According to the model of Technical Rationality ... professional activity consists in instrumental problem solving made rigorous by the application of scientific theory and technique. (p. 21)
Technical Rationality assumes that ends of professional practice can be pre-established based on specialized knowledge and the means for achieving the pre-established ends can also be obtained through rigorous scientific research. This means, practically speaking, social scientists who conduct basic research discover principles and laws that govern human conduct and supply them to their colleagues in applied science. The latter turn the principles and laws into diagnostic problem-solving techniques. Practitioners of professional social services play the role of an instrumental problem-solver, selecting and applying the best technical means made available by systematic, preferably scientific, research in meeting pre-defined objectives in the delivery of their service. Professional practice depends on or should be grounded in scientific knowledge.

Schön does not examine the fundamental presumptions underlying the positivist conception of science and knowledge and the practical implications for professional education. Instead, he faults the model of Technical Rationality from the perspective of practice. Technical Rationality presumes agreement about ends and emphasizes problem solving through the application of scientifically proven means best suited to established ends in practice. But the fact of professional life is that, argues Schön, the "specialized, firmly bounded, scientific and standardized" knowledge simply cannot meet the particular demands of practice. This is because

In real-world practice, problems do not present themselves to the practitioner as given. They must be constructed from the materials of problematic situations which are puzzling, troubling, and uncertain. (p. 40)
Schön also points to the fact that competent practitioners are able to find ways to understand complex problematic situations, restructure strategies of action against uncertainty and indeterminacy, break the conventional boundaries of normative practice, and make a thoughtful choice among conflicting values, goals, and interests in their respective fields of professional practice. This observation leads Schön to believe that there is a kind of professional knowing that the model of Technical Rationality fails to account for. He goes on to assert that

If the model of Technical Rationality is incomplete, in that it fails to account for practical competence in 'divergent' situations, so much the worse for the model. Let us search, instead, for an epistemology of practice implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness, and value conflict. (p. 49)

It is clear that Schön is inquiring about a kind of tacit knowing inherent in the performance of competent practitioners in dealing with problematic situations in practice. Tacit knowing is not available to direct observation and cannot be readily put into propositional statements. It only reveals itself in the spontaneous behaviour of skilful performance. How would it be possible for Schön to get at this kind of knowing which cannot be directly observed? Schön suggests that it is possible to construct a model of professional knowing through an analysis of the structure of what he refers to as the process of reflection-in-action. He then presents a number of case descriptions of competent performance observed in such diverse professional fields as architecture, psychotherapy, engineering design, city planning, and a master class of music performance to illustrate
Schön's Model of Professional Knowing

At the core of Schön's model for representing professional knowing of and in practice is the notion of "reflection-in-action," which is

an ephemeral episode of inquiry that arises momentarily in the midst of a flow of action and then disappears, giving way to some new event, leaving in its wake, perhaps, a more stable view of the situation. (Schön, 1992, p. 125)

Reflection-in-action is distinguished from "knowing-in-action" and "reflection-on-action." Schön (1987) states in Educating the Reflective Practitioner that the notion of knowing-in-action refers to

the sorts of know-how we reveal in our intelligent action -- publicly observable, physical performances like riding a bicycle and primate operations like instant analysis of a balance sheet. In both cases, the knowing is in the action. We reveal it by our spontaneous, skilful execution of the performance and we are characteristically unable to make it verbally explicit. (p. 25)

The tacit and spontaneous knowing-in-action is said to enable a practitioner to deal with day-to-day familiar situations through a sequence of routine activities without having to think about what is being done. Yet, from time to time, in the midst of action, a problematic situation or surprise may arise and threatens to interrupt the smooth execution of the routine sequence of action. Under such circumstances, the practitioner must respond to the situation by way of reflection-in-action.

There is some puzzling, or troubling, or interesting phenomenon with which the individual is trying to deal. As he tries to make sense of it, he also reflects on the understandings which have been implicit in his
action, understandings which he surfaces, criticizes, restructures, and embodies in further action. It is this entire process of reflection-in-action which is central to the "art" by which practitioners sometimes deal well with situations of uncertainty, instability, uniqueness, and value conflict. (Schön, 1983, p. 50)

In their day-to-day work, practitioners encounter problematic situations constantly. Schön quotes an eminent physician claiming that "85 percent of the problems a doctor sees in his office are not in the book" (p. 16). Since competent practitioners are said to engage in reflection-in-action to resolve unfamiliar, unique situations frequently occurring in action, the case seems to be made that "reflection-in-action is centrally important to the artistry of competent practitioners" (Schön, 1992, p. 125).

One crucial function of reflection-in-action is what Schön calls problem setting or problem (re)framing (see also Rein and Schön, 1977, 1991; Schön and Rein, 1994). A surprise arising in the midst of action has first of all to be noted and perceived to be presenting a specific problem to be dealt with. The general practice of medical care is analogous. A family physician notices the presence of a patient in the office who complains of a headache. The physician gathers the patient's symptoms as well as other relevant information and determine what kind of a medical problem the patient has. When the case is complicated, it may take the physician several diagnoses to determine what exactly is the problem. In other words, the initial, tentative diagnosis will be reframed until a definitive one is reached. The physician then decides on the kind of treatment that would best suit the patient. If the patient shows no improvement after
the treatment, the physician will have to look at the case again, following the same process.

Reflection-in-action involves what Schön calls "a reflective conversation." When responding to a problematic situation in action, a practitioner is said to be engaged in "a reflective conversation with the materials of the problematic situation at hand", listening to the "situation's backtalk" as a result of the inquirer's appreciation of the surprise and experimenting with strategies and procedures of on-the-spot improvisation. Through this complex process of reflection-in-action, the practitioner resolves the problematic situation.

I understand from reading some of the philosophical literature that the problem of knowledge concerns not only what we know ("the context of justification") but also, more importantly in view of professional education, how we come to know in the first place ("the context of discovery"). A robust epistemological theory of knowing in relation to human conduct thus needs to account for knowing not only in the sense of coming to know but also in the sense of having knowledge. A bifurcated account of knowing that emphasizes the process of coming to know is as incomplete and prone to disputation as one that is only concerned with the justification of knowledge claims.

What is odd about Schön's epistemology of practice is that it seems to juxtapose knowing in the sense of having knowledge and knowing in the sense of obtaining knowledge in the realm of professional practice. Experienced practitioners are said to be in possession of a kind of professional knowing which differs from propositional knowledge written in the books. This kind of
knowing is then described as a process of reflection-in-action. Schö

Schön seems to suggest that so long as we recognize competent performance of professional practice in resolving situations of uncertainty, uniqueness, and conflict, we could forego questions about what it is that competent practitioners know. Competent practitioners' knowing of practice is tacit and intuitive, not the propositional kind that can be analyzed and judged on the basis of its internal logic or empirical evidence. Hence we cannot apply what Fenstermacher (1994) refers to as the "standard analysis" to evaluating the epistemic merit of practitioners' knowing of and in practice.

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Eraut (1994), as a metaphorical exposition on human cognition in diverse problematic situations in practice. But Schön's model of professional knowing is not adequate for advancing our current understanding of professional knowing for the benefit of improving practice. Schön conjectures that there is a kind of tacit knowing implicit in competent practitioners' performance in resolving problematic situations in action. Competent performance reveals the tacit kind of knowing of and in practice. This tacit kind of knowing is described in terms of a process of reflection-in-action, which is not available to observation. To make the case, there is nothing else but the observation of competent performance. The model is inadequate also because of its internal conceptual difficulties and practical implications for professional education. I will now turn to a critical assessment of Schön's epistemology of practice.

Critical Assessment of Schön's Epistemology of Practice

Teacher education is a field of practical endeavour. Teacher educators, who design programs, teach various foundational and methods courses, and supervise practice teaching, are susceptible to, and at the same time, suspect of various kinds of external influence. In the case of Schön's epistemology of practice, the teacher education community has approached it with mixed reactions. Some teacher educators embrace it with enthusiasm, sometimes with a note of caution though (e.g., Clarke, 1992; Erickson and MacKinnon, 1991; MacKinnon, 1987; Munby and Russell, 1989, 1993; Schön, 1991), and others find fault with it from their respective positions (Adler, 1991; Berrie, 1992; Eraut, 1994;

Three lines of criticism levelled at Schön’s epistemology of practice are particularly pertinent to programmatic deliberations in teacher education. These lines of criticism point to the internal conceptual difficulties in Schön’s thesis (Eraut, 1994; Grimmett and Erickson, 1988, chapters 9, 10, and 11; Pearson, 1989), Schön’s disposition towards the relationship between scientific knowledge and professional practice (Fenstermacher, 1987, 1988; Shulman, 1987b, 1988), and a perceived narrow focus on the world of practice (Adler, 1991; Liston and Zeichner, 1991; Ross, 1992; Selman, 1988). I will subsequently discuss each of these three areas of critique.

Schön’s Conceptual Difficulties

Coombs and Daniels (1991) advise us that

if our conceptual structures lack logical coherence, blur important distinctions, or create useless dichotomies, or if we understand them so poorly that we are unable to translate them adequately into research instruments and policy prescriptions, curricular policies and research studies will fail to be fruitful. (p. 27)

The conceptual difficulties inherent in Schön’s epistemology of practice should be dealt with first.

Knowing vs. doing

Central to Schön’s analysis of professional knowing which is revealed in a practitioner’s competent performance of resolving problematic situations in practice are the notions of knowing-in-
action and reflection-in-action. Knowing-in-action is the kind of tacit knowledge we reveal in what we do. In a reverse order, routine performance reveals tacit knowledge, at least the know-how kind.

Reflection-in-action, on the other hand, is described as a process which involves taking note of and responding to surprises or problematic situations. When, for instance, Dorothy’s daily driving route to work is blocked by a detour sign, she will, a la Schön, reflect-in-action, taking note of the situation, decoding the sign, thinking about and deciding what alternate action to take. Reflection-in-action seems to denote a succession of mental activities of a person in responding to and resolving an unfamiliar situation and implies at the same time a capacity for doing so in dealing with unfamiliar situations. It is pertinent here to ask what enables practitioners to reflect in action. Schön’s answer to the question is quite straightforward. Over the years,

The practitioner has built up a repertoire of examples, images, understandings, and actions... [which] includes the whole of his experience insofar as it is accessible to him for understanding and action. (Schön, 1983, p. 138)

He further suggests that

The artistry of a practitioner... hinges on the range and variety of the repertoire that he brings to unfamiliar situations. Because he is able to see these as elements of his repertoire, he is able to make sense of their uniqueness and need not reduce them to instances of standard categories. Moreover, each new experience of reflection-in-action enriches his repertoire... Reflection-in-action in a unique case may be generalized to other cases, not by giving rise to general principles, but by contributing to the practitioner’s repertoire of exemplary themes from which, in the subsequent cases of his practice, he may compose new variations. (p. 140)
Schön stops short there. It seems to me reasonable to infer from the two statements quoted above that the level of artistry displayed in a practitioner's competent performance is related, quite obviously, to the range and variety of the repertoire the practitioner brings to an unfamiliar, unique situation. The greater the range and variety of the repertoire a practitioner brings to the situation, the more alternative ways there will be for the practitioner to make sense of it. A repertoire of a narrow range and variety will put a limit to a practitioner's ability to respond to a problematic situation.

Presumably, when an experienced practitioner and a novice encounter a surprise in action, both would respond to it. What makes the difference in the eventual outcome would be the richness of the personal repertoire each of the two brings to the surprise and with which each of the two reflects about and deals with the surprise. The novice's repertoire has a limited range and variety. This makes it difficult for the novice to get a proper sense of the surprise encountered. Consequently, the novice will not be able to get the same result the experienced practitioner is able to achieve.

My reading of Schön's exposition also suggests to me that the tacit knowing inherent in competent professional practice is dependent on a combination of several factors: 1) a problematic situation or surprise experienced in the midst of action, 2) the process of reflection-in-action in response to the situation, 3) a working repertoire as the cognitive basis of reflection-in-action, and 4) successful resolution of the situation.

The first three factors are self-evident. The process of
reflection-in-action requires that there is something to reflect about (a surprise in action) and something to reflect with (a repertoire). The fourth factor that evidence of competent performance that leads to or predicts the successful resolution of a problematic situation will be required to make a case of reflection-in-action needs some qualification. It could be argued that reflection-in-action does not necessarily always lead to successful resolution of a problematic situation in action. This argument is acceptable as long as we are only concerned with a cognitive process in the context of a problematic situation in action, irrespective of whatever outcome the process eventually leads to. But it certainly will not take us very far when we want to better understand the kind of professional artistry to which Schön draws our attention. This is not only that the kind of professional knowing Schön describes is inferred from the observation of practitioners' competent performance in resolving unfamiliar situations in action. Also, if both novice and experienced practitioners will reflect in action but produce different outcomes, one wonders whether reflection-in-action is central to professional artistry that competent practitioners display and novice practitioners are yet to develop. May we also conclude then that which makes the difference in performance outcome rather than the cognitive process of reflection-in-action is really central to (our understanding of) professional knowing, to professional artistry?

The process of reflection-in-action itself is admittedly a complex one as Schön makes of it. When caught up in an unfamiliar situation, the practitioner has lots of things to
think back and forth about, (re-)frame the situation, engage in a reflective conversation with the materials of the situation and experiment with strategic moves improvised on the spot. However, complex as it is, the process of reflection-in-action will unlikely be possible without the cognitive base of a working repertoire. For this reason, shouldn’t professional knowing be better understood in terms of the practitioner’s repertoire instead of reflection-in-action? Wouldn’t it be more advisable to consider knowing in practice as an inquiring person, with his/her working repertoire, interacts with the materials of a problematic situation? That would allow us to further explore the nature of a practitioner’s professional repertoire and ask how competent practitioners in their respective fields of professional practice build up their repertoire as rich as it would enable them to resolve problematic situations through reflection-in-action.

Reflection-in-action

In reading Schön’s description of an architect’s studio, Eraut (1994) points out that Schön makes it quite clear that he regards the ‘action’ as being the design process rather than the teaching process.... Presumably the design process is normally a relatively silent deliberative process combining thinking, sketching and accurate drawing over a long period of time. Yet Schön treats it as an archetypal example of reflection-in-action, without actually stating which parts or aspects of the master designer’s behaviour are reflective and which are not. (p. 146)

On my part, I wonder if a physician is prompted to reflect-in-action only by those 85% of the cases that are not written in the book. But even for the 15% cases that are written in the books,
it is very unlikely that they would present themselves as pre-determined in practice. Their particular features have to be identified as representing those cases written in the books. In other words, in professional practice, framing will always be required of both competent practitioners and novices, whatever situations they are dealing with. Or, perhaps the physician engages in reflection-in-action only when there is a surprise arising in treating any individual case, whether or not the case has been written in the books. If there is no surprise in action, knowing-in-action will suffice. Reflection-in-action is required only when there is a unique, unfamiliar problematic situation occurring in the midst of action.

Some readers are doubtful about the possibility of reflection IN action. Court (1988), for instance, argues that Schöns examples seem to illustrate several rather different kinds of 'reflection-in-action' and most, upon examination, appear to involve removing oneself from the action in order to reflect. [It seems that reflection] requires a time out, albeit a brief one, from the action. (pp. 145-146)

Eraut (1994) observes that many of [Schöns] long examples fail to provide any evidence that reflection-in-action is occurring, and in several examples, including all those from science, engineering and management, reflection-on-action appears to have been at least as likely a cause of reframing as reflection-in-action. (p. 148)

In their essay review of Schöns two books on reflective practice, Munby and Russell (1989) suggest that the confusion about reflection-in-action and reflection-on-action may have to do with how the phrase of reflection-in-action is read. They write,

Several years of research activity in which we have
attempted to apply and better understand the term 'reflection-in-action' have led us to realize that this phrase so central to Schön's argument is easily misread, by focusing on reflection rather than on action. 'Reflection' typically suggests thinking about action, but the crucial phrase on our reading is 'in-action'. The reflection that Schön is calling attention to is in the action, not in associated thinking about action. (p. 73)

But, this sympathetic move from "reflection" to "in-action" gives little help to these two reviewers themselves in getting a clear sense of

what Schön’s cases are cases of [and what] case studies as examples of what happens when reflection-in-action begins, as examples of what causes it to begin, and as examples of what the precise conditions are that would assure us that it is occurring. (p. 74)

Elsewhere, Russell and Munby (1991) state that

From the researcher's perspective, reflection-in-action is difficult to detect and challenging to document. While we find observation of teaching essential to the process of interviewing teachers about their professional activities and professional knowledge, we would not expect to observe directly the "event" of reflection-in-action. (p. 185)

According to Schön (1987),

[reflection-on-action] has no direct connection to present action, [whereas reflection-in-action] occurs in an action-present -- a period of time, variable with the context, during which we can still make a difference to the situation at hand -- our thinking serves to reshape what we are doing while we are doing it. (p. 26)

The distinction between reflection-on-action and reflection-in-action in terms of being able to make a difference to the situation at hand seems unmistakable. Schön is talking about a kind of knowing inherent in competent professional practice in resolving unique situations arising in action. It would not make much sense to talk about competent practitioners displaying their professional artistry while disregarding what they actually
accomplish.

Let us follow Munby and Russell's sympathetic move and focus our attention on the phrase "in-action" and take a look at Schönh's idea of reflection-in-action from a different angle. The question to be raised here is what is meant by "action-present" or "in action." Take an artist doing an oil painting for example. If we use the phrase "in-action" in the sense of during the entire range of activities leading the artist from the moment of having the idea of painting a picture to the completion of the painting, we may infer, a la Schönh, that anything the artist does during the process could be the artist's response to some kind of a surprise, although we cannot be sure that there is a surprise the artist is responding to. If the artist is not responding to a surprise, then whatever the artist does would be part of her routine activity.

We may narrow the action-present frame of reference to the mixing of colours. Suppose that in the process of mixing colours to get a desired shade, some surprise occurs. The artist notices the surprise and responds to it. As a result, the artist is able to get a different shade than the one she originally desired, thereby bringing some unique feature to the painting she is working on. There does not seem to be anything ambiguous or confusing about reflection-in-action.

Perhaps, the confusion may have something to do with the way Schönh tries to describe reflection-in-action. Schönh describes reflection as a process of mental doing. In other words, reflection-in-action constitutes "action." It may thus create an impression that there has to be some time lapse between the
activity of reflection and some other activity or anything that precedes or is preceded by reflection. Such confusion could perhaps be avoided when the phrase reflection-in-action is written as reflection-about a problematic situation-in an action present. In the phrase "reflection-on-action," action refers to the object that a person reflects on, whereas in "reflection-in-action," action denotes a specific context in which reflection takes place. Reflection aims at resolving a problematic situation that occurs within that context. The resolution of the problematic situation bears direct consequence on the course and outcome of (a predesigned program of) action.

It is perhaps helpful to remind ourselves that descriptions of competent performance are not descriptions of professional knowing in and of practice. Doing this or that itself is not knowing. Observed competent performance of resolving problematic situations in action provides at best the circumstantial evidence upon which knowing may be conjectured. What Schon says is involved in the process of reflection-in-action is imaginative.

There is another complication in regard to "action present." The question is what constitutes the action context in which a problematic situation arises and reflection-in-action occurs in response to it. As Court (1988) suggests, a teacher can be said to be reflecting about a situation that occurred during a lesson she taught a few minutes ago or last week. No matter how she reflects about the situation, she cannot bring any change to the outcome of that particular lesson. So we have a case of reflection-on-action. However, the same teacher can also be said to be reflecting-in-action when the lesson constitutes part of a
larger unit of instruction. By reflecting about the same situation, the teacher may be able to do something about it in a subsequent lesson, increase her understanding of teaching, enrich her teaching repertoire, and make adjustments in her long-term teaching strategies. The action present now becomes more extensive than a single lesson that took place in the past. In this sense, the teacher's reflection on the situation becomes reflection-in-action. However, when the action frame becomes extensive in time and place, it may be difficult to see clearly to what situation at hand reflection-in-action responds and how reflection-in-action helps to make a difference to the situation. If a design project constitutes a problematic situation that provokes reflection-in-action, what is its action present?

It is easy to understand why novice practitioners are unable to respond adequately to problematic situations in practice. It is largely because they do not have the kind of knowing that makes competent performance of professional practice possible, not that they do not reflect in action. We also have cases where very intelligent and decent professional people fail to resolve their problems, no matter how hard they try. Worse still, sometimes, a lot of hard thinking even leads them to erroneous decisions that result in serious undesirable or disastrous consequences. In those cases, we could assume that those intelligent and decent professionals had also reflected in action. If reflection-in-action could also lead to failure to resolve a unique, unfamiliar situation in action, on what ground could one assert that reflection-in-action is central to the artistry of competent professional practice? Do we ever
associate competent professional practice with failure to solve problems?

We also know that sometimes it is possible for two persons to engage in reflection-in-action in response to the same problematic situation but come up with two different solutions. For instance, Dorothy runs into a detour sign on her way to work, she reflects about the situation at hand and decides to take an alternate route. When Dorothy’s co-worker, Gloria, comes to the detour sign, she too reflects about the situation at hand but ignores the detour sign and drives right through. Imagine that Dorothy is late for work and Gloria gets to the work place on time as usual. If getting to work on time were the criterion for judging competent performance in these two cases, we might say that only Gloria had engaged in reflection-in-action, which is evidenced in her getting to work on time. If we use a more complicated evaluative scheme for judging competent performance in this case and take other things into account, we will come to a very different conclusion.

The example used above is admittedly trivial but it helps to bring up the point that talking about professional knowing inherent in competent performance also involves the question of what criteria we use for judging competent professional practice, even in the context of dealing with problematic situations. "What works" is too vague to be useful. When criteria for judging competent professional performance are in doubt or in dispute, it becomes difficult to talk about professional knowing in terms of reflection-in-action.

Eraut (1994) remarks candidly that "to rescue Schöön’s
original contribution from this morass, I believe it is necessary to take the term 'reflection' out of his theory, because it has caused nothing but confusion" (p. 148). Eraut also suggests that we view schön's work as contributing to a theory of meta-cognition to account for practitioners' competent performance in diverse situations. For exploring the cognitive process involved in the context of problematic situations in action, Schön's other metaphors such as "conversation with the situation" and "the situation's backtalk" seem to me to be more useful. Yet, reflection-in-action is the pillar stone of the epistemology of practice Schön proposes to replace the model of Technical Rationality. Without the notion of reflection-in-action, there will not be much left of his epistemology of practice.

"Seeing ... as ..."

Pearson (1989) challenges Schön's clarion call to abandon the model of Technical Rationality. Focusing on two central features of reflection-in-action, namely, problem setting and on-the-spot experimentation, Pearson argues that whereas Schön has rightly criticized the model of Technical Rationality for the omission of problem framing in dealing with indeterminate situations, he has not made a case for abandoning the model.

Recall that Schön bases his argument for a new epistemology of practice on the observation that "in real-world practice, problems... must be constructed from the materials of problematic situations which are puzzling, troubling, and uncertain." According to Schön, each and every unfamiliar situation is a unique case in its own right and therefore has to be dealt with
as such. What the practitioner does or must do is to frame and reframe a situation into a problem that can be dealt with.

Pearson argues that

to see something as something else is to see it under a description.... To put some case under a description is to see the case as an instance of a general type. In Schön's process of problem setting, once the problem has been set by reframing it in terms of some other general descriptive category it would not seem to be unique any more.... Once the situation has been formulated as an instance of a general type, the practitioner can use the standard theories and techniques for situations of this type. (p. 32)

An example from Schön's (1983) own text is illustrative. The teachers who participated in the MIT Teacher Project were shown a video-tape of two boys playing a game in which one player gave out instructions and the other put some blocks of various colours, shapes, and sizes into a structure according to the instructions given. At one moment, something happened and the game became chaotic. The teachers noted the situation and interpreted it as presenting "a communication problem" on the part of the player who received instruction.

After being prompted to a small detail which they had failed to notice, the teachers came to a different interpretation of the situation. It appears to me that the teachers already possessed two different interpretive frameworks for framing the situation. One helped them to interpret the situation as presenting "a communication problem" on the part of one player and the other enabled them to "see" the situation quite differently, with the added information. (Note: The original purpose of the teachers viewing the video was different from my discussion here.) As far as setting the problem and what comes after are concerned,
Pearson concludes that Schön's model is little different from the Technical Rationality model.

Pearson suggests that Schön may reject his challenge on the ground that when a practitioner makes sense of a situation he perceives to be unique, he sees it as something already present in his repertoire. To see this as that is not to subsume the first under a familiar category or rule. It is, rather, to see the unfamiliar, unique situation both similar to and different from the familiar one, without at first being able to say similar or different with respect to what. (Schön, 1983, p. 138)

In response, Pearson further contends that Schön has not made a clear distinction between "seeing... as..." and category subsumption. In Pearson's view, the use of "seeing... as..." implies category subsumption. Pearson is only partially right, though, in noting that the term which follows "as" is a categorical term, grammatically speaking. But seeing something as something else can differ from category subsumption also in what comes after "seeing."

The term following "seeing" may refer to some unspecified object (an indeterminate situation) to be put under some general category, provisionally or definitively. In subsuming something under a general category, the object of interest is yet to be known, to be specified, for instance, the thing on my desk, an animal or even a dog. The question to be asked is whether or not the object of interest is a particular case of a general type. Is the thing on my desk a telephone? Is that animal a dog? Is that dog a spaniel? Does the defendant's behaviour constitute contempt of court? Does the puzzling situation present a problem of X, or Y, or Z? To be sure, in verbal communication, the act
of subsuming something under a general category may not actually require the employment of the phrase "seeing ... as...."

More often, "seeing...as..." is implied in a metaphorical expression, in which case, what comes after "seeing" denotes something already subsumed under a general category, as, for instance, the product developers seeing a paintbrush as a pump in one of Schön’s examples. In the metaphor "the paintbrush as a pump," "paintbrush" apparently denotes a general type of thing. It was the design of paintbrushes, not an unknown something, that the product developers were trying to improve. Paintbrushes and pumps are two different types of things. One cannot be subsumed under the other and vice versa. Seeing something of one general category as something else of a different category is thus distinctively different from subsuming something unknown under a general category. It is possible, though, to subsume two general categories of things under one broader category, such as magazines and newspapers under the category of print material. But that is a different matter.

Schön’s use of "seeing...as..." can now be reconsidered. On the one hand, a particular case of a general type could always be expected to possess some unique features of its own. Paintbrushes are of different sizes and made of different materials. To the extreme, we may even say that no one paintbrush is exactly the same as another. However, whatever unique features a particular paintbrush may have, it nonetheless belongs to a general type of thing called paintbrush. Likewise, we may say that no problematic situation is exactly the same as another. But that does not mean that each and every situation constitutes a type of
its own. Until an experienced indeterminate situation is understood as presenting a particular kind of problem, that is, subsumed under a general category of problem, provisionally, one does not know what it pertains to. To frame an indeterminate situation into a problem that can be meaningfully dealt with is in essence to subsume it under a general category of problems or an explanatory framework.

Practitioners do run into problematic situations that defy category subsumption, on rare occasions though. For example, a physician may encounter a patient with a disease little known to the medical profession. Under the circumstance, the physician, I suppose, would try to understand the nature of the disease on the basis of the currently available medical knowledge and at the same time treat the case tentatively and cautiously as a known type. In Schön's terminology, the physician would reflect-in-action, framing the situation, improvising and testing strategic moves, and listening to the backtalk of the treatment. As a result, a new type of disease and its standard treatment will be established. In either way, the physician will rely on the currently available knowledge and technology.

That every problematic situation needs to be "framed" does not necessarily make each and every situation a type of its own. Nor does a problematic situation constitutes a type of its own because it could be framed in several different ways. It can be argued that the complexity of an indeterminate situation in professional practice does not lend itself to clear-cut category subsumption. The possibility of clear-cut categories for problems of practice could also be questioned. However, if
action is required to resolve an indeterminate situation, it seems to me that the situation has to be subsumed, provisionally, under some general type of problems. It is inconceivable to me that competent practitioners do not know what problems they are dealing with but somehow manage to come up with some solution through reflection-in-action. For the act of framing to be intelligent, some kind of a rule and category has to be followed, whether or not they could be explicitly stated (see Green, 1966). Solution of the problem will rely on the currently available technical means, scientific or practical.

I understand that Schön is trying to emphasize professional artistry in interpreting and dealing with complex problematic situations, not actually situations that cannot be subsumed under currently available explanatory categories nor problems that defy solution. Admittedly, a problematic situation can be framed in different ways, as a result of attention being directed to some of its constitutive elements at the expense of others. Also, a great many problematic situations in professional practice are complex and may present a combination of problems. But the need to frame problematic situations properly and the complexity of framing are not the same as the nature and outcome of framing, to which, I believe, Pearson tries to draw our attention.

Schön’s argument is actually self-defeating in terms of the context in which he would like us to use "seeing... as...." What Schön means by "seeing... as...," if we read between his lines carefully, is a suggestion of seeing, deliberately, an unfamiliar situation in a novel or, to be exact, a metaphorical way. This, hopefully, will lead to a novel solution to the situation.
Irrespective of its literary aesthetic appeal, the pump metaphor appears to have provided the product developers with a novel way of improving the design of paintbrushes.

From the perspective of ordinary language analysis, the verb "see" is generally used as an upshot term denoting the outcome of the complex workings of human neuro-physiological and psycho-linguistic mechanisms. That is, when someone says "I see a letter on the desk," the utterance is preceded by a complex process of neuro-physiological and psycho-linguistic activities. It does not appear to me that Schöén wants to use the verb "see" as an upshot term. For, as an upshot term, the verb "see" would imply that when the product developer saw the paintbrush as a pump even at the moment he still could not articulate with respect to what paintbrushes were similar to and different from pumps, the thinking job on the similarities (and differences) between the two things must have already been done. The product developer must know, albeit tacitly, that paintbrushes are similar to pumps in respect to the way they function. Otherwise, the product developer might as well try to discover a novel way of improving the paintbrush by seeing it as the witch’s hair or a dandelion. What kind of metaphorical understanding could possibly be arrived at, then? "Seeing" is determined by the interpretive, cognitive frameworks available to the person who sees (Erickson and MacKinnon, 1991), not a deliberate but vain effort in trying to see a problematic situation as A, B, C, or D.

I understand that Schöén wants to use "seeing... as..." to imply a deliberative effort. Try to see A (situation) as B (problem) so as to arrive at a novel C (solution).
one unfamiliar situation as a familiar situation and then articulate in respect to what the two are similar and different. This would somehow help one to make sense of the uniqueness of the situation and arrive at a novel solution to it (Schön, 1990). But, lest we need be reminded, a problematic situation needs, first of all, to become known, to be framed into a problem that could be dealt with. Whereas the problematic situation at hand remains to be known, it is difficult to see how metaphors could be generated. If the product developers did not know what a paintbrush was, how would it be possible for them to try and improve it with some kind of metaphorical understanding?

Schön’s observation is correct that often in the process of problem solving, where deliberate thinking and language are involved, metaphors are generated. Some metaphors can be linked to a novel way of thinking that leads to novel solutions to the problems at hand, as it is in the case of the product developers improving the design of paintbrushes. Yet, that observation does not seem to me to lend itself to the supposition that we could deliberately make metaphors so as to get to know what problem an unfamiliar situation presents.

Schön may secure his use of "seeing...as..." in the Nietzschean position: "All that we know, we know metaphorically" and "to know is merely to work with one’s favourite metaphors." However, as Cantor (1982) points out, the Nietzschean attempt to break down the distinction between the literal and the metaphorical may turn its back on its own master and make it difficult for us to understand Nietzsche’s writings that express his distinctive view of the world. Cantor illustrates his point
with Nietzsche's use of the term "war" and remarks that

But like Jesus, Nietzsche paid a price for the mode of expression he chose as the only means of embodying his distinctive view of the world. By leaving the metaphoric status of his expressions unclear, Nietzsche exposed himself to the possibility of gross misinterpretations. In particular, Nietzsche made it very easy for his readers to take the "wrong" metaphors in his prose literally. (p. 84)

I find the interactive theory of metaphor (Black, 1962, 1979) very helpful for considering Schöhn's use of "seeing... as...."

Metaphor, according to the interactive theory, involves two distinct (known) subjects. It functions to highlight the secondary, hidden feature(s) of the primary subject with the help of the prominent feature(s) of a different subject. For instance, the familiar metaphor "Man is a wolf" is generally used, if I understand it correctly, to highlight the beastly aspect of human nature. (There may be other interpretations.) If we do not know literally that Man is capable of cruel behaviour, the metaphor "Man is a wolf" would convey as many different meanings as our knowledge about the wolf can afford. The metaphor of "the paintbrush as a pump" clearly involves two known objects -- paintbrush and pump. Had the product developer not known about either paintbrushes or pumps, where would the metaphor of the paintbrush as a pump come from? In some sense, we could well say that we use metaphors to help make unfamiliar what is familiar to us, not vice versa (The interactive theory of metaphor and its relevance to teacher education was discussed in my presentation at the Canadian Learned Society annual conference, CSSE/CATE, Yang, 1994). Lakoff and Johnson (1980) suggest that the essence of metaphor is to help us better
understand a subject in terms of another but not in the sense of replacing the subject with another. To be sure, we rely on our prior knowledge in trying to understand the situation at hand. That, however, should be recognized on the basis of a clear distinction between the literal and the metaphorical.

**Schön's Disposition Towards the Theory-Practice Relationship**


> In the midst of writing *The Reflective Practitioner*, I realized that I was reworking that [doctoral] thesis now on the basis of empirical studies of professional practice that would have been out of order in the Harvard philosophy department of the mid-1950s. I was attempting, in effect, to make my own version of Dewey's theory of inquiry, taking "reflective practice" as my version of Dewey's "reflective thought." (p. 123)

In praise of Dewey's legacy to education, he writes that

> the greatest American philosopher of education, John Dewey, devoted his life to the project of overcoming the dualisms that afflict the field of education along with the rest of the modern world - the dualisms of thought and action, research and practice, science and common sense, the academy and everyday life. The centrepiece of Dewey's revolt against these dualisms, as against epistemological individualism and the quest for certainty, was his theory of inquiry. (p. 121)

One would expect Schön, who has written a doctoral thesis on the basis of Dewey's *Logic* and professes to develop the idea of reflective practice in the spirit of Dewey, to be particularly attentive to the dangers of dichotomous thinking. Ironically,
however, Schón’s eulogy on Dewey’s revolt against dualisms seems
to have surprisingly little impact on his own thinking about
professional practice and professional education.

Schón (1987) writes,

In the varied topography of professional practice,
there is a high, hard ground overlooking a swamp. On
the high ground, manageable problems lend themselves to
solution through the application of research-based
theory and technique. In the swampy lowland, messy,
confusing problems defy technical solution. The irony
of this situation is that the problems of the high
ground tend to be relatively unimportant to individuals
or society at large, however great their technical
interest may be, while in the swamp lie the problems of
greatest human concern. The practitioner must choose.
Shall he remain on the high ground where he can solve
relatively unimportant problems according to prevailing
standards of rigor, or shall he descend to the swamp of
important problems and nonrigorous inquiry? (p. 3)

The distinction between the high, hard ground and the swampy,
lowland, according to Schón, entails two dilemmas. The dilemma
of rigor or relevance bears especially on educational research in
terms of what problems academic researchers should study and how
they should conduct their research. The dilemma of abandonment
or alienation concerns practitioners in the field. The academy
grounded in Technical Rationality abandons practitioners for its
own interests, and at the same time attempts to prescribe
esoteric knowledge that cuts practitioners off "both from the
possibility of reflecting and building on their own know-how and
from the confusions that could serve them as springboards to new
ways of seeing things" (Schón, 1992, p. 121).

Katz and Raths (1992) suggest that a dilemma

refers to a predicament that has two main features: (a)
It involves a situation that offers a choice between at
least two courses of action, each of which is
problematic, and (b) it concerns a predicament in which
the choice of one of the courses of action sacrifices
the advantages that might accrue if the alternative were chosen. (p. 376)

According to this definition, the dilemma for academic researchers and scholars seems quite obvious. Given the "rules of the game" of academic inquiry and the institutional reward system attached to research in contradistinction to the practical demands in the world of practice, it is difficult for university-based researchers and scholars, especially the junior ones, to choose between "the high, hard ground" and "the swampy, lowland" and decide what problems to study. One has to be a practitioner in the practice world to experience problematic situations and try to deal with them through reflection-in-action.

Schön's charge that (social science) researchers in the academy work on problems "relatively unimportant to individuals or society at large" instead of "problems of greatest human concern" is, however, hard to substantiate. How do we decide or who is to decide which problems are of greatest human concern and therefore worth studying in what particular way(s)? Does research mean the same in the "swampy, lowland" as it does in the academy aside from the kinds of problems to be studied? A host of like questions about the nature and conduct of academic research and "practitioners' action research" in relation to professional practice have, as a matter of fact, been a significant part of the current educational discourse. So far, in my view, a clearly articulated, well grounded conception of the relationship between theory and practice has yet to be worked out. Teacher educators are not in a position either to abandon the "high, hard ground" nor to keep the academic business as
usual, as far as pre-service teacher education is concerned.

The dilemma for practitioners is confusing to me. Schön makes it as if practitioners must either depend on the academy’s esoteric knowledge or rely on their own. Yet, in his own account of professional artistry, competent practitioners do not at all seem to depend on the academy for technical solutions to their problems. In resolving problematic situations in practice, they rely on their knowing-in-action and reflection-in-action. If that is indeed the case, perhaps, instead of feeling abandoned, practitioners themselves should abandon the academic institution, or the esoteric knowledge the academy tries to prescribe, and Schön provides them with a seemingly good reason for doing so.

The difference between researchers in the academy and practitioners in the field of practice is quite obvious in terms of what problems they each try to solve and the ways in which they each try to solve their respective problems. It is also clear that academic researchers and scholars produce explicit, propositional knowledge about the various aspects of the world of practice through systematic inquiries sanctioned by their respective disciplines. Competent practitioners, on the other hand, produce their knowledge in practice that enables them to resolve problematic situations. Yet, Schön’s preoccupation with knowing in the context of problematic situations in professional practice should not stop us from further considering other ways of construing a positive relationship between the academy’s esoteric knowledge and professional practice (see Boggs, 1992; Fenstermacher, 1979, 1986; Selman, 1988; Weiss, 1986; Wittrock, 1991). Many scholars working in policy studies, a field Schön is
quite familiar with, share the view that the positivist conception of the theory-practice linkage, the top-down, one-way flow of information, has been misconstrued and that research and theoretical knowledge are connected to practice in ways that are intrinsic rather than explicit, diffused rather than direct (Bulmer, 1986; Gagnon, 1990; Weiss, 1980, 1991).

Shulman (1987b) comments that Schöen... burdens his analyses by dividing the conceptual world into dichotomous, non-interacting camps: technical rationality and reflection-in-action. In the first camp he places positivism, technique, and molecular notions of knowledge. In the second he places tacit, non-analytic, and reflective cognition that occurs during complex processes of design, judgment and decision making. Schöen's analyses... are insightful and stimulating, but the hard and fast distinction between the technical and the reflective, the analyzed and the whole, the dispassionate and the impassioned, distorts the proper complexity of teaching. Dewey's warnings against either/or thinking apply well to these arguments. (p. 478)

I should caution myself not to read too much into Schöen's topography and properly understand Schöen as only trying to illuminate the problematic relationship between the academy's esoteric knowledge and professional practice conceived under the influence of Technical Rationality. Schöen is mainly interested in the kind of tacit knowing revealed by competent performance in resolving unfamiliar, unique situations in professional practice. And yet, he fails to consider whether esoteric knowledge could be useful, say, in the practitioner's framing and reframing of a problematic situation. I would assume that a practitioner's rich repertoire will contain at least some (transformed) element of esoteric knowledge.

The point is that dissociation of research knowledge from
the notion of "laws" governing human conduct provides no ground for asserting that it, the good part of it, cannot be purposefully and constructively linked to intelligent conduct in situations of complexity, uncertainty, instability, uniqueness, and value conflict. When appreciating Schön's critique of the Technical Rationality model of professional practice and his unique way of probing into the realm of professional knowing, I think we are with good counsel to keep in mind the English saying "do not throw out the baby with the bath-water."

It should be noted that Schön sometimes does not appear to stand very firm on his own ground when it comes to the role of esoteric knowledge in professional education. On the one hand, Schön is critical of professional education based on the Technical Rationality model, which follows the traditional program format of medical education, with a normative curriculum that begins with the classroom teaching of relevant basic and applied science and ends with a practicum devoted in principle to applying classroom knowledge to the problems of everyday practice" (Schön, 1992, p. 119).

If what is written in the books cannot meet the demands of practice, what is the use of anyone spending months and years studying it on the university campus?

On the other hand, he concedes that

Perhaps we learn to reflect-in-action by learning first to recognize and apply standard rules, facts, and operations; then to reason from general rules to problematic cases, in ways characteristic of the profession; and only then to develop and test new forms of understanding and action where familiar categories and ways of thinking fail. (Schön, 1987, p. 40)

This acknowledgement apparently contradicts his own argument against the model of Technical Rationality and professional
education based on that model. After all, there seems to be little wrong with university-based professional schools that teach aspiring practitioners standard rules of professional practice, facts, and operations of systematic inquiry, if that is what they need to start with. But, where do "standard rules, facts, and operations" come from? How does an individual person recognize them as such? In what sense are they applicable in practice?

In a footnote to the statement just quoted, Schön reinstates his argument, however, that

the knowing-in-action characteristic of competent practitioners in a professional field is not the same as the professional knowledge taught in the schools; in any given case, the relationship of the two kinds of knowledge should be treated as an open question. Ordinary knowing-in-action may be an application of research-based professional knowledge taught in the schools, may be overlapping with it, or may have nothing to do with it.... competent professional practitioners often have the capacity to generate new knowing-in-action through reflection-in-action undertaken in the indeterminate zones of practice. The sources of knowing-in-action include this reflection-in-action and are not limited to research produced by university-based professional schools. (ibid., p. 40)

The point Schön seems to be making here is that professional knowledge learned at school may suffice in the world of practice to some extent, as a starting ground, so to speak, but not sufficient for dealing with unique situations that are not written in the book. In dealing with unique situations, competent practitioners generate new knowing-in-action through reflection-in-action. It appears to me, where the organization of professional education is of concern, Schön is arguing not so much against the Technical Rationality model as for incorporating the kind of professional knowing as he describes it. His
representation model has been turned into a prescription of what to do in professional education.

Schön's Narrow Focus on the World of Practice

Whereas the first two lines of criticism are focused directly on Schön's epistemology of practice, the third line of criticism is targeted at what Schön has not explicitly addressed in presenting, defending, and revising his thesis. The major concern expressed, mostly from a critical perspective, has been towards the perceived narrow scope of Schön's ideas about the world of professional practice.

In his explication of professional artistry, Schön focuses his attention on competent practitioners resolving unfamiliar, unique situations through reflection-in-action. Schön presents us with a picture of the world of practice in which competent practitioners react to one unfamiliar, unique situation after another, and in between there are familiar situations that are taken care of by their routine action. He does not say what makes some situations familiar and others unfamiliar and how practitioners manage to establish their routine practice.

The focus on professional knowing in resolving unfamiliar situations has a double-edged effect on our reading of Schön's work. On the one hand, it seems to shed some interesting light on an important aspect of professional practice which has been neglected in the academic discussions on professional knowledge - the artistry that competent practitioners display in dealing with unfamiliar, unique situations.
On the other hand, the focus on unfamiliar, unique situations seems to have diverted Schön’s attention away from issues that do not arise with those situations but rather are germane to professional practice as a whole in connection to other aspects of social life. In Schön’s terms, professional practice, as a collective experience, operates on the basis of a shared body of "conventions, constraints, languages, and appreciative systems." When professional practice is regarded as an individual experience, practitioners depend upon their personal repertoire of exemplars, images, understanding, and actions that they each bring to their work. Schön indicates that reflection-in-action not only is directed at a surprise presently experienced but also turns back on the knowing implicit in a person’s response to the surprise.

As [the practitioner] tries to make sense of it, he also reflects on the understandings which have been implicit in his action, understandings which he surfaces, criticizes, restructures, and embodies in further action. (Schön, 1983, p. 50)

But, it is not clear in Schön’s account whether reflection-in-action would also extend to the norms of professional practice or the exemplars, images, understanding, and actions we each hold in our personal repertoire, especially when we feel they work fine for us. As a popular adage goes, "My wagon ain’t broken, why fix it?" Understandably, this omission has come to be considered as a serious weakness in Schön’s position on reflective practice. Selman (1988), for instance, charges that

It is surely significant that Schön’s account of the professions is remarkably devoid of consideration of the political, economic, legal, and other social ramifications of professionalism. Even the obvious differences between the rights and responsibilities of
educators working as private tutors, and educators working in publicly funded-institutions, are barely noted. While Schön recognizes that the professions are invested with significant power to define and control aspects of people's lives, the aesthetic and individualistic focus of his examples draws attention away from these questions. Even the obviously "loaded" distinction between "Major" and "minor" professions is adopted without comment. (p. 188)

In a similar vein, Adler (1991) argues, more specifically, that by focusing on surprises in action, teachers' attention may be turned away from critical questions about curriculum content or goals. It may also in effect diminish the possibility of the analytic application of social science knowledge to broader and more significant issues of education and schooling.

Liston and Zeichner (1991) take issue with Schön in regard to what he considers to be the four constants -- "media, language, repertoire; appreciative system; overarching theory; and role frame" -- the essential conditions that "affect the scope and direction of reflection-in-action" (Schön, 1983, p. 275). Liston and Zeichner raise the concern that

While Schön maintains that [the constants] are amenable to change through reflection, he does not elaborate further the evolution or alteration of these "constants." From our vantage point, these constants represent unquestioned assumptions that frequently contain significant implicit social beliefs and preconceptions. (p. 80)

Take the constant of language for example. Schön himself has developed a metaphorical language to re-present the kind of knowing inherent in professional practice that other languages (academic and ordinary) have supposedly failed to capture. If we are to take his language as a constant in our thinking about the puzzling phenomenon of professional artistry, our inquiry will likely be confined within an effort to find better empirical
evidence that would purport to show that reflection-in-action is occurring and help differentiate reflection-in-action from knowing-in-action and reflection-on-action. But all that we can actually do is to identify competent performance and then make assertions about knowing-in-action and reflection-in-action. If we do not take Schön's language as a constant and instead we turn it into a subject of inquiry, we may then, with Coombs and Daniels (1991), raise questions about the conceptual clarity of the key concepts with which Schön constructs his epistemology of practice. We may also ask whether Schön's language is capable of rendering a true representation of the tacit knowing inherent in competent professional practice. Is his language indeed more a matter of rhetoric (Fenstermacher, 1988; Shulman, 1988), a novel way of talking about professional artistry which has already been captured, albeit in fragmented pieces, in both technical language (e.g., meta-cognitive ability, schemata, automaticity, etc.) and ordinary language (e.g., know-how, wisdom, experience, expertise, green-thumb, etc.)?

Liston and Zeichner contend that teaching, as any other kind of professional practice, is always conducted within a particular institutional and social context. In the context of educational reform in North America, they have identified three general traditions of educational thought and practice, namely, the conservative, the progressive, and the radical traditions. These traditions embody conceptually distinctive views of the teacher's role and educational activity. Each exerts its influence upon the "constants" that practitioners bring to their reflection-in-action, appropriating language use, shaping up appreciative

128
systems, prescribing overarching theories, and defining role frame. Liston and Zeichner point out that

while it does seem that, in some sense, a "professional" community exists, we doubt that it is either coherent or cohesive enough to ground sufficiently the role of the teacher or the activity we call teaching. The unitary notion of a professional community overlooks deep divisions within the professional community. Conservative, progressive, and radical educators share certain views about teaching and, at times, the role of the teacher; however, their educational views differ in important and significant ways. (p. 42)

Since differing conceptions of the teacher's role and teaching exist, the criteria for judging competent professional practice or the rationale behind individual or collective action will also be identified with the distinct sets of beliefs and values associated with these competing traditions.

What's more, the bureaucratic and hierarchical institutional conditions add further structural constraints on teachers' work. The public school, Schön (1983) says, is built for the purpose of efficient transmission of privileged knowledge, and

contains a knowledge structure which includes not only the content of the curriculum but technologies of measurement, communication, control, and maintenance, which are essential both to teaching and administration. (p. 331)

To achieve maximum efficiency in transmitting knowledge, a system of controls is put into place. The teacher, who usually works in isolation from her colleagues, controls student learning through quizzes and examinations, rewarding students who have successfully acquired the appropriate knowledge and skill with good marks and sending those with learning disabilities off to remedial programs. The teacher is in turn controlled by the supervisor who monitors her teaching performance in implementing
the official curriculum content and applying instructional techniques recommended by experts. The teacher is rewarded or punished according to the institutional measures of student achievements.

Schön states that, at the collective level,

as teachers attempted to become reflective practitioners, they would feel constrained by and would push against the rule-governed system of the school, and in doing so they would be pushing against the theory of knowledge which underlies the school. Not only would they struggle against the rigid order of lesson plans, schedules, isolated classrooms, and objective measures of performance; they would also question and criticize the fundamental idea of the school as a place for the progressive transmission of measured doses of privileged knowledge. (p. 334)

And at the personal level,

A practitioner who reflects-in-action tends to question the definition of his task, the theories-in-action that he brings to it, and the measures of performance by which he is controlled. And as he questions these things, he also questions elements of the organizational knowledge structure in which his functions are embedded. (p. 337)

To Liston and Zeichner, Schön’s recognition of the practitioner reflecting on the institutional constraints on their work is not sufficient. They assert that

to adequately reflect on these constraints, practitioners need to question their role frames, appreciative systems, and overarching theories. Given Schön’s penchant for individual action and his tendency to treat the four ‘constants’ as backdrops to reflection, it seems unlikely that these social and institutional constraints can become proper objects of reflection. (p. 81)

They further argue that

To be capable of examining these institutional obstacles, Schön’s individualistic and action-oriented role frame would have to expand to include more collaborative action and deliberation and less of an emphasis on only those changes that teachers can make within the classroom. In order for Schön’s approach to
be used to reflect on the social context of schooling, the four "constants" could no longer be treated as constants. They, too, would have to become objects of reflection. (p. 81)

Some might consider this line of criticism impressionistic and too harsh. Yet, it is Schön's expressed intention to prescribe a new epistemology of practice for professional education that makes the critical commentary highlighted above too important to be left aside. For teacher educators who engage in programmatic deliberations about professional preparation for teaching and who are concerned about the effect that any institutional change may have on their work and on their students' effort to learn to teach, the messages this line of criticism conveys are clear and should be read with an open mind.

A Schönean Model of Reflective Teacher Education?

Having provided an epistemology of practice to account for the professional artistry that competent practitioners display in resolving situations of uncertainty, uniqueness, instability, and value conflict, how does Schön relate his ideas of professional knowing of and in practice to professional education? What would an RTE orientation based on Schön's epistemology of practice be like?

In Schön's epistemology of practice, professional knowing of and in practice is inherent in competent performance, understood as a process of reflection-in-action, in contradistinction to research and theoretical knowledge written in books. But an account of knowing-in-action and reflection-in-action in the context of problematic situations itself is hardly sufficient for
grounding professional education. We need to know how competent practitioners (continuously) build up their personal repertoire and capacity for reflection-in-action. In other words, we need a theory of professional learning for grounding RTE programs.

Schön's treatise on professional knowing contains two messages for teacher education: 1) prospective teachers may need academic knowledge to start with, and 2) academic knowledge cannot meet the particular demands of professional practice in the context of problematic situations in action. Accordingly, a teacher education program should also be oriented towards helping prospective teachers to develop the professional artistry of reflection-in-action.

More specifically, Schön (1987) has the following to say about learning a professional practice,

> when someone learns a practice, he is initiated into the traditions of a community of practitioners and the practice world they inhabit. He learns their conventions, constraints, languages, and appreciative systems, their repertoire of exemplars, systematic knowledge, and patterns of knowing-in-action. (pp. 36-37)

But how might prospective teachers learn these things? Schön suggests that novices may learn a practice in several different ways. (It seems to me that the phrase "under different conditions" would do better.) They may learn on their own, or through apprenticeship with a master professional, or by entering what he refers to as "a reflective practicum." Learning on one's own or through apprenticeship both have their respective advantages, but their weaknesses make them unfavourable choices for professional education. In short, learning on one's own may keep the person away from the benefit of the accumulated
collective wisdom of professional practice, and apprenticeship may often involve undue expectations and demands for performance. Schön recommends the reflective practicum.

A practicum is a setting designed for the task of learning a practice.... a virtual world, relatively free of the pressures, distractions, and risks of the real one, to which, nevertheless, it refers. It stands in an intermediate space between the practice world, the "lay" world of ordinary life, and the esoteric world of the academy. It is also a collective world in its own right, with its own mix of materials, tools, languages, and appreciations. (p. 37)

In the practicum setting, students work under the guidance of senior practitioners who "function as coaches whose main activities are demonstrating, advising, questioning, and criticizing" (p. 38) as well as teach in the conventional sense from time to time. Schön refers to the senior practitioners involved in the practicum as coaches rather than teachers. There is a reason for this. Schön asserts earlier that "the student cannot be taught what he needs to know, but he can be coached" (p. 17). Schön must have been thinking of the conventional transmission model of teaching.

Schön's description of coaching should prove to be enlightening for teacher educators in thinking about improving their own practice of teaching. I will leave to them the details of how the senior practitioner coaches the novice (three kinds of supervisory guidance -- Follow Me, Joint Experimentation, and Hall of Mirrors). I will explore some practical difficulties that would arise in an RTE program based on Schön's ideas about professional knowing and learning a practice.

Schön makes quite clear what should be learned in professional education and identifies reflective practicum as an
ideal setting for learning reflection-in-action, but his language becomes elusive when it comes to how prospective practitioners actually learn. It is rather odd that he makes no reference to any theory of learning that might help to account for learning a practice in the reflective practicum. He is also ambivalent about the role of theoretical knowledge. He seems to suggest that once we put prospective practitioners in the virtual world of a reflective practicum under the guidance of an omnipotent master professional who knows the stuff of reflection-in-action, desirable outcome of learning on the part of the students will ensue. Learning outcome in the practicum setting is said to be achieved through the dialogic interactions between the novice and the coach engaged in a project. Schön (1987) states that

not surprisingly, confusion and mystery reign in the early stages of a design studio or in any reflective practicum. Yet often, in a matter of a few years or even months, some students begin to produce in some significant measure what they and their coaches regard as competent designing; and student and coach achieve a convergence of meaning evident in the ease with which they appear to understand each other, finishing each other's sentences, speaking elliptically in ways that mystify the uninitiated. (p. 163)

To the extent that [the student] has not mastered the skills of participation in the dialogue, her attempts to learn to practice are hindered. But as she learns the reflection-in-action of the dialogue, she increases her ability to draw from it lessons useful for designing. (p. 165)

In Schön's example of the architectural design studio, the students were given the assignment of a design project. One of the students Petra encountered a problematic situation in completing her design project. The master designer Quist came along and showed her how the problem could be reframed and resolved. The example shows Quist's competent professional
performance in coaching Petra and helping to solve her problem, but gives no direct indication of what Petra had learned from the process, if she had learned anything at all.

Practically speaking, teaching is vastly different from other kinds of professional practice. Professional education for teaching and professional education for working in those technical fields such as engineering design take place under very different conditions. In learning architectural design, the quality of a student's design project has no immediate effect beyond the practicum setting itself. No one is going to construct a building according to Petra's design. The student can stop the work in progress and go to the master professional for advice and help. The two can talk through the project.

In learning to teach, things are different. If we regard practice teaching, that is, delivering instruction in the classroom, as the action-present context, the prospective teacher is under normal circumstances not in a position to consult the master teacher when there is a problematic situation that threatens to interrupt the flow of planned action. The lesson must go on whether or not the prospective teacher is able to resolve the problematic situation. It is also possible that a prospective teacher may fail to note a problematic situation and feel that everything is going well. What the master teacher and the prospective teacher can do is engage in reflection-on-action. But, reflect-on-action is not central to Schön's epistemology of practice in the first place. Reflection-on-action relies on memory and interpretation of a past event. It cannot make any difference to problematic situations already experienced in
action. Its contribution to a student teacher's development of professional artistry depends on what lessons are drawn through reflection-on-action and whether the lessons drawn will be brought to bear on any problematic situation in the future.

Prospective practitioners have to be in action so that they can encounter problematic situations in action. But we know they do not have the knowing of practice that enables a competent practitioner to deal with emerging problematic situations, so why do we put them in action then? It is important to remember that teaching involves and affects students. If we care about the welfare of students and prospective teachers themselves, we will not find it desirable and responsible to prepare prospective teachers in action. This may sound paradoxical. But the seeming paradox inheres in a lack of proper understanding of the role of practical experience in learning to teach. I will come back to this point in Chapter V.

I infer from Schön that the responsibility of coaching prospective teachers must be entrusted with publicly recognized master teachers, not with university academicians. It is the master teachers who inhabit the practice world and have the knowledge of and in practice. But, "the traditions, constraints, languages, appreciative systems, repertoire of exemplars, systematic knowledge and patterns of knowing-in-action" must be expressible or demonstrable. They must be. However, what can be expressed or demonstrated is not the kind of knowing Schön tries to describe. Tacit knowing is inferred from the observation of competent performance in resolving unfamiliar situations in their particular action contexts. It is not clear whether the
traditions, constraints, and languages can only be picked up in an action-present.

It may not be fair to say that Schon wants to throw out theoretical knowledge in professional education. After all, he is trying to make a case that competent professional performance in resolving problematic situations in practice requires a special kind of knowing, namely, reflection-in-action, which is different from the theoretical knowledge written in the books. Professional education should focus on two kinds of knowledge instead of one. But why do we need theoretical knowledge if it cannot meet the particular demands of practice? How do we know that prospective teachers are developing their professional knowing in the practicum setting? How can teacher educators structure RTE programs in such a way that prospective teachers will get the help they really need in their effort to learn to teach?

Summary

In this chapter I have discussed Schon’s epistemology of practice and three lines of criticism towards it. Schon’s work on professional practice has its merit in the persistent critique of the model of Technical Rationality and in his novel way of talking about knowing imbedded in professional competence in resolving unfamiliar situations in practice. His focus on the artistry of competent professional performance in resolving problematic situations with an emphasis on problem framing is insightful. His elaboration on reflection-in-action, offers a more complete picture of problem solving in professional practice.
than the Technical Rationality model allows. Yet, his general argument about professional knowing and professional education is diluted by the lack of conceptual clarity in the key concepts he uses to construct his epistemology of practice, his dichotomous tendency towards the relationship between theory and practice, and the narrow scope in his approach towards the practice world.

It can be said that Schön has offered us an imaginative, and yet sometimes confusing, account of how practitioners deal with situations of complexity, uncertainty, instability, uniqueness, and value conflict, that is, reflection-in-action. Nonetheless, despite his continuing efforts, he has not been as successful as he himself believes in advancing an epistemology of practice to initiate further research into professional knowing in the realm of practice and to ground professional education. Schön's inability to exhibit what professionals know in and of practice beyond a metaphorical account of a process called reflection-in-action imbedded in competent performance does not, however, diminish the possibility of an epistemological theory to better account for professional knowing and guide professional practice and education. I will now move on to revisit Dewey's theory of reflective inquiry, with the phenomenon of RTE in mind.
Chapter IV: DEWEY'S LEGACY: THE THEORY OF REFLECTIVE INQUIRY

The name of John Dewey (1859-1952) became known to me some twenty years ago when I was learning to be a teacher of English as a Foreign Language in East China Normal University. As I recall, Dewey, and his 26-month-long visit to China in the 1920s, was mentioned very briefly in a short introductory seminar on the modern history of education outside China, not meant to be taken seriously. Dewey was said to be a spokesperson for the American philosophy of pragmatism and "bourgeois reformism." Dewey's philosophy and educational ideas were denounced as incompatible with, and indeed reactionary to the late Chairman Mao's orthodox version of Marxist philosophy and socialist education. That reputation seems to have sustained (see Zeng, 1988).

My graduate study at Queen's University Faculty of Education and the University of British Columbia Faculty of Education in Canada has provided me with an opportunity to re-acquaint myself with Dewey and his most profound intellectual contribution to the culture and thinking of American society. I have time and again come across in the education literature references to Dewey and the American "Progressive Education" movement, of which Dewey was regarded at once as a proponent and a critic (Cremin, 1966; Kliebard, 1985). Lately, Dewey has been frequently evoked in the resurgence of the American style of democratic liberalism (see Feinberg, 1993; Robertson, 1992; Rosenthal, 1993; Ryan, 1995) and the growing influence of constructivism in pedagogical thinking (Garrison, 1995; Phillips, 1995). There are clear signs of a revival of interest in the academia in the philosophy of
pragmatism, in Deweyan scholarship in particular (Scheffler, 1991; Seigfried, 1993a,b; Thayer, 1982).

In promoting RTE as an alternative approach towards teachers' initial and continuing professional development, many teacher educators have referred to the distinction Dewey (1904, 1933) made between routine activity and reflective practice as well as the three requisite attitudes that he associated with reflective thinking -- open-mindedness, whole-heartedness, and responsibility. However, these often tend to be cited as if they constituted some a priori principles. They serve the function of a foundation stone, ceremoniously laid but hardly having anything to do with providing the actual foundational support to the edifice to be built. It is rather odd to me that proponents of RTE should have stayed away from exploring the epistemological implications of Dewey's theory of reflective inquiry for guiding their programmatic deliberations.

Hayon (1990), for instance, identifies Dewey's conception of reflective thinking with the idea of active and persistent careful consideration of ends and means in relation to social, educational, and political contexts and the three requisite attitudes for reflective thinking. She then contends that "fully accepting that these are necessary conditions, one may at the same time doubt whether they are sufficient" (p. 59). Another example is LaBoskey's (1993, 1994) study of reflection in preservice teacher education. After briefly describing the three steps of what is said to be Dewey's reflective process, (1) problem identification, (2) means/ends analysis, and (3) generalization, LaBoskey goes on to state that
One problem with this model is that it tends to over-emphasize the procedures of logical thinking. I suggest that Dewey's attitudes of open-mindedness, responsibility and wholeheartedness are more critical to the reflective process than the specific steps. Though the stages do help to focus attention on potential aspects of the general process, they are not all necessary to each act of reflection. Any of the stages may be carried out reflectively or unreflectively. (p. 26)

I suspect that both Hayon and LaBoskey may have read Dewey's theory of reflective inquiry the way one would read a cooking recipe in the kitchen. It seems to me that they were looking for a formula of reflective practice that could be literally applied step by step in teaching or learning to teach. Consequently, they find their Deweyan models either insufficient or too formal. These two authors do not seem to be aware that in developing his theory of reflective inquiry, Dewey was not at all trying to write out a recipe of or for reflective teaching. He was trying to develop an epistemological theory to account for knowing in relation to intelligent human conduct.

The significance of Dewey's theory of reflective inquiry to teacher education today lies in that it is a robust theory of knowing in relation to intelligent human conduct. Instead of a recipe of reflective practice that might somehow be followed through step by step in teaching or learning to teach, we should read it in a way that will help us better understand the issues concerning PKT and prospective teachers' development of PKT. It is the understanding of the issues concerning PKT and prospective teachers' development of PKT afforded by Dewey's theory of reflective inquiry that will provide the epistemological and conceptual ground for RTE as a viable alternative approach
towards teacher education. In this way, the connection between Dewey and the current interest in RTE can be substantiated beyond the cliches we have become familiar with.

I do not intend to make my own version of Dewey’s theory of reflective inquiry. My effort in this chapter is devoted to re-introducing Dewey’s theory and discussing the theoretical implications for teacher education program development. People who are familiar with Dewey’s intellectual legacy know that Dewey had devoted a good part of his intellectual life to the development of a new theory of knowledge and he had written extensively, over a span of four decades, explicating, refining, and defending his philosophical position. Reviewing the entire body of Dewey’s work on the problem of knowledge will go far beyond the scope of the present study. I have chosen instead to focus on three of his major works, namely, *The Quest for Certainty* (1929), *How We Think* (1933), and *Logic: The Theory of Inquiry* (1938a). I think these three works will be sufficient for answering two questions: Why did Dewey develop his theory of reflective inquiry and what is his theory of reflective inquiry?

Very briefly for the moment, in *The Quest for Certainty*, we read Dewey’s exposition of the problem of knowledge in relation to human conduct and his approach towards this problem. In *How We Think*, Dewey offered a summary description of the theory of reflective inquiry and a discussion of its relevance to education. In *Logic*, the theory of reflective inquiry was, in Dewey’s own term, "symbolically formalized" in the abstract realm of logic.

My proposal that Dewey’s theory of reflective inquiry can
provide the necessary epistemological underpinnings for teacher education program development does not mean, however, that I am prepared to take the theory for granted. I find it necessary to discuss several important elements of the theory that are particularly pertinent to the issues concerning PKT and learning to teach. Making adjustment where necessary to the intellectual tool we use, I think, is very much in the spirit of Dewey's experimentalism.

Dewey's Approach Towards the Problem of Knowledge

Before I set out to outline the main features of Dewey's theory of reflective inquiry, it is worthwhile to briefly look into the intellectual context of Dewey's theorizing on the problem of knowledge. The problem of knowledge has been the subject of philosophical inquiries since antiquity. Ryle (1989) summarizes the historical debate between the absolute Rationalist and the classical Empiricist over the problem of knowledge, concluding that "their tug-of-war lacks a rope" (p. 100).

To put the Rationalist vs. Empiricist debate in a nutshell, from one end of the debate, the absolute Rationalist claimed that ultimate truths of the world were attainable only by exercise of pure reason. From the opposing end, the classical Empiricist insisted instead on unadulterated sense impressions as the source of (probable) truths. Ryle observes that while the two opposing sides each had its own difficulties (e.g., correspondence of "ideas" with what actually exists or happens for the absolute Rationalist, and the reliability of sense-data, theory-laden
observation for the classical Empiricist), both rationalist and empiricist theories missed the crucial element of experience, which, Ryle seems to suggest, could be furnished by special training (for more extensive discussions on the Rationalist vs. Empiricist debate, see Bernstein, 1983; Musgrave, 1993; Smith, 1989).

Dewey had a different concern in regard to the problem of knowledge. He made it very clear in The Quest for Certainty that the question which prompted his systematic theorizing on the problem of knowledge was:

What is the bearing of our existential knowledge at any time, the most dependable knowledge afforded by inquiry, upon our judgments and beliefs about the ends and means which are to direct our conduct? What does knowledge indicate about the authoritative guidance of our desires and affections, our plans and policies? (Dewey, 1929, p. 297)

Concerned with the demands of practice in the various social fields in the American Progressive era and keenly aware of the philosophical difficulties concerning knowledge in respect of human conduct, Dewey (1949) believed that the problem of knowledge in relation to human conduct should and could be resolved through an attempt to convert all the ontological, as prior to inquiry, into the logical as occupied wholly and solely with what takes place in the conduct of inquiry as an evergoing concern. (p. 321)

Dicker (1976) has succinctly summarized Dewey's intellectual endeavour in this respect,

Rather than attempt to describe or classify the objects of knowledge, or to establish principles by appeal to which knowledge claims may be justified, or to analyze discourse in which men make and defend such claims, Dewey ... tries to describe the process or activity which he calls "knowing." (p. 3)
It is clear that Dewey was theorizing about the problem of knowledge but the subject matter of his inquiry was different from what was being pursued by many other epistemologists of his time and before. It seems to me that this very starting point of Dewey's philosophical thesis has rather unfortunately received very little attention from Dewey's sharp minded critics.

Dewey's position on the problem of knowledge marks a radical departure from traditional epistemology in two ways. On the one hand, Dewey did not pursue the question of knowledge as it had been traditionally pursued in philosophy. In reply to a philosopher friend's query about his work on the theory of reflective inquiry, Dewey (1949) stated that

whatever relative novelty may be found in my position consists in regarding the problem [of knowledge] as belonging in the context of the conduct of inquiry and not in either the traditional ontological or the traditional epistemological context. (p. 317)

On the other hand, Dewey's theory of reflective inquiry entails a rejection of all traditional theories of knowledge before his for they were all founded on the taken-for-granted Spectator View of knowledge. According to the Spectator's View, knowing is conceived on the analogy of seeing an object by means of either the "mind's eye" of the Rational Thinker or the naked sense organs of the Empiricist Observer. The Kantian formula -- "The truths of reason as the principles organizing the sense-impressions, and the sense-impressions as the concrete material to be organized by the truths of reason" -- would not be able to repair those theories of knowledge, for it

had asserted that knowledge is determined by the objective constitution of the universe. But it did so only after it had first assumed that the universe is
itself constituted after the pattern of reason.... His "revolution" was a shift from a theological to a human authorship; beyond that point, it was an explicit acknowledgment of what philosophers in the classic line of descent had been doing unconsciously before him. (Dewey, 1929, pp. 273-274)

In advancing his theory of inquiry, Dewey was, as Phenix (1966) and Schön (1992) have observed, at war against the dualisms central to traditional epistemologies. The influence of the dualistic philosophical tradition was so profound and pervasive that, Dewey (1929) observed,

\[\text{We are so accustomed to the separation of knowledge from doing and making that we fail to recognize how it controls our conceptions of mind, of consciousness and of reflective inquiry. (p. 25)}\]

Despite a general recognition of the problems associated with dichotomous thinking, the dualistic tradition still exerts its unrelenting influence over the present-day theorizing in and about education. "There is sometimes a nod in the direction of the importance of healing the split between fact and value, between what can be called true and what is believed to be right. Still, the either/or's continue" (Greene, 1994, p. 432). The pervasiveness of dichotomous thinking in current theorizing in and about education requires serious treatment which is beyond the scope of the current project and will not be pursued here.

To Dewey, the fundamental dualisms of human attention and regard, notably, mind and body, theory and practice, knowing and doing, experience and reason, subject and object, culture and nature, individual and society, etc., were symptomatic of the intellectual confusion, ironically, resulting from the very intellectual development that nurtured Western academic scholarship. The dualistic philosophical tradition was, as Dewey
(1929) pointed out, a cultural product of a particular time in the Western history -- "the transition of the medieval period into that age that is called modern" -- and it gained its influence when "philosophy reflected upon it and gave it a rational formulation and justification" (p. 17). After all, it was the philosophers who split the human mind from the human body and seriously debated for centuries over whether knowledge had to do with mind or with body, and whether it would be possible to furnish an indubitable foundation for all knowledge claims.

To Dewey, knowledge for guiding and regulating human conduct does not exist in an antecedent, eternal and unalterable Being which "can be approached through the medium of the apprehensions and demonstrations of thought, or by some other organ of mind, which does nothing to the real, except just to know it" (Dewey, 1929, p. 24), and be superimposed in one way or another upon human conduct in dealing with ordinary affairs of life. Rather, knowledge intimates and indeed is inseparable from inquiry. "As an abstract term, [knowledge] is a name for the product of competent inquiries" (Dewey, 1938a, p. 8). That knowledge is the product of competent inquiries is not difficult to be reckoned with. But, what is inquiry then, if the problem of knowledge is to be understood in the context of the conduct of inquiry?

**Dewey's Theory of Reflective Inquiry**

"What is the definition of inquiry?" Dewey (1938a) wrote,

Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole. (pp. 104-105)
To Dewey, reflective inquiry or reflective thinking (Dewey seemed to use these two terms interchangeably) is neither the birthright of the highbrow nor the property of the professional. Rather it is "a human undertaking, not an aesthetic appreciation carried on by a refined class or a capitalistic possession of a few learned specialists, whether men of science or of philosophy" (West, 1989, p. 97). In Democracy and Education, Dewey (1916) stated,

We sometimes talk as if "original research" were a peculiar prerogative of scientists or at least of advanced students. But all thinking is research, and all research is native, original, with him who carries it on, even if everybody else in the world is already sure of what he is still looking for.... The child of three who discovers what can be done with blocks, or of six who finds out what he can make by putting five cents and five cents together, is really a discoverer, even though everybody else in the world already knows it. (pp. 148, 159)

Reflective inquiry understood from Dewey's naturalistic tendency is, as Zedler (1960) puts it, "a purely natural event no more mysterious than the process of digestion" (p. 78). It is nonetheless "a better way of thinking," better than either the mere having of mental images or the recording and recalling of what is believed to be true.

Reflective inquiry exhibits both the natural biological and psychological tendency and the unique intellectual cognitive capability human beings develop throughout their life and depend on in searching for security under the perilous conditions of life. In times long past, reflective inquiry enabled our ancient ancestors to grow and store food, build shelters, use and make tools, domesticate animals, etc. Reflective inquiry is such a built-in cognitive mechanism that we employ it effortlessly. For instance, when we move to live in a new neighbourhood, we will
start taking note of, among other things, its physical lay-out. The practical need of getting our way around, in and out the new neighbourhood occasions the inquiry. The result of the inquiry is the acquired familiarity with or knowledge of the physical environment that prevents us from getting lost there.

To me, the far greater significance of reflective inquiry lies in that it can also be a deliberate, purposive human conduct, "a process by which intelligent beings deliberately seek and acquire knowledge" (Dicker, 1976, p. 1). As a deliberate, purposive, knowledge-seeking conduct, reflective inquiry operates at a more conscious level and it involves intention. For instance, we read a road map before starting out on a trip to decide which route we should take or to familiarize with the route we are going to take. It is in the sense of reflective inquiry being a deliberate, purposive, knowledge-seeking conduct that Dewey's theory is epistemologically significant and pedagogically pertinent to our understanding of PKT and learning to teach.

Reflective inquiry starts with "a doubtful situation." The presently experienced doubtful situation compels us to inquire. "To see that a situation requires inquiry is the initial step in inquiry" (Dewey, 1938a, p. 107). In transforming a doubtful situation into one in which "the difficulty is resolved, the confusion cleared away, the trouble smoothed out, the question it puts answered," reflective inquiry evolves through several phases: (1) Suggestion, (2) Intellectualization, (3) the Guiding Idea, (4) Reasoning, and (5) Hypothesis Testing. The sequence of these phases is not necessarily fixed.
When we are caught up in a doubtful situation, our spontaneous reaction is a felt need to do something about it. When the situation is understood as being problematic, some vague suggestion or idea comes forward for determining what is the problem that the situation presents (Phase I). A doubtful situation cannot be meaningfully dealt with, let alone resolved, unless its perplexity is intellectualized as presenting a particular problem that could be dealt with. Few physicians will proceed with prescription of medication upon hearing a patient's complaining of a headache. The cause of the headache has to be determined before anything else is to be done. The physician will inquire into the constituent elements of the situation at hand, the patient's other symptoms, current physical condition, and medical history, etc., (Phase II).

In determining the problem that a doubtful situation presents, or intellectualizing the situation, the initial suggestion serves as a working hypothesis and guides the inquiry. The initial suggestion itself also undergoes correction and modification as the inquiry evolves till it becomes a definite supposition (Phase III). Would stress be the cause of the patient's headache? Are there any other symptoms or information that would corroborate the supposition? An inquiry into a doubtful situation involves trains of reasoning which help to link present and relevant past ideas together. More importantly, reasoning helps to elaborate the supposition reflective inquiry has reached at various moments of time and further develop it into one that is most congenial to the situation under concern (Phase IV).
I think that Phase III and Phase IV should be better read as elaborations on rather than independent of Phase II. These two phases help bring out the complexity of reflective inquiry. In determining the problem a doubtful situation presents, there could often be more than one possibility. If my own commonsense knowledge of medicine suffices, a headache may be (causally) linked to one of the following physical conditions: brain tumour, common cold/flu, allergy, stress, head injury, lack of sleep, excessive consumption of alcohol, or drug. The physician will think back and forth and consider as many possibilities as necessary to determine the case in hand. To arrive at a final diagnosis that has a certain degree of "warranted assertibility," to know what the case is, the physician’s thinking does not jump randomly from one thing to another, nor does it necessarily follow the linear progression of formal logic. Reflective inquiry is continuous correction and modification of its own process and product, linking past ideas with the present leading to the final conclusion.

The refined idea or hypothesis finally reached is then put to experimental testing either in overt action or in thought (Phase V). "The two methods do not differ, however, in kind" (Dewey, 1933, p. 98). After reviewing the case at hand, the physician comes to believe that a correct diagnosis has been obtained and then goes on to prescribe medication, if necessary. Besides offering some medical advice for the benefit of the patient’s recovery from the sickness, the physician will probably also say to the patient, "If the headache does not go away after a couple of days, please come back and see me." This illustrates
well the experimental nature of the practice of medicine.

Reflective inquiry is a continuous process in two senses. In one sense, reflective inquiry relies on the results of past inquiries (prior knowledge) for suggestions and ideas as instrumentalities in dealing with a situation experienced in the present. "When suggestions (ideas) occur to us, they come to us as functions of our past experience and not of our present will and intention" (Dewey, 1933, p. 42). Also, reflective inquiry, while dealing directly with a present doubtful situation, is always carried out in anticipation of certain desired existential consequences, or with some ends-in-view, in the settlement of the doubtful situation. The physician anticipates curing the patient's illness, not sustaining the suffering, and predicts that if the medical advice is followed and medication is taken as prescribed, the patient will be cured of the sickness. It should be clear therefore that reflective inquiry involves a value commitment in making choices of what ends-in-view are desirable and should be achieved.

Reflective inquiry is continuous also in the sense that, in Dewey's (1938a) own words,

the attainment of settled beliefs is a progressive matter: there is no belief so settled as not to be exposed to further inquiry. It is the convergent and cumulative effect of continued inquiry that defines knowledge in its general meaning. (p. 24)

In the example of medical practice used above, suppose that the patient has taken the medication prescribed by the physician but does not recover as the physician has anticipated. The physician will re-examine the case and design a different program of treatment. Physicians, as any other professionals, are fallible
human beings. They may make hasty conclusions and sometimes even mistakes. There is no guarantee that so long as we engage in reflective inquiry, we will always arrive at the right conclusions or settle the doubtful situation we are dealing with. The Deweyan conception of reflective inquiry bespeaks thus also the fallible nature of human knowledge and the need for "inquiry into inquiry" (Dewey, 1938a). Reflective inquiry is "a process capable of indefinite continuance."

Having outlined the general features of Dewey's theory of reflective inquiry, I could now go on to discuss the kind of theoretical implications drawn from the theory to help establish and sustain RTE as a conceptual orientation towards teacher education. However, I think it will be helpful to pause for a moment here and say a few words about the general reception of Dewey's theory of reflective inquiry.

Reception of Dewey's Theory of Reflective Inquiry

While agreement or harmony cannot be said to be a normal feature of the ordinary controversial life of philosophy or philosophy of education, the roots of disagreement about Dewey are exceptionally deep. His teachings, which, once met with too much uncritical acceptance, especially in the United States, are currently under strong attack there. And while the critics and the admiring rescuers debate about "the real Dewey," their verbal skirmishes seem only to succeed in making Dewey more obscure to the non-partisan observer. For, in disputes of this kind the many problems of interpreting Dewey are quite often overlooked. Do we, for instance, comment on Dewey as a whole, consider his doctrines as all of a piece? Or, do we study his views in historical contexts, in the context of problems and purposes from which he set out? There may be, beside the understandable difference of emphasis at different times, manifold conflicts of doctrine and purpose within Dewey. It is also quite possible that there are serious inconsistencies and vagueness in Dewey's own thinking on many matters.
I take Bhattacharya's observation as a gentle warning to me and anyone else today who would, for various reasons, be drawn to or interested in what Dewey had written over half a century ago. I am doubtful though if it is at all possible for anyone to be a non-partisan observer of "the real Dewey" beyond recognizing the fact that people have reacted to Dewey's ideas differently. There are challenges to be met and I believe they can be met.

The challenges that I have in mind come from Dewey's own writings on the theory of reflective inquiry and from the many criticisms Dewey's critics, past and present, have staged against it. As mentioned earlier, in developing the theory of inquiry, Dewey was engaged in theorizing on the problem of knowledge in relation to human conduct in the everyday affairs of American life and society. He was trying to develop a philosophical thesis of knowledge that could help his fellow American citizens in controlling and directing their personal and social conduct in an intelligent manner in an effort to build up a democratic society. In other words, Dewey was trying to develop a theory of knowledge for a public audience at large who were directly involved in the everyday affairs of life and society. But Dewey was also a philosopher theorizing on a theoretical problem in the field of epistemology, and therefore he was expected not to evade the issues the field had been traditionally concerned with. He was held accountable by philosophers who were also dedicated to the problem of knowledge but in a quite different manner.

It seems as though Dewey was trying to address himself to two different audiences at the same time: a large public audience
who, with their mundane concerns of life and society, turned to philosophy for intellectual enlightenment but do not command the technical proficiency to engage in the formal discourse of logic and a small audience chiefly made up of professional philosophers who, with their expertise in the formal discourse, would hold Dewey accountable on the ground of their disciplinary interests. It could be expected, and it has been repeatedly pointed out, that Dewey's intellectual contribution would suffer as much from some reading too little of his work as from others reading into it what is not there. Proponents of RTE, for instance, have paid scant attention to Dewey's philosophical thought. There is evidence to suggest that Dewey's own practice of teaching was not enlightened by his theory of reflective inquiry (Berube, 1995; Ryan, 1995).

It is important to note again that Dewey did not approach the problem of knowledge the way the problem had traditionally preoccupied the philosophical mind since antiquity. Dewey (1938b) asserted that

the business of philosophy, in logic or the theory of knowledge, is not to provide a rival account of the natural environment, but to analyze and report how and to what effect inquiries actually proceed, genetically and functionally, in their experiential context. (p. 633)

In developing his philosophical thesis, Dewey was calling for reconsideration of the role of philosophy beyond its own self-interest but his critics seemed to be more interested in what had been thought to be the proper subject of epistemology -- the dualistic mind/body puzzle, and lately, the decontextualized and impersonal "justified true belief."
The established tradition of epistemological inquiry with its own subject matter, canons, methodology, and technical language was deficient for Dewey to develop his philosophical thesis. In a sense, we could say that Dewey was compelled to be inventive, in a serious manner, with language. He redefined some of the topical concepts that were considered to be well established in the field of epistemology, such as "experience," "knowledge," "propositions," "truth," and "mind." He also introduced a few of his own, such as "a doubtful situation," "organism-environment interaction," "transaction," and "warranted assertibility." In doing so, he appeared to some philosophers to have evaded many issues co-existing with those staple concepts of traditional epistemologies and at the same time stirred up some new controversies. Kulp (1992) is not alone in recognizing that the development of [Dewey's] criticism [of the Spectator's View of knowledge] is rather like the spinning of an elaborate web. Pivotal concepts are elaborated and integrated into Dewey's wider philosophical position in an effort to render its force ever greater. New concepts are added and developed as new connections and relevances are detected. It is this kind of development, in connection with Dewey's thankfully unimitated writing style, which does much to render the criticism so difficult to grasp clearly. (p. 23)

Dewey was aware of the difficulty that his public audience would have with his theoretical exposition. In the preface to Logic, he extended the following advice,

Readers not particularly conversant with contemporary logical discussions may find portions of the text too technical, especially perhaps in Part III. I suggest that such readers interpret what is said by calling to mind what they themselves do, and the way they proceed in doing it, when they are confronted with some question or difficulty which they attempt to cope with in an intellectual way. If they pursue this course, I think the general principles will be sufficiently
intelligible so that they will not be unduly troubled by technical details. It is possible that the same advice is applicable in the case of those whose very familiarity with current logical literature constitutes an obstruction to understanding a position that is at odds with most current theory. (Dewey, 1938a, iv)

Responses from within the philosophy circle to Dewey's theory of reflective inquiry were of two kinds. Some considered Dewey's terms rich in meaning and others were critical of the same terms for their vagueness and lack of clarity. Some spoke highly of Dewey's spirited ingenious philosophical thinking while others tried to show where and how he failed in producing an acceptable philosophical thesis of knowledge as a whole or in some specific aspects, from their respective theoretical vantage-point (see the collection of critical papers on Dewey's philosophy in Schilpp, 1939; and recent critical appraisals of Dewey's philosophical thinking by Kulp, 1992; Paringer, 1990; West, 1994). Dewey never hesitated to respond to his critics in defense of his position, although he was aware that this was not an easy thing to do. In a reply to a philosopher friend's query, Dewey (1949) wrote,

When, however, I began to write to you in reply, I found myself in a quandary; in fact, on the horns of a dilemma. On the one hand it seemed obligatory for me to take up each one of your difficulties one by one, and do what I could to clarify each point. The more, however, I contemplated that course, the more I became doubtful of its success in attaining the desired end of clarification. If, I thought, I had not been able to make my position clear in the course of several hundred pages, how can I expect to accomplish that end in the course of a small number of pages devoted to a variety of themes? The other horn of the dilemma was that failure to take up all your points might seem to show a disrespect for your queries and criticism which I am very far from feeling. (p. 313)

Dewey was not fighting a lonely battle (see for example essays in defense of Dewey's philosophy in Schilpp, 1939; Burke, 1994;
Dewey and Bentley, 1949; Dicker, 1976; Handy and Harwood, 1973; Thayer, 1969). Piatt (1939), one of the defenders of Dewey’s philosophy, commented on the charges laid against Dewey’s philosophy that just because Dewey differs from most philosophers more than they differ from one another, because he challenges their common premises, misunderstandings easily arise and are hard to remove. Insiders and outsiders speak a different language or, what is worse, use the same words with different meanings, and there is no recognized common referent for getting in and out of Dewey’s thought. In this predicament "clarification" of meanings fail to clarify and merely repeat the underlying difficulty; no genuine dispute takes place. (pp. 105-106)

If Piatt would be suspect of holding a partisan view, let’s hear the British analytic philosopher Bertrand Russell’s (1939) concluding remark in his analysis of Dewey’s theory of knowledge. Russell stated,

ultimately, the controversy between those who base logic upon "truth" and those who base it upon "inquiry" arises from a difference of values, and cannot be argued without, at some point, begging the question. I cannot hope, therefore, that anything in the above pages has validity except for those whose bias resembles my own, while those whose bias resembles Dr. Dewey’s will find in his book just such an exposition as the subject seems to them to require. (p. 156)

Whether there is a hidden message in Russell’s statement is of no concern to me. It bears however clear indication that what is at issue here is not just how to think about some key notions of interest to logicians but more generally how to conceive of the very subject matter of logic. Russell and Dewey’s debate over the proper conception of particular logical concepts is ultimately a debate about what logic is. (Burke, 1994, p. 14)

The fundamental difference between Dewey and his critics seems to me to lie in their respective dispositions towards the role of philosophy and what constituted the proper subject matter of
epistemological inquiry. For teacher educators today who think of PKT as something codified, transported into a curriculum, and transmitted to prospective teachers for future application in practice, I doubt their concerns would draw them to what Dewey had to say half a century ago on the problem of knowledge. But for those who are concerned with knowledge in relation to practice, especially the practice of teaching and learning to teach, Dewey left behind a robust theory of reflective inquiry to their benefit.

I will avoid rehearsing the details of the debate between Dewey and his philosophy critics. Nor will I attempt to point out any "misunderstandings and misinterpretations" of Dewey’s philosophical and pedagogical views as Schilpp (1939) and many others have spoken of (e.g., Prawat, 1995). Not that I would consider the theoretical debate between Dewey and his critics insignificant or uninteresting. On the contrary, I find the esoteric conversation fascinating and challenging, and sometimes alienating due to my lack of the relevant background knowledge in formal logic on the one hand and, on the other hand, to the lack of a clear connection between what was being debated on and what was fundamentally at issue. Moreover, the theoretical dispute between Dewey and his critics belongs to a different context of academic inquiry, where, it seems to me, there is more interest in (safe-guarding) the rules of epistemological inquiry than concern about the purpose of inquiry itself (see the contrastive discussions by Fenstermacher, 1994 and Greene, 1994 on knowledge and educational research). To use Wittgenstein’s metaphor of throwing away the ladder after we have climbed up it, I will move
on to discuss how Dewey's theory of reflective inquiry can help us in rethinking the issues concerning PKT and learning to teach. But before I do that, it is necessary to make some further notes on several elements of Dewey's theory of reflective inquiry that are pertinent to the later discussion. These are: (1) the antecedent condition of inquiry, "a doubtful situation"; (2) prior knowledge in reflective inquiry; (3) method of reflective inquiry; (4) outcome of reflective inquiry; and (5) the knower and the known.

Some Further Notes

"Indeterminate/doubtful Situation"

Since knowledge is defined in Dewey's theory as the product of competent inquiries and reflective inquiry starts with an indeterminate or doubtful situation, it is important to be clear about the term "doubtful situation." Admittedly this is a vague and elusive term. Not surprisingly, some people have misgivings about it. The British philosopher Russell (1939), for instance, queried,

The question arises: How large is a "situation"? ... Although this question is nowhere explicitly discussed, I do not see how, on Dr. Dewey's principles, a "situation" can embrace less than the whole universe; this is an inevitable consequence of the insistence upon continuity. It would seem to follow that all inquiry, strictly interpreted, is an attempt to analyze the universe. We shall thus be led to Bradley's view that every judgment qualifies Reality as a whole. (pp. 139-140)

Dewey (1939) responded to Russell's query, and on a different occasion, he explained to a philosopher friend that
'Situation' stands for something inclusive of a large number of diverse elements existing across wide areas of space and long periods of time, but which, nevertheless, have their own unity. The discussion which we are here and now carrying on is precisely part of a situation. Your letter to me and what I am writing in response are evidently parts of that to which I have given the name "situation"; while these items are conspicuous features of the situation they are far from being the only or even the chief ones. In each case there is prolonged prior study: into this study have entered teachers, books, articles, and all the contacts which have shaped the views that now find themselves in disagreement with each other. It is this complex of fact that determines also the applicability of "problematic" to the present situation. That word stands for the existence of something questionable, and hence provocative of investigation, examination, discussion -- in short, inquiry. (Dewey, 1949, p. 315)

A few philosophers have tried to clarify this particular concept (e.g., Burns and Brauner, 1962, pp. 174-180; O'Connor, 1953; Thayer, 1969). On my part, I take from Dewey's explanation just quoted that we would be better off reading the term "doubtful situation" as a convenient label or sign for any existential phenomenon that provokes inquiry, instead of treating it as an unrefined theoretical construct. What we need to do is to focus on one or another exemplary case of a doubtful situation and see how reflective inquiry evolves and leads to knowledge that helps resolve it. I do not see how this would in any way do damage to Dewey's theory. Dewey himself used many daily life examples of doubtful situations for illustrative purposes, for example, the forked road and the mast pole.

Doubtful situations that prompt reflective thinking can be divided into two kinds: one demands immediate action and the other requires action in the future. In either case, reflective inquiry has an action context in which it deals with a presently experienced doubtful situation. The context of a doubtful
situation that demands immediate direct action can be described with phrases like "in the midst of doing something." A doubtful situation here stands for some unexpected happening that threatens to interrupt the course and progression of a predefined program of (routine) action. Judgment made and action taken to resolve a doubtful situation that occurred "when I was about to turn round the corner," say, I noticed the traffic jam down the street and decided not to make the turn, may appear to be so instantaneous that there seems to be little room for reflective inquiry to take place. Spontaneous action, when successful, is often accounted for in terms of "reflexes" and "wits."

If we put the process in slow motion in our imagination, however, we can "see" that reflective inquiry is there, although, as we might say, clicking at a sub-conscious level. The doubtful situation is experienced and comprehended to present a particular problem. What is deemed necessary and suitable action for solving the problem is decided on and carried out. It helps to ensure the smooth progression of action till its goal is accomplished. Reflective inquiry in this case is Schön's "reflection-in-action," which is, to quote Schön again, an ephemeral episode of inquiry that arises momentarily in the midst of a flow of action and then disappears, giving way to some new event, leaving in its wake, perhaps, a more stable view of the situation. We tend to "wipe it out" as soon as it is over, like the error one makes and quickly forgets on the way to discovering the solution to a puzzle.

Dewey (1929) asserted that "relatively immediate judgments, which we call tact or to which we give the name of intuition, do not precede reflective inquiry, but are the funded products of much thoughtful experience" (p. 249).
Doubtful situations that do not demand immediate action, on the other hand, assign reflective inquiry with a less restrictive action context in terms of time and space. It could be a context in which one prepares for the accomplishment of a specific task, for instance, teaching a unit of social studies to a Grade 10 class in a suburban high school. When inquiring about such a doubtful situation, the teacher is not standing in front of a group of students and doing things such as talking, explaining, demonstrating, questioning, listening to students' responses, assigning exercises, administering a test, etc. The teacher is not responding to a surprise in the midst of carrying out a sequence of routine action. But the teacher is in action, doing something in advance in order to act intelligently and achieve the intended goals of teaching that unit of social studies.

Doubtful situations that do not demand immediate action offer us an opportunity to conduct reflective inquiry in a deliberative manner at a more conscious level. For in dealing with this kind of situations, we are afforded a duration of time which allows us to not only inquire more carefully and more extensively into the situation we are dealing with in its multitude of constitutive elements, determine what kind of a problem it presents, and consider the alternative solutions as our prior knowledge would suggest. More importantly, it also makes it possible for us to subject to re-examination the prior knowledge our reflective inquiry depends upon as well as the conclusions reached at different stages of inquiry so as to make decisions with a higher degree of warranted assertibility and predictability over the existential consequences. Reflective
inquiry in dealing with this kind of a doubtful situation is deferred, preparatory, present exploratory action. Dewey's notion of reflective inquiry denotes action, not in action (cf., Schön's notion of reflection-in-action).

Since I am concerned with program development in teacher education, the question I have here is: If we think of learning to teach as a process of reflective inquiry to produce PKT for intelligent teaching conduct, should prospective teachers' inquiry be directed at teaching as a doubtful situation that provokes inquiry, or at the problem situations, literally speaking, that may or may not occur in a particular classroom setting?

Prudence suggests that some preparation should be necessary for prospective teachers before practice (teaching). The problem-solving approach must assume that problems of teaching can be identified and made known prior to prospective teachers experiencing them in the classroom context. But, as Schön points out, "in real-world practice, problems do not present themselves to the practitioner as given. They must be constructed from the materials of problematic situations which are puzzling, troubling, and uncertain." Competent professional practice of teaching thus requires that teachers have, among other things, the ability to identify or construct what is problematic in their understanding and practice of teaching. When problems of teaching are taken as given in the initial stage of professional preparation, the opportunity is lost for prospective teachers to develop that vital ability.

Putting prospective teachers in the classroom will provide
them with endless opportunities to experience problem situations personally. But, will they be able to frame the encountered problem situations properly, and what if they fail to take note of some situations? When a prospective teacher misinterprets and fails to resolve a problem situation promptly and adequately on the spot, it may jeopardize the intended outcome of teaching. Both the students involved as well as the prospective teacher her/himself are immediately affected by the consequence. Under normal circumstances, from what I know, external intervention in the practicum setting is largely limited to an ad hoc basis. Reflection-on-action can be pedagogically significant and contribute to prospective teachers’ development of their PKT. But are teacher educators really sure how reflection-on-action actually leads to significant, positive learning, if it does?

If learning to teach is concerned with teaching as a doubtful situation, "a total existential matrix that provokes inquiry" (Burns and Brauner, 1962, p. 175), things will be quite different. It will allow teacher educators to think about learning to teach in terms of the different phases of reflective inquiry and about what external intervention measures would be necessary and helpful to prospective teachers in controlling and directing their inquiry into teaching to produce their PKT before they take their place in the classroom. As Dewey (1938) put it, "preparation for possible action in situations not as yet existent in actuality is an essential condition of, and factor in, all intelligent behaviour" (p. 49). Good preparation leads to intelligent teaching conduct and can help to prevent at least some problematic situations from occurring, even though the
possibility of problematic situations occurring when one is
teaching can never be totally eliminated.

Teaching consists in a multitude of constitutive elements,
the teacher, students, curriculum, purpose of instruction,
textbooks and other instructional materials, physical facilities
(the classroom), seating patterns, external expectations, social
values, teaching methods, and you name it. But what does it mean
in practical terms that prospective teachers try to settle the
doubtful situation we usually call teaching through reflective
inquiry in their preparation programs? What programmatic
intervention measures should be designed to help them in their
inquiry? These will be discussed in the next chapter.

Prior knowledge

Reflective inquiry into teaching is not carried forward in a
void. It relies on the inquirer’s prior knowledge as the
intellectual sources of initial suggestions and the continuing
adjustments made to them until a final solution is reached and
put into practice. I use the term prior knowledge broadly to
cover the many different terms that denote the cognitive basis of
action, such as image or ideas, predisposition, presumption,
perspective, belief system, preconception, understanding,
repertoire, and the like. "When suggestions (ideas) occur to us,
they come to us as functions of our past experience and not of
our present will and intention" (Dewey, 1933, p. 42).

Success or failure in resolving a doubtful situation that
requires immediate action is largely affected by the kind of
prior knowledge reflective inquiry falls back on to comprehend
the situation, determine the problem it presents, and suggest solutions. The difference between an experienced practitioner and a neophyte in dealing with a similar doubtful situation in practice is, from the cognitive side, a difference in the richness of prior knowledge each of the two possesses and deploys in resolving the situation. This is not to say that prior knowledge is all that it takes to lead reflective inquiry to the desirable outcome. Attitudes towards reflective inquiry — open-mindedness, whole-heartedness, and responsibility — do make a difference. Also, recall what is involved in the five phases of reflective inquiry and take into account the complexity and uncertainty of the world of practice.

The significance of prior knowledge in reflective inquiry, which itself is the result of past inquiries, is however double-edged. Prior knowledge may often be taken for granted, or wilfully, and brought forth and used in the present inquiry without itself being subjected to examination, and is sometimes directly carried over as the solution to the situation currently experienced. For instance, Chinn and Brewer (1993) have reviewed research in science education on the instructional strategy of presenting students with "anomalous data," evidence that contradicts their pre-instructional theories. The intention of the strategy is to cause students to change their currently held theories and adopt the target theory. However, research findings show that when students are presented with anomalous data incompatible with their held theory, they are often led by their prior beliefs to diffuse, in various ways, the challenge that the anomalous data presents than to change their held theory.
I recently came across a classic example in Musgrave's (1993) discussion on the theory of knowledge. In 1795, a French astronomer by the name of Lalande observed a then unknown planet, now called Neptune, in the region where he, and other astronomers of the time, believed that no planets existed. Although Lalande recorded his observations carefully and even realized that the planet kept changing its position relative to the stars in the region under his observation, his knowledge of the planets in existence led him however to decide that his observations had been erroneous. Fifty-three years later in 1848, the honour of (re-)discovering Neptune went to Adam and Leverrier who predicted where the named planet would be seen.

Dewey (1938a) paid due attention to the possibility of reflective inquiry being misled by prior knowledge and asserted that

One indispensable condition of controlled inquiry is readiness and alertness to submit even the best grounded conclusions of prior inquiry to re-examination with reference to their applicability in new problems. (p. 141)

Dewey (1938b) stated, on a different occasion, that

Directing conceptions tend to be taken for granted after they have once come into general currency. In consequence they either remain implicit or unstated, or else are propositionally formulated in a way which is static instead of functional. Failure to examine the conceptual structures and frames of reference which are unconsciously implicated in even the seemingly most innocent factual inquiries is the greatest single defect that can be found in any field of inquiry. (p. 507)

The presence and active role of prior knowledge in any realm of human experience is a well-recognized fact, at least in theory. Popper (1972), among many others, asserts that
the growth of all knowledge consists in the modification of previous knowledge -- either its alteration or its large-scale rejection. Knowledge never begins from nothing, but always from some background knowledge -- knowledge which at the moment is taken for granted -- together with some difficulties, some problems. (p. 71)

As far as teacher education is concerned, I believe that this point shall be very worth (re-)making and emphasizing even at the risk of stating the obvious. For in program development in teacher education, prospective teachers' prior knowledge has until recently tended to be viewed as a negative factor in their professional growth and its pervasive effects on their learning to teach have been underestimated (Bullough, Knowles, and Crow, 1992; Feiman-Nemser, 1983; Pajares, 1993; Weinstein, 1988, 1990). Research and other scholarly writings are emerging on the active role of prior knowledge in the professional practice of teaching and teacher preparation (e.g., Anderson, 1977, 1984; Bullough et al., 1992; Calderhead, 1987, 1988; Carter, 1995; Chinn and Brewer, 1993; Clark, 1988; Connelly and Clandinin, 1988; Diamond, 1990; Eisner, 1985; Feiman-Nemser, 1983; Grimmett and MacKinnon, 1992; Hollingsworth, 1989; Pajares, 1993; Rumelhart, 1980; Vosniadou and Brewer, 1987). Although I am not aware of any teacher education programs taking prospective teachers' prior knowledge as a thematic focus at the programmatic level, the literature on teacher education bears clear indication that at the practical individual level, some teacher educators do make an effort to provide an opportunity for their students to articulate their personal views of teaching and being a teacher.

However, such efforts often seem to me, at the present moment, to concentrate on identifying and analyzing prior
knowledge. Access to such knowledge is usually limited to some verbally expressed personal views or perspectives of teaching and being a teacher which are obtained mostly through interviews or journal writing. Sometimes, personal views are also probed in reflecting on events in the practicum setting. What the research says, at this stage, appears to have more to do with affirming that teachers and prospective teachers do have something, rather inadequate, in their mind about teaching and that which prospective teachers have in their mind may change over time or otherwise resist change.

It is almost a truism nowadays that prospective teachers should be encouraged to confront, challenge, re-examine, and change their prior beliefs. The problem is that at the programmatic level the necessity and importance of examining personal beliefs is generally asserted, but the purpose of challenging personal beliefs and the ways in which personal beliefs are to be challenged and changed are usually not made very clear. It remains to be incorporated into a comprehensive theory of learning to teach. There are also questions to be answered in terms of what access we may have to individual prospective teachers' prior knowledge, how prospective teachers' articulated personal knowledge is actually related to practice, and what programmatic interventional measures are to be taken to help student teachers to change their knowledge structure.

Dewey's theory of reflective inquiry calls our attention to prospective teachers' prior knowledge in learning to teach not simply because what prospective teachers already know is not adequate for the complex task of teaching but because, more
importantly, it reveals to us the conditions and operations of prospective teachers' inquiry of teaching. The implication is that if teacher educators know what their students know, they will then be able to think and decide what kind of programmatic and pedagogical provisions should be made to help prospective teachers in better controlling and directing their inquiry towards desirable outcomes.

Articulation and analysis of personal prior knowledge is only one necessary step towards the achievement of the intended outcome of learning to teach, the development of PKT. Personal prior knowledge tends to operate at the subconscious level. The purpose of raising it to the conscious level should not be just to find some subject matter for the intellectual exercise called analysis. The effort should be made to help prospective teachers to take control of the direction of their reflective inquiry. Desirable outcomes of teaching and learning to teach will not result from analysis and criticism. They ensue rather from the prospective teachers' increased understanding of the doubtful situation of teaching and from careful, responsible deliberations on what action to take on the basis of that understanding.

This point can be briefly illustrated. Some prospective teachers may conceive of teaching as a matter of caring for children or a matter of transmitting knowledge. But teaching also involves administrative and parental expectations, curriculum content knowledge, methods of instruction, in and after class activities, the teacher's own objectives and expectations for the students, individual students learning together in a group, and each student's perception of and
reaction to the teacher's effort, among a myriad of other things. It is obvious that the conception of teaching as caring for the taught must be expanded or substantiated by incorporating these and other constitutive elements of teaching if intended and desirable outcomes are to be achieved. Analysis of prior knowledge may help prospective teachers to reassess what they know but it does not itself constitute experience in the sense that they can derive new knowledge from it to inform their teaching.

**Outcome or Ends-in-View of Reflective Inquiry**

Reflective inquiry in the world of practice is always engaged in with some ends-in-view. In medical practice for instance, a physician inquires about a patient's case not just to know what problem the patient has. The physician's inquiry is conducted with the intention and anticipation of curing the patient of the illness. This important element of Dewey's theory can easily get overlooked, though, when attention is drawn to the procedural aspect of inquiry.

Ends-in-view towards which the movement of reflective inquiry is directed must however not be confused with the conclusions drawn at different stages of an inquiry. They are not the diagnosis of the problem that a doubtful situation presents nor the hypothetical alternative solutions that one could choose and apply to the problem. Ends-in-view entail some intended existential consequences to be produced by way of transforming a doubtful situation into one that is "clear, coherent, settled, harmonious." The doubtful situation becomes...
"so settled that we are ready to act upon it, overtly or in imagination" (Dewey, 1938a, p. 7). We see here how inquiry, knowledge, and action are intimately connected in Dewey's theory.

There is a clear distinction in terms of ends-in-view between prospective teachers' reflective inquiry and academic inquiries. Generally speaking, educational research and academic inquiries, with the exception of what is known as "participatory research" or "practitioners' action research," are mainly concerned with advancing theoretical understanding. Teaching is an object viewed from distance and studied in its fragmented pieces of interest to particular researcher(s) or theorist(s). Some try to describe and explain what it is and others argue what ought to be. Outcomes of educational research and academic inquiries are measured by the internal consistency of the logical conclusions drawn between data and the operating theory. Educational researchers and theorists are not required to put the results of their work into practice themselves. They make recommendations for policy and practice. The thorny question has been how research findings and academic scholarship about teaching may travel back to the world of practice, to dictate or inform or transform practice.

For prospective teachers and experienced teachers alike, teaching is fundamentally a matter of both decision making and acting upon the decisions made. Their reflective inquiry is directly connected with practice and is engaged in with a view of knowing for the purpose of producing some intended, desirable existential consequences of student learning. To learn to teach is thus not just to come to know what teaching is or ought to be.
but to know in order to act intelligently and achieve the goals which are also set in the process of inquiry. As Buchmann (1993) puts it, "the deliberative search is not, in the first place, a search merely for means but also a search for truly pertinent concerns and the best specification of practical ends" (p. 97). The conclusions prospective teachers reach in their inquiry, their understanding of teaching and the pedagogical decisions they make, are tested both in thought and overtly in practice. For instance, there is much to be thought about and filled in between a conception of teaching as caring for the taught and the kind of action a teacher takes in the classroom as well as the intended practical consequences that action will bring about.

Ends-in-view are not given but set within the process of inquiry. Every prospective teacher, so does every teacher and every teacher educator, has to answer the question persistently: What do I intend to achieve in teaching in view of student learning? Ends-in-view in learning to teach may not always be easy to envision. There is, on the one hand, a tendency for ends-in-view to be couched in high sounding slogans or idealistic images of an omnipotent master teacher, a virtuoso of teaching, such as "reflective practitioners" and "transformative intellectuals." Such ends-in-view are not realizable unless it is made clear what constitutes a reflective practitioner and how a reflective practitioner differs from an unreflective practitioner. We must also know what is necessary for a person to do to become a reflective practitioner, if it is less desirable to be an unreflective one.

On the other hand, ends-in-view may be so narrowly defined
that they will give rise to doubt about the significance, and justification, of achieving them. Some prospective teachers, and some teacher educators too, may feel that what is important for them to learn is effective ways of classroom management and methods of instructional delivery that will work. Saving a lengthy argument against the language and practice of management and control in education, I will maintain, and I believe many will agree, that learning to teach is not just about learning how to manage a group of people and keep them under control. Nor is it simply a matter of acquiring some effective methods of instruction. The purpose of learning to teach is to develop one's PKT for intelligent conduct of teaching. This may sound elusive. The discussion in the next chapter will show it is not.

The knower and the Known

The significance of Dewey's theory of reflective inquiry to programmatic deliberations in teacher education today lies not only in its affirmation of the inseparable connection between inquiry, knowledge, and intelligent conduct. It also, more importantly, comes from a different conception of the relationship between the knower and the known that the theory brings forth, even though Dewey's definition of reflective inquiry does not explicitly include this crucial element.

Dewey's theory of knowledge reinstates the inseparable connection between a knowing or inquiring person and what is to be known. Knowledge is the product of competent inquiry. To inquire so as to know, there must be an inquiring person who has the intention to know. The knower, that is, the inquiring
person, is not a passive recipient of what is known as given. The knower comes to know through his/her interaction with the "doubtful situation." This means that PKT is actively produced by the knower inquiring into teaching, not something which is produced by research and theorizing and then packaged into the curriculum to be internalized, and then applied.

It is important to note that the knower does not exist as an "autonomous" traditional ideal knower, as the standard analysis of what it means to say that "S knows that p" may imply. The knower, constituted by race, class, and gender, lives and acts as a member of a (divided) community and society, with self-interests, values, and beliefs, and at the same time subjected to all kinds of internal and external influences and pressures. Knowing, in short, is thus also a social act and knowledge a social product. It is "a matter of vital participation in a world of which it is a part rather than the idle glances of a disinterested and outside watcher" (Geiger, 1955, p. 141). For prospective teachers, their PKT is developed in the process of reflective inquiry they are engaged in.

The brief account of the pursuit of PKT in teacher education program development in Chapter I shows that the thinking involved at the programmatic level has long tended to regard formal knowledge from external sources as providing the foundation of teaching, even though it has been long recognized that teaching is practised on the basis of individual teachers' personal knowledge. The on-going debate over the classic question of "What knowledge is of most worth" has had surprisingly little effect on this very fundamental thinking that guides teacher
education program development and pedagogical practice. The assumption is that once prospective teachers acquire the prescribed knowledge, they will apply it in the classroom setting, or, to put it in a different way, they will become prepared for teaching in the classroom. There is this one way flow of knowledge: External knowledge -- Prospective teachers -- Practice of Teaching. The standard problems for teacher educators are how to select the curriculum content and get it across to prospective teachers. The nature of the theoretical knowledge transmitted has been debated upon largely outside the realm of teaching and learning to teach.

Dewey's theory of inquiry suggests a different way of thinking about the issues concerning PKT and learning to teach in teacher education. The focus is on prospective teachers engaging in reflective inquiry. In other words, it puts the knowing and learning person first in order. Referring to prospective teachers as the knowing person does not mean that they know what they need to know. Rather, it points to the fact that prospective teachers bring their prior knowledge into the process of learning to teach. Through inquiry, they produce their personal PKT to inform their practice. They must therefore not be treated as mere recipients of prescribed knowledge, of what is deemed necessary for them to know.

Since knowing, both theoretical and practical, professional and ordinary, is an evergoing concern of an inquirer interacting with the environment, instead of the grasp of an antecedent Being, what a prospective teacher has come to know and prepared to do, must be recognized as hypothetical and conjectural. The
conclusions prospective teachers reach in their reflective inquiry into teaching result from the interaction between their internal conditions — their prior knowledge, disposition, interest, etc., — and the external conditions that constitute the doubtful situation that they try to resolve. We should always be consciously aware of the possibility that the internal conditions of the inquirer are inadequate and need to be further developed, and deficiency in the internal conditions will lead to inadequate or even mis-interpretation of the doubtful situation, which will in turn abort the effort to resolve the situation. Possibly, confusion will arise in both thinking and action.

A doubtful situation is a total existential matrix made up of constitutive elements that are obscure, disorderly, and sometimes conflicting. Through reflective inquiry, an inquirer identifies the elements and tries to organize them into an orderly and coherent system as the intellectual basis of action. In dealing with a complex doubtful situation, it is possible that reflective inquiry as it is directed and controlled may neglect some of its constitutive elements which nonetheless must be taken into consideration if ends-in-view are to be set and met. The neglected elements may have been perceived as insignificant or irrelevant. Or, they may simply be outside of the inquirer’s realm of experience. Another possibility is that the inquirer, having recognized the relevant elements, may still fail to construct them into a harmonious, unified whole. The relations between the recognized constitutive elements may be arbitrarily drawn. A person may be able to articulate several different views of teaching which do not form a coherent system of
thinking. In such a case, reflective inquiry would very likely fail to produce adequate knowledge, leading action to undesirable consequences.

Because of the conjectural nature of knowledge, reflective inquiry cannot guarantee the achievement of ends-in-view in practice. For no belief, whether in science or in common sense, can be "settled in such a way as not to be subject to revision in further inquiry" (Dewey, 1938a, p. 9). Where practice means the actual performance of a particular task, such as repairing a gate, lecturing on the subject of freedom, etc., we have no other way out but, as Dewey (1929) put it, "act, but act at your peril" (p. 10). This does not mean that reflective inquiry makes no difference. What we come to know through reflective inquiry enables us to act in the best intelligent way we can.

Reflective inquiry can turn back on itself, subjecting the completed operations and conclusions to re-examination. This is what Dewey (1938a) called "inquiry into inquiry." "Inquiry into inquiry" does not produce absolute knowledge either but helps to reduce the degree of chance in the consequences thought of and increase the degree of warranted assertibility of the results of inquiry as well as the inquirer's ability of anticipating the existential consequences.

Furthermore, reflective inquiry is an ongoing process, not only in the sense that new situations arise after old ones have been resolved, but also in the sense that some doubtful situations are so complex that they can never be expected to be settled once for all, for example, the origin of the universe, the assassination of the American president J.F. Kennedy, running
the government at the federal, provincial, and municipal levels, etc. Teaching in the classroom is also such a doubtful situation. The more persistently we inquire into teaching, the more knowledgeable we become and the better control we will have over the existential consequences of our teaching. Reflective inquiry in the sense of reflection-on-action also enables us to evaluate and learn from the existential consequences, whether they are regarded as success or failure.

A thoughtful person... while he cannot call [his overt deeds] back and must stand their consequences, he gives alert attention to what they teach him about his conduct as well as to the non-intellectual consequences. He makes a problem out of consequences of conduct, looking into the causes from which they probably resulted, especially the causes that lie, in his own habits and desires. (Dewey, 1933, p. 116)

The ongoing process of reflective inquiry into teaching comes to its end only when a teacher stops teaching. At that time, it is not that the doubtful situation of teaching has been settled but rather that the teacher is not confronted with the situation any more. Some retired teachers may still be interested in thinking and talking about teaching and be concerned about what is going on in the classroom, but their interest no longer has any direct connection to practical action, for no practical action is demanded of them.

Method

One of the topics that received extensive coverage in Dewey’s epistemological thesis is the issue of method. Dewey’s position in this regard is quite explicit, although it does not seem to me to be always consistent. Dewey saw the issue of method a matter
within reflective inquiry. Methods of reflective inquiry are not to be superimposed from outside in but are developed and refined within the process of inquiry.

The method that is employed in discovery, in reflective inquiry, cannot possibly be identified with the method that emerges after the discovery is made. ... The common assumption that unless the pupil from the outset consciously recognizes and explicitly states the method logically implied in the result he is to reach, he will have no method and his mind will work confusedly or anarchically is fallacious. (Dewey 1933, p. 128)

All logical forms (with their characteristic properties) arise within the operation of inquiry and are concerned with control of inquiry so that it may yield warranted assertions. (Dewey, 1938a, pp. 3-4)

The search for the pattern of inquiry is, accordingly, not one instituted in the dark or at large. It is checked and controlled by knowledge of the kinds of inquiry that have and that have not worked; methods which, as was pointed out earlier, can be so compared as to yield reasoned or rational conclusions. (p. 104)

Dewey also believed that the experimental method of modern science featuring observation, abstraction, experimentation, verification, and generalization would be the method for reflective inquiry in various social fields. Schön (1992) comments that

[Dewey] reveals, at least, in Logic, a faith in the progress that can be achieved by applying to human, social, and political problems the methods that he thought had worked so well in fields like metallurgy, agronomy, and medicine. (p. 122)

The diversification in social science research methodology since Dewey's time shows that the "scientific method" Dewey spoke of has not achieved the status of a unifying method for inquiries in the various social fields and it is doubtful that it ever will, unless the term "method" is not limited to the technical, procedural aspects of scientific inquiry. Dewey himself seemed
sometimes to express views that appear to counter his own faith in the "scientific method," especially when common sense and values are under consideration.

Dewey (1929) asserted that

there is no kind of inquiry which has a monopoly of the honourable title of knowledge. ... The criterion of knowledge lies in the method used to secure consequences and not in metaphysical conceptions of the nature of the real. (pp. 210-211)

He repeatedly pointed out in *Logic* that

The difference that now exists between common sense and science is a social, rather than a logical matter. ... a difference of languages. (Dewey, 1938a, p. 77)

The attainment of unified methods (for social inquiry) means that the fundamental unity of the structure of inquiry in common sense and science be recognized, their difference being one in the problems with which they are directly concerned, not in their respective logics. (p. 79)

[The difference between common sense and scientific inquiries] resides in their respective subject-matters, not in their basic logical forms and relations; that the difference in subject-matters is due to the difference in the problems respectively involved; and, finally, that this difference sets up a difference in the ends or objective consequences they are concerned to achieve. (pp. 114-115)

However, when Dewey turned his attention to the "scientific method," the position he took seemed to be subtly shifted, which may help to illustrate that Dewey's own thinking about reflective inquiry in respect of method was, in his own words, "socially conditioned" (p. 19). He drew his illustrations from the operations of industrial arts and believed the principles of scientific experimentation also underlay operations of social inquiry. Against this observation, common sense inquiry seems suddenly to have lost its equal footing with scientific inquiry. In *Logic* again, Dewey stated,
Because common sense problems and inquiries have to do with the interactions into which living creatures enter in connection with environing conditions in order to establish objects of use and enjoyment, the symbols employed are those which have been determined in the habitual culture of a group. They form a system but the system is practical rather than intellectual. It is constituted by the traditions, occupations, techniques, interests, and established institutions of the group. The meanings that compose it are carried in the common everyday language of communication between members of the group. The means involved in this common language system determine what individuals of the group may and may not do in relation to physical objects and in relations to one another. They regulate what can be used and enjoyed and how use and enjoyment shall occur. (p. 115)

The operations of common sense are restricted because of their dependence upon limited instrumentalities, namely, bodily organs supplemented by instrumental apparatus that was invented to attain practical utilities and enjoyments rather than for the sake of conducting inquiry. The cumulative effect of these operations conducted for a practical end is to give authority to a set of conceptions made familiar in a given culture. (p. 534)

Should the "scientific method" be instituted in inquiries in the various kinds of social practice to achieve their respective ends-in-view, those of "use and enjoyment"? Does common sense inquiry in various social fields already command its own methods developed out of prior inquiries and to be refined in present inquiries? Perhaps, common sense inquiry and scientific inquiry are, as Schön (1992) reasserts, "distinguished from each other, not by their epistemologies, but by their particular purposes and subject matters: the pattern of inquiry is the same in both" (p. 122). Then the issue will be turned back to the process of reflective inquiry itself in the various social fields in which it is engaged. Greene (1994) comments on Dewey’s faith in the "scientific method,"

Yes, he spoke of "the supremacy of method," meaning the
method of empirical inquiry, however, he emphasized the need to define mind in terms of doing and its results and the importance of avoiding the assumption that what knowledge must be had to be known in advance.... In another text, he objected once more to any supreme devotion to a single truth and, in fact, to the dominance of the scientific method over all other modes of knowing -- and this in spite of his earlier insistence on "the primacy of method." Treating science as truth meaning, he wrote that it should not have "monopolistic jurisdiction" over all other meanings. (p. 434)

Perhaps we should understand Dewey's faith in the "scientific method" not in terms of the technical, procedural aspect of inquiry in modern physical sciences but in terms of the requisite attitudes he identified -- open-mindedness, whole-heartedness and responsibility -- that form a person's disposition favourable to an on-going engagement of reflective inquiry. To quote Dewey (1904) himself,

> It cannot be too strongly emphasized that this scientific method is the method of mind itself. The classifications, interpretations, explanations, and generalizations which make subject-matter a branch of study do not lie externally in facts apart from mind. They reflect the attitudes and workings of mind in its endeavour to bring raw material of experience to a point where it at once satisfies and stimulates the needs of active thought. (p. 161)

Where initial teacher preparation and continuing professional development are concerned, being open-minded means recognizing the fact that PKT is an on-going concern and the need to listen to more sides than one; to give heed to facts from whatever source they come; to give full attention to alternative possibilities; to recognize the possibility of error even in the beliefs that are dearest to us. (Dewey, 1933, p. 30)

Being whole-hearted means that we inquire into teaching for the purpose of understanding its complexity in order to act in an intelligent manner, not for the sake of just knowing something
about teaching or meeting some institutional or administrative requirements. For prospective teachers and teachers alike, being responsible means being consciously aware of the need to carefully consider the ends and means of teaching, thereby ensuring that what they plan to do for/with their students in the classroom will not lead to undesirable or even harmful practical consequences. Teaching responsibility is fundamentally a moral responsibility.

**Summary**

Proponents of RTE often profess to draw their inspiration from Dewey's idea of reflective inquiry. However, few have given much serious consideration to its epistemological implications for the development of teacher education programs. In this chapter, I have introduced the major features of Dewey's theory of reflective inquiry and discussed several elements of the theory that I perceive to be particularly pertinent to our thinking about PKT and learning to teach. I have deliberately chosen to stay away from the abstract, technical aspects of Dewey's theory for the reason that they constitute a different kind of subject matter and belong to a different realm of inquiry.

Feiman-Nemser (1990) suggests that

> ideally, a conceptual orientation includes a view of teaching and learning and a theory about learning to teach. Such ideas should give direction to the practical activities of teacher preparation such as program planning, course development, instruction, supervision, and evaluation. (p. 220)

Feiman-Nemser's notion of a conceptual orientation offers a very useful framework for thinking about the fundamental theoretical
as well as practical issues concerning the organization and practice of teacher education. How can Dewey's theory of reflective inquiry help us address those issues?

It is quite obvious that Dewey's theory of reflective inquiry does not contain an explicit view of teaching, for the development of the theory itself was in the first place aimed at the general problem of knowledge, not the mundane issues concerning teaching and teacher education. This however does not necessarily reduce in any significant measure the immediate relevance of Dewey's theory to teacher education today.

I will maintain that classroom teaching, at all levels of education, is in the final analysis an intentional conduct of the teacher to intervene in the intellectual, moral, psychological, physical, and social development of other people, often younger ones. If any measure of institutional intervention is to have the intended effect on prospective teachers' learning to teach, it is essential that programmatic and pedagogical decisions be made on the basis of an adequate understanding of learning to teach, instead of resorting to the very tenuous claim on the existence of a putative knowledge base. For sure, there are research findings and scholarly writings about teaching that learning to teach cannot afford to ignore. But, they are the means to be employed in helping prospective teachers to develop their PKT. The legitimation and authority of teacher education, whether it is university-based or school-based, come from a moral consideration.

Although an explicit view of teaching is not a part of Dewey's theory of reflective inquiry, a theory about learning to
teach can be well derived from it. Incidentally, one of the chief misgivings about Dewey's theory has been that "in developing his own positive epistemological views, Dewey has spoken at length about what is involved in acquiring knowledge, but has said nothing about what it is to have knowledge" (Kulp, 1992, p. 58; see also Dicker's defence of Dewey's position in this regard, 1976). To quote Dewey (1938a) again, "knowledge, as an abstract term, is a name for the product of competent inquiries" (p. 8). For prospective teachers to develop their PKT, they must inquire into teaching. As Perkinson (1984) asserts,

knowledge is not transmitted or transferred from one human being to another, nor is it transmitted by a book. It is not received nor discovered. Knowledge is created. Every knower is the creator of what he (she) knows. (p. 168)

This apparently constructivist conception of PKT may give rise to concerns about relativism. The worry is not necessary, though, for the real issue in teacher education program development is not about the comparative reliability and truth values of theoretical knowledge, objective and public, measured against personal practical knowledge, subjective and intuitive. What needs to be carefully (re-)considered is the role of external knowledge rooted in different philosophical traditions, positivist, interpretive, critical, as well as the norms and conventional wisdom of the teaching profession, in prospective teachers' reflective inquiry of teaching. To put the issue straightforward, what is or ought to be recognized as the foundation of learning to teach and the practice of teaching? This question will be discussed in light of Dewey's theory of
inquiry in the next chapter.

Before I move on to the next chapter, I should say a few words about the difference between Dewey and Schöns. In Dewey’s thesis, the problem of knowledge is considered in the context of the conduct of reflective inquiry, which is an evergoing concern. It is competent inquiry that produces knowledge that directs and controls human conduct. While the unison of inquiry, knowledge, and action is emphasized, the distinction between the three is as clear as it is easy to see. Knowledge claims can be tested in thought and/or in overt action, in terms of their "warranted assertibility" and "predictability" in regard to their existential consequences. The implication for learning to teach and teacher education program development is quite clear: if we could help prospective teachers to have better control of the conditions and operations of their reflective inquiry into teaching, they would be better able to develop their PKT for intelligent conduct of teaching.

In contrast, Schöns epistemology of practice is concerned with ascertaining and representing a special kind of professional knowing in and of practice. In Schöns account, practitioners’ knowing in and of practice, the tacit kind, is described as a process of reflection-in-action revealed in competent performance in dealing with problem situations in the respective fields of professional practice. That competent practitioners know of and in practice, albeit tacitly, is premised on the recognition of their competent performance. Beyond that, there is no way to test the kind of professional knowing Schöns tries to represent with his model. Indeed, why do we need to test professional
knowing at all when we are already satisfied with the practical consequence of competent practitioners' performance? What can be tested is Schön's model for representing that kind of knowing.

For developing programs of professional education, it is far more important to know how competent practitioners come to know what they know than to construct theoretical models in a vain attempt to capture whatever special kind of knowing we believe competent practitioners possess. In that regard, it is hard to see what theoretical implications can be derived from Schön's model of professional knowing for the development of professional education programs. Dewey's theory of reflective inquiry can help us enormously to that end, as it will be discussed in the next chapter.
Before getting down to the task set in this chapter, I will take a quick look at the ground that has been already covered. In Chapter I, I survey the fragmentation of PKT underlying teacher education program development in the changing social and cultural contexts of different historical times. Fragmented views of PKT are inadequate for teacher education program development because (a) none of them alone captures the multi-faceted nature of PKT in relation to practice in the complex world of teaching; (b) they do not add up to a coherent, overarching view of PKT and some of them embody conflicting principles that work at one another's expense; and (c) they are in close alliance with the traditional transmission model of teaching that reduces learning to teach to receiving codified knowledge from external sources.

In Chapter II, I turn my attention to the fuzzy phenomenon of RTE. Since the early 1980s, RTE has been promoted by many as an alternative approach to teachers' preservice preparation as well as their continuing professional development. However, in laying an emphasis on "mak[ing] the relationship between theory and practice problematic," enthusiasts of RTE have diverted their attention away from the issues concerning PKT and learning to teach.

At a personal level, many proponents of RTE may claim to adopt one kind of a constructivist view of knowledge or another. It is clear however that much emphasis at the programmatic level has been given to getting across to prospective teachers, or having them practice, some preconceived ideas and procedures of
reflective practice/teaching/inquiry that their professors espouse. It has not been made clear, though, whether and how the espoused goal(s) and procedures of reflective practice/teaching/inquiry are or can be connected to prospective teachers' development of their PKT. RTE, as it stands now, is short of support from an adequate epistemological understanding of PKT and learning to teach.

RTE has often been linked, albeit in a rather simplistic manner, to Schöns's epistemology of practice and/or Dewey's theory of reflective inquiry. I revisit Schöns's account of professional knowing of and in practice in Chapter III. Schöns's work can be appreciated in terms of its critique of the Technical Rationality model that emphasizes the application of scientific knowledge in achieving given ends in professional practice. Schöns's thesis has enriched the problem solving model of professional practice with the notion of reflection-in-action through which competent practitioners resolve problematic situations in their respective fields of professional practice.

With Eraut (1994), I think Schöns's account of reflection-in-action could be better read as an analogy to help re-affirm that professional practice is "minded practice" or as a theory of cognition to help us to better understand how the mind of a competent practitioner is engaged when it is confronted with a problematic situation in action. Yet, as an account of what competent practitioners know that makes professional artistry possible, I find Schöns's epistemology of practice inadequate, for, as it has been discussed in Chapter III, it fails to observe the distinction between
what a person knows and how that person comes to know what s/he
knows, either propositional knowledge or tacit knowing implicit
in intelligent action. In Schön's thesis, professional knowing
inferred from competent practitioners' performance is described
as a process of reflection-in-action. It bars questions about
what competent practitioners know beyond that imaginative process
and how they come to know what they know.

The reflection-in-action model of professional knowing is
inconsequential to the development of professional education
programs. The kind of professional knowing Schön calls knowing-
in-action and reflection-in-action is inherent in competent
performance in resolving problematic situations arising in the
midst of action. We observe a master teacher's competent
performance of coaching his students, so we believe that the
master teacher knows the stuff of coaching. But we do not know
what it is exactly that individual master teachers know and, more
importantly, how they each came to possess the knowing without
which their competent performance of coaching is unlikely
possible. The assertion that competent practitioners are
operating from some knowledge, whatever model we may use to
describe that knowledge, cannot itself suffice to provide an
epistemological ground for developing programs of professional
education of any kind.

To better understand the issues concerning PKT and learning
to teach, I turn to Dewey's theory of reflective inquiry in
Chapter IV. Dewey left behind a robust theory of knowing, in the
sense of acquiring and having knowledge, in relation to
intelligent human conduct. I have revisited Dewey's theory of
reflective inquiry without going into those methodological and terminological issues that belong in the realm of formal logic. For the limited scope of my study, I have excluded philosophical discussions rooted in the conception of knowledge as "justified true belief."

The value and pertinence of Dewey's philosophical thesis to the current discourse on RTE does not lie in the possibility that it might offer a definition of reflective practice or a set of procedures that could be followed step by step in teaching or learning to teach. Rather, Dewey's theory of reflective inquiry should be read to help us to arrive at a better understanding of the issues concerning PKT and learning to teach. It is Dewey's emphasis on the unison of inquiry, knowledge, and action and his explication of the process of reflective inquiry that, I believe, will help, in Feiman-Nemser's words, "give direction to the practical activities of teacher preparation such as program planning, course development, instruction, supervision, and evaluation." It is of course not sufficient to appreciate Dewey's theory of reflective inquiry and assert that it can help furnish the epistemological ground for teacher education program development.

In the following discussion, I will not offer yet another stipulative definition of reflective practice/teaching/inquiry that might somehow be delineated from Dewey's theory. I will not repeat what has been covered in Chapter IV in regard to Dewey's theory and then try to say in what respects it may be translated into practical guidance for teacher education development. Instead, in light of Dewey's philosophical thesis, I will focus
my discussion directly on learning to teach as an on-going process of reflective inquiry into teaching for the purpose of developing PKT and how programmatic provision of theoretical studies and practical experience in teacher education should be best made accordingly.

For a general theoretical framework for the development of RTE programs, I draw from Dewey's theory the following principles in regard to PKT and learning to teach:

a) PKT is the product of competent inquiry into teaching; professional knowing and learning to teach are a matter of prospective teachers developing their personal PKT through a continuing process of reflective inquiry into teaching.

RTE programs emphasize the unison of inquiry, knowledge, and action. RTE programs are designed for assisting prospective teachers in their inquiry into teaching.

b) Prospective teachers are knowing persons and makers of their personal PKT; prospective teachers' personal (prior) knowledge of teaching is recognized as the foundation of their professional preparation. Therefore,

RTE programs aim at helping prospective teachers to reconstruct, consolidate, and expand that foundation upon which their future professional practice will be based;

c) Viewed as a process of reflective inquiry, learning to teach goes beyond knowing about teaching in its fragmented pieces for knowing's sake. Learning to teach should enable prospective teachers to develop their PKT so as to act in a professionally competent manner. This requires that both the personal goals of teaching and the means for achieving the goals be subjected to re-examination and revision continuous with the initial preparation and their teaching career.

RTE programs ensure that each and every component contribute to the development of prospective teachers' PKT for intelligent conduct of teaching.

Understanding Learning to Teach

Learning to teach is a serious, career-long endeavour which
entails a moral responsibility, for teaching is in the final analysis a moral endeavour. One crucial criterion for being a morally responsible teacher is, I think, an awareness that our personal knowledge of teaching is limited and conjectural and therefore in our personal conduct of teaching there is always room for improvement. Besides, the practice world of teaching is complex and in a constant state of flux, which means that our knowledge for teaching cannot be static. Like theoretical knowledge, personal PKT needs to be continuously developed.

We do not have to worry about not seeing an end to the development of personal PKT (and how good a good teacher should be). It is, however, very important and necessary for teacher educators to know where each prospective teacher’s inquiry into teaching starts and how it progresses so that effective programmatic provisions can be made to help them to control and direct that development. As Dewey (1904) put it, "the important function of the teacher is direction of the mental movement of the student, and that the mental movement must be known before it can directed" (p. 158).

Dewey’s theory tells us that we are prompted to inquire when we encounter a doubtful situation. For prospective teachers, as I have suggested earlier, teaching is the doubtful situation they inquire into. I assume that the great majority of prospective teachers are consciously aware that they enter teacher education to learn to teach, to develop their PKT. Thus, in light of Dewey’s description of reflective inquiry, prospective teachers can be regarded as having taken the initial step of their inquiry into teaching when they enter a teacher education program. Since
prospective teachers have already taken the initial step of their inquiry upon entering teacher education, the preoccupation at the programmatic level should be duly concerned with how prospective teachers may (be helped to) have better control of the direction of their inquiry to ensure desirable outcomes. Again, according to Dewey’s theory, there are two things to consider now — (1) individual prospective teachers’ intellectualization of the doubtful situation of classroom teaching, and (2) ways in which they each try to resolve the doubtful situation.

Having experienced teaching since an early age, prospective teachers have become familiar with some of the constitutive elements of teaching. This familiarity with teaching is no doubt severely limited because it is by and large based on direct experience with teaching from an individual student’s personal vantage-point. To avoid confusion, I will refer to what prospective teachers already know about teaching at the entry level as prior knowledge. When their prior knowledge is taken into consideration, it becomes clear that prospective teachers have done more than taking the initial step of reflective inquiry. They can be considered to have already intellectualized to some extent the doubtful situation they are inquiring into. Some prospective teachers may regard teaching as a matter of caring for their students. Some, often among those would-be high school teachers, may be more passionate about classroom teaching as a vehicle for passing on to their students specialized knowledge and/or skills that are thought to be good and/or useful for their future life. A few others may take teaching to be a mission of liberating the oppressed and transforming society at
large. Some prospective teachers may be able to articulate several views of teaching. The question is then whether these views make up a coherent system of thought and which view(s) will actually be acted upon.

Not realizing that teaching in the classroom is more complex and extensive than what each and every one of them takes it to be, many prospective teachers are anxious, understandably, to find some effective means, particularly of classroom control and management or effective methods of instruction, that could help them to achieve their personal goals of teaching. Many share the belief that if I have control of the class, if I am in possession of an effective method of delivering instruction, I will be able to get my students to do what I intend them to do and achieve what I set out for them to achieve. Against this belief, any input, be it theory or research findings or even practical advice, which is not perceived to be helpful to that end, would be considered as irrelevant and not attended to.

However, as Schön rightly points out, when a doubtful situation is inadequately framed in the first place, the search for effective means to resolve it will unlikely be successful, no matter how adept one is at improvisation. Take the conception of teaching as caring for the taught as an example. Strike (1990) argues that "a view of the ethics of teaching that makes caring central may be inattentive to those values and moral principles that are internal to subject matter or to the characteristic activities of teaching" (p. 217). The emerging case literature in teacher education (Bullough, 1989; Bullough et al., 1992; Shulman, 1987) suggests that the conception of teaching as caring
for the taught would become inoperative in the classroom setting if other constitutive elements of teaching, for instance, instructional objectives and individual student characteristics, are not taken into the teacher's overall strategic consideration.

It has been noted earlier that since prior knowledge has a decisive role in learning to teach, it seems reasonable for teacher educators to make an effort to get prospective teachers to become aware of, challenge, analyze, and criticise their prior knowledge. But, suppose that prospective teachers are willing to examine critically their prior knowledge of teaching and have come to realize how inadequate it is, what must they do to change it? Where do correct ideas or adequate knowledge for action come from?

It is plainly clear that critical analysis alone is not sufficient for learning to teach, for it is usually concerned with fragments of a deconstructed knowledge structure. Learning to teach, on the other hand, is a dual task of deconstructing the knowledge structure already in store and constructing a new one. The metaphor of sailors rebuilding their ship at high seas is illuminating. The existing knowledge structure is inadequate for attaining some intended goals. But the construction of a new knowledge structure depends on and is affected by the existing knowledge structure. It must be kept in our mind that rebuilding the ship is not really the ultimate goal. Essential as it is, the ship is the means to an end, not the end itself. The goal is to continue the journey to an intended destination. Learning to teach must go beyond knowing for its own sake or being critical of what is known. Once we lose sight of the ultimate goal of
learning to teach, prospective teachers developing their PKT for intelligent conduct of teaching, learning to teach runs adrift in the direction of changing winds.

**Developing a Harmonious, Unified Conceptual Map of Teaching**

Learning to teach can be considered in terms of doing certain things, for instance, studying pedagogical theories, designing a teaching plan, engaging in practice teaching, keeping a reflection-on-action journal, and participating in a group discussion. These and many other pedagogical activities have long been instituted in the practice of teacher education. But doing these things does not necessarily always lead to the intended outcome. We learn to swim by striking our arms and kicking our legs in the water. We might get drowned doing the same things.

Learning to teach has also been thought of in terms of behaviour modification through conditioning and stimulus-response-positive reinforcement. Forming appropriate teaching behaviour was what the Apprenticeship and Competence/Performance-based models of teacher education were mainly concerned about. The Apprenticeship model has been discredited for its limitation on intellectual input from external sources. Competence/Performance-based teacher education went out of fashion as it became clear that it was based on too narrow a conception of PKT.

Today, it has become more customary to discuss learning to teach in terms of conceptual or schema change. I think this is a much better way of thinking and talking about learning to teach, for it builds upon the premise that teaching behaviour is
controlled by a personal conceptual system or schemata structure. For behaviour change to occur, the existing conceptual system or schemata structure must change. Talking about learning to teach in terms of conceptual change can also help to account for the necessity of prospective teachers participating in the various kinds of pedagogical activities. At least it can be claimed that the pedagogical activities are designed or chosen with the intention to bring about desirable conceptual change that will in turn lead to behaviour change. Two questions remain though: How does or may conceptual change occur? How can conceptual change be positively linked to the development of professional competence? Dewey's theory of reflective inquiry can help us to answer the questions.

To quote Dewey again, "inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole." It is relatively easy to speak of learning to teach as a process of reflective inquiry into the doubtful situation of teaching, but what does it mean in practical terms "to convert the elements of the original situation into a unified whole" in learning to teach?

The answer to the above question will come from an appreciation of the Deweyan idea of teaching as a relational world constituted by various existential elements, such as teachers, students, physical facilities such as classrooms and the playground, textbooks, curriculum guidelines and resources, long-term goals and specific short-term objectives, instructional...
strategies and techniques, parents, colleagues, motivation, interest, the principal and school administration, just to name a few. To develop PKT is to map, conceptually, the existential elements into a harmonious, unified whole to serve as the cognitive basis of intelligent conduct.

Obviously, each and every one of the constitutive elements of teaching can be studied in its own right. For instance, we can inquire about teachers, raising questions about their family background, educational attainment and professional preparation, command of subject matter knowledge, self-awareness, role perception, socialization, socio-economic status, ideological commitment, pedagogical practice, thinking processes, etc., and trying to find satisfactory answers to the questions we raise. Curriculum is another of those constitutive elements. It can be official or "hidden." It too can refer to a number of different things: (1) content or subject matter, (2) a program of planned activities, (3) intended learning activities, (4) cultural reproduction, (5) experience, (6) discrete tasks and concepts, or (7) an agenda for social reconstruction (Schubert, 1986) or "a study of what is valued and given priority and what is devalued and excluded" (Cherryholmes, 1987, p. 297).

But learning to teach is a kind of reflective inquiry different from academic inquiries. Learning to teach, in light of Dewey's theory, is an on-going inquiry conducted at a personal level that aims at bringing the constitutive relational elements of teaching together and into a harmonious, unified whole. Three additional statements should be made in regard to this personal conceptual map of the world of teaching -- (1) the personal
conceptual map of teaching has an existential base made up of inquirer's experience with the various constitutive elements of teaching; (2) the personal conceptual map of teaching serves as the cognitive base of an inquirer's conduct of teaching; and (3) the adequacy of the personal conceptual map can be assessed in terms of its "warranted assertibility" and predictability of the intended outcomes of teaching and learning. In plain language, what a person knows about teaching should enable that person not only to talk about teaching but more importantly to act in a professionally competent manner, producing the intended outcome in student learning.

To construct and reconstruct a conceptual map that will enable a teacher to live, work, and realize goals in the practice world of teaching, the various constitutive elements of teaching must be clearly identified: what kind of a teacher dealing with what kind of students in what context for what purpose with what kind of pedagogical means under what kind of social and institutional conditions and constraints, and so forth. Since prospective teachers' prior knowledge of teaching is on the whole gained from the experience of being a student, it is reasonable to assert that much of what they know about the various elements of teaching will not be appropriate for the reconstruction of their conceptual map. Take homework as an example. It can be assumed that homework will mean quite different things to a student who is required to do it and to a teacher who assigns it.

The point to be made here is that prospective teachers' knowledge about the various constitutive elements of teaching cannot be taken for granted. Prospective teachers must, in their
inquiry into teaching, re-acquaint themselves with those seemingly familiar elements of teaching and familiarize themselves with other elements that they have not experienced before, for instance, students working together as a group, subject matter knowledge, language of instruction, curriculum guidelines, ethic code of professional conduct, lesson planning, long and short-term goals, instructional resources, institutional constraints, interpersonal relationships with students, colleagues, and administration, etc.

It is important to be clear that "facts" and "truth" about the various constitutive elements of teaching are not given. They have to be ascertained within the inquiry process. Getting to know the constitutive elements of teaching may not always be an easy task. A dictionary definition or some generalization about a particular element will not likely suffice. But the constitutive elements are not themselves problems. That the students in a class have multi-ethnic backgrounds, for instance, is a fact that does not require sophisticated theorizing or a research program to obtain. This fact itself does not present any problem. The problem is how this particular element so known may fit into a harmonious relationship with other element(s) of teaching. What will happen if we put this element with the transmission of mainstream cultural knowledge set as the objective of teaching? In that case, questions about cultural domination and bias will arise. Even granting that those questions could be resolved, or ignored, the teacher may still have difficulty achieving the intended outcome of teaching and learning because of the lack of the prerequisite preparation on
the part of the students.

However, if there is a teacher who is appreciative of cultural diversity and the instructional objective is to promote cross-cultural understanding, these elements would fit well with a group of students with multi-cultural backgrounds towards a harmonious, unified conceptual map of teaching. To be sure, this is still not sufficient and there are still other elements to be brought into the picture. For instance, if in this multi-cultural student body, some students have a low proficiency in the language used as the medium of instruction, something more will be required of the teacher than having an appreciation of cultural diversity and the desire to promote cross-cultural understanding.

The formation of a harmonious relational conceptual map of the practice world of teaching would amount to nothing more than some propositional statements unless it enables the teacher to act out in a way that the intended goal of promoting cross-cultural understanding will be achieved. To make the conceptual map operative in the actual conduct of teaching, the teacher also has to consider other constitutive elements of teaching. For instance, what is the cross-cultural understanding that is to be promoted? What kind of curriculum material should be used? What format of the lesson should be taken? What kind of evaluative measures are to be used to assess student learning outcome? etc. To reiterate, the personal conceptual map of teaching that prospective teachers each develop through their inquiry must not exist only in words. It should enable its beholder to act in a certain way consistent with it.
Subjectivity vs. Objectivity

Since I look at learning to teach as an inquiry into teaching conducted at a personal level through which prospective teachers develop their PKT, I cannot avoid addressing the thorny issue of subjectivity and objectivity. There are at least three different ways in which the topic of subjectivity and objectivity has been discussed. First, there is the traditional philosophical debate on whether the world as we know of it exists objectively out there or subjectively in our mind, whether what we know is a mirror image of the world or our own construction of it. As the discussion in the previous chapter shows, this philosophical issue has already been dealt with in Dewey's theory of inquiry. I accept Dewey's thesis of knowledge resulting from "organism -- environment interaction" and have nothing more to add here.

A second way of dealing with the topic of subjectivity vs. objectivity is seen in the debate on whether the world can be known only subjectively through individual personal experience. It is a given that human mechanisms of sensation, perception, and cognition operate only on the basis of an individual person. I have personally experienced teaching both as a student and as a teacher and come to know what teaching means to me. The experience I have is unique to me. No one else in the world can have my experience of teaching and therefore know what I know about teaching. Yet, I am fully aware that I cannot give meaning to my personal experience of teaching or think about teaching without the medium of a language, which is public. Neither the phenomenon of RTE I am writing about nor the language in which I

205
am writing about it is my own invention. In that sense, I cannot claim that my thoughts on the subject of RTE are totally private except in the sense that I am doing the thinking.

The dependence of self-consciousness on human communication through the medium of a public language is most well illustrated in the case of Helen Keller, who lost her sight and hearing shortly after her birth. With the help of her wonderful teacher, Miss Sullivan, Hellen Keller learned to read and write. She said in her autobiography,

"Before my teacher came to me, I did not know that I am. I lived in a world that was a no-world. I cannot hope to describe adequately that unconscious, yet conscious time of nothingness. I did not know that I knew aught, or that I lived or acted or desired. I had neither will nor intellect. I was carried along to objects or acts by a certain blind natural impetus... I had a power of association... After repeatedly smelling rain and feeling the discomfort of wetness, I acted like those about me. I ran to shut the window. But that was not thought in any sense. It was the same kind of association that makes animals take shelter from the rain.

When I learned the meaning of 'I' and 'Me' and found that I was something, I began to think. Then consciousness first existed for me. (quoted in Musgrave, 1993, p. 67)

Language, said Dewey (1897), "is the tool through which one individual comes to share the ideas and feelings of others. (not merely the expression of thought, a logical instrument)" (p. 12). It seems that we can put to rest the issue of subjectivity and objectivity once we have come to terms with the two sides of the coin. Yet, there is another stumbling block to be removed. The issue of subjectivity vs. objectivity here is also associated with the controversy over whether knowledge claims (e.g., women's knowing, practitioners' knowing, cultural knowing) can be
rationally grounded rather than simply asserted on the basis of individual or group experience. At the core of the controversy is the role of rational criticism. On the subjective side, arguments have been made against historical prejudice involved in rational criticism and the unjustifiable imposition of external evaluative criteria. On the objective side, there is the insistence on the legitimacy of rational criticism as the arbiter of knowledge claims. This is obviously a complex and highly contentious issue and I will leave it for the moment and return to it later in the discussion on the provision of theoretical studies and practical experience in teacher education.

Nagel (1986) suggests a third alternative that brings the issue down to the personal level of understanding. Instead of bifurcating the issue of subjectivity and objectivity, Nagel suggests a reconciliatory approach in which a deliberate effort is made to "juxtapose the internal and external or subjective and objective views at full strength, in order to achieve unification when it is possible and to recognize clearly when it is not" (p. 4). Nagel suggests that we individual human beings are posited on a wide spectrum, trying to move away from a subjective standpoint to an increasingly objective standpoint. In this way, we increase our understanding of the world and ourselves.

To acquire a more objective understanding of some aspect of life or the world, we step back from our initial view of it and form a new conception which has that view and its relation to the world as its object. In other words, we place ourselves in the world that is to be understood. The old view then comes to be regarded as an appearance, more subjective than the new view, and correctable or confirmable by reference to it. The process can be repeated, yielding a still more objective conception.... Thus objectivity allows us to transcend our particular viewpoint and develop an
expanded consciousness that takes in the world more fully. All this applies to values and attitudes as well as to beliefs and theories. (pp. 4-5)

While confident that we can make successive objective advances and develop an increasingly detached view of the world with ourselves in it, Nagel also points out the limitation to the capacity of objectivity.

An objective standpoint is created by leaving a more subjective, individual, or even just human perspective behind; but there are things about the world and life and ourselves that cannot be adequately understood from a maximally objective standpoint, however much it may extend our understanding beyond the point from which we started. A great deal is essentially connected to a particular point of view, or type of point of view.... The subjectivity of consciousness is an irreducible feature of reality -- without which we couldn't do physics or anything else -- and it must occupy as fundamental a place in any credible world view as matter, energy, space, time, and numbers. (p. 7)

Nagel also warns us of the dangers of ambition in the pursuit of objectivity, such as "excessive impersonality, false objectification and insoluble conflict between subjective and objective conceptions of the same thing" (p. 86). I will not rehearse the details of these dangers.

Nagel's juxtaposition of subjective and objective standpoints is plausible and yet I am not entirely satisfied with it. Nagel's thesis leaves something extremely important little explored. How would it be possible for us to get a detached view of the world? In ordinary visual experience, we can broaden our view by stepping back from where we stand and we can look over our shoulder to see what is behind us. However, a broadened visual view is obtained at the sacrifice of the details that the previous, closer but narrower view obtains. We cannot see both what is in front of us and what is behind us at the same time.

208
Only when we combine what is presently in view and what is retained in our memory of the previous view, will we be able to form a larger mental picture.

Broadening or objectifying a conceptual view of the world is a far more complicated matter however. A conceptual view pertains to some understanding of experience with/in the world. I have been a graduate student over the last several years. I have developed my view of graduate study on the basis of my own personal experience. How am I to try and stand away from my current understanding of graduate study and arrive at a more objective view? "To what could I appeal, if my own analysis was correct?" (MacIntyre, 1981). It seems that something other than volition must be available to us in order that we may be able to realize what we know at the moment is only what it appears to be. That something will also enable us to see through the appearance, that is, to help us to achieve some degree of self-transcendence. If that something is already in us, why does it remain inactive when we first experience the world and arrive at our subjective view of it? If that something has to be supplied from an external source, would it simply be an attempt of fitting our experience into someone else's subjective framework to form a different view which would not necessarily include our own? Can a higher degree of self-transcendence be obtained simply by us accepting a subjective view supplied by someone else?

Nagel's Position Modified

I think Nagel's position could be modified on the basis of Dewey's original idea of "organism-environment interaction." I
take a subjective stand point of view to imply a split between the subject "I" and the world out there that the subject "I" sees and feels about. The subject "I" is an external observer peeking in on the world from outside. It may see the world as being governed by natural laws or pre-arranged by God or constituted by individual human beings of free-will or bounded by a communal membership. It seems to me that educational researchers and theorists tend to take the position of this subject "I," whether they try to discover, interpret, or criticize. Where practical action is of concern, the subject "I" regards itself as an external, benevolent force acting upon the world from without in the hope of achieving goals either self-determined or set by others. Failing to achieve the goals may lead the subject "I" to a feeling of being unfit in the world. Failure may also be accounted for in terms of the hostile conditions of the world.

In contrast, an objective stand point of view in light of Dewey's idea of "organism-environment interaction" entails a recognition on the part of the beholder of that view that "I" is but one constitutive element in an interactive relationship with other constitutive elements of the world and reasons on its behalf. This recognition makes it possible and necessary for the subject "I" to appreciate and consider, among many other things, the ways in which "I" may contribute either positively or negatively to the shaping of those elements. There are around us things both material and immaterial. It is the "I" that gives meaning to them and constructs a relationship among them. In other words, the subject "I" should hold itself responsible for what the world is in its attempt to achieve what it intends to
achieve.

In this case, the pursuit of objectivity is not the pursuit of eternal truth about the world out there or consensus on what might be taken as true or good on the basis of a majority vote. Nor would it aim at achieving a more objective view, which seems to come from nowhere, in place of a subjective view afforded by prior experience. An increasingly objective standpoint view of the world can be achieved only through a continuous effort of the "I" in ratifying facts about the constitutive elements of the world and bringing in elements that have not been included in the previous view, recognizing that "I" shape the environment while being shaped by it. When facts or meanings about the familiar constitutive elements change and when additional elements are taken into consideration, the previous subjective standpoint view will not be able to sustain itself and will have to give way to a more objective standpoint view.

Again, Schön's example of the MIT research project can be used to help illustrate the point. The teachers involved in the project did not notice in their first viewing of the video-taped game that one player did not have the designated block to continue the game with and had to improvise subsequent moves. The game appeared to them to have turned chaotic. They concluded that there was a communication problem with that player. It is difficult to imagine how it might be possible for the teachers to come to the new (more objective?) interpretation without the additional information provided by the researcher. The example of the MIT research shows clearly that the new interpretation was arrived at only after the additional information was brought into
consideration together with the previous held information. The additional information makes the previous framing of the problematic situation unsustainable. (Note: The MIT research project was designed for a different purpose.)

The foregoing discussion can help shed light on prospective teachers' learning to teach. By implication, in their effort to develop a more objective standpoint view of teaching, or an increasingly harmonious, unified conceptual map of teaching, prospective teachers need to see themselves as one very crucial element of the world of teaching in an interactive relationship with the other elements. It is very important for them to be aware that "facts" or meaning about the various constitutive elements of teaching including themselves are not given but are what they are taken to be in the process of inquiry. They need to constantly ratify the "facts" or meaning about the various constitutive elements of teaching in respect of their interactive relationship. This means that it is never enough to just think what is the right thing to do and what is the better or best way of doing it. Nagel considers "the distinction between more subjective and more objective views ... a matter of degree" (p. 5). I think the same speaks of the construction of a harmonious, unified personal conceptual map of teaching, the development of personal PKT.

Often, teaching in the classroom is said to be complex because teachers are faced with many practical issues and demands from different circles. From the perspective of Dewey's theory of reflective inquiry, the complexity of teaching is rather inherent in familiarizing with and mapping its many constitutive
elements, inclusive of the practical issues and demands, into a harmonious, unified relationship. The more elements are brought together, the more complicated the conceptual map of teaching becomes and the more difficult for it to achieve harmony and unity. Learning to teach as a process of reflective inquiry into teaching should contribute to the development of the personal conceptual map of teaching in increasing complexity, harmony, and unity that will enable its beholder to act as a teacher in a socially responsible and professionally competent manner. What kind of help should be provided at the programmatic level then?

Programmatic Provision

What implications can teacher educators draw from Dewey's theory of reflective inquiry for the development of RTE programs? How may it help teacher educators to make rational decisions about the institutional provision of pedagogical activities, namely, theoretical studies on the university campus and field experience in the school setting? This leads us back to the persistent question of the relationship between theory and practice in teacher education. Earlier, I have suggested that the problem of the relationship between theory and practice in teacher education is a problem of understanding the nature of those conventional forms of knowledge, theoretical knowledge from various intellectual sources as well as the stories teachers tell, and their proper role in learning to teach. I would like to add here that the role of field experience requires the same kind of consideration. Why does a RTE program need the components of
theoretical studies and practical experience? What is the purpose of providing theoretical studies and field experience in view of prospective teachers' development of their PKT? To say that they are provided for the purpose of helping prospective teachers to develop their PKT is obviously not enough. In what follows, I will discuss the role of theoretical studies and practical experience in learning to teach.

Theoretical Studies

The Foundations Metaphor

The component of theoretical studies in a teacher education program used to bear the metaphorical title of Foundational Studies of Education. Today, the foundations metaphor may sound a lot less convincing to many. Nevertheless, talk about the foundations of education continues, and in some teacher education institutions, we can still find a Department of Foundational Studies responsible for offering courses of study in the areas of philosophy of education, sociology/anthropology of education, history of education, and educational psychology, and in a few other fields of educational studies as well, such as comparative education, multicultural education, and women's studies.

The foundations metaphor is a historical product that emerged around the turn of the 20th century when education began to take its foothold in the university academia as a multi-disciplinary field of academic inquiry (Tozer, Anderson, and Armbruster, 1990). This architectural metaphor was originally used to refer to the psychological (the mind) and social-cultural
(culture and institution) foundations of educational policy and practices. These foundations of education were identified and became the staple subject of systematic disciplinary inquiries. However, as time went by, the metaphor was somehow taken to imply and assert that the results of scholarly inquiry and research (should) constitute or provide the foundation of educational policy and practice. There is little doubt that this metaphor played a significant role in helping legitimize theoretical studies as an essential component of teacher education delivering codified knowledge from the contributing disciplines. Arguments have been continuously made that the edifice of (reflective) practice could not sustain without the support of a theoretical foundation supplied by research and scholarship.

The foundations metaphor has however been faulted on the ground that theoretical studies cannot live up to the dubious hopes of delivering either technical solutions to classroom problems or clear-cut prescriptions of the good for educational policy and practices (Broudy, 1967). Broudy argues that even though practical advice was not entirely absent from foundational courses, theoretical studies should not be expected to yield important rules of practice. Broudy asserts that

One would hardly justify reading Alcuin’s educational writings by promising that they will help prospective teachers to teach arithmetic. Nor would one justify the study of the Principia Mathematica by Bertrand Russell and Alfred N. Whitehead on these grounds. These studies may have a contribution to make to teacher training, but not as technical handbooks. (p. 3)

Broudy also points out that in every field of disciplined inquiry there are differences and controversies over fundamental issues such as what phenomena constitute the proper subject matter of
the field and what methodology is more appropriate for achieving the intended goals of inquiry in the field and what constitutes the good. This seems to apply not only to philosophy and history of education. It is true also of those fields of inquiry that have an empirical science base. Garfinkle (1981) has put the matter most succinctly,

We look at a body of theory and find a confusing patchwork of schools and approaches, and it is very hard to see how they fit together. ... Faced with any such list, what strikes us is the difficulty of finding a coherent way of comparing the different theories. They seem to be different sorts of things. Some of the theories may address different phenomena or different realms of phenomena. Some are genuinely competing, others can be reconciled with one another, while still others pass one another by, answering different questions. They fit together only in a very complicated and overlapping geometry. (p. 1)

The existence of different and competing theories is a matter of fact and may not be a bad thing at all as far as any field of disciplinary inquiry itself is concerned. It becomes a great problem however when we consider the ambitious project of constructing a foundation for the practice of teaching with theoretical input from those independent sources.

If everything of the several contributing disciplines of education were to be put into the teacher education curriculum, the limited time allotted to theoretical studies would leave little chance for prospective teachers to have an adequate understanding of what they are required to study, let alone applying it in their future practice. Besides, the differing and conflicting messages from each disciplinary field would very likely work to the effect of confusing rather than informing or enlightening them. In the meantime, teacher educators themselves
would be expected to have a decent command of at least one entire field of study. This expectation may sound reasonable but the extensiveness of a discipline field such as philosophy of education or educational psychology and the current practice of specialized background training in graduate studies leave little room for hope.

It seems that teacher educators will have to make selective use of what each disciplinary field has to offer. But what kind of criteria can teacher educators use for the selection of the input from the fields of disciplined inquiry and educational research? I would think that teacher educators are generally averse to justifying their pedagogical decisions on the basis of personal beliefs. The next choice seems to be group consensus. If, for instance, everybody in the department who teaches courses in philosophy of education agrees on philosophical understanding of educational issues as the proper subject matter, one might proceed to have prospective teachers read and discuss selective philosophical analyses of those issues.

The consensus criterion can be problematic however for the reason that consensus may not always be achievable. In my view, group consensus tends to avoid rather than help resolve existing conflicts within a discipline. It may actually mean upholding one particular view while abducting other competing views that are also constitutive of the discipline. Whereas choice over theoretical input seems inevitable, reasoning behind the choice may not always be made public. Unaware of the choice made and the reason(s) for it and for the lack of background knowledge in the relevant areas of study, prospective teachers might get the
impression as if what theoretical studies delivered were First Principles all arrived at a priori or proven by empirical research beyond any reasonable doubt. When they set foot in the classroom, reality quickly disillusioned them.

The problem is compounded by the fact that group consensus is confined within discipline boundaries and particular institutional contexts and there are a number of disciplines and fields of educational study which claim to make contributions to the teacher education curriculum. The ill-conceived project of theoretical studies providing a foundation for practice can be assessed with Goodman's (1978) idea of world-making. Goodman suggests that world-making consists of decomposition and composition, of dividing wholes into parts and partitioning kinds into subspecies, analysing complexes into component features, drawing distinction... [and] composing wholes and kinds out of parts and members and subclasses, combining features into complexes, and making connections. (p. 7)

Intra- and extra-disciplinary divisions of educational study and research make it obvious that the contributing disciplines and fields of study, in the words of Goodman, "embody different world-versions of independent interest and importance, without any requirement or presumption of reducibility to a single base" (p. 4). Educational theorists and researchers from different fields of inquiry with different intellectual traditions each take a slice of classroom teaching and try to make their idiosyncratic versions of it. No one is responsible for or interested in composition beyond the disciplinary boundary. It is doubtful that the various world-versions within any discipline
or field of study could ever be reduced to a unified one. What theoretical studies deliver are some selective, often inconclusive, results of decomposition of the practice world of teaching. If the contributing disciplines were to provide a foundation for education policy and practice, the foundation would be so loose that it could hardly be expected to hold up anything.

The foundations metaphor for theoretical studies in teacher education is problematic also in terms of its intimate connection to the view of theory and practice as decontextualized and disembodied entities and to the traditional transmission model of teaching. In reality, however, there will be no professional practice whatsoever without a specific context either broadly or narrowly conceived in which the practice is situated. At the same time, no professional practice is possible without some practitioners actually engaged in it. Since professional practice is contextualized and operates at a personal level, it requires knowledge that is contextually derived and personally embodied. That is, practice depends really on personal practical knowledge. I think it only fair to refer to personal PKT as the foundation of the practice of teaching. However, if theoretical studies cannot really provide a foundation for practice, what role will it play then in teacher education, if prospective teachers should be required to take the so-called Foundational courses as part of their initial preparation?

Three Alternative Views

The recognition that the foundations metaphor is a misnomer for
Theoretical studies in teacher preparation does not constitute a judgement upon the importance and relevance of theories and research findings. It does help to raise the question and call on teacher educators to rethink the role of theoretical knowledge in teacher education. Broudy (1967) proposes an alternative view of theoretical studies as "an interpretive use of knowledge" or "interpretive understanding of problems." He suggests that intellectual disciplines, as well as religion, art, and instructional folkways, provide systems of meaning for the interpretation of experience.

The advantage of locating problems within systems of meaning is obvious, for having done so, one can talk and think about the problem with the conceptual resources of the whole system. To understand something is therefore to be able to talk and think about it in terms of a system of concepts related to teach other by predetermined routes of thought. (p. 10)

Broudy’s argument has been reflected recently in a number of discussions that also attempt to reexamine and reconceptualize foundational studies in teacher education (Tozer et al., 1990; Beyer, Feinberg, Pagano, and Whitson, 1989). This alternative view may well be the most favoured in teacher education today towards the component of theoretical studies.

The connection between theoretical studies and interpretive understanding seems to strip away the pretensions built into the foundations metaphor in teacher education. However, a closer look reveals that the two do not really differ as much as they sound. Beyond the apparent difference, both share the same syntax of theoretical studies delivering SOMETHING to prospective teachers for their future practice of teaching, a body of theoretical knowledge as the foundation of practice or meaning.
systems for interpreting educational problems. Both fail to recognize that each and every individual prospective teacher is already in possession of their own unique personal meaning system (see Hollingsworth, 1989, Peterson, Clark, and Dickson, 1990). The interpretive understanding approach also inherits the problems with the foundations metaphor, for example, selection of theoretical input, meaning, transfer, and application or applicability. All in all, Broudy's position and the recent attempts to reconceptualize theoretical studies in teacher education can be traced back to the same source, where the interest is in decomposition of the world. We must argue, however, that composition, instead of decomposition, should be the preoccupation of learning to teach and programmatic deliberations.

Another alternative view to be considered here has been advanced by Fenstermacher (1978, 1986, 1987). Although Fenstermacher's discussions are mostly focused on establishing "an epistemologically and morally sound linkage" between educational research (teaching effectiveness research in particular) and the practice of teaching, I take his argument to be applicable to theoretical studies in teacher education. In developing his argument, Fenstermacher introduces a distinction between knowledge production and knowledge use as well as the concept of practical argument defined as "a reasonably coherent chain of reasoning leading from the expression of some desired end state, through various types of premises, to the expression of an intention to act in a certain way" (Fenstermacher, 1987, p. 413). I will leave aside the questions of whether the production
of knowledge about and for teaching is the exclusive business of educational researchers and theorists, whether practice is only a matter of knowledge use, and whether it involves both knowledge production and knowledge use. I will concentrate only on the linkage Fenstermacher draws between research and the development of teachers' pedagogical competence.

In a reply to his critics, Fenstermacher (1987) reinstates the position that

research connects to practice when research is used to alter the truth value of existing empirical premises, when it is used to complete or to modify empirical premises, or when it serves to introduce new empirical premises in the practical arguments in the minds of teachers. (p. 413)

The linkage Fenstermacher tries to establish between research and practice is plausible. It departs from the position enshrined in the foundations metaphor. Practice is now seen to be based on practitioners' practical argument or practical reasoning rather than on a putative theoretical foundation provided by the disciplines. It is also significant that the central concept of practical argument "evokes a conception of the practitioner as a thinking, complex agent, rather than an automaton who simply puts the findings of research into practice" (Fenstermacher, 1987, p. 414). In these two respects, I take Fenstermacher's argument to be unequivocal, but I do not think that the linkage is as firmly established as he believes.

We may raise an objection on the ground that pedagogical thinking behind every pedagogical decision, be it strategic or tactical, is a great deal more complex than what the standard logical system can capture. Feiman-Nemser and Floden (1986)
suggest that

Practical knowledge is difficult to describe. People often know how to do things without being able to state what they know. Furthermore, neither teachers nor researchers have an adequate vocabulary for describing practical knowledge, much of which is tacit. Philosophical and psychological talk of theories, propositions, and concepts fits codified knowledge, not tacit knowledge. To date, researchers have not gone much beyond suggesting concepts to guide the study of practical knowledge. If teachers are pressed to give general descriptions of themselves and their work, they often use the same language that social and behavioral scientists do. These abstract descriptions may be remembered from college courses or picked up as part of the vocabulary of educated people, but they do not express teachers’ own perspectives. (p. 506)

Connelly and Clandinin (1985) argue along a similar line that

A user does not call up a mode of knowing in the sense that he tries out different cars or recalls items for a test. In the pages of philosophy, and in the textbooks and methods of instruction, the modes of knowing have this quality of identifiability. But this quality is lost in a user’s submersion of it in his mind and body. Something else, which we call "personal practical knowledge," is "on call." ... [Personal practical knowledge] does not have an identifiable conceptual status. (p. 183)

Fenstermacher suggests that research can help improve practice by way of altering the truth value of the empirical premises in the practical arguments that are the basis of practice. For that to happen, practical arguments involved in pedagogical decision making must be reduced to sets of logically connected propositional statements. Research can then be brought to bear upon, and alter, the empirical premises in those arguments. If we concur with Fenstermacher that the concept of practical argument is not meant to be an analytical tool for studying teacher thinking, rather it only suggests a way of exploring and understanding the linkage between research and practice, we cannot challenge Fenstermacher’s position on the ground that
practical knowledge is not reducible to a set of propositional statements.

However, we could raise objections within the parameter Fenstermacher sets for us. Suppose we were somehow able to reduce teachers' pedagogical thinking to the form of a practical argument, a set of logically connected propositional statements, we could still have alternate ways of reasoning about it that would render research irrelevant. I will illustrate my point with one of Fenstermacher's (1986) examples. The example is paraphrased below with its basic content intact. A teacher made extensive use of work-stations and learning centres in her teaching on the basis of her practical argument,

a) I intend students to acquire the material presented to them.
b) I honour student individuality.
c) Work-stations and learning-centres enhance individual learning.
d) I use work-stations and learning centres in my teaching to achieve a) and b).

It turned out that the students did not score well on the end-of-year standardized examinations. What had gone wrong? Fenstermacher draws our attention to the empirical premise c) in the practical argument. He reports that teaching effectiveness research shows no evidence of a positive correlation between the extensive use of work-stations/learning centres and students' achievement of instructional goals assessed by standardized examinations. Fenstermacher suggests that once the research is brought to bear on the empirical premise in the teacher's practical argument, she will be compelled to change that premise, which will lead to a change of her use of work-stations and learning centres.
There is however a different way of looking at the practical argument. It may well be that the problem does not lie with the use of work-stations and learning centres per se. Rather, it may have a lot to do with the way the teacher used work-stations and learning centres. The use of work-stations and learning centres, I suppose, needs to be accompanied by proper teacher supervision and intervention when and where necessary in order that student activities in the work-stations/learning centres are relevant and contributing to the achievement of the intended goals of teaching and learning. When we consider the teacher's practical argument along this line of thought, whether teaching effectiveness research shows evidence of a positive correlation between the use of work-stations and students' achievement of instructional goals measured by standardized examinations will become irrelevant. The teacher is entitled to continue her use of work-stations and learning centres so long as she provides proper supervision and necessary intervention to make sure that activities at the work-station/learning centre are relevant and contributing to the achievement of teaching and learning objectives. The teacher may also question, quite legitimately, the value and validity of standardized exams imposed on her students.

The linkage Fenstermacher proposes between research and practice is weak also in consideration of the underlying assumption that research evidence has higher truth value than evidence accrued by direct experience in a particular context of practice. Although academic inquiries of teaching and teachers' inquiry appear to share the same reference of object, they actually belong to two different realms of experience. In the
realm of academic research and theorizing, experience vests its interest in advancing theoretical understanding, whereas in the realm of practice, experience is preoccupied with getting things done. Experience in the realm of practice is by no means blind and unenlightened. It embodies understanding and reasoning in its own right. If we fail to recognize that, how meaningful would the concept of practical argument itself be?

Besides the difference in intended goals, experience in each realm of practice commands its own meaning system and operative mechanism such as basic assumptions, methodology, language, and discourse patterns. What has proved to be true in research may have little to do with what is true in practice. For instance, the thermometer on the wall marks the room temperature at 18 degrees C. The person in the room reports feeling a bit chilly. It is hard to compare the truth value between these two. But when it comes to the person deciding to put on a light sweater, we could easily tell, under normal circumstances, which empirical evidence is relevant and which is not.

The discussion can be extended to the pending question of subjective understanding and external criticism. If we intend to go beyond examining subjective understanding in light of a different view or frame of reference, it is doubtful that any "sophisticated" meaning system or research findings can help us to achieve that. Subjective understanding is imbedded in a personal meaning system. The personal meaning system sustains itself by filtering incoming messages, accepting those that are comprehensible and compatible to the system and rejecting those that are incomprehensible and incompatible. When the personal
meaning system remains intact, challenges to subjective understanding and established behaviour patterns will be diverted and explained away. De Landsheere (1987) puts it very succinctly,

As long as content learning is an objective in itself, it does not influence field behaviour. That is why psychological and educational theory learned by the students just to pass their examinations have so little influence on actual teaching practice. (p. 79)

If a direct linkage cannot be satisfactorily drawn between theory and practice in terms of the former providing the latter with a foundation or interpretive meaning systems or empirical evidence, what role can theoretical studies play in teacher education? I think that the linkage between theory and practice has to be drawn via the personal meaning system without which practice would not be possible. Since the personal meaning system resists the importation of foreign meaning systems due to incomprehension or incompatibility, chances are that change to the personal meaning system will have to be brought about through changes in its experiential base. It has been suggested earlier in light of Dewey’s theory that when more existential elements of the world are brought into consideration, the held standpoint view, the existing knowledge structure, will not be able to sustain itself and has to give way to a more objective standpoint view. Criticising an existing knowledge structure is one thing and constructing a new structure is quite another.

A third alternative view of the role of theoretical studies in teacher education comes from the perspective of Dewey’s theory of reflective inquiry. On the one hand, theoretical studies should be aimed at helping prospective teachers to locate their personal meaning system with which they inquire into teaching.
If teacher educators do not know what their students already know, they will not be able to make informed decisions about how they may best help prospective teachers to better control and direct their inquiry. Helping prospective teachers to become conscious of what they know does not require the direct assistance of theoretical knowledge and research findings. The component of Theoretical Studies provides a setting in which prospective teachers try to get access to and reconstruct their personal meaning system.

To help prospective teachers to reconstruct their existing conceptual structure, that is, to help them to gain a better understanding of teaching, efforts should be made to help them to expand the experiential base of their personal meaning system. Theoretical knowledge and research findings will come to play a very significant role here. Dewey's description of how reflective inquiry in dealing with a doubtful situation evolves indicates that one of the crucial tasks involved in settling the doubtful situation of teaching is for prospective teachers to familiarize themselves with the existential constitutive elements of teaching. Some of the constitutive elements of teaching are immaterial and not accessible to direct experience and other elements are missing from the experiential base of prospective teachers' personal conceptual structure because it is constructed on the limited personal experience of a student. Theoretical knowledge can help to draw prospective teachers' attention to those elements. In this sense, it is the various elements of teaching with which educational research and scholarship are concerned that are immediately relevant to learning to teach,
much more than the conclusions, findings or the technical procedural aspects of various kinds of disciplined inquiry.

Theoretical knowledge should be introduced to highlight some constitutive elements of teaching rather than something in and of its own. Theoretical knowledge is also needed in helping prospective teachers to differentiate truth from falsity and right from wrong. What is important in learning to teach is a familiarity with the constitutive elements of teaching that are missing from individual prospective teachers’ existing conceptual structure and how they could be helped in trying to reconstruct the conceptual structure with the additional elements. To be sure, analytical tools, for example, conceptual analysis, are necessary but should be exercised within the process of learning to teach and find its proper subject matter there. The focus is not on how to do conceptual analysis, for instance, but on how and what concepts in the personal meaning system need to be made clearer so as to lead to conceptual change.

This role of theoretical knowledge in learning to teach is conceived upon the recognition that the experiential base of an individual person’s conceptual world is limited in scope whereas the practice world of teaching is infinite and in constant flux. It is also premised on the supposition that we can know more than our direct experience with the world can afford, through communication with other fellow human beings. The historian Elton (1991) puts it extremely well,

Human beings learn primarily from experience; if they are to think and act profitably -- with positive and useful results -- they need as wide a vision of the possibilities contained in any given situation and any present assembly of other human beings as they can
acquire. An individual experience, of course, is always limited and commonly distorted by prejudice and self-interests: what men and women need is an enlarged experience against which to measure the effect of those disadvantages. (p. 72)

Theoretical knowledge represents a particular kind of human experience with teaching that can be shared to the advantage of prospective teachers' development of their PKT. If any teacher educators would insist on bringing the standards of excellence of research and scholarship to bear upon prospective teachers' subjective understanding, they would have to face questions of the relevance and commensurability of the standards of research and scholarship to practical knowledge and reasoning as well as the legitimacy of imposing external evaluative criteria upon practice. Those teacher educators would also have to carry the burden of helping prospective teachers to comprehend, assimilate, accommodate, and apply theoretical knowledge. But, as we know in light of Dewey's theory, learning to teach is a process of prospective teachers interacting with/in the world of teaching and it is dependent upon prospective teachers' prior knowledge. The study of theoretical knowledge can be beneficial to prospective teachers' development of PKT. It could also be a waste of time and even detrimental to that end, if it is conducted only in the interest of knowing for knowing's own sake.

Practical Experience

The term practical experience is used here to refer to the provision of pedagogical activities of learning to teach which take place in the classroom setting, known as the teaching practicum/practice teaching/field experience. The component of
practical experience is perhaps the most researched area of
teacher education (e.g., Applegate, 1986, 1987; Griffin, 1986,
Lanier and Little, 1986; Watts, 1987; Waxman and Walberg, 1986;
Wideen and Holborn, 1986; Zeichner, 1980, 1987b). Both the
folklore and research literature indicate that practical
experience in the classroom setting is generally perceived by
prospective teachers, and by many teacher educators too, to be
the most beneficial component of their initial professional
preparation. One would hope that research findings on how
learning to teach takes place in the classroom setting might help
compensate for the dearth of knowledge about how prospective
teachers actually learn to teach throughout a teacher education
program. But unfortunately,

Despite knowledge of research on teaching, learning,
and educational psychology, many critics have charged
that student teaching has failed to evolve much beyond
the medieval apprenticeship training model, has not
developed a sound theoretical basis, and has no uniform
or standard structure. (Guyton and McIntyre, 1990, p.
514)

Preference for learning to teach in the classroom setting,
however, finds support in the commonsense belief of "learning by
doing/experience."

The role of experience in the maturing of human intellect is
unequivocal, notwithstanding the complexity involved in the use
of the word "experience" (see Hanson, 1961). For those who are
keen on solving practical problems in the "real world," the
learn-to-swim analogy suffices to make their case against the
"ivory tower" with its Utopian idealism and its alleged lack of
relevance to the practical demands of teaching.

To learn to swim, you have to be in the water. "The general
consensus seems to be that the greater the number of hours a student spends in the classroom ..., the better prepared he/she will be" (Beyer, 1984, p. 36). There has been a strong tendency of lengthening practice teaching at the sacrifice of theoretical studies and moving teacher education back to the school-based, traditional apprenticeship Model of professional preparation. It is believed by some that housing teacher education in the school setting could somehow better meet the practical needs of prospective teachers that university-based teacher education would, allegedly, not be able to satisfy.

But the commonsense belief of "learning by doing" is not without controversy. The learn-to-swim analogy, while indicating a necessary condition of being in the water, also bears the possibility of drowning in the water. We are constantly reminded of the negative effect of socialization in the school setting on prospective teachers' professional growth. Some teacher educators argue that learning to teach in the classroom setting may not necessarily contribute positively to the development of prospective teachers' professional competence (Buchmann and Schwille, 1983; Feiman-Nemser and Buchmann, 1985; Guyton and McIntyre, 1990; Tabachnick and Zeichner, 1984; Zeichner and Gore, 1990). Lanier and Little (1986) observe that studies of teacher education bear little to indicate that the curriculum surrounding student teaching was arranged to provide the knowledge and inclinations needed for an intellectual career in teaching. If anything, prospective teachers were encouraged to maintain their narrow view of teaching. (p. 527)

I think there is a way of getting out of this muddled dispute.
What teacher educators really need to do is to ask about the necessity of the provision of pedagogical activities in the classroom setting in view of prospective teachers' development of their PKT. I will briefly consider the purpose(s) of practical experience in the classroom and then return to learning to teach as reconstructing or remapping a personal conceptual world of teaching.

The Purpose(s) of Practical Experience

My own familiarity with the practice of teacher education suggests that practice teaching is generally taken to serve two purposes. One of them is for prospective teachers to put theory into practice and the other is for prospective teachers to prove their capability to undertake a prolonged teaching assignment. Both the Foundations and the Interpretive Understanding approaches towards learning to teach treat the teaching practicum component as the time and place for theory application and/or for practising intellectual skills such as observation, lesson planning, instruction, individual tutorial, classroom management, problem solving, communication, social interaction, reflection, etc. Both approaches assume that prospective teachers have acquired some theories or intellectual skills that can be applied in the classroom teaching. Practice will help make them perfect.

But the "applied science" notion of teacher preparation has some difficult questions to answer regarding the nature of the theories that have been brought into the teacher education curriculum and their applicability to the practical, complex, and
sometimes conflicting, demands of classroom teaching (see Schön, 1983, 1987; Entwistle, 1982; Wilson, 1975; Schwab, 1970). Also, questions must be raised about the effectiveness of pedagogical activities of learning to teach on the university campus. It seems paradoxical, for instance, that critical analysis of teaching situated in a social and political context could be expected to make prospective teachers more competent in performing instructional tasks that are constitutive of teaching which is the subject of criticism.

The notion of prospective teachers proving their capability of teaching has personal psychological ramifications. Few of us will choose teaching as a career unless we can convince ourselves that we are capable of it. Where grades and employment are at issue, we also have to show others our capability through observable performance. But competence testing, if it could be a legitimate purpose of practice teaching, only serves the function of showing whether individual prospective teachers have acquired or failed to acquire a certain degree of professional competence. Prospective teachers have to acquire that competence from somewhere. If the practicum is meant for testing prospective teachers' competence, the competence has to come from their own life experience (Lortie, 1975; Zeichner and Gore, 1990) or from their theoretical studies on the university campus. Since prior knowledge based on the experience of being a student is inadequate for teaching and the contribution of theoretical studies is in serious doubt, what gets tested is actually the adage that "Teachers are born, not taught."

It seems to me that the difficulty we are having here comes
from an inattention to the role of practical experience in learning to teach and the distinction between the performance sense and the outcome sense of learning. The performance sense of learning implies a process of doing something. The outcome sense of learning refers to some result of doing something. Although, the two do not appear separable from each other, it is helpful to keep the distinction in mind. Learning, I would argue, should be assessed in terms of its intended outcome rather than the activity one participates in. I am presently learning to write academic papers. My learning should be assessed by applying certain evaluative criteria to the completed pieces of my writing, rather than my sitting in front of the computer for hours trying to organize my thoughts and put them down into connected sentences and paragraphs. Efforts made in learning are worth commending. However, to be truly worthwhile, efforts must lead to the achievement of the intended goals of teaching and learning.

In teacher education program development, the distinction of learning activity and learning outcome does not seem to be clearly and consciously maintained. It often seems though that the outcome sense of learning slips out of sight where the performance sense of "learning" gets all the attention. Prospective teachers are required to engage in various kinds of activities of learning to teach and they are evaluated in terms of how well they perform these activities. Learning to teach thus becomes a matter of performing various kinds of pedagogical activities making up a program of preparation. The assumption seems to be that if prospective teachers can somehow perform the
learning activities well according to the standards set for them, they will be able to perform activities of teaching well. The whole point of practice teaching becomes prospective teachers performing pedagogical activities to be measured as an indicator of their professional competence, instead of serving the purpose of learning to teach. When the outcome sense of learning fails to get its due attention from teacher educators, possibilities are, in regard to prospective teachers learning to teach: a) one may not achieve the intended outcome; b) one may achieve the intended outcome; and c) one may achieve some unintended outcome. All happens without begging the question of how they actually learn. This could perhaps help to explain why many first-year teachers experience "a reality shock."

I have already noted that many teacher educators have expressed their concern over the conduciveness of practical experience in the classroom setting. Their concern is legitimate to some extent. But those teacher educators miss one crucial point that, besides the distinction between the performance sense of learning and the outcome sense of learning, the outcome of learning is not logically determined by the conditions under which the learning experience takes place. An experience is an experience is an experience, be it observation or instruction or critical analysis or reflective inquiry and whether it occurs under favourable or unfavourable conditions. The terms "educative" and "mis-educative" assigned to experience are not ontological properties of experience that has not yet occurred. They are rather terms used in our evaluative judgement about experience we have already undergone. Who would appreciate, for
instance, the experience of being held hostage in the Middle East for five years, of which four years were spent in solitude confinement? But Terry Waite (1993), assistant to the Archbishop of Canterbury, who actually had the experience, writes in the forward of his book *Taken on Trust*,

Living for years deprived of natural light, freedom of movement and companionship, I found that time took on a new meaning. Now I can see that past, present and future are carried in the experience of the moment, and the exhortation of Christ to live for the day has assumed a new depth and resonance for me. ... I am truly happy to have discovered that suffering need not destroy; it can be creative.

The experience Terry Waite had endured was miserable but led to a most positive outcome in his new understanding of time and suffering. How could it be so? The answer is simple. From a Deweyan point of view, worthwhile experiences yield from the interplay of an inquirer's internal conditions and the external conditions that constitute the environment (Dewey, 1938b).

It is not difficult to understand the desire on the part of teacher educators and prospective teachers to control external conditions. We all wish the environmental conditions for learning to teach on the university campus as well as in the schools could be as we desire them to be. There should be well trained, supportive supervising teachers and faculty staff, cooperative students and parents. No pressure should be put upon prospective teachers to conform to questionable norms and demands. Prospective teachers should be assigned with adequate, non-trivial workload, and be given the freedom of experimenting with innovative ideas and initiating change, etc. But ideal conditions are hard to find.
Even if we suppose that ideal environmental conditions could be created, they alone still could not determine the learning outcome. Learning outcomes depend more on how prospective teachers interact with the environmental conditions than the kind of conditions under which practical experience takes place. When, for example, a prospective teacher is asked to take care of classroom routines during practice teaching, what can be learned is not limited to the "boring" execution of, say, handing out and collecting papers, which leads to a feeling of being deprived of an opportunity to teach. Prospective teachers should come to realize that routines are part of teaching and bear directly upon an overall program of instruction and, if not handled properly, may well block the way to the achievement of instructional objectives. Also, being put in charge of simple routines in practice teaching offers a prospective teacher a good opportunity to observe and the freedom to contemplate how one might act under a given circumstance and explore other possibilities.

Elsewhere I presented my personal (empirical) observation that prospective teachers tend to reflect on their learning-to-teach experience more from a spectator's point of view and their reflection tends to lean towards the emotional, that is, practical experience tends to be recounted more in terms of a person's emotional reaction than that person's cognitive growth (Yang, 1992, 1993). We often hear individual prospective teachers talking about how they feel about their experiences. Some feel good because the experience has turned out to be a success. Some feel frustrated due to some unfulfilled aspirations and expectations. Some feel duly disillusioned about
the value of the theoretical knowledge learned on the university campus, if not the entire program of teacher education. Seldom do we hear what exactly prospective teachers have learned from their individual experiences that will effect and affect the further development of their PKT. Many teacher educators seem to be more interested in debating about the ontological nature of practical experience. But, without knowing what prospective teachers have learned, teacher educators cannot be sure whether or not learning to teach in the classroom setting has achieved its intended outcome. Without knowing what prospective teachers have learned, teacher educators will not be able to determine the quality of their learning. Without knowing what prospective teachers have learned, teacher educators cannot decide what else and more they should learn.

Experience with theoretical knowledge and the concrete materials of classroom teaching is a necessary condition for learning to teach but it does not equate learning something from that experience. The task of teacher educators is to help prospective teachers to make their experience educative. It takes more than an exposure to selected pieces of theoretical knowledge and/or an immersion in the "real world" to make prospective teachers educated and prepared for teaching. The achievement of the intended outcomes of learning to teach will depend upon the interplay of prospective teachers’ internal conditions and the environmental conditions.

I am of the opinion that far more important than continuing the debate on the value of practical experience is the task to search answers to questions such as: How do prospective teachers
interact with the environmental conditions of classroom teaching? What changes are needed in prospective teachers' internal conditions? What can teacher educators and prospective teachers do together to bring about those changes? How can teacher educators help prospective teachers to maximize the educativeness and minimize the miseducativeness of their theoretical studies as well as practical experience? Of the three, I find the third question most calling and challenging.

Summary

For a long time, teacher educators have been preoccupied with providing prospective teachers with "valuable and useful" knowledge and skills. Many have also been concerned with the negative influence of practical experience on prospective teachers' professional growth. At present, reflection (-on-action) has become the magic wand in the hands of many teacher educators, although, its power is more imaginary than real. Dewey's theory of reflective inquiry offers us a different way of understanding learning to teach. When learning to teach is seen as a process of reflective inquiry, it allows us to rethink the role of theory and experience in teacher education.

Theoretical studies and practical experience are different means employed to help prospective teachers to develop their PKT. They help prospective teachers to expand the experiential base of their personal meaning system. Changes in the experiential base are necessary for changes to take place in the personal meaning system. For teacher education to be effective, teacher educators need to become clear about (1) the role of theoretical studies
and practical experience in learning to teach; (2) what prospective teachers actually learn from their experiences in theoretical studies and in the teaching practicum; and (3) how the learning contributes to the development of a harmonious and unified conceptual map of teaching. Posner (1989) puts it well,

> An experience is educational, if we learn something from it. If your field [and on-campus] experience is to be educational, then it will have to help you learn something about teaching, about yourself, about learners, about your subject matter, or about the social milieu in which teaching occur. (p. 141)

Teacher educators should also become aware that their role is to help ensure that what prospective teachers learn, whether on the university campus or in the classroom setting, will enable them to teach rather than to converse about what good teaching is or ought to be. Learning to teach in a teacher education program should not have "the effect of arresting and distorting the growth of further experience" (Dewey, 1938a, p. 13).
CONCLUSION

The study presented in this volume is concerned with the fuzzy phenomenon of reflective teacher education. In the teacher education literature, this phenomenon has been seen by some as a problem of meaning. The lack of conceptual clarity or a shared sense of RTE results from the emergence of different conceptions of reflective teaching/practice/inquiry in the many efforts of developing new programs of teacher preparation within varying institutional contexts. Common across the various RTE programs is that reflective teaching/practice/inquiry, irrespective of how it is defined, is set as a goal to be attained and reflective inquiry/exercise is taken to be the means for achieving that goal. Scant consideration has been given to the conceptual and epistemological grounding of RTE programs.

Talking about teaching as reflective practice and setting reflective practice as the goal of teacher preparation should not, however, make irrelevant the issues concerning PKT and learning to teach. To quote Saltis again,

the point is to see that the more adequate our grasp of what we understand as "knowledge," the more we can consciously, responsibly, and morally play the role of educator.

Instead of wrestling with the problem of meaning, I approach the phenomenon of RTE with the question: What kind of epistemological understanding of PKT and learning to teach is required for establishing a viable alternative conceptual orientation towards teacher education?

An excursion into the brief history of institutionalized teacher education shows that program development in this field
has traditionally been guided by fragmented thinking that takes PKT as something that exists in the various intellectual sources external to those who are learning to teach. In the early days of institutionalized teacher training, PKT was largely embedded in the behaviour of the master teacher who demonstrated to aspiring teachers what (good) teaching was and how it was done. Learning to teach was to observe and imitate the master teacher’s teaching behaviour. Great emphasis was given to the moral aspect of PKT.

With the rapid accumulation of scientific knowledge and scholarship in the field of education, the primary role of the teacher educator has changed to transmitting research knowledge and scholarship or intellectual skills peculiar to those fields of disciplinary inquiry. Despite the fact that the transmission model of teaching has long been discredited, at least in theory, many teacher educators continue to believe that their role is to pass on or provide access to research findings and academic scholarship and/or intellectual skills. Prospective teachers have been kept at the receiving end of prescribed knowledge and learning to teach is mainly concerned with acquiring and applying that knowledge, including the what and how of reflective practice/teaching/inquiry.

It is rather unfortunate that the fragmented views of PKT should have been the backdrop of teacher education for so long, and never critically examined, even though epistemological theories and theories of learning abound. Few seem to be aware that this is the very root of the many persistent problems that teacher educators have been trying to resolve for the past
hundred and fifty years, problems such as the identification and codification of PKT as well as the selection and transmission of the codified knowledge. These problems are complicated by questions of the relevance and usefulness of theoretical knowledge to the practical demands of teaching as well as the effect of practical experience in the school environment on prospective teachers' professional growth. RTE programs have apparently inherited those problems.

The widespread interest in RTE is often attributed to Dewey's theory of reflective inquiry and/or Schön's epistemology of practice. My reading of the relevant literature suggests however that the connection between RTE and Dewey's idea of reflective inquiry or Schön's epistemology of practice is rather superficial. References have been frequently made to Dewey and Schön, respectively, but there has been little effort to explore their implications for teacher education program development.

Schön's epistemology of practice provides an account of professional knowing implicit in competent practitioners' performance of resolving problematic situations in action. The ideas of problem setting, reframing, and reflective conversation are refreshing and significant in so far as they contribute to a better understanding of problem solving in professional practice. It is however inadequate to be used as a theoretical foundation for developing RTE programs for several reasons.

The discussions in Chapters III and IV show that Schön's representational model of professional knowing falls far short, in both scope and depth, of Dewey's theory of reflective inquiry for addressing the question of knowledge in relation to human
conduct. Aside from the conceptual ambiguity inherent in his metaphorical language, Schön’s account of what experienced practitioners know of and in practice, which is evidenced in their competent performance of resolving unfamiliar problematic situations in action, leaves an important question inadequately explored: How do competent practitioners come to possess their knowing of and in practice?

A more immediate objection has been raised in regard to Schön’s dichotomous framework of thinking about professional practice and professional education, between Technical Rationality and Reflective Practice, the "high, hard ground" of the academia and the "swampy, lowland" of the world of practice, rigor and relevance, esoteric knowledge and professional artistry. With its focus on deciphering the artistry of competent professional performance in diverse situations, Schön’s thesis fails to provide a theory of professional learning which teacher education needs. Schön’s account of coaching may prove to be a useful way of thinking about how teacher educators could help prospective teachers in their effort to learn in a more meaningful and constructive way, but it does not constitute a theory of learning to teach.

A further problem is that the emphasis on knowing-in-action and reflection-in-action in Schön’s epistemology of practice, in my view, may actually undermine the legitimacy of the teacher education institution. If professional practice is only about resolving problematic situations occurring in the midst of action, we will then have to ask how it might be possible at all for on-campus coursework, theoretical studies (including methods
courses), to be meaningful and relevant to prospective teachers, who need some preparation before getting into action. How are we to rationalize the necessity of preparation that precedes action, which involves the study of theoretical knowledge that cannot meet the particular demands of practice?

We can benefit a great deal from Dewey's philosophical thesis, from the vantage-point of practice, even though some philosophers may insist that Dewey did not resolve the problem of knowledge to their satisfaction. Dewey's theory is significant and pertinent to teacher education today not because it might entail a prescription of reflective practice. Rather, it offers the kind of theoretical implications that can help us to arrive at a better understanding of the issues concerning PKT and learning to teach. Dewey's theory of reflective inquiry helps to bring knowledge (PKT), inquiry (learning to teach), and action (conduct of teaching) intimately together. It views prospective teachers as knowing persons engaged in the process of reflective inquiry to produce their PKT for intelligent conduct of teaching. Prospective teachers are not mere recipients of prescribed knowledge. They develop their own personal PKT through inquiry, with the help from others: teacher educators, teachers, peers, etc.

When learning to teach is understood as a process of reflective inquiry into teaching conducted at the personal level, it becomes clear that programmatic provision in teacher education should be oriented towards helping prospective teachers to better control and direct their inquiry into teaching. The attempt to ground teacher education on a scientific knowledge base has been
of little avail not only because a consensus on the content of the knowledge base is hard to come by but also because it fails to recognize that, in the final analysis, it is prospective teachers who (re-)construct their own knowledge structure and decide what knowledge will be useful to them, no matter how eloquent teacher educators can be in preaching the intrinsic value of theoretical knowledge.

In light of Dewey’s philosophical thesis, a theory of learning to teach can be formulated with the following basic tenets: (1) Learning to teach depends upon and is affected by the learner’s prior knowledge. Prospective teachers’ personal PKT, to be continuously developed through an on-going process of reflective inquiry, should be recognized as the foundation of their professional growth and practice; (2) What makes teacher education necessary and important is the moral responsibility of prospective teachers to learn for the welfare of their future students, not the availability of a putative body of scientific knowledge and scholarship about teaching; (3) Individual prospective teachers’ personal PKT, the foundation of their practice, should be identified, examined, and reconstructed always in anticipation of certain intended and desirable outcomes of teaching in the classroom at the personal level. This means that personally defined ends to be achieved in teaching must too be subjected to examination in terms of anticipated existential consequences; and (4) in addition to the study of prior knowledge, activities of instruction, supervision, and evaluation in a teacher education program should be oriented towards helping prospective teachers to a) become familiar with the various
constitutive elements of teaching; b) construct the constitutive elements into a coherent conceptual system of teaching that would enable them to make pedagogical decisions appropriate to the contexts in which teaching and student learning take place; c) secure intended and desirable consequences of teaching and prevent undesirable ones from occurring; and d) relate their personal goals of teaching to the larger social goals of education.

The theory of learning to teach derived from Dewey’s theory of reflective inquiry does not take prospective teachers’ prior knowledge as unproblematic. The very personal foundation of teaching has to be continuously reconstructed so as to lead to change in the conduct of teaching. That is what learning to teach is about. Reflective inquiry is "a process capable of indefinite continuance" because

the attainment of settled beliefs is a progressive matter: there is no belief so settled as not to be exposed to further inquiry. It is the convergent and cumulative effect of continued inquiry that defines knowledge in its general meaning. (Dewey, 1938a, p. 24)

The theory of learning to teach derived from Dewey’s theory of reflective inquiry also emphasizes that the reconstruction of prospective teachers’ knowledge structure for teaching not be carried on in a self-contained manner but always in connection to some intended and desirable outcomes of teaching. It will be of little avail to engage prospective teachers in analysing and criticizing their held beliefs only for the sake of analysis and criticism. We know that prior knowledge was constructed on the basis of past experience, it follows that new knowledge will also be obtained from new, enlarged experience.
The questions to be raised at the programmatic level are:
What learning opportunities should RTE programs provide and what institutional interventional measures should be taken to ensure that the learning opportunities provided will contribute to, not hinder or block, prospective teachers' professional growth? The questions that teacher educators should ask prospective teachers, and help them to answer, will be: Given their understanding of teaching, how will they account for the worthwhileness of what they intend to achieve in teaching in both long and short terms? What makes them believe that they will be able to accomplish what they intend to accomplish in teaching? And how will they relate their personal goals of teaching to the larger goals of institutional and social change?

Understanding learning to teach in light of Dewey's theory of reflective inquiry will, hopefully, lead teacher educators to rethinking the role of theoretical studies and practical experience in learning to teach. I believe that a sensible relationship between theory and practice can only be established in teacher education by first locating the knowing and learning person, the prospective teacher, in the process of reflective inquiry into teaching. In addition, both theoretical studies and practical experience in the practicum setting should be organized and conducted to serve the purpose of broadening prospective teachers' awareness of the complexity of teaching in its many particular constitutive elements. Professional growth, or conceptual change, results from prospective teachers' continuous effort to construct an increasingly complex and more coherent conceptual map of teaching as more and more constitutive elements
of teaching are brought into consideration. Theoretical knowledge does not help define what problem(s) teaching presents to teachers nor does it provide technical solutions to problems. Its value to practice does not lie with methods of inquiry and conclusions. Theoretical knowledge is important in that it helps to highlight those constitutive elements of teaching that must be incorporated into prospective teachers' existing conceptual map. Prospective teachers must themselves inquire so as to produce PKT for intelligent conduct of teaching.

The phenomenon of RTE is an interesting subject worth studying. The significance of studying this phenomenon lies in that it symbolizes the major programmatic deliberations currently undertaken in teacher education. It is the improvement of teacher education more than the much discussed conceptual difficulty of RTE that is the motive force of this study. To reiterate what has been stated in the previous chapter, an RTE orientation on the basis of Dewey's theory of reflective inquiry will be grounded on four general principles:

a) RTE recognizes prospective teachers as knowing and learning persons who are engaged in a process of reflective inquiry about the doubtful situation commonly referred to as teaching in the classroom. Through this process of reflective inquiry, they develop their PKT.

b) RTE recognizes prospective teachers' prior knowledge as the foundation of their professional preparation and aims at helping prospective teachers in their effort to consolidate and reconstruct that foundation. The first step is to help prospective teachers to become consciously aware of what they already know.

c) RTE emphasizes that examination and reconstruction of personal knowledge of teaching must not be conducted for its own sake but always in anticipation of some intended and desirable consequences of teaching. This requires that both the goals of teaching and the means for achieving the goals at the personal level be subjected to continuous examination.
d) RTE employs both theoretical knowledge and practical experience for the purpose of helping prospective teachers to become aware of their prior knowledge and increase their familiarity with the constitutive elements of teaching at the perceptual level and lead them to change their existing knowledge structure.

The ideas of and arguments for a Deweyan orientation towards teacher education presented in this thesis have the support of the available research literature in the relevant fields of inquiry that are concerned with knowledge, experience, and cognitive development, and the actual practice of many competent teacher educators and prospective teachers that the literature regrettably provides little account of.

Teacher education is in the final analysis a practical endeavour requiring the joint efforts of the many individual people involved, administrators, professors, teachers, and prospective teachers. The complexity of learning to teach in the institutional setting cannot be explored here. This thesis does not offer solutions to the many problems facing teacher education today at both institutional and individual personal levels. It proposes instead a way of thinking about the epistemological foundation of teacher education program development. I sincerely hope that this thesis will contribute to the current discourse(s) on teacher education and be of both theoretical and practical value to the development of teacher education in the long run.

It is customary to conclude an academic study with some suggestions for further research or recommendations for educational policy and practice. For its limited scope, this thesis has touched upon some areas of teacher education, where
further inquiry should be encouraged. In the course of my research, I have become aware of the lack of historical studies of teacher education program development from philosophical, sociological, and psychological perspectives of knowledge. Also missing from the literature are observational studies of the interaction between prospective teachers and their learning environment on the university campus and in the school setting. Such studies, I believe, shall prove to be valuable in helping teacher educators to "understand better our own past, locate ourselves more exactly in the present, and discern a little more clearly what our educational future may be" (n.a).

The construction of the teacher education curriculum will continue to rely on input from educational research and scholarship. For this reason, I think that some serious efforts of "secondary or tertiary level" theorizing should be made to help sort out the controversies within and across the relevant fields of educational inquiry. It is, to be sure, foolhardy to suggest that the conflicts within and across the various fields of educational inquiry could all be resolved. But, if educational researchers and theorists are producing inconclusive, and conflicting, conclusions, if they are themselves not able to work out their dispute, one cannot help wondering how teacher educators (many of them do research and theorize) would be able to help prospective teachers make intelligent choices of competing views of teaching.

Personally, I think that greater impact on teacher education will come from a continuing effort in resolving the tension between theory and practice in learning to teach. A further
study on this issue needs to have its subject properly reframed. Instead of arguing for the dubious intrinsic value of theoretical knowledge or asserting its lack of relevance or its impotence to the particular demands of practice, it is important to see that the relationship between theory and practice poses not only a theoretical problem calling for a theoretical solution. It is, more significantly, a practical problem confronted by practitioners as well as aspiring practitioners of teaching and policy making. That is to say practitioners and aspiring practitioners of teaching and policy making cannot wait for others to provide a solution to the problem. They must themselves deal with that problem. Therefore, I suggest that an inquiry into this pivotal issue should not be the exclusive business of academic researchers and theorists attempting to obtain a spectator's view. Teacher educators, teachers, and prospective teachers should be invited to participate in the inquiry in the context of practice, be it policy making, teaching, or learning to teach.

The first two questions that the participants in the inquiry will consider are: What problem does the issue of the theory-practice relationship present to teacher education program development and to learning to teach? Whose problem is it or (how) am I affected by this problem? These two questions will help locate the inquirer in relation to the issue under exploration. Answers to the two questions will help to show whether the inquirer is in pursuit of a detached or personally involved view of the issue. The latter is preferable and should be encouraged.

Dewey (1904) stated in his classic article on this issue,
It is difficult, if not impossible, to define the proper relationship of theory and practice without a preliminary discussion, respectively, (1) of the nature and aim of theory; (2) of practice. (p. 142)

Following Dewey's advice, the inquiry will proceed with another set of questions: What is this thing called "theory" and what is "practice" in policy making, teaching, and learning to teach? What is the nature of "theory"? Is it possible that policy making, teaching, and learning to teach can proceed without theory? (Note: "Theory" does not stand for the component of "Theoretical Studies.") What is the proper role of "theory" in educational policy and pedagogical decision making? What does a proper relationship between theory and practice mean at the personal pedagogical level?

The outcome of the inquiry will, it is hoped, lead the participants to a better understanding of theory and practice, thereby becoming aware of the need to maintain a critical and productive engagement with theory in their personal practice throughout their career life, which means they will appreciate the contributions of research and scholarship to their thinking and will at the same time be able to guard against high sounding slogans, wrong ideas, and harmful prescriptions. Within this inquiry, it is also possible to incorporate an experimental study to explore under what conditions/circumstances prospective teachers are susceptible or resistant to what kind of theoretical input. The result, I imagine, will be fascinating and extremely useful to teacher education.

Finally, I find no better recommendation for policy and pedagogical decision making in teacher education than what
Aristotle offers us, "We are inquiring not in order to know what virtue is, but in order to become good, since otherwise an inquiry would have been of no use" (Ethica Nicomachea, 1103).


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266


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