TEACHING MADE WONDERFUL: REDESIGNING TEACHER EDUCATION WITH IMAGINATION IN MIND

by

Anne Chodakowski
Bachelor of Arts, Acadia University, 1993
Master of Arts, Acadia University, 1994
Bachelor of Education, University of British Columbia, 2000

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APPROVAL

Name: Anne Victoria Robertson Chodakowski

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Examining Committee

Chair: Lynn Fels, Assistant

Mark Fettes, Associate Professor
Senior Supervisor

Kieran Egan, Professor
Committee Member

Cheryl Amundsen, Associate Professor Committee
Member

Dr. Stephen Smith, Associate Professor, Faculty of Education, SFU

Dr. David Coulter
External Examiner

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ABSTRACT

How should pre-service teachers be educated, if they are expected to make imagination a central theme of their professional practice? This question is explored using Kenneth Howey's recommended triadic approach to the design and implementation of teacher education programs: a defensible conceptual framework, derivative themes and programmatic structures.

Part One, comprised of three chapters, is the conceptual framework for an imaginative teacher education program. Chapter one is a discussion of the purposes of education, and, by extension, of teacher education. I argue that the imagination is essential to achieve three educational goals: helping individuals develop a breadth and depth of knowledge, personal and collective agency, and a 'moral compass.' Chapter two is a consideration of why Kieran Egan's theory of imaginative development is particularly helpful for these purposes. I explain the theory and highlight certain features that make it a suitable basis for an imaginative teacher education program. Chapter three is a discussion of the ways in which the theory needs further development to be used in the context of teacher education. I address three theoretical issues that need resolution and suggest four principles to guide the program.

In Part Two, likewise comprised of three chapters, I consider the remaining two components of Howey's triadic design: derivative themes and programmatic structures. Chapters four, five and six examine the three cornerstones of teacher education, respectively: understanding of subject matter, pedagogy and contexts. In each of these

chapters, I clarify the kinds of imaginative understandings pre-service teachers need to develop in this area ("derivative themes"), consider in some depth relevant teacher education research literature, and then propose design features of an imaginative teacher education program ("programmatic structures") that reflect the program principles derived earlier and respond to challenges identified in the literature.

In the concluding chapter, I explain the relationships between pre-service teachers' imaginative understanding of subject matter, pedagogy and contexts and the three educational goals I argued for in chapter one. I then summarize the program features developed in chapters four, five and six. Finally, I briefly consider how an imaginative teacher education program might affect faculties of education and schools.

For Norah

May your life, and education, be filled with wonder.

ACKNOWLEDGEMENTS

expand my vision enough to see it. And finally, my daughter, Norah, teaches me on a daily basis about how wonderous one human being, and the world, can be, as she gives me the precious gifts of gratitude, joy and love. To all of my gifted teachers, I offer my heartfelt admiration, sincerest thanks and love. This journey was made possible because of you.

TABLE OF CONTENTS

PREFACE

When I held my newborn daughter in my arms and looked into her eyes for the first time, I felt a love and wonder the magnitude of which I had never imagined. Since that first moment, her presence in my life has changed me on a daily basis. Being her parent has been a profound gift to me, because it has taught me, every day, that I am capable of far more than I had ever realized. My heart, so human and small, crashes over with love when I hold her babysoft hand, feel her child's heart beat against my chest, see her flapping arms and exploding smile when she greets me. My patience, so limited in many areas of my life, seems bountiful and endless when she nurses all night for months on end, is fevery and crying and needs to be held from dawn to darkness, takes hours, and hours, rather than minutes to fall asleep in my arms, night after night after night. My appreciation for the joys and mysteries of life, which, before her arrival, seemed to flash into my vision from time to startling time, now seems to live in every cell of my being, or perhaps, in every cell of her being.

In many regards, being Norah's mother has helped me be a much better human than I had ever been before she came into the world. Who knew, before that heart-brimming-over first moment, that this was what it meant to parent, to love? Who knew, indeed, that this is who I could be? By the gift of her life, Norah has helped me see, feel and live possibilities I had never fathomed. And isn't this, too, what education should do? Is it too fanciful to imagine that education, really, should be about something similar: That it too should help us become bigger, vaster and better, both individually and

collectively? Surely in its finest form, education can help us to imagine our selves, others and our world as our ideal, and, as well, help us become, if not exactly that ideal, at least something closer to it. Surely what I feel for my daughter, as precious and personal as it is, is, indeed, what life offers all of us. Surely education should help us get at this mystery of life, this magic, this beauty, this wonder. This thesis is my exploration of this new vision for education, one that I can both imagine and believe in, where teaching, and teacher education, are, as they always should have been, made wonderful.

PART ONE

CHAPTER 1: THE PURPOSES OF EDUCATION

This thesis presents a vision of how pre-service teachers might be educated so that the imagination can become a central theme of their professional practice. As a vision based on a striving for ideals—personal, institutional and cultural—it could be regarded as somewhat utopian. However, a substantial proportion of the thesis involves consideration of some of the empirical realities of current teacher education and its effects, by way of a through investigation of recent research literature. In this way, I try to balance the idealistic and realistic aspects of imaginative teacher education, in order to make my vision more vivid and convincing. Thus, the conceptual exploration that is the focus of Part One of the thesis also sets the scene for the more detailed and, in some ways, pragmatic considerations of Part Two.

I open this chapter by considering why teacher education programs must be based on a clear conceptual framework. I then begin to map the conceptual framework upon which an imaginative teacher education program will be based. I describe what I see as the three central purposes of education, and by extension, also of teacher education. Next, I explain what I mean by the term imagination, so that I can then explore why the imagination is necessary to achieve the three educational goals I describe.

What, ideally, should teacher education be about? Is it sufficient to give prospective teachers the knowledge that we deem necessary for them to be effective

teachers? Is initiating teacher candidates into the culture and norms of the profession, norms that they experience in particular schools, adequate? Or, as I suggested in the preface, should teacher education be about something more? I believe that teacher education has the potential to be far more profound than either of these two more pragmatic options: at its best, it promises to transform individuals, to help them become better and vaster. Teacher education should help individuals develop rich knowledge, a sense of agency, and a moral compass: after one has begun the journey of becoming a teacher, one should, in some important ways, be different than before one initially set out. Surely this is a lofty goal: achieving it cannot be easy.

So how might we design a program that has such a complex and important goal? In his description of the attributes of coherent and effective teacher education programs, Howey (1996) identifies a defensible conceptual basis as essential for program coherence and efficacy. Of course, this seems logical: efficacy seems to depend, at least to a large degree, on coherence, and we would assume that a strong conceptual basis would lead to coherence. In order for a program to be coherent and effective, it needs to have a conceptual basis that is both clear and explicit. Howey argues that a conceptual framework

> results from dialogue and some degree of agreement by program architects about the commonplaces of formal education—the mission and nature of schools, the character of academic learning and teaching, and what these imply for learning to teach. (p. 168)

He further suggests that

An explicit conceptual framework takes on significance for a number of reasons. In the related field of studies, Howey and Zimpher (1989) found that when there was an explicit and thoughtful conceptual framework, there was also likely to be a reasonable number of core teaching abilities or teacher qualities derived from this framework that were addressed thematically over time in a variety of program activities. Thus, one would expect the development of identifiable program themes to be about as prevalent as the development of explicit conceptual frameworks, and this appears to be the situation. (p. 147)

In other words, a defensible conceptual framework—one that is explicit and thoughtful—is the basis for program coherence. And program coherence is necessary for a program to be effective.

And yet, surprisingly, in the world of teacher education programs, this seems to be far from the norm. Indeed, there is a lack of coherence evident in many teacher education programs: there are a "number of preservice programs that superficially engage students in a large number of disparate and unconnected ideas and practices" (Howey, 1996, p. 150). Many teacher education programs fail to "promote a coherent ideology that would allow for a robust sort of professionalism" (Barone et al., 1996, p. 1111).[1] The RATE VI (1992) study of fifty institutions offering teacher education programs shows "considerable variability across programs relative to progress [from the late 1980s] in developing a thoughtful conceptual framework for programs of teacher preparation" (cited in Howey, 1996, p. 147). As Howey laments,

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[1] In his survey of twenty-nine teacher education programs in the United States, Goodlad (1994) similarly found much incoherence: "We looked for well designed, well constructed houses of teacher education and found roofs missing, doors hanging loose, and windows broken" (p. 7) (cited in Zeichner & Conklin, 2005, p. 695); Zeichner and Conklin (2005) similarly describe teacher education programs as "fragmented" (p. 699).

A series of loosely coupled course in professional education culminating in an even more disconnected experience, commonly referred to as 'student teaching,' obviously cannot be the standard for professional preparation. (1996, p. 143)

Clearly, an imaginative teacher education program will aim to create for pre-service teachers something far more coherent and thereby effective than "disparate and unconnected ideas and practices" resulting in "loosely coupled courses" and "disconnected [experiences]." The first step in doing this is to develop a defensible conceptual framework. And the first step in this process is to establish what education should be about.

I will postpone a discussion of teacher education specifically until chapter three, where I consider how Egan's theory needs to be further expanded for effective use in the context of teacher education. Before taking this on, however, I need to establish both the purposes of education, and the central role of the imagination in achieving those purposes (as I do in this chapter), and why Egan's theory, in particular, is one upon which to base an imaginative teacher education program (as I do in chapter two).

1.1. The purposes of education

It may be that the prospect for education holds neither joy, nor love, nor light, nor certitude, nor peace, nor help for pain; education may continue always to be a darkling plain where ignorant armies clash by night. But I suppose one has to hope there will be voices who demand of education that it should help people to understand something of whence our lives come and whither they go. (Egan, 1997, p. 181)

Certainly, I agree with Egan that education should help students to understand "something of whence our lives come." However, I would argue, perhaps more strongly than Egan suggests here, that education should also give us some indication of whither our lives *should* go. In other words, I see the central purposes of education as threefold. First, it should give individuals a breadth and depth of knowledge. For example, a rich sense of our personal and collective history, or "whence our lives come," requires knowledge of our past, of our stories about ourselves and others, and of the meanings these hold for us as individuals and as groups. Second, education should instill a sense of both personal and collective agency, that is, consciousness that one is an active participant in the creation of one's own life, as well as of the larger cultural communities to which one belongs, and an ability to act on this awareness. This sense of agency is certainly implicated in understanding "whence our lives come." Importantly, awareness of this agency is also what allows us to determine whither our lives go. Third, education should allow us to develop a 'moral compass,' or a sense of the ethical ways in which our knowledge can be used and our agency enacted. In other words, education must help us determine, both as individuals and as members of larger communities, whither our lives should go. A well-educated person, then, will be one who has developed a depth and breadth of knowledge, a sense of her or his individual and collective agency, and a moral compass.

These three capacities are related to each other in important ways. Sufficient knowledge can increase our sense of agency: when we know more, we have a greater sense of possibilities from which to choose. Knowledge also helps in the development of a moral compass: we need a rich source of information upon which to base decisions that

are grounded in compassion and wisdom. For example, knowledge enables one to understand the larger contexts within which one's own understanding and actions exist, such as the historical and contemporary contexts within which similar decisions have existed, their efficacy and possible explanations for their success or failure, and so on. An individual who is wise and compassionate, then, needs sufficient knowledge. Conversely, sufficient knowledge but an inadequate sense of agency may enslave us to be victims of the larger forces of life and society; an education that develops knowledge without an adequate development of agency cannot 'empower.' Similarly, knowledge without an accompanying moral compass can be used destructively, harming either oneself or others, or both.

Agency that is morally grounded can be both personally and socially beneficial. However, a moral compass without sufficient knowledge or a sense of agency may prevent our acting in ways that benefit ourselves or the larger communities to which one belongs: 'goodness' is limited by ignorance and passivity. To summarize: agency is what allows us to act; knowledge gives us the resources to imagine possibilities that we need to help create ideals—that we then try to manifest by means of our agency; and a moral compass ensures that our knowledge and agency are well used.

As I will demonstrate in the following section, central to this conception of education is the imagination: imagination is needed to develop a rich knowledge base, a sense of individual and group agency, and a moral compass. Before exploring the connections between the imagination and these three purposes, however, it is necessary to clarify what we mean by the term imagination.

1.2. Describing the imagination

Most people seem to have a general sense that the imagination is something positive. The comment, "He has a vivid imagination," is most likely intended as a compliment, rather than a criticism. Similarly, most educators, whether they are kindergarten teachers or professors teaching in graduate programs, would likely consider a lively imagination an asset to learning. Yet when we look more closely at what we mean by the term imagination, our pedestrian understanding seems to be rather vague. Common images of someone using her or his imagination might include a child creating magical creatures or fantastic explanations for phenomena, or a scientist discovering an innovative way to solve a problem or improve upon life in a significant way. Such examples suggest that our everyday understanding of the imagination might be something similar to inventiveness, novelty or transformation. Certainly these are both popular and important associations. However, because they are simplistic and limited, they are insufficient for my purposes.

One way in which we might think of the imagination, a way that I think captures both its power and the potential, is as a certain "flexibility of mind" (Egan, 1992, p. 36).[2] [3] Thinking of the imagination as flexibility of mind highlights that it is neither a part of the mind nor a distinct faculty; it is more accurately characterized as a type of activity or quality of the mind. It is a flexibility of mind that allows us to conceive of possibilities: to not be shackled to the immediate, visible or concrete but to be able to imagine alternatives. Chodakowski, Crowley and Fettes (2006) similarly emphasize flexibility and

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[2] Many before Egan (e.g. Sartre, Husserl, Richards) have made a similar point (Egan, 1992, p. 29; see also Barrow, 1988).

[3] Egan (1992) suggests that we take descriptors of imagination such as "flexibility" somewhat metaphorically (p. 37).

the consideration of possibilities in their description of the imagination as "a more or less limitless set of capacities for perceiving the possibilities in things… the potential for invention, adaptation, comparison, discovery, and so on" (p. 1). In much of Egan's writing on the imagination, he refers to White's (1990) statement that "to imagine something is to *think of* it as possibly being so" [italics in original] (1992, p. 30). While we should remember that Egan's explanation of the imagination is far more robust than this pithy definition, White's description does vividly capture that the sense of possibility is fundamental to the imagination. It is flexibility of mind that allows one to imagine alternatives, to conceive of possibilities.

Imagination is not simply a generative act: it can also involve evaluation. In other words, imagination is not simply the production of endless, although perhaps ineffective, possibilities; it is not simply "a power of generating endless possibilities interrupted by a selecting mechanism" (Egan, 1992, p. 37). Rather, considering the possible can imply some degree of awareness that those possibilities be "useful, appropriate, or fulfilling" (p. 31): the process of selecting and evaluating may go on in the act of generation (p. 37). Or, as Barrow (1988) puts it, an important part of considering the possible is the awareness that the possibilities one is thinking about are "unusual and effective" (p. 84).

An important feature of the imagination is that it engages the emotions. This does not mean that one must be in the grips of passion or terror to be imaginative, of course, but rather that our imaginative engagement seems to rely in some fundamental way on our feelings. This aspect of the imagination has been well explored by Egan[4]: my

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[4] Again, many philosophers prior to Egan (such as Hume and Kant) have made a similar point (Egan, 1992, p. 21).

explanation draws on his work significantly. Egan claims that, in any use of the imagination, there may be "an irreducible affective component" (1992, p. 31); there may not be anything we can imagine that we have little or no feelings about.[5] In other words, emotions are central to imaginative activity, because "what drives us to think of things as possibly being so is commonly tied to our hopes, fears, and intentions" (p. 42). The centrality of the emotions is apparent in the "common observation" that "imaginatively engaged learning" gives pleasure (p. 51)[6] and that our ability to remember, which seems to be a significant part of learning, also seems to be directly tied to our feelings (pp. 11-12).[7]

To suggest that feelings are central to imaginative engagement does not imply that feelings are somehow antithetical to thinking or to reason. Rather, feelings are intricately tied up in our thinking. Indeed, we might consider using Kresch's term "perfinking" to better get at the enmeshed nature of our perceiving, feeling and thinking (cited in Egan,

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[5] The use of the modal 'may' is important here: Egan suggests that the question of the certainty of emotions' role in all imaginative activity might more wisely be left open (pp. 32-33).

[6] Egan (1986) suggests that "stimulation and use of the imagination" can be intoxicating (p. 88).

[7] The imagination has been frequently associated with our image-making capacities. For example, Nadaner (1988) suggests that "the mental image is a plausible basis of imagination, open to the introspection of everyone" (p. 198). Whether such image-making capacities are recreations of actual experiences or new inventions, they may, at least according to many people, be characterized as imaginative acts. However, for my purposes (and indeed in agreement with other theorists on the imagination, such as Barrow, 1988, p. 81; White, 1990, cited in Egan, 1992, p. 29), the imagination as only the capacity to create images is far too limited an understanding of the concept. I would argue that while imagination can, clearly, involve our visual capacities, we do not necessarily need to see or create images in order to be engaging our imaginations, at least not in the way we usually understand the term "images." If, on the other hand, we expand the notion of image-making beyond simply visual images to include other sensory images as well, then it is plausible that imaginative activity does involve some kind of image-making. Egan (1992) suggests that it actually may be images that underwrite the feelings that are so fundamental to imaginative activity (p. 41). In other words, underlying all imaginative experiences may be images (of one kind of another) for which we have feelings: "the most fleeting, impressionistic evocations that may feel more like moods or emotions… nevertheless have some imagistic component" (p. 39). Egan further suggests that our use of "the image-forming capacities of imagination" commonly brings into play a "nexus of affect, narrative, and metaphor" (p. 40).

2005, p. 89). Nor is the imagination opposed to rationality; rather imagination is, in fact, what gives rationality its vividness. It is

> A particular kind of flexibility, energy, and vividness that comes from the ability to think of the possible and not just the actual and which can imbue all mental functions. To be imaginative, then is not to have a particular function highly developed, but it is to have heightened capacity in all mental function. It is not, in particular, something distinct from reason, but rather it is what gives reason flexibility, energy, and vividness. It makes all mental life more meaningful; it makes life more abundant. (Egan, 1992, p. 65)

To be imaginative then, or to use a certain flexibility of mind to be able to conceive of possibilities beyond the immediate and concrete, implicates our feeling minds.[8]

Yet we might be wise to remember that it is perhaps impossible to come up with a description of the imagination that is completely satisfying. Fettes (n.d.) makes the point that "any attempt to anatomize the imagination will prove inadequate in some way" (p. 4) as "messiness, ambiguity, and openness to surprise… are inherent in the real world of the imagination" (p. 5). Tiernay (1994) similarly suggests that the imagination is a "notoriously difficult concept to define" (p. 16) (cited in McKellar, 2006, p. 53), as does Egan (1986), who agrees that the concept of the imagination is "difficult to get any firm

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[8] Some theorists suggest that imaginative activity be conscious. For example, Egan's (1992) depiction of the imagination as "a conscious, intentional activity" implies that an activity such as daydreaming only becomes imaginative "when we assume the driver's seat" (p. 38). Sutton-Smith (1988) similarly claims that the imagination is "thought's direction" (p. 7) or "thought's first practice—not its echo" (p. 8), emphasizing the elements of both consciousness and generativity. Barrow (1988) also argues that imagination "can only be displayed in activities that involve thinking" (p. 86). In contrast to these theorists, I find the requirement that imaginative activity be conscious too limiting, because such activities as free association or relaxed mind play, during which one could argue that the mind is or is not conscious, can certainly be regarded as highly imaginative activities.

grasp on" (p. 5), as the imagination is "an inner experience, difficult to observe and therefore difficult to describe" (Egan & Nadaner, 1988, p. xii). In other words, despite our attempts to effectively define the imagination, we must remember that any categorization will necessarily be limited in some regards. This caveat should be kept in mind in the following discussions, both the immediate one of the relationship I outline next, between the imagination and the three purposes of education, as well as the later discussion of the imagination's role in teacher education.

1.3. The imagination and education

As I will explain shortly, the imagination is central to achieving the three purposes of education I outlined earlier. First, however, I will address the fact that, in general, the imagination has not been seen as central to education. While I agree with Egan and Nadaner (1988) that the imagination is "the heart of any truly educative experience" (p. ix), and is therefore "a prerequisite to making any activity educational" (p. ix), this is certainly not a common belief. Indeed, a more popular perception might be that the imagination is only relevant to the "frills" of education such as the arts (Egan, 1986, p. 18; see also 1992, p. 25; Egan & Nadaner, 1988, p. ix). While it is beyond present purposes to explore in detail the argument that this is related to the fact that our common understanding of the imagination contains vestiges of its former meaning, it is worth briefly noting.[9] Egan (1992), among others (e.g. Sutton-Smith, 1988), suggests that we have inherited a sense that the imagination should be encouraged because it is central to discovery and personal expression, and can bring joy and delight; however, since its

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[9] Interested readers are directed to Egan's (1992) chapter, "A Very Short History of the Imagination," for a fuller explication of these ideas.

unrestrained use can challenge the status quo—potentially shaking or destroying stability

and security, and thereby possibly leading to frightening possibilities such as anarchy or

nihilism—the imagination should also be controlled or at least only fostered in small

doses.[10] In other words, this is a conception of the imagination as positive, and valued, as

long as it is limited or contained; while the imagination may be important for personal

expression, or self-understanding, it is not central to the 'serious' work of learning, or to

the subjects of significant educational worth, such as math and science (see also Greene,

1988, p. 45). Rather, the imagination serves an entertaining or ornamental educational

function.[11] We may see such conceptions at work in schools, where children engage in

the important work of learning throughout the week, and then are 'rewarded' on Friday

afternoons with some activity that is intended to stimulate their imaginations and give

them some degree of pleasure and satisfaction—activities that are not, by any means,

centrally connected to the task of learning. The role I see for the imagination in education

is vastly different: it constitutes the heart of learning. Imagination is needed to become an

educated person, or for one to achieve the three purposes of education I have described:

the development of a breadth and depth of knowledge, personal and collective agency,

and a moral compass.

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[10] Of course, one can acknowledge the importance of the imagination and support its educational
applications and still recognize its potential for danger if used unwisely. For example, Fettes (n.d.) suggests
that the imagination is "a fundamentally risky mode of thought" (p. 6). However, this does not indicate any
inherent destructive capacity in the imagination; rather, it suggests that its use must be guided by wisdom.
(See also Sutton-Smith, 1988, p. 19.)

[11] "When imagination becomes a fantasy only to be consumed and only a diversion in the life of an
individual, it is not perceived as a very important capacity to develop further…" (Egan & Nadaner, 1988, p.
xi); Sutton-Smith (1988) calls a conception of the imagination as fanciful or frivolous "the greatest enemy
of all" (p. 13); Nadaner (1988) suggests that seen only as a personal force, the imagination "can be
deprived of its life-giving power—when it is deprived of irrationality, of knowledge, and of flexibility"
(p. 15).

1.3.1. Imagination and knowledge

Why is the imagination, as I have described it, as a certain flexibility of mind that is centrally concerned with emotional engagement, fundamental to knowledge acquisition? First, we need the imagination to imbue knowledge with personal meaning. Flexibility of mind, and an emotional connection to knowledge, is required for knowledge to be alive; otherwise it remains, to use Whitehead's (1967) term, simply inert.[12] In other words, education is "crucially about the *meaning* [italics added] knowledge has for the individual," which is why the imagination is "vital" in the process (Egan, 1992, p. 53).

Second, without imagination, it is difficult, if not impossible, to use our knowledge. For example, a flexibility of mind allows us to see important connections— such as between oneself and various groups, historical and contemporary situations, or causes and various outcomes. These connections are central to our knowledge gaining depth. Interestingly, the converse also seems to be true: our well-developed imaginative capacities rely on a rich repertoire of knowledge (Greene, 1988, p. 54). Egan (1992) also highlights this connection when he argues that "the development of students' imaginations will not go forward without their learning and memorizing much and diverse knowledge" (p. 53); without adequate knowledge, the imagination is starved (p. 52).

In one way, we can think of a breadth and a depth of knowledge as resourcefulness. When our understanding of a problem is both deep and broad, the ways in which we can consider it and so the alternatives we can conjure for dealing with or

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[12] Inert ideas are "ideas that are merely received into the mind without being utilized, or tested, or thrown into fresh combination" (p. 1).

solving it are necessarily richer than when our understanding is shallower. Our imaginative capacities, then, are implicated in this richness of understanding. This sense of knowledge is somewhat similar to that explained by Egan in *The Educated Mind*. In chapter two, I will expand further upon how Egan sees the imagination as central to the development of knowledge: our use of a wide range of cultural tools to imaginatively engage with various concepts—which shapes both the meanings we make of knowledge, as well as the ways in which we can make meaning.

1.3.2. Imagination and agency

Imagination is also central to the development of personal and collective agency—both a consciousness that one is an active participant in the creation of one's own life, as well as of the larger cultural communities to which one belongs, and an ability to act on this awareness. Of course, to suggest that an important role of education is to give us an expanded sense of our own potential is hardly novel: numerous theorists, among them Greene (1988) and Egan (1992) have argued that the cultivation of agency is an essential purpose of education. For example, Egan (1992) suggests that education can help us make "the world closer to our heart's desire" (p. 166). Similarly, Greene (1988) underscores that education should be concerned with fostering agency, so that we have a feeling "that life is more than a futile, repetitive, consuming exercise" (p. 48). Yet what are the specific ways in which a certain flexibility of mind, one that fundamentally engages our emotions, contributes to our agency?

First, as I have previously explained, it is imagination that allows us to consider alternatives, and this is crucial for the realization of agency. Egan makes this argument when he suggests that

> Being able to change the world around us in ways we find desirable and satisfactory is clearly an important capacity.... it is a capacity whose strength or weakness turns on the strength or weakness of our imagination.... A well-developed imagination enables us to feel, in Coleridge's nice phrase, unsubdued by habit, unshackled by custom. (1992, p. 58)

This imaginative capacity that drives our sense of agency may be evident in something as trivial as daydreaming:

> the sense of freedom in these choices [even apparent in the pedestrian activity of daydreaming].... remains a capacity connected with our ability to imagine a different future and to plan and bring about the conditions for that different future. (Egan, 1992, p. 58)

Second, the greater our imaginative capacity to consider alternatives, to engage with "the notion of something beyond" (Greene, 1988, p. 46), the greater our repertoire of possibilities from which to choose and act, both as individuals and as members of larger groups. A greater repertoire of possibilities makes possible increased agency. Egan (1992) suggests that "The more flexibly we can think of things as possibly being so, the richer, and the more unusual and effective can be the meanings we compose" (p. 51). The converse, a stifled imagination or significantly limited imaginative capacities, can be seen, as Greene (1988) puts it, as "an acquiescence to existence within boundaries or

frames: a contained, systematized way of living closed to alternative possibilities"

(p. 45). In other words, it is very difficult to change one's situation without the

imaginative capacity to imagine how one would do so and evaluate whether considered

possibilities are likely to be beneficial.

Greene's (1988) claim that creating our world (or one closer to our ideal)

"inevitably engages people in a quest for possibility" (p. 52)[13] highlights the fact that

agency itself can be seen as an imaginative act. It is "a power to choose, to move towards

what is not yet, while he or she looks at things… as if they could be otherwise" (p. 48).

This imaginative capacity that is central to the realization of, and so the actualization of,

our agency is an important part of what makes us human; in other words, central to our

humanity is this imaginative and agential potential:

> The sense of being able to see possibilities beyond the actual and so to
> make choices and to make the world more nearly like what one's heart
> desires has long been considered central to whatever it is in human beings
> that makes us feel freer than we assume animals or vegetables are. (Egan,
> 1992, p. 58)

Indeed, learning itself can be seen as both an imaginative and an agential act:

> to learn, after all, is to become different, to see more, to gain a new
> perspective. It is to choose against things as they are. To imagine is to look
> beyond things as they are, to anticipate what might be seen through a new
> perspective or through another's eyes…. The crucial point has to do with
> the capacity to break somehow with what is merely given, to summon up
> some absent or alternative reality. (Greene, 1988, p. 49)

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[13] Imagination can "create new domains, new vistas, expansions of ordinary awareness" (Greene, 1988, p. 47).

If a primary purpose of education should be the cultivation of a sense of personal and collective agency, and if imagination is necessary for the development of this agency, then clearly an education that attempts to foster the realization and actualization of our agency must necessarily cultivate the imagination:

> Imagination entails the ability to transcend the obstacles to thinking with which easy acceptance of conventional beliefs, ideas, interpretations, representations, and so on, confront us…. Imagination is what enables this transcendence, and is consequently necessary to education. It is important because transcending the conventional is necessary to constructing one's sense of any area of knowledge; accepting conventional representations is to fail to make knowledge one's own, is to keep it inert rather than incorporate it into one's life (Egan, 1992, pp. 47-48)[14]

Greene (1988) writes of a "desire to speak of a kind of education that recognizes imagination as fundamental to learning to learn" (p. 48). Imaginative education, which fosters agency, gives individuals an acute sense that "It is simply not enough for us to reproduce the way things are" (Greene, 1995, p. 1). Education that makes the imagination central is necessarily more than reproductive:

> My commitment is to do what can be done to enable as many people as can be reached to crack the old forbidding codes, to break through the artificial barriers that have so long served to exclude. The idea is to offer opportunities to release imagination as all sorts of energies move outwards…. The idea is to challenge awed passivity or a merely receptive attitude or a submergence in pleasurable reverie. If people can choose themselves as imaginative beings present to particular works, if they can

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[14] "Education, to put it a bit tendentiously, is a process that awakens individuals to a kind of thought that enables them to imagine conditions other than those that exist or have existed" (Egan, 1992, p. 47).

attend in some 'space' they have carved out in their own experience, the works will emerge in their particularity, and new dimensions of the perceiver's lived world may be disclosed. (Greene, 1988, p. 53)

People's choosing "themselves as imaginative being" and acting on this choice is, I would suggest, one of the central purposes of education—the awareness and manifestation of our agency.

1.3.3. Imagination and a moral compass

While agency might be defined as the ability to contribute to the creation of both one's personal and social worlds, the development of a moral compass means that the worlds one chooses to create will be good ones, or that the decisions one makes in the creation of these worlds are guided by wisdom and compassion. There are several reasons why an education that helps individuals develop a moral compass requires the imagination. First, a moral compass requires the development of empathy, or an awareness that one's decisions and actions influence others, and a sense of how these influences might be experienced by those others. Like agency, empathy can also be considered an imaginative act. Greene emphasizes the centrality of imagination in empathy:

One of the reasons I have come to concentrate on imagination as a means through with we can assemble a coherent world is that imagination is what, above all, makes empathy possible. It is what enables us to cross the empty spaces between ourselves and those we teachers have called 'other' over the years. If those others are willing to give us clues, we can look in some manner through strangers' eyes and hear through their ears. That is because, of all our cognitive capacities, imagination is the one that permits

us to give credence to alternative realities. It allows us to break with the taken for granted, to set aside familiar distinctions and definitions. (1995, p. 3)

Empathy, or what we could call a "mystical ability to forget the self and acknowledge difference and autonomy in the other" (Egan, 1997, p. 92) requires imagination. However, imagination is a necessary, but not sufficient, condition for empathy:

> To understand and feel [that other people are unique, distinct and autonomous] requires thinking that transcends our conventional sense of the 'other.' The development of that imaginative insight does not, however, guarantee that we will then treat others as we wish to be treated, but it is a necessary prerequisite. (Egan, 1992, p. 54)[15]

Relatedly, minimal empathy also seems to be related to a lack of imaginative capacity:

> By imaginatively feeling what it would be like to be other than oneself, one begins to develop a prerequisite for treating others with as much respect as one treats oneself. Prejudice—in the religious, class, or racial forms in which we see it so commonly—may be seen in part at least as a failure of imaginative development. (Egan, 1992, p. 55)

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[15] Egan (1992) argues that stories are excellent vehicles for helping us to develop empathetic capacities, as they give us the ability to imagine the lives, feelings, hopes and dreams of others:

> The powerful stories of the world do not simply describe a range of human qualities: they make us somehow a part of those qualities. They hold up for us, and draw us into, thinking and feeling what it would be like to make those qualities a part of our selves. In this way stories are the tool we have for showing others what it is like to feel like we do and for us to find out what it is like to feel as others do. (p. 55)

A similar point is made by Nussbaum (1995).

It seems clear that imagination is needed for empathy. An education that aims to help students gain empathy, in the development of a moral compass, must then foster the imagination. One way in which a kind of empathy can be fostered in students is by teachers displaying pedagogical modesty:

> We can also contribute towards the end of encouraging social virtues by displaying appropriate modesty, uncertainty, or even bewilderment when teaching. We often present knowledge to students as certain, secure, unquestionable. By presenting it as our best understanding at the moment, or as relatively insecure, or as one possibility, we can encourage students' sense that the world their growing knowledge is enabling them to construct is not Truth or Reality, but one of a number of ways of making sense of the world and experience. Such an attitude towards knowledge encourages open-mindedness and tolerance towards other views. Such as attitude does not commit us to relativism or the belief that all knowledge is socially constructed; rather it simply recommends appropriate epistemological modesty in the classroom. (p. 57)

Second, the development of a moral compass requires the imagination because our moral agency—or the ability to consider and act on various moral choices—is necessarily based in the imagination. The development of a moral compass requires considering and acting on these choices with wisdom and compassion, or, as Egan puts it, "learning what is right for us among the range of possibilities open to us" (p. 165). Egan emphasizes the important connection between moral agency and the imagination when he suggests that:

> Moral agency is tied in with the power to make choices. And the power to make choices is again tied in with the power to conceive of different

possibilities. To realize our individuality requires our learning what is right for us among the range of possibilities open to us. The greater our imaginative power, it would seem to follow the greater our moral autonomy. (p. 165)

As will become clearer in chapter two, where I discuss Egan's theory of imaginative education, an education that is imaginative necessarily involves the cultivation of what we might call moral reasoning:

I cannot easily distinguish the kinds of understanding I have been dealing with from morality; that is, morality and education seem not to be discrete categories…. one can see the kind of connection I mean in Iris Murdoch's observation that "'Truth' is not just a collection of facts. *Truthfulness*, the search for truth, for a closer connection between thought and reality, demands and affects an exercise of virtues and a purification of desires… Thought, goodness and reality are thus seen to be connected" (1992, p. 8). Well, that connection may not be quite so easily seen, especially by an ironist, but its potential suggests why I think this book is about moral education as much as intellectual education. (1997, p. 186)

Imaginative education also helps in the development of a moral compass because it puts human emotions at the center of learning. In chapter two I will expand upon why imaginative education makes students' feelings fundamental to their learning and makes the hopes and fears of others central to understanding the stories of the curriculum. Because of this, imaginative education is intricately bound up with morality:

When focusing on the means to make the lives of others meaningful to students, on humanizing knowledge, on imaginatively engaging with people's hopes, fears, and intentions, and so on, we are focusing on

matters that are intricately bound up with morality. So, while there is little explicit discussion of the moral dimension [in this book], I think it is fair to observe that this discussion of students' imaginative lives rarely moves far from moral issues. (Egan, 1992, p. 166)

There is a third way in which the imagination is needed in the development of a moral compass. One's own moral compass is formed within the context of the larger community in which one exists. The socio-cultural context in which meaning is defined Taylor (1991) calls "horizons of significance." In his words,

Things take on importance against a background of intelligibility. Let us call this a horizon. It follows that one of the things we can't do, if we are to define ourselves significantly, is suppress or deny the horizons against which things take on significance for us. (p. 37)

So our own moral compass, which we might call "Reasoning in moral matters," is "always reasoning with somebody" (p. 31). Understanding horizons of significance requires a certain flexibility of mind, or an imaginative capacity. For example, in a multi-cultural society such as ours, different cultural groups hold very different values. Yet even within these groups, there is considerable variety in the particular values, and their relative strength, held by various individuals. Understanding oneself, who one is and the position one takes on various moral matters, requires some degree of understanding of the range of possibilities available to one, as well as what various possibilities mean in different contexts and to different people. One needs a flexibility of mind to both conceive of these possibilities, as well as to consider which alternative is the best for oneself, in the particular context in which one exists. Taylor puts is thus:

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When we come to understand what it is to define ourselves… we have to take as background some sense of what is significant. Defining myself means finding what is significant in my difference from others. (pp. 35-36)

Imagination, then, is needed for the development of a moral compass: a process that does not occur in a vacuum, but rather requires some degree of understanding of the socio-cultural situatedness of morality itself.

1.3.4. Imagination as understanding

In the preceding discussion, I have dealt with the three purposes of education, and the imagination's role in achieving these purposes, separately. Yet if we take the whole of imagination as our focus, then the conceptual fragmentation built into the terms "knowledge," "agency" and "moral compass can become unhelpful. As I envision it, by educating imaginatively, we are developing a capacity for knowing, acting and orienting oneself in moral terms, all in one. We might refer to it as an imaginative mode of *understanding*: an imaginatively rich and energetic way of being in and seeing the world. Throughout the remainder of this thesis, I will employ the term *understanding* in this imaginative sense. It implies a transformative vision of education, in which a breadth and depth of knowledge, a sense of personal and collective agency and a moral compass play central and interlinked roles.

It follows from this vision that the purposes of teacher education are to help prospective teachers further develop such imaginative understanding themselves, and to cultivate in them an ability to foster similar understanding in the students they will teach.

If the imagination is central to the achievement of these three goals and the development of such understanding, then it also must be foundational to the education of both school students and pre-service teachers.

The ways in which the purposes of education in general and teacher education in particular are defined necessarily shape the practical questions of how one designs and implements teacher education programs. In chapters four, five and six of the thesis, I will clarify how an imaginative teacher education program might be designed to make the imaginations of both students and pre-service teachers central to their education, and so help both students and pre-service teachers achieve the three purposes of education I am proposing.

1.4. Chapter summary

This chapter is the first of three that develops the conceptual framework for an imaginative teacher education program. After I explained why a coherent and effective teacher education program must be based on a clear conceptual basis, I argued that there are three central purposes of education: to help individuals acquire a breadth and depth of knowledge, to instill a sense of both personal and collective agency, and to develop a moral compass. I then explained why the imagination—which I defined as using a certain flexibility of mind to be able to conceive of possibilities beyond the immediate and concrete, a flexibility of mind that is centrally concerned with emotional engagement—is necessary for education to achieve these three purposes. In chapter two, I will discuss why Egan's theory of imaginative education is especially germane to this goal. In the following chapter, I will also explain the principles and practices upon which the theory of imaginative education is based.

CHAPTER 2: EGAN AND THE IMAGINATION

This chapter clarifies why Egan's work is fundamental to achieving the goals of education I outlined in chapter one. As I explained in the first chapter, imagination is central to education's ability to give students a breadth and depth of knowledge, to instill in them a sense of both personal and collective agency, and to help them develop a 'moral compass,' or a sense of the ethical ways in which knowledge can be used and agency enacted. In this chapter, I will explain why Egan's work in particular is needed to create the kind of education, and by extension, the kind of teacher education, that we want. In other words, this chapter includes my rationale for using Egan's theory of imaginative education in the theory and practice of teacher education. I will explain the key features that distinguish Egan's theory from those of other philosophers of education who have similarly argued for the centrality of imagination in education, and clarify why these features make his theory a particularly suitable one upon which to base an imaginative teacher education program. I will also explain two significant characteristics of Egan's theory, and in doing so, explain in some detail the theory of imaginative education. Finally, I will sketch out what imaginative education can look like in practice, by providing both a general overview of some characteristics that tend to be present in imaginative teaching and learning contexts and a summary of two quite different and successful units, based on the principles of imaginative education, that were taught by teachers in real classrooms. The discussion in this chapter helps contextualize the subsequent consideration (in chapter three) of how Egan's theory needs further

development to be effectively used in the context of teacher education, and the program principles that necessarily follow from the theory.

2.1.   A robust theory: curricular and practical

There are numerous theorists who have argued that the imagination is central to the goals education should achieve (e.g. Greene, 1995; Warnock, 1976; White, 1990). While these writers all contribute to our understanding of the imagination and the philosophical rationale for fostering it in schools, none offers as comprehensive a theory of the imagination as Egan. Egan's theory is robust in several regards; I will explain those two that are most pertinent to its suitability in the context of a teacher education program. First, in addition to fully exploring what we mean by the imagination and its important role in education, Egan has also developed what we could call a theory of curriculum. That is, he has considered and explored in some detail how his theory of imagination necessarily shapes both what and how we teach. Second, unlike other philosophers of education, Egan has spent considerable time exploring how his theory will be used by and for real teachers and students; the work concerning the practical aspect of the theory is significant. Egan's theory is also distinct in two other significant regards: his conception of education importantly involves both gains and losses, and it builds upon the notions of kinds of understanding and cognitive tools—general ways in which we make meaning, and which also shape our meaning-making, and the 'tools for thinking'

associated with each.[16] In explaining these two distinguishing features, I describe his theory in some detail. First, then, I will consider the two features of Egan's theory that make it an especially suitable one upon which to base an imaginative teacher education program: one that attempts to help students and teachers develop the three aims of education I am arguing for, and so one that aims to make the fostering of the imagination of pre-service teachers and their students central to its purposes.

2.1.1. A theory of curriculum

As I will explain shortly, Egan's theory of imaginative education includes a thorough explication of the central role of imagination in education. This is clearly an important feature, but not one that distinguishes it from other philosophers of education who have similarly argued that engaging the imagination should be fundamental to educating. One unique feature of Egan's theory, however, is that it includes what one could call a theory of curriculum. In *The Educated Mind*, Egan devotes one chapter to outlining how our curriculum decision-making will be shaped by using his theory: the general ways in which students make meaning of and in the world shape how knowledge should be organized. In addition to this chapter, Egan has also written other books that explain how the curriculum can be chosen and organized around the particular kinds of understanding most commonly used by students in elementary school (Egan, 1988) and by those in middle school (Egan, 1990). Here, I will provide only a brief summary of the

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[16] Egan's is also a cultural recapitulation theory: he argues that the ways in which individual understanding tends to develop recapitulates, at least in some regards, larger developments in the culture, over time. While this certainly makes Egan's theory distinct, I do not expand on it here because this aspect does not significantly influence its suitability for the context of teacher education programs. Readers are encouraged to consult *The Educated Mind* for further elaboration about this aspect of the theory.

main ideas found in Egan's discussion of the curriculum in *The Educated Mind*. Readers are directed to Egan (1997) for a fuller explication of these ideas.

In *The Educated Mind*, Egan identifies changes to the curriculum that one could implement immediately "without serious disruption" to the typical public school classroom (p. 207). This chapter is not meant to be exhaustive; rather, Egan uses "broad brush strokes" (p. 207) to indicate some ways in which we might structure the curriculum of "typical schools" and universities based around the ways in which students understand the world (p. 207). I will not describe Egan's five kinds of understanding in detail here, but will wait until I explain the other two features of his theory that make it distinct: the notion of gains and losses and the role of cognitive tools and kinds of understanding.[17] For present purposes, I will simply explain that Egan suggests that the characteristics of each kind of understanding (Mythic, Romantic and Philosophic)[18] become principles for determining the curriculum for students who are mostly developing that particular kind of understanding. This means that middle school teachers, the majority of whose students will be most predominantly using and developing the tools of literacy that are associated with Romantic understanding, will use and allow students to use the 'tools' of this kind of understanding to engage them in topics. Teachers who use the features of Romantic understanding in the selection and organization of units and lessons, therefore, will allow

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[17] Egan first clarifies that two general principles will necessarily shape curriculum selection: our reflection on the common cultural forms of oral and literate use; and reflection on the direction we want the curriculum to take students towards (toward Romantic, Philosophic and Ironic understanding).

[18] Mythic roughly corresponds to the ways in which most students make meaning in elementary school, Romantic to that in middle school and Philosophic, ideally, to that in high school. Egan clarifies that he has "nothing much to say about the curricula for Somatic understanding [which is pre-linguistic from birth to about age two] and for Ironic understanding [which is generally developed in adulthood and therefore after the completion of public school], assuming that the former is constrained in ways that do not leave much room for curriculum content choices and the latter is unconstrained in ways that leave so much room that prescription would be pointless" (p. 207).

students to: engage with what is wonderful about the topic; understand the reality and the limits of experience inherent in the topic, exhaustively collect and organize information related to one feature of the topic; humanize their knowledge by identifying the hopes and dreams of individuals whose stories are implicated in the topic; allow students to explore the possibilities for revolt and idealism in the topic, and so on. The teachers of students who will be primarily developing Mythic and Philosophic understanding will similarly use the features of those kinds of understanding, obviously different from those listed above, to guide their curriculum selection and organization.

In this chapter of *The Educated Mind*, Egan also identifies the general changes to the curriculum of the four core subjects that would result from implementing the principles of his theory. So for each of Mythic, Romantic and Philosophic understanding, Egan outlines features of the math, science, language arts and history curriculum "that differentiate it most clearly from those that currently dominate schools, colleges, and universities" (p. 207). For example, Egan suggests that to help elementary students develop the tools of oral language associated with Mythic understanding, language arts teachers might support students' greater metalinguistic awareness by making a concerted effort to include, and draw attention to in their teaching, jokes (both frequently telling them themselves and encouraging students to tell them), simple forms of parody, rhythmic language use, word play, songs, the telling of folk tales, and so on. As I will explain in more detail later, these are some of the 'tools' of Mythic understanding—tools that teachers will be using to help students imaginatively engage with the topic, and tools that students themselves will be using and developing throughout the elementary school years.

The consideration Egan has given to curriculum selection and organization not only makes his theory noteworthy, it also aids dramatically in making his theory more comprehensible: it provides a stronger and more explicit connection between the alignment of the 'theory' and the 'practice' of imaginative education. Clearly, a feature such as this is invaluable to both teacher educators and pre-service teachers, both of whom will be concerned with fostering the imaginative engagement of their students. Other philosophers of education who have argued for the centrality of the imagination in education (e.g. Greene, 1995; Warnock, 1976; White, 1990) do not share with Egan this distinguishing feature.

2.1.2. A practical theory

Egan's theory is also distinct from those of other philosophers of education, and a more suitable one upon which to base an imaginative education program, because it includes consideration of how real teachers can use the principles and practices of his theory in real classrooms, with real students. Specifically, for each of the kinds of understanding that schools are to foster, Egan has developed practical planning frameworks. These planning frameworks clarify, for example, key questions that teachers can ask to help them identify the emotional importance—or the 'story'—of the topic, how the unit can best be shaped around this story, how the unit can be concluded and so bring emotional and intellectual satisfaction to students and the teacher, and various means of evaluation. Remaining true to the spirit of his theory, Egan has also encouraged

others to adapt these frameworks to suit their own needs and preferences.[19] Egan's books

also include countless sample lessons and units that are built upon the principles and

practices of imaginative education. He has also, through the Imaginative Education

Research Group, and various other research initiatives, supported teachers' developing

and teaching their own imaginative lessons and units and publishing the results (e.g.

Judson, 2008).

While one might not go so far as to say that Egan has developed a pedagogy of

imaginative education,[20] there is no doubt that his theory makes substantial contributions

to our understanding of imaginative education and teachers' ability to use the principles

and practices of imaginative education in their classrooms. In other words, Egan has

examined and made explicit many of the implications of his theory for practice, and has

thereby made the theory more understandable and accessible for a wide variety of

practitioners. No other theorists who have written about the uses of the imagination in

education have similarly taken into consideration the practical concerns faced by real

teachers in real schools and classrooms—by both providing detailed and specific

examples of how to plan and offering sample lessons and units based on the principles of

their theory in order to make it more comprehensible and concrete.

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[19] As I will explain shortly, Egan has repeatedly argued against his theory simply being understood as a methodological tool; the frameworks can be adapted in various ways and for a variety of purposes and still manifest the basic principles and practices of imaginative education.

[20] As I have suggested, Egan's theory has a more programmatic, rather than a pedagogical, focus. In other words, there is more work that can be done in terms of the potential pedagogical design of imaginative education. In the second half of this thesis, chapters four, five and six, I describe the programmatic structures that follow from both the clear conceptual framework I have articulated and the ideal kinds of understanding that imaginative pre-service teachers should have (what Howey, 1996, calls derivative themes). In these chapters, I add to the potential pedagogical design of imaginative education, specifically as it relates to the context of teacher education.

2.2. Egan's important contributions

As I suggested earlier, in addition to being both a curricular and practical theory, there are two additional, and very important, ways in which Egan's theory is distinct. First, his conception of education importantly involves both gains and losses. To Egan, education is not simply a process of learning more, or even of learning differently, in some kind of increasingly complex way. Rather, while education certainly does bring some kinds of gains, it also inevitably involves losses. Second, Egan's theory builds on two important concepts: cognitive tools and kinds of understanding. As I indicated earlier, Egan has identified five distinct kinds of understanding that shape how we make meaning of and in the world. Each kind of understanding has particular cognitive tools, or 'tools for thinking,' associated with it.

2.2.1. Gains and losses

An important feature of Egan's educational theory is the recognition that education is not simply a process of consecutive gains. Indeed, Egan suggests that viewing education according to this "current bland and comfortable belief" (1997, p. 58) is "a serious mistake" (p. 97) and "cannot any longer be sustained" (p. 58). To Egan, the process of becoming educated also involves some losses:

> The usual conceptions of education see it, or define it, as a straightforward progressive process; it is a process of pure gain; it is 'hierarchical integrative,' encompassing and adding to its previous stages; it is a gradual accumulation of worthwhile knowledge and skill. The danger of accepting such a view is that we can become insensitive to the losses that seem to be tied to each gain…. Education, I will argue, is properly a process of

important gains, certainly, but also, and perhaps inevitably, a process of losses sacrificed for those gains. (1988, p. 5)

Egan highlights that the development of what he calls later kinds of understanding necessarily brings a loss of the vividness of the ways in which we made meaning in and of the world with an earlier kind of understanding, and that these losses "are not trivial" (1997, p. 192).[21] Indeed, Egan almost mournfully acknowledges that "what we would preserve seems at best only an ever-fading vision of what was once so bright" (p. 192). Encouragingly, Egan does suggest that there are ways in which the losses implicated in the "trade-off" of education (p. 58) can be minimized, but that in order to accomplish this, educators need to be aware of what those losses are:

> In the conception of education to be developed here, at least, education will be seen not simply as maximizing gains but, equally importantly, as minimizing losses. To minimize them, one first has to be aware of them…. A clear sense of the losses… enables one to teach [particular abilities] more effectively and more richly, minimizing cognitive and affective losses. (1988, p. 5)[22]

Of course one must be also aware of the losses involved in the process of developing understanding so that one can ascertain whether they are "worthwhile or necessary" (1997, p. 57). In order to fully understand what it is that is potentially gained and lost, we must consider two of Egan's central concepts, cognitive tools and kinds of understanding.

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[21] "The repertoire of discourse forms available to the child is always both enabling and constraining at the same time" (1997, p. 68).

[22] Put in a more pithy form: "The educational trick is to maximize the gains while minimizing the losses. If we are unaware of the potential losses, we do little to minimize them" (1997, p. 7).

2.2.2. Cognitive tools

Egan's is a socio-cultural educational theory. Unlike more Piagetian-based scholars, who suggest that learning is progressive and development largely a matter of biological changes, Egan (1997) argues that all learning occurs within the contexts of culture, a culture that necessarily shapes both what and how one learns:

> the human mind is not an isolated phenomenon; it is not sharply divided from its cultural contexts the way the physical brain is divided from the outside world by the skull. The nature of individuals' minds is shaped by and coalesces with its cultural contexts. (p. 66)

Egan's socio-cultural theory shares many similarities with that of the Russian psychologist, Lev Vygotsky (e.g. 1978). Indeed, Egan's notion of cultural/ cognitive tools has its roots in Vygotsky's concept of interpsychic and intrapsychic processes (1997, pp. 29-30). Vygotsky argued that individuals learn particular practices from our cultural contexts, practices that eventually become internalized. For example, a conversational structure (which varies across different cultural contexts) is, to a young child beginning to talk, initially an interpsychic process. She or he listens to it, starts to experiment with it, and then begins to use it with increasing flexibility and confidence, until it is fully internalized as an intrapsychic process. Vygotsky highlighted that the act of internalizing such processes changes the ways in which we make meaning, or understand the world. Egan similarly suggests that development primarily involves individuals picking up cultural tools from their social interactions, tools that, once internalized, become cognitive tools. Like Vygotsky, Egan also suggests that the process of internalizing

cultural tools brings about significant changes in the ways and kinds of meaning the individual can make, or what he calls kinds of understanding: "each kind of understanding results from the development of particular intellectual tools that we acquire from the societies we grow up in" (p. 4). A child who is learning to read, for example, initially looks at squiggles on a page and has no understanding that a letter represents a sound. Slowly, she starts making connections between particular sounds and letters. Soon, she is sounding out words. Finally, she has internalized the process of reading to such a degree that it is very difficult for her to look at a familiar word, such as 'cat,' and not see the three letters as a signifier for an animal, but only as squiggles on a page, as she once did.

While there are many cultural tools that are shared by numerous cultures, the tools themselves are not necessarily stable: different ways of meaning-making may emerge, change or drop away in various cultures over time. However, because they are learned through interaction with other humans, cultural tools are more easily picked up by individuals in communities that value and practice them. For example, if a particular culture did not use literacy in any systematic way, some of the cognitive tools associated with it may not be as fully developed by individual members of the culture as in one that relied heavily on literacy as a fundamental way to understand the world.

Egan suggests that understanding and using these cognitive tools is key to educating well: "Our intellectual development … requires an understanding of the role played by the intellectual tools available in the society into which a person grows" (1997,

p. 29).[23] In other words, education is not simply a process of an individual acquiring an increasing amount of knowledge; rather, it is a process of an individual gaining increasing mastery and flexibility in how she or he comes to understand the world. Because particular tools are associated with various kinds of understanding, the development of the ability to make sense of the world primarily with oral language, for example, brings with it, and is mutually dependent upon, the tools of rhyme, metaphor, story, etc. Egan's kinds of understanding, like the tools that accompany them, are culturally mediated. This means that there is no 'natural,' biological development from one kind of understanding to another. Rather, various kinds of understanding will develop and be accessible for use by an individual if she or he lives in a culture that values, practices, and fosters the development of them.

Importantly, both the acquisition of various cultural tools and the development of different kinds of understanding depend on the use of the imagination:

> the central dynamic [of my educational scheme] is imagination—that generative feature of the mind involved both in the invention of intellectual tools in cultural history and in their acquisition in education. What the imagination can grasp is enabled and constrained by the logic inherent in the various forms of knowledge and by the psychologic inherent in the process of human development. (1997, p. 189)

Like cognitive tools, kinds of understanding are central to, and make unique, Egan's theory of imaginative education.

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[23] Egan (1997) clarifies that "It would be a pity to replace the isolating focus on individuals with its binary opposite, ascribing total responsibility for the formation of the mind to cultural context. We might be better with an interactionist mediation" (p. 66).

2.2.3. Kinds of understanding

Egan (1997) identifies five kinds of understanding that shape the ways in which we make meaning from and in our world.[24] While he acknowledges the category of 'kinds of understanding' may be "unfamiliar," Egan suggests that it "has at least the virtue of bringing into focus features of students' thinking and learning that are prominent and powerful in their lives but have been somewhat neglected in educational writing" (p. 6). These five kinds of understanding, which I will describe shortly, are Somatic, Mythic, Romantic, Philosophic and Ironic understanding, and roughly correspond to the ways in which we make meaning with our bodies (when we are pre-linguistic babies), with oral language, with literacy, with theoretic thinking, and with extreme reflexivity. Egan makes the important distinction that these five kinds of understanding are not entirely, but only "somewhat," distinct.

There are three ways in which kinds of understanding are "somewhat distinct." First, we do not develop a new kind of understanding suddenly and completely and never again use earlier kinds of understanding: "we cannot talk about students being exclusively in [one kind of understanding]. Rather, a particular kind of understanding tends to assume prominence at particular times" (p. 179). In other words, as we develop the ability to see the world more or less with a new kind of understanding, we still retain the ability, at least at times, to view the world according to an earlier kind of

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[24] "the mind is not an isolable thing like the brain inside its skull; it extends into and is constituted of its socio-cultural surrounding, and its kinds of understanding are products of the intellectual tools forged and used in those surroundings" (1997, p. 30).

understanding; "Our thinking… is more heterogeneous than we seem willing to realize" (p. 192).[25]

The second way in which kinds of understanding are "somewhat distinct" involves the degree to which they coalesce. Egan suggests that "These kinds of understanding are only 'somewhat' distinctive in that they are not wholly different forms of thought, mutually incomprehensible" (1997, p. 179); we are, Egan argues, a "five-minded animal, in whom the different kinds of understanding jostle together and fold in on one another, to some degree coalescing,[26] to some degree remaining 'somewhat distinct'" (p. 180). Egan suggests that we have "typically polysemous understanding" (p. 4) and that the five kinds of understanding "[coalesce] to a large extent (but not completely) as each successive kind has emerged" (p. 4).[27] Egan (1997) suggests that a useful image for this limited coalescence is partially scrambled eggs; while "one can 'somewhat' distinguish the yolk from the albumen," in some parts they are "indistinguishably mixed," while in others they may be more distinct. Yet as "one

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[25] "These kinds of understanding are not neat, discrete categories, each on its distinctive primary color, each marked off definitively from the others. They do not represent irreconcilable features in the minds of their users; they do no represent incommensurable *mentalites*. In daily life we think, talk, and communicate using one kind or another, slipping more or less easily from one to another, combining or coalescing one with another. I have referred to them as 'somewhat distinctive'; more like different perspectives than different *mentalites*, by means of which particular features of the world and experience are brought into focus and prominence and combination" (Egan, 1997, p. 104).

[26] For example, Egan (1997) suggests that Mythic and Romantic understanding "share a great deal more than what distinguishes them, and the dramatic difference between them masks a significant continuity underneath" (p. 95).

[27] "kinds of understanding do retain some degree of autonomy, and so our thinking in general is more incoherent than we allow ourselves to recognize" (p. 180).

certainly cannot unscramble" partially scrambled eggs (p. 180), neither can one completely separate out partially coalesced understanding.[28]

Third, kinds of understanding are also somewhat distinct because 'embryonic' tools of later kinds of understanding are present in earlier forms: "All the kinds of understanding are potential or embryonic in all minds" (p. 176). The existence of these embryonic tools does not mean that earlier kind of understanding inevitably lead to later kinds, of course, because cultural mediation is necessary for the adequate development of all later kinds of understanding.

Each of Egan's five kinds of understanding has particular cognitive tools associated with it. As suggested earlier, cognitive tools are ways we make meaning—we might think of them as tools for thinking: "Our intellectual development … requires an understanding of the role played by the intellectual tools available in the society into which a person grows" (1997, p. 29). Egan describes kinds of understanding as "the ways the mind works when using particular tools" (p. 176). It is through the use of cognitive tools that various kinds of understanding can be developed as fully as possible: "tools are to be stimulated and developed by specific content" (p. 186). Indeed, Egan emphasizes that the adequate development of the kinds of understanding requires both "learning a lot" (p. 186) and "particular kinds of knowledge…. the knowledge that is of most worth will vary during the course of the individuals' education and may be determined by the kind of understanding most actively being stimulated and developed" (p. 25).

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[28] Egan (1986) suggests we consider human understanding like a hologram: "If a hologram is broken into pieces, each piece contains an image of the whole. The laser will not show simply a part of the picture, but will show a fuzzy image of the whole. As pieces are added the whole picture becomes clearer.… [Developing understanding] is a matter of coalescence and increasing clarity, in whose composition linear processes are inadequate" (p. 136).

It might be more helpful to think of one making meaning of and in the world

using the tools of one kind of understanding rather than to think of an individual as

having or not having a particular kind of understanding.[29] As Egan reminds us,

"understanding is not an on/off condition; it is, as the holograph metaphor suggests,

amenable to ever-increasing clarity" (1997, p. 91). Similarly, students are not

"exclusively in Mythic or Romantic 'stages.' Rather a particular kind of understanding

tends to assume prominence at particular times" (p. 179). In the following brief

discussion of kinds of understanding, I will list the tools associated with each of Egan's

five kinds of understanding; readers are directed to *The Educated Mind* for a fuller

account of each of the tools and an exploration of their educational implications.

2.3. Describing the kinds of understanding

The first kind of understanding, Somatic, is the way children make sense of the

world with their bodies, before they can understand and use language in any kind of

consistent way. Egan (1997) calls Somatic understanding "our bodily foundation in the

natural world" (p. 171): the body "is the most fundamental mediating tool that shapes our

understanding" (p. 5). From birth, infants and young children use their bodies to

understand the world, noticing and responding to colours, patterns, textures, pitch,

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[29] There are two reasons why this is so: 1) To some degree, kinds of understanding are contextually bound: one might be able to use the tools of one kind of understanding to make sense of personal relationships, for example, but be unable to use those same tools with much mastery in another area, such as mathematics. Egan (1988) makes this same point about being imaginative: "one cannot be imaginative in the abstract: it is the particular contexts that are important. Once can be imaginative in mathematics, language use, science, running, playing, or whatever, but one cannot be contextlessly imaginative" (p. 150). Similarly, "One cannot be effective in the abstract either. One is effective at something" (p. 150); 2) Considering understanding as an active process instead of as a more stable condition or ability which one achieves highlights the important point that we need to keep earlier kinds of understanding alive (continually use their cognitive tools) in order to keep later kinds of understanding vigourous: otherwise they can become desiccated or hollowed out, as Egan describes in *The Educated Mind*. I will discuss the issue of keeping later kinds of understanding alive in chapter three.

rhythm, temperature, motion, pressure, and so on. In this pre-linguistic state, children also

interact with their worlds, by moving objects, balancing their bodies, creating and

destroying order and patterns, and playing with their voices. Somatic understanding has a

unique status because, of Egan's five kinds of understanding, it is the only one that is not

mediated by language; Somatic understanding is "a distinctively human but prelinguistic

understanding of the world" (p. 35). This kind of bodily knowing through direct

experience is, at least at some level, "ineffable" (p. 170). Somatic understanding, and the

particular cognitive tools associated with the body, will be discussed in more detail in

chapter three.

The development of Mythic understanding marks children's entrance into the

world of language. Egan (1997) explains that "each characteristic of Mythic

understanding is a direct consequence of language development, and so can be found in

both the mythic thinking of traditional oral societies and the everyday, spontaneous

discourse of young children in modern literate cultures" (p. 37). When children can start

to understand and use oral language in a consistent way, they no longer need to rely on

direct experience to make sense of the world, but now have a degree of representation not

possible with Somatic understanding. They can talk about people who are not present,

understand complex stories, and use language inventively, including creating new words

and making jokes. Mythic understanding is characterized by fantasy, magic and make-

believe; the delight children take in made-up characters and places is evident often before

a child's second birthday. A sense of time, and thus the past and the future, also becomes

increasingly active as Mythic understanding develops. Children can now talk about things

that happened to them months or years ago, and make future plans as well. An important

tool of Mythic understanding is the story; Mythic understanding "finds a prominent place for the story" (p. 64). Other tools include mystery, images, metaphors, binary opposites, rhythm and rhyme, jokes, and drama and role play.

Obviously, children who make sense of the world primarily with oral language do not lose the ability to also understand and interact with the world with their bodies. Anyone who has spent some time in an elementary school will have noted how incredibly physical most young children are. However, as I discussed earlier, the development of later kinds of understanding do seem to cause a loss of vividness of earlier kinds of understanding. So a child who understands the world with the tools of Mythic understanding is not likely to understand the world by means of direct experience as vividly as he did when he only made sense of the world through direct, unmediated experience, by means of Somatic understanding[30]: there is some loss of the "intimate participation in a vividly sensed world" (1997, p. 101). Now, he has a new sense-making ability, oral language, with which to make meaning. Like the literate child who finds it extremely difficult, if not impossible, to look at the letters 'cat' and not associate it with a four-legged animal, the child with Mythic understanding similarly finds it next to impossible to hear a word such as 'mother' only as sound babble.

Romantic understanding begins to develop when children start to understand and use symbol systems, most notably literacy, in some kind of consistent way. Now, in addition to being able to hear and tell stories, children can also read books, computer screens, magazines, and graffiti. As well, they can represent and communicate thoughts

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[30] At least not at all times. There may be ways by which or times in which the vividness of Somatic understanding can be better retained, or is heightened, such as through mystical experiences such as prayer and meditation, or in profound emotional states such as grief and love.

and feelings in other kinds of symbol systems, such as musical and mathematical notation, for example. While the locus of understanding with Mythic understanding was the ear, with Romantic understanding it becomes the eye. The fantasy that characterizes Mythic understanding gives way in Romantic understanding to a focus on reality, and its possibilities and limitations. Now, children will not so readily believe in a fairy godmother or talking animals: they seek explanations that make such unusual skills or characteristics more plausible. Children who are developing Romantic understanding seek to know

> the range and extent of reality, with the associated security that reality isn't infinite in all regards…. By discovering the real limits of the world and of human experience, we form a context that enables us to establish some security and to establish proportionate meaning within it. (1997, p. 85)[31]

A central tool of Romantic understanding is narrative, the means by which one can organize events and feelings into larger coherent wholes. Other tools include transcendence, associating with heroes, the limits and extremes of reality, collecting and organizing, the humanization of meaning, and revolt and idealism. The ability to code and decode languages, read and write texts, and compose and read scores that comes with the development of Romantic understanding brings with it the loss of some of the vitality of making sense of the world, and the word, primarily with oral language, as one did with Mythic understanding. In other words, with literacy, "One also [loses] the intensity of participatory experience in an immediate life-world, in which one's store or knowledge

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[31] "The tension characteristic of romance comes from the desire to transcend a threatening reality while seeking to secure one's identity within it" (Egan, 1997, p. 90).

and lore was profoundly and vitally meaningful" (1997, p. 98). So, for example, a child using the tools of Romantic understanding will find it difficult to separate textual forms of expression from their assigned meaning: for example, to see 2+2=4 or 'word' simply as ink shapes.

The development of Philosophic understanding is underway when adolescents or young adults begin to make meaning of the world in theoretic terms: in terms of consistent claims to knowledge such as through science or linguistics. As young people explore, challenge, adopt or dismiss theories, they also encounter the principles underlying those theories, and the criteria upon which the principles are based. While a young person making sense of the world primarily with the tools of Romantic understanding is fascinated by reality, one using the tools of Philosophic understanding uses ideas to make sense of the world: "the central feature of Philosophic understanding is theoretic thinking and an insistent belief that Truth can only be expressed in its terms" (1997, p. 105). The adequate development of Philosophic understanding requires a "significant accumulation of detailed knowledge" (p. 120). Narrative, a central tool of Romantic understanding, gives way with Philosophic understanding to the central tool of metanarrative. Other cognitive tools used with Philosophic understanding are the search for generalities, authority and truth, and anomalies.

The development of Philosophic understanding brings with it the predictable loss of some of the vividness of earlier kinds of understanding. For example, a child with Romantic understanding may see language as a remarkable invention of human beings that gives us enormous advantage in developing and sustaining social relationships; an adolescent with Philosophic understanding may have less of a sense that language is a

'solid' feature of reality and may realize that the connections between signifiers and signifieds are largely arbitrary—that the connections that exist do so mostly because we agree to recognize and function as if those connections are real. So some of the majesty of what was previously thought of as reality may diminish when one begins to understand the world through the use of ideas and theories, as happens with the development of Philosophic understanding.[32]

Ironic understanding involves a "self conscious reflection about the language one uses" (1997, p. 4). When one begins to develop a reflexive use of language, one realizes the limitations of language for making meaning. Ironic understanding allows one to see that understanding itself as some final place, as finite, is also an illusion: at some level, our humanity cuts through all methods we have of making meaning—so Ironic understanding is truly aptly named. Ironic understanding clarifies that none of the various ways of meaning-making are perfect, but that each has strengths and weaknesses and is more or less appropriate in different contexts: while one situation might best be understood using the tools of Philosophic understanding, another might prompt our use of Somatic understanding. A person using the tools of Ironic understanding realizes that, while each kind of understanding is important and needed in particular situations, any typology, explanation, or theory is at some level inadequate. Yet Ironic understanding also prevents someone from completely discarding all theories or explanations: their potential usefulness is recognized. The understanding of paradox that attends Ironic

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[32] Egan notes that Philosophic understanding tends not to be well-developed by the majority of adults in our culture: "Systematic development of Philosophic understanding seems at present normal for only a smallish proportion of the population—those who enter and interact with communities that support this kind of thinking, such as some academic streams in senior high schools and in colleges and universities, and who also have adequately accumulated Mythic and Romantic capacities" (1997, p. 118).

understanding can also be considered, at least at some level, a spiritual place—where we can simultaneously experience both clarity and ignorance, unity and aloneness, finity and infinity, destitution and awe, and the sacred and the profane.[33] Some of the tools of Ironic understanding are reflexivity, limitations of theories, and radical epistemic doubt.

Egan (1997) claims that the goal of his educational theory is the adequate development of Ironic understanding. One might take this to mean that his theory is hierarchical: that Ironic understanding is necessarily superior to the other four kinds of understanding. In response to this, Egan, and I, answer that this is both true and untrue. In particular cultural contexts, such as in "modern, high-literate culture" (p. 190), using the tools of Ironic understanding may indeed be beneficial because it affords an individual the greatest flexibility with the ways in which she may make meaning. On the other hand, in other cultural contexts, there could be no benefit, and indeed, could possibly be definite drawbacks to an individual using Ironic understanding (especially, for example, if all other members of the culture made meaning primarily using the tools of Mythic understanding). As Egan simply puts it, "Mythic understanding is better if you live in a mythic culture" (p. 190). In other words, the potential benefit of Ironic understanding itself is culturally constrained.[34] Additionally, Ironic understanding is not better than all other kinds of understanding because well-developed Ironic understanding is the "mature coalescence of the previous forms" (1988, p. 7). In other words, full use of Ironic

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[33] "The spiritual aims of [Buddhist and Christian meditation traditions] connect, it seems to me, with my discussion of Ironic understanding's ability to see the coffee cup as a ceramic object stripped of its association with our conventional purposes. Various spiritual traditions teach us to see the world stripped of our stories, metanarratives, and philosophic schemes and released from the perspective constructed by the ego self (Bai, 1996). I do not see this kind of spiritual experience a distinctive kind of understanding, rather, I see it as a fruit of Ironic understanding when a richly developed Somatic understanding is preserved within it" (1997, p. 193).

[34] "there is no 'natural progression' in [the direction of Philosophic understanding]" (Egan, 1997, p. 105).

understanding requires the adequate development of Somatic, Mythic, Romantic and Philosophic understanding and an ability to both determine the usefulness of and use the cognitive tools of each, in particular contexts. Indeed, recognition of the significance of the losses entailed in the development of later kinds of understanding also means that Ironic understanding cannot be superior: "As one kind of understanding is partially coalesced with a subsequent kind, it seems that something of the former is lost" (1997, p. 192).

In much the same way as the adequate development of Ironic understanding involves the full development of all earlier kinds of understanding, an adequate understanding of Egan's theory of imaginative education also requires some degree of Ironic understanding. For example, using Philosophic understanding might lead one to conclude that this theory both is complete and has no significant weaknesses, and so is a panacea to all our educational woes. Ironic understanding, however, allows us to see that the theory, like any other theory and indeed like our own understanding, is necessarily limited. While it definitely has strengths, the theory itself is not perfect. Nor does it attempt to be: built into the theory is the reflexivity that requires one to challenge the claims upon which it is based. In other words, the theory is characterized by a kind of open-endedness. This relates to my earlier point that our understanding of the imagination is also necessarily limited: there may always be a piece, or a sense, of the imagination that defies adequate description, that is 'other,' magical and transcendent, and so eludes our attempts to categorize its features, nature and development. Similarly, when applied to the understanding of the theory of imaginative education, Ironic understanding also helps us understand its potential and usefulness, its limitations, as well

as its open-ended nature; one could say it surpasses our desire to 'tie it down,' categorize it, define it and therefore understand it in a kind of fixed way. In chapter three I explore this notion of the incompleteness of the theory in more detail.

To this point, I have described two features of Egan's theory that distinguish it, in important ways, from those of other philosophers of education: it includes a theory of curriculum and it attends to some of the practical needs of real teachers—specifically by providing adaptable planning frameworks and sample imaginative lessons and units. These two features help make Egan's theory more comprehensible and accessible for practicing teachers and teacher educators, and so make it an especially suitable theory upon which to base an imaginative teacher education program. I have also explained two other ways in which Egan's theory of imaginative education is distinct: his argument that education inevitably involves both gains and losses, and that educators must be aware of the potential losses entailed in the educational gains they foster; and his notions of cognitive tools and kinds of understanding as central to the process of education and engaging the imaginations of learners. At this point, I will move from a more theoretical focus to one that is more practical. In the hopes of clarifying how the principles and practices of Egan's theory can be manifest in real contexts, I will first discuss some of the general characteristics that tend to be present in imaginative learning contexts. Then, I will describe two imaginative units that were taught by teachers of real students, with the aim of providing examples that help the theory come to life in the context of real teaching practice.

2.4.   Imaginative education in practice

As emphasized earlier, imaginative education engages the imaginations of learners—and thus attends to their emotions—and uses cognitive tools to do so, while developing various kinds of understanding as fully as possible. How, then might one envision a learning environment based on the principles and practices of imaginative education?[35] Clearly imaginative education cannot be reduced to particular behavioural characteristics. Nor can the possibilities of what it might mean to educate imaginatively in various contexts, with different teachers and students—who are both real and complex—be captured in an image or a simple description. However, one can briefly sketch some of the ways in which Egan's principles can be manifest in practice, to give a degree of specificity to some of the possibilities of imaginative education. One should keep in mind, though, that imaginative education will necessarily be far more than the simple depiction that follows.

Learning that is imaginative primarily attends to students' emotions. However, feelings are not used simply as a 'hook' to get students interested in the otherwise difficult, and sometimes unpleasant, task of learning. Rather, imaginative education allows students to engage with the content because it is organized in such a way that highlights what makes the topic wonderful, mysterious, transcendent or beautiful. In other words, students understand the 'story' of the topic: their emotional engagement is sustained throughout the lesson or unit in a meaningful way. Students understand, and so emotionally respond to, the topic's importance: they see how it is valuable, either to them personally, or to a larger human or non-human community, or both. They will have a

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[35] The following explanations are expanded and adapted from Fettes's (2005a) description of imaginative learning situations.

sense of the ways in which they are 'actors in a larger human story': that there are important relationships between their learning and the various communities to which they belong (local and global, familiar and strange). In a word, students who are imaginatively engaged in their education will care about what they are learning.

Obviously if children's emotions are caught up in their learning, they will feel curious, excited, indignant or passionate about what they are investigating. Even though there will be expected variations in the types and degree of emotions various students experience over the duration of a lesson or unit, students will be neither 'going through the motions' of learning nor only initially emotionally engaged in the lesson or unit. The centrality of children's emotions should be evident in their expressions and conversations, as well as in their willingness to complete tasks, ones that might otherwise be considered challenging or even boring, because those tasks are genuinely seen as important and worth pursuing.

Importantly, an imaginative teacher is also emotionally engaged in what he is teaching. It is his job to clarify what about the topic is exciting, beautiful or mysterious in his curriculum planning and delivery: his feelings towards the topic of study are also important and will be evident in an imaginative learning situation. Either directly or indirectly, an imaginative teacher will express his curiosity, passion, or indignation about the content of the lesson or unit. In his caring, the teacher will necessarily share an important aspect of who he is.

Because imaginative education is also primarily concerned with the possible, rather than only the actual, or the immediate and concrete, at least in some regard, student learning will deal with the unfamiliar, the strange, the distant or unknown. One way in

which this focus on the unfamiliar may be evident is in students' learning environment. As both a physical space and a social environment, an imaginative classroom may become an extension of the students' learning: the appearance of the room, the roles students take up, the structuring of class time, and so on may be, at least to some degree, reflective of the material being studied and the students' emotional engagement with it.

Because imaginative education helps students develop, as fully as possible, various kinds of understanding and the cognitive tools of each, students' increasing mastery in the use of such tools will be evident in an imaginative learning situation. Students will use these cognitive tools for educational purposes: to simultaneously engage and enliven the imagination, to learn content, and to develop further kinds of understanding. Additionally, as students become increasingly confident and flexible in the use of these cognitive tools, they are likely to use cognitive tools in more areas of their lives, including in their discussions, arguments and play. Similarly, students who are imaginatively engaged in their learning are likely to use content-related concepts outside of the contexts of the specific lessons or units. The terms and ideas central to the topic are also likely to emerge in students' discussions, arguments and play. Increasing mastery of the use of various cognitive tools and an ability to apply terms and ideas central to particular units will also most likely enable students to make meaning in a variety of modes of representation (such as oral and written language, music and dance) and genre (story, explanation, and so on).

While considering some specific features of imaginative learning situations might help us to envision at least one way in which imaginative education might be manifest in practice, it is important to remember that imaginative education cannot be reduced to

individual indicators. Of course, it may not be particularly helpful to talk about education as completely imaginative or unimaginative. It may be more productive to consider education as more or less imaginative, or imaginative in varying degrees. However, given the earlier explanations of Egan's conception of imagination, we may say that education that engages students' emotions, in meaningful and sustained ways, in their learning, helps students develop a flexibility of mind by considering the possible, rather than just the actual—the immediate and concrete, and uses various cognitive tools to help students develop different kinds of understanding is more imaginative than education that fails to accomplish these goals.

2.5.   Examples of imaginative teaching

No doubt there are numerous teachers who have attempted to teach more imaginatively by basing their practice on the principles and practices of imaginative education that I have described. In this section, I will describe two imaginative units taught by experienced teachers who have successfully done so. Clearly, we cannot generalize what imaginative teaching can or should look like in various contexts from a few examples. However, understanding how particular teachers have effectively used the principles and practices in their own classroom teaching may help to provide vivid images of the possibilities of imaginative education, clarify how some of the features of Egan's theory that I discussed earlier, such as cognitive tools and kinds of understanding, can look in different contexts, as well as further substantiate that real teachers have been successful in applying the theory of imaginative education to their own practice. The first unit is one on piracy taught to teens in an alternate school. The second is a unit on the

water cycle, taught to elementary students. As will become clear, both teachers organized the 'story' of the unit around the cognitive tools associated with Romantic understanding to help their students become imaginatively engaged with the topic.

2.5.1. Pirate students: pirate teacher

James (2008) spent two months teaching a unit on pirates and piracy at an alternate school for thirteen to sixteen year olds. She describes her students as "alienated and rebellious young people" (p. 41) and suggests that a high percentage of them have parents who "teach them to shoplift and fail to question the arrival of a new $200 jacket in the closet" (p. 43). James thought that the notion of pirates, who were "living outside the jurisdiction of any authority" (p. 39) provided "great opportunities for emotional engagement" (p. 41), especially so for her students. James predicted that the topic might resonate with the disenfranchised students whom she taught, as the metaphor of pirates is particularly effective in highlighting many of the difficult pulls and choices that often challenge contemporary teens:

> Piracy embodies the intensity of opposites that many teens face: loyalty and betrayal, family versus individualism, planning for the future or living for today, survival by any means versus living by a moral code, following the rules or suffering the consequences of rebellion, greed and generosity, right and wrong. (p. 42)

The central questions that guided the structure of James's unit were, "In what ways am I a pirate? Are alternate school students the pirates of our educational system? What are the emotional realities of piracy?" (p. 42). The central theme around which she organized that unit was that "survival and loyalty by any means may sometimes be 'more

right' than living by the moral code of established society" (p. 43); other themes that emerged included survival, adventure, greed and teamwork. James's extensive unit incorporated social studies, science, math and English.

The activities of the unit were varied. James chose a picture book, *The Pirate Queen*, as a starting point for discussing "the rewards and costs of living opportunistically" (p. 40). Exploring the text led to discussions about "Britain's coastal geography, Elizabethan England, and how to get away with burning someone's property right before your eyes" (p. 40). The class also "studied a graphic novel of *Mutiny on the Bounty*, read *Treasure Island* aloud, and interacted with several picture books and poems" (p. 40). In discussions, James often tried to draw out questions and dilemmas related to moral themes (p. 43). Reading and discussing these texts led students to explore seafaring pirates who have sailed all over the globe, and thus to the study of the geography and trade with China, Indonesia, the Caribbean, Spain, England and even the west coast of Canada. En route, the students adapted a modern popular song, discussed the history of the Métis nation and completed many creative projects. Together, James and her students also explored similarities between piracy on the high seas and that on the 'unchartered waters' of the internet. Finally, James drew the unit to a close by watching *The Pirates of the Caribbean* together as a class.

A major activity in James' piracy unit was the class's construction of sextants, a simple instrument traditionally used by sailors to calculate their latitude. James found this activity particularly engaging for her students:

> I have never seen a group of teens so interested in learning how to use sine, cosine, and tangent calculations as our class prepared for the

equinox…. I have taught geometry in the past and usually required students to memorize the formulas for angles. Now, students were applying what they knew to mapping. They breezed through a variety of math problems involving trees and shadows. (p. 40)

James reports that her students were able to calculate their latitude with impressive accuracy. In fact, the "heavy smoking, 'I'm hungry'" students became so engaged in using the sextant that they failed to notice when the lunch break started (p. 40). Their interest in the sextant even extended beyond the teacher's assignment as they decided to find "the best place to locate satellites" (p. 40).

James acknowledges that planning her imaginative unit required commitment on her part. The sextant project, in particular, required her "enormous personal investment" (p 41): she spent approximately thirty-six hours researching in order to construct the four hour sextant unit. There were other demands as well. Writing report cards "was a nightmare" as James had to tease apart from a well-integrated unit the particular skills acquired and the marks to allocate in each of the subject areas (p. 41). Additionally, James suggests that considerable intellectual effort is required in imaginative planning:

> Following a narrative is a complex intellectual task of fitting things together, identifying what is important, constructing emotional meaning and synthesizing the parts into a reasonable whole. Some of us do this well, and even easily, but others struggle to identify important themes, or fail to connect emotionally with the subject. (p. 43)

Yet for James the payoff was undeniable: "I knew that these students had learned more about the world than they had for years" (p. 41). She found the mapping part of the unit

the most rewarding, as she found that it "integrated the study of science and math in a meaningful way" (p. 41).

It seems that one could attribute the success of James' unit to several factors. First, she knew her students well and was able to accurately assess what might appeal to their emotions and imaginations: "Teenagers, especially those labeled 'at risk,' need a metaphor to help them explore the idea of living outside the rules" (p. 42). Piracy seemed to effectively capture a dynamic that spoke to her group of students. In fact, James began to see her students as kinds of pirates of the educational system. Second, James also felt a personal resonance with the topic, which allowed her to bring "[her] own sense of fun and passion to the serious job of educating" (p. 41). James could see how she, and indeed anyone aiming to teach in ways that challenged traditional standards and norms, was a bit of a pirate of the profession: James felt she risked "a little piracy of [her] own by setting off with [her] students on a multi-disciplinary voyage" (p. 42). In other words, exploring the topic of piracy with her students helped James to reflect more deeply about who she was as a teacher and who and how she could be:

> I oppose the practice of giving the least capable teenagers collections of worksheets in the hopes that this will raise the level of their basic skills. I see that, although teachers must operate within the jurisdiction of 'the system,' there is a sense, for some of us, of setting out to sea when we close the door of the classroom…. We are the pirate teachers, trying to operate outside the jurisdiction of traditional practice. (p. 44)[36]

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[36] James recommends that, as teachers, "we might benefit from occasionally acting like philosopher pirates when we teach our children. At our best, we can be fierce, loyal, persistent, and shrewd" (p. 43) and that we should "add philosopher to the vision of ourselves" (p. 43).

Third, James seemed to achieve a successful balance in directing the unit and following students' interests and needs, or responding to their imaginative engagement while maintaining the unit's coherence. It is clear from James' writing that both she and her students felt an emotional connection to the topic and found it meaningful; it is also evident that, as a teacher, she is proud of both what she and her students accomplished.

2.5.2. Wondering, wandering water

Calder (2008) describes an imaginative unit she created to help her elementary students more meaningfully and vividly understand the cycle of water. Since Calder believes that "it is always easier to understand someone or something when you begin to see how he, she or it thinks or feels" (p. 23), she decided to humanize water: she had her students role play as water molecules that were part of the water cycle. Calder wanted to "bridge the realm of fantasy and reality" (p. 23) and so give students the opportunity to "imagine that water molecules do in fact have human-like hopes and fears" (p. 23):

> By becoming water, the students can take with them their own human emotions and view the journey of water through their own hopes and fears thereby allowing a level of understanding much deeper than what would otherwise be possible. (p. 23)

In unit planning, Calder identified five characteristics that she wanted her main activity to have: the chance for students to each have a unique journey (so emphasizing the variety in the water cycle and highlight for students a sense of individual adventure); simultaneity (journeys taking place simultaneously both imitated the water cycle and allowed Calder to work within the constraints of the school timetable); a balance between

a stable narrative framework and flexibility that allowed for students' imaginative input; human-like hopes and fears emerging from the content; and an opportunity for students to explore the exotic elements of the water cycle (pp. 23-24). With these goals in mind, Calder structured a main activity that allowed her students, as water molecules, "to boldly go where no one has gone before" (p. 23).

Calder's main activity included nine stations, arranged around the classroom, of where water might be found: ocean, clouds, air, groundwater, land, streams, plants, animals and the polar ice caps. She began the activity by reading a letter addressed to "Dear student water molecules" in which they were: welcomed to the "great water system"; familiarized with the upcoming journey they were about to embark upon; warned that they will give up their agency to "throw [themselves] at the mercy of the winds and the ever-powerful warmth of the sun"; instructed to record experiences and attendant thoughts and feelings in a travel log; encouraged to embrace their journey into the unknown, "the true mark of adventure"; and finally given a blessing for their impending travels (p. 25). Then students drew from an envelope a slip of paper with information about what would happen to them as water molecules at that station. (For example, two instructional slips at the animal station read: "The animal is eaten by another animal. Stay at animal" or "The animal urinates you out. Go to land.") After the students glued the instructions to their journals and spent a few minutes writing down their response to their new circumstances, they followed the instructions, and moved to another station (or stayed at that one, as indicated on the drawn paper), picked up another slip of paper, and recorded their thoughts and feelings. The students continued the cycle for about twenty-five minutes, or until one of the envelopes was empty.

Calder realized, both while planning the activity, and through discussions with students, that the water cycle provided an excellent opportunity to highlight the extremes and limits of reality. In a follow up activity, in which students shared their experiences and feelings as water molecules on the journey, Calder described her students as

> eager to compare journeys and the things that they felt and saw along the way. Some students described the vivid images that they imagined seeing while on the journey, while others focused on their emotional connection to the journey and how they felt about being stuck in a glacier for four turns in a row, or wishing they could have the opportunity to be in urine, but never having the opportunity to get there. (p. 26)

Calder also had the class chart students' destinations, most common location, favourite place, and so on.[37] To further elaborate upon students' imagined experiences as water molecules, Calder had her students transform their journal entries into pieces of creative writing. In preparing for this activity, Calder connected the students' experiences with those of past and contemporary explorers' experiences and feelings, highlighting typical challenges and how they might be overcome, identifying various resources available to them, and so on. In this way, Calder connected the science, language arts and social studies curriculum. In the linking of these three subject areas, Calder focused on the themes of travel and adventure, and attempted to further imaginatively engage her students by stimulating their use of vivid sensory images (in imagining the experiences of other adventurers as well as in writing about their own adventures as water molecules)

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[37] Calder also provides the lyrics she wrote to be sung to the tune of "50 Ways to Leave Your Lover." Her "50 Ways to Keep on Moving" vividly and humorously captures some of the variety that characterizes the water cycle: "Just fall down with snow, Joe/ Evaporate, Kate/ You can go anywhere, Claire/ Just get yourself free" (pp. 27-28).

and in highlighting the feelings and hopes of other adventurers, as well as of their own as water molecules. One student's creative writing piece was an undercover agent's report, in which the spy interviewed water molecules about their travels and attempted to piece together various clues to discover the origins of the water cycle. Ultimately, however, the increasingly frustrated spy aborted the seemingly hopeless mission.

The unit ended with students showcasing their own accomplishments and sharing their learning with others: Calder's students presented their travel memoirs to their parents, published and read their stories to younger students, and/or led parents or younger students through their own version of the water cycle activity.

While Calder's unit was clearly focused around Romantic themes, her lesson also allowed students to begin to use at least one of the tools of Philosophic understanding: developing personal agency. In a post-activity discussion, Calder asked her students to describe how it felt "having no control over their movements and being at the mercy of the wind and sun" (p. 26) and to consider how the dynamics of the water cycle would be significantly altered if, indeed, water did have some degree of agency.[38]

Calder used both formal and informal assessment to determine her students' understanding of the central concepts of the water cycle as well as their imaginative engagement in the lesson. She describes herself as "constantly on the lookout for their understanding in the class discussions, their writing and in the way they presented their stories and experiences" (p. 30). In her attempt to ascertain that students were emotionally engaged with the topic (for example, by creating vivid images), had learned

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[38] Calder also includes suggestions for other activities related to the water cycle that might allow students to gain an increasing sense of their own agency, such as writing to the mayor about water issues in the community.

the 'content' of the water cycle, and had made significant connections with other historical explorers, Calder frequently noticed discrepancies between the level of detail and comprehension apparent in students' oral and written communication. Calder implies that her more inclusive assessment strategies (that also focused on students' imaginative engagement) gave her a more accurate sense of her students' understanding.

Like James's unit, Calder's unit had many features that contributed to its success: Calder seemed to know her students well enough to be able to reasonably predict what they would find emotionally and imaginatively engaging; Calder was imaginatively engaged in the narrative of the unit; and the coherent structure of the unit allowed for students' imaginative input. Obviously there are also noteworthy differences: James's unit was much more extensive, seemed to be based more significantly on the particular cultural and personal needs of her students, and seemed to encourage students' greater consideration of moral dimensions than did Calder's.

Yet, as I suggested earlier, neither of these examples is a paragon of imaginative education. Indeed, the more one plans one's own imaginative lessons and units and works with other imaginative educators who do the same, one realizes that there is no such thing as a paragon of an imaginative lesson or unit. Rather, there are myriad ways in which the principles of imaginative education can be effectively used in various teaching contexts. By exemplifying two of the countless ways in which imaginative education can be effective in very different educational contexts, these units do, I hope, vividly illustrate some of the possibilities of imaginative education, demonstrate how some of the principles of imaginative education I described earlier can be manifest in different contexts, and evidence that some of the successes that imaginative education promises

have in fact been achieved by teachers who have been willing to experiment with their own practice in imaginative ways.

2.6.   Chapter summary

This chapter is the second of the three that develops a defensible conceptual framework for an imaginative teacher education program. I began the chapter by describing two features of Egan's theory that distinguish it from those of other philosophers of education who have also argued for the centrality of the imagination in education: the inclusion of a theory of curriculum, or a rich description of how using the principles of his theory necessarily shape both what and how we teach; and explicit guidance in response to practical challenges faced by teachers attempting to use aspects of the theory in their classrooms—specifically, planning frameworks and numerous sample imaginative lessons and units. I suggested that these two features contribute to the suitability of Egan's theory in the context of teacher education, as they make his theory of imaginative education more comprehensible and accessible for both pre-service teachers and teacher educators. I then explained two other important characteristics of Egan's theory: the notion that education is a process that inevitably involves both gains and losses, and that educators should be aware of potential losses to both minimize them to the degree possible and to determine whether the related gains are worth the losses; and the concepts of cognitive tools and kinds of understanding. I then described the five kinds of understanding and the cognitive tools of each. I ended the chapter with a description of some of the characteristics common in imaginative learning situations, and a summary of two successful imaginative units, used in quite different contexts.

In the following chapter, I will turn my attention specifically to the area of teacher education and consider some of the challenges arising from basing an imaginative teacher education program upon Egan's theory of imaginative education. Specifically, I describe the theoretical issues that need further development and the program principles that necessarily follow from the theory. Chapter three is the final one that concerns the defensible conceptual basis for imaginative teacher education.

CHAPTER 3: A THEORY OF IMAGINATIVE TEACHER EDUCATION

This chapter is my consideration of the ways in which Egan's theory, as it has been described, requires further development in order to be successfully used in the context of teacher education. The chapter is comprised of two parts. In the first, I will consider some key theoretical issues that an imaginative teacher education program needs to address to make its conceptual framework clearer. In the second, I will describe four program principles that necessarily follow from the theory, as articulated in the previous chapter. I suggest that with the kind of elaboration that I provide here, Egan's theory provides an excellent conceptual framework upon which a teacher education program can be based.

3.1. Introduction

In *The Educated Mind*, Egan humorously describes his theory in all its ramshackle glory:

> I confess that this theory still seems to me like an engine with bits falling off, steam coming from inappropriate joints, oil dripping, some gleaming pieces attached insecurely to scavenged old bodywork—but it does seem to chug forward a bit. (1997, p. 204)

This image highlights both Egan's humility and his ironic ability to see that, like any theory, his also has potential inadequacies. While I appreciate Egan's humour, I would argue that an image of an engine that is broken, patched together, in need of repair,

or perhaps at best only modestly able to perform its desired function is not one that accurately captures the potential of Egan's theory in the context of teacher education. Certainly, teacher education is not an area that Egan has, at least to date, spent substantial time investigating in his work. Because of this, there are certain issues arising from his theory that do need further examination and explication; I will discuss these issues at some length in this chapter. However, rather than being too imperfect, inappropriate or ill-fitted for its purposes, Egan's theory, with the kind of elaboration I will provide here, is exactly the kind that teacher education is in dire need of. The theory is not too hermetically closed and so is an excellent starting point for a program that attempts to make revision and self-critique fundamental to its purposes. The hermetically open nature of the theory is evident in the fact that, for example, the theory is not only adaptable across cultures, but various contexts change what should and can be done in terms of imaginative teaching and learning—in other words, it requires attention to cultural context and a reflexivity about one's own assumptions. Put another way, the hermetically open nature of the theory helps to assure that imaginative education will not simply be transformed into a method or a behavioral edict. Before addressing the three theoretical issues that need resolution and the four program principles that follow from the theory, I will briefly discuss the extant work related to the application of Egan's theory to teacher education to clarify the degree of guidance it might provide for the development of an imaginative teacher education program.

3.2. Egan and teacher education

As suggested earlier, most of Egan's writing, the responses of critics, the development of resources related to imaginative education, and various associated

research projects have all related to K-12 education or professional development for K-12 teachers. Indeed, we might call the interest in Egan's work in these contexts widespread (e.g. Egan was the recipient of the 1991 Grawemeyer Award in Education[39]; he has been a Canada Council Research Chair in Education since 2001; the Imaginative Education Research Group,[40] whose goal is to further pursue the central ideas articulated by Egan, was established in 2001, and includes on its webpage names of one hundred and ten members from twenty-two countries; in 2003, an annual international conference was established as a result of interest in Egan's and other work related to the role of the imagination in education). However, despite the widespread interest in and acknowledgement of the importance of Egan's work, neither Egan, nor others, has given much consideration to how this theory might be used in the context of adult learners whose prior education has placed little emphasis on imaginative development.

Little exists in the way of resources to guide the development of an imaginative teacher education program in the literature on teacher education. For example, an electronic journal search[41] using the terms teacher education and Egan results in only two articles related to using Egan's theory, one of which is in the area of history curriculum selection (Hawkey, 2007), the other in the context of teachers' professional development,

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[39] This award is "intended to reward the individuals responsible for outstanding ideas in education and to draw attention to those ideas and achievements." The criteria for selection for the award are: "originality, creativity, feasibility, accessibility and scope of potential applicability." The award is granted through the University of Louisville and is accompanied by a cash prize of $200,000 (http://louisville.edu/education/about/grawemeyer-award.html).

[40] Generously funded by the CRC/ Canada Council, the Canadian Foundation for Innovations, the B.C Knowledge Development Fund, and by Simon Fraser University.

[41] This was conducted using ERIC and Education Full Text (Wilson) search engines on December 3, 2008.

not in pre-service teacher preparation (Dooner, Mandzuk & Clifton, 2008).[42] Similarly,

there is limited examination of this area in the conference proceedings from the six

international conferences on the imagination and education, from 2003 to 2008.[43] Of the

five hundred and eighteen conference proceedings available from those years, there are

only twenty-eight whose titles relate to teacher education (roughly five and a half

percent).[44] Of those, only four make direct connections between the work of Egan and

teacher education courses or programs (Compton, 2006; Frein, 2003, Ullrich, 2008a;

Warburton & Egan, 2007).[45]

　　　Of these, Compton (2006) is the only one with the full text available. Compton's

paper describes three ways in which she used Egan's principles in her teacher education

course on holistic approaches to curriculum: pre-service teachers used Egan's

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[42] Fettes's (2005c) article, "Imaginative Transformation in Teacher Education," does explore the possibilities of using some of the principles and practices of imaginative education in a cohort of pre-service teachers enrolled in Simon Fraser University's professional development program. This article was not identified in the above search; there is the possibility, then, that there has been other work investigating the possibilities of using Egan's theory in the context of teacher education that similarly was not identified. However, this possibility does not refute the point I am making here, that, if indeed any such work does exist, it is neither extensive nor systematic.

[43] As one of the eight streams of the 2009 Conference on Imagination and Education is imagination and teacher education, we would expect there to be more interest in understanding and experimenting with how Egan's principles of imaginative education might be used in the context of teacher education programs.

[44] Included in this tally were titles that included direct reference to teacher education (such as 'teacher education,' 'pre-service teacher,' 'teacher candidate,' 'teacher training,' 'Bachelor of Education,' 'graduate education program' and so on). It is possible that there were presentations that did deal with the role of the imagination in teacher education (including making some reference to Egan's work) that did not include terms such as these in their titles. However, I think it is fair to assume that, if these did indeed exist, they would be few in number, and so not refute my basic point. It should be noted that papers from the 2005 conference are not available online so were not included in this total. Additionally, there were four titles that were potentially generative, but for which neither abstracts nor full texts were available, so I was unable to clarify whether they related Egan's theory of imaginative education to the area of teacher education: Beattie (2003) "Educating the Imagination: Interacting and Enacting Narratives in Graduate Education": Frein (2003) "The Educated Adult and Professional Mind: Egan's Model Beyond K-12"; Sinnott (2003) "Friends, Lovers and Other Strangers in Teacher Education"; and Thomson (2003) "Imagining Other's Lives: Academic Service Learning in Teacher Education."

[45] The abstract of Ullrich (2008b) "Is Imaginative Teacher Education Viable in the Face of Reform? Views from the United States and Canada" alludes to the use of some of Egan's principles in teacher education programs; however this does not seem to be the focus of his presentation.

imaginative planning frameworks in their own lesson planning; they spent deliberate time fostering their Somatic understanding (through meditation); and they actively reflected on and attempted to use their imaginations in their work. While Compton's paper certainly evidences some exciting possibilities for the potential of teacher educators' imaginative pedagogy in helping pre-service teachers conceiving of teaching, learning, curriculum, and themselves as teachers somewhat differently, Compton clarifies that this was the first time she had taught the course. It will be exciting to see how Compton's future work might add to our understanding of the potential of imaginative teacher education. Specifically, clarification about her own theoretical understanding of the imagination, kinds of understanding, and so on, as well as descriptions of how she adapts her practice over time, with various pre-service teachers and in different contexts, and a richer critique of the effects of her practice on her pre-service teachers' understanding and own teaching practice (e.g. a clearer explication of significant successes and failures) will be most welcome and helpful.

No full texts are available for the other presentations that make direct connections between Egan's work and teacher education (Frein, 2003; Ullrich, 2008a, 2008b; Warburton & Egan, 2007). Unfortunately, neither the abstract nor the full text is available for Frein's (2003) promisingly titled presentation, "The Educated Adult and Professional Mind: Egan's Model Beyond K-12." The abstracts of the final two suggest that, in two other locations, some preliminary efforts, in some ways perhaps similar to Compton's (2006), have been made to apply some components of Egan's theory to teacher education. The abstract for Ullrich's (2008a) presentation, "Imaginative Teacher Education: Metaphor Analysis, Integrative Curriculum, and Action Research," suggests

that the middle school teacher education curriculum in which Ullrich teaches cultivates

Mythic, Romantic, Philosophic and Ironic understanding. Similarly, the abstract of

Warburton and Egan's (2007), "Imaginative Teacher Education," suggests that their

workshop comprised a summary of their work on developing a teacher education module

using imaginative education and a report on how early implementation of some features

of their module fared in a teacher education program. Clearly, these three presentations

demonstrate that there is some interest in using at least some aspects of Egan's theory in

the context of teacher education. Unfortunately, however, this interest, and indeed the

extent of the application, seems to be sporadic and unsystematic; this work's potential for

offering guidance about the development of an imaginative teacher education program,

therefore, seems to be regrettably limited.

Another resource that might help clarify some of the central issues related to the

application of Egan's theory to the context of teacher education might be Egan's own

work that deals, in some detail, with the development of Philosophic and Ironic

understanding. Unfortunately, however, this is also a fairly limited area, at least at the

current time. While Egan has devoted entire books to the nature of Mythic and Romantic

understanding and how to foster them in children (e.g. 1986, 1988, 1990, 1992), no

similar books exist, at least as of yet, for how this might be done with Somatic,

Philosophic or Ironic understanding. If they existed, certainly such books would be

fruitful resources for considering how Egan's theory might need to be adapted or

developed for the context of teacher education. There is also not much we can

unproblematically infer about teacher education from his work (e.g. 1997). Indeed, when

one examines *The Educated Mind* closely for guidance about how the theory might best

be used in the context of teacher education, it is clearly helpful in numerous regards; however, concerning some issues that teacher education must fundamentally deal with, it is lacking in thorough explications.

In summary, Egan theory has not been extended, by himself or others, into what one might consider pedagogy proper—including an examination of how time, space, resources, and relationships are organized to facilitate the development of imaginative understanding. Because so little exists in the way of resources to guide this endeavour, in either the literature on teacher education or in Egan's own work, an imaginative teacher education program will therefore require faculty, pre-service teachers and cooperating teachers to engage with issues that challenge and build upon existing theory. In the first half of this chapter, I sketch some of the most central of these issues that must be addressed.

There are also some organizational principles implied by the nature of imaginative education as both a theory and a practice. One might consider them to be corollaries of the theory—necessary attributes of a program that strives to incorporate imaginative education in everyday teaching practice, in school contexts that typically undervalue and de-emphasize the uses of imagination. These principles have far-reaching consequences for the design of imaginative teacher education programs, as will become increasingly evident in subsequent chapters. In the second half of the present chapter, the four most important of these principles will be discussed.

3.3. Unresolved theoretical issues

If Egan's theory can be considered as in progress, to be further adapted and extended in the context of practice, we might ask what theoretical issues most urgently need to be addressed in the development of an imaginative teacher education program. I will argue for the primacy of three such issues. The first is the nature of the development of understanding in adults who have not experienced imaginative education in their own schooling. The second, which relates to the first in some important ways, is how earlier kinds of understanding might be kept alive or developing once later kinds of understanding are well developed. The third concerns the nature of Somatic understanding, which provides the foundation of other kinds of understanding in Egan's scheme, but which remains significantly under theorized.

3.3.1. The development of adult understanding

The first theoretical issue that an imaginative teacher education program will need to resolve is how understanding develops in adults who have not experienced imaginative education in their own schooling. Egan's description of the development of various kinds of understanding, as explained in *The Educated Mind*, is based on the assumption that, from kindergarten through to high school graduation, schools will adequately develop each kind of understanding in children. The successful development of Ironic understanding, "the appropriate aim of education" is based on this premise (1997, p. 6). Unfortunately, Egan's writing gives us no guidance about how we might approach the education of adults, many of whom are likely to have at least some inadequately developed understanding. Yet this issue is central to how his theory may be applied to the context of teacher education. Surely we are not to think of adults who have been

inadequately educated in the same way as we think of children—either those who have yet to develop a particular kind of understanding, or those who have had it developed fully; surely such adults require different consideration and pedagogical approaches.

> Egan suggests that

> Once a kind of understanding has been systematically developed and is sustained by communities using it, that kind of understanding will be accessible to anyone with adequate reasons or motivation to learn it within the appropriate community. (1997, p. 176)

But is it as accessible to adults as to children? Is it easier for children, in roughly the sequence Egan outlines, to develop the kinds of understanding that he describes than for adults to access particular kinds of understanding after later ones have been at least partially developed? Egan suggests that this may indeed be the case; he even goes so far as to suggest that, as adults, we tend to have "difficulty and pain in expanding our understanding into and throughout adulthood" (p. 278). The challenge of developing adult understanding is also implied in Egan's suggestion that "The fullest use of new tools comes to those who have most fully developed the earlier ones" (p. 182) and that "significant development of a 'later' kind [of understanding] is unlikely to occur unless some degree of preceding kinds have been developed" (p. 178). In fact, Egan argues that the less than adequate development of earlier kinds of understanding can produce a "shadow" later kind of understanding (for example, "alienating" as opposed to "sophisticated" irony [p. 161]). The most extreme example of this, where "people have deliberately struggled to extirpate all vestiges of prior kinds of understanding" can result in "sterility, desiccation, and a danger of inhumanity in the development of the new kind"

(p. 117). In other words, there are significant dangers in attempting to foster later kinds of understanding in individuals, including pre-service teachers, who have not adequately developed earlier kinds of understanding. Egan summarizes some of the dangers of inadequate development:

> inadequate Somatic development leaves one susceptible to difficulties constructing meaning and seeing patterns and rhythms in events; inadequate Mythic development leaves one susceptible to uncritical and simplistic beliefs; inadequate Romantic development leaves one susceptible to sentimentality and cynicism; inadequate Philosophic development leaves one susceptible to know-all, imagine-nothing general schemes; and inadequate Ironic development leaves one susceptible to alienation. (1997, p. 202)

Fettes (2005c) suggests that there may be good evidence of this kind of inadequate development in pre-service teachers, many of whom seem to find it challenging, if not impossible, to view teaching and themselves as teachers in imaginative ways. Specifically, he notes that many pre-service teachers seem unable to conceive of teaching other than in purely instrumental ways. For example, most pre-service teachers in his imaginative teacher education module appeared unable to think of a curriculum topic as anything other than the mastery of facts, procedures or skills and seemed to have great difficulty making connections between their personal interests and aspirations and their teaching. Fettes suggests that such teachers' own imaginative development would greatly expand their sense of possibility about what teaching, themselves as teachers and their students can be and do.

As I have suggested, nowhere in Egan's work does he directly address and explore the problem of inadequately developed adult understanding. He does allude to the fact that adults can have some kinds of understanding well-developed and other kinds 'impaired' but still function (at least apparently) adequately in the world. For example, in Egan's description of the various kinds of understanding regularly used by adults who mix and mingle at a supermarket, he describes those who have well-developed Philosophic and Ironic understanding, but who may be unable to adequately use the tools of earlier kinds of understanding, even in situations in which it may be more beneficial:

> Among the people in the supermarket at any one time may be minds so consistently stimulated to Philosophic and Ironic thinking that these kinds of understanding predominate regardless of the task to be performed, even if such refined thinkers experience significant disadvantages in doing the weekly shopping. Jostling their elbows at the cereal shelves may be others who very rarely receive that kind of stimulation and have not acquired the intellectual tools that make Philosophic or Ironic thinking common or easy. (1997, p. 177)

Unfortunately, however, Egan does not explore how such individuals might foster kinds of understanding that are inadequately developed.[46]

Yet this issue is central to an imaginative teacher education program. Certainly, such a program will want to help its graduates gain the most confidence and flexibility using as many kinds of understanding as is possible. This means that attending to

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[46] Egan does briefly address a related issue, that of "students who are least able to develop Ironic understanding" and suggests that his scheme, unlike the more commonly accepted educational scheme at work today, is more inclusive of more students and their varied abilities, and will provide "useful guidance" for their continuing education (p. 199). Unfortunately, no further elaboration is provided by Egan.

inadequately developed understanding of pre-service teachers—what one theorist calls 'backfilling' (S. Blenkinsop, personal communication, December 2, 2008)—will be an important goal of such a program.[47] Yet how should an imaginative teacher education program attempt to help pre-service teachers develop those kinds of understanding that have not yet been adequately developed? Clearly, pre-service teachers cannot develop inadequate earlier kinds of understanding simply by discussing this phenomenon. Nor can they retrace the earlier steps they took as they began to first, experiment with and later, use with some degree of confidence and flexibility their bodies, oral language, literacy and theoretic thinking; if such a 'relearning' were indeed possible, it might be sufficient to ensure that pre-service teachers completing an imaginative teacher education program have adequate development of all kinds of understanding. Indeed, while it might be regrettable that pre-service teachers cannot somehow relearn, with as much vitality as an infant understanding the world somatically, to use their bodies to make sense of the world, and be supported to continue to use and keep strong this bodily way of knowing—and similarly so with oral and written language—clearly, this is not an option. How then might a program help pre-service teachers best develop inadequately developed kinds of understanding?

One option might be by means of intense immersive experiences that might, in some admittedly limited ways, attempt to imitate the experiences of the early years prior to the invasion of language and literacy. Pre-service teachers' extensive use of and focus on (for a significant but limited period of time) tools that have lain dormant might be the

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[47] Can the reawakening of earlier tools of earlier kinds of understanding, such as an association with the heroic, also help us to reawaken, at least to some degree, those of earlier kinds of understanding, such as the Mythic sense of mystery?

best way to revitalize them. Another possibility is less dramatic: making the continual use of the cognitive tools of earlier kinds of understanding a regular part of pre-service teachers' learning. This option would involve pre-service teachers' use of cognitive tools of several kinds of understanding in their consideration of all (or at least a good deal) of the topics they explore in their program. Of course, the degree to which particular kinds of understanding are attended to and their cognitive tools practiced would depend to a large degree on the kinds of understanding most in need of development in the particular pre-service teachers in the program.[48]

3.3.2. Keeping understanding alive

The second theoretical issue that an imaginative teacher education program needs to resolve is how to keep earlier kinds of understanding alive once later kinds of understanding are well developed. Egan (1997) suggests that we can use all kinds of understanding throughout our lives. For example, even with the development of oral, written, theoretic and reflexive language, Somatic understanding still remains "endlessly active without or 'below' language" (p. 168). As I discussed earlier, Egan also claims that as we progress from one kind of understanding to the next, we do experience some

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[48] An interesting research question to pursue would be whether any arts-based adult education programs have a similar goal: a kind of reawakening of individuals' imaginative potential through painting, dance, drama, and so on and if so, whether what is being done in such programs might provide some kind of guidance for an imaginative teacher education program. There is the additional potential benefit that practices based on different foci (e.g. imaginative education and adult education) could, at least to some degree, be united by way of Egan's educational theory, or, at the least perhaps prove fruitful grounds for informing each other (and so possibly contributing to a less isolationist notion of teacher education).

inevitable losses of the particularities of the earlier kinds of understanding.[49] Yet, we can maximize the gains and minimize the losses by continuing to practice or keep alive the earlier ways of meaning-making (p. 176). No matter whether our predominant way of making meaning of the world is with Romantic, Philosophic or Ironic understanding, then, it is important that we keep active the tools of earlier kinds of understanding.

In *The Educated Mind*, Egan elaborates on some particular ways in which later kinds of understanding can undermine the acuity of earlier kinds of understanding:

> the energetic development of a new kind of understanding [leads] to losses of characteristics of the previous kind…. The development of Mythic understanding [cuts] away indeterminable intellectual possibilities…. The development of Romantic understanding… implies losses to our sense of magic, our sense of involvement in the natural world, and creates a barrier between our conceptions and the reality they try to capture and represent. The development of Philosophic understanding implies a loss of vividness and personal association with knowledge. The development of Ironic understanding implies loss of a holistic conception of one's self and of

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[49] Egan (1997) argues that earlier kinds of understanding are somewhat altered by the development of later kinds of understanding. For example, he claims that Somatic understanding "is not something that exists only prior to language development but rather, like each of these kinds of understanding, ideally remains with us throughout our lives, continuing to develop within, though somewhat modified by, other kinds of understanding" (p. 163). He also claims that "each kind of understanding does not fade away to be replaced by the next, but rather each properly coalesces in significant degrees with its predecessor (p. 5) and that "The later kinds of understanding are not alternatives to the earlier; they incorporate the earlier in significant degree" (p. 182). Yet the nature of this development, and how and to what degree earlier understanding might be modified by developments of later kinds of understanding, is not clarified. Egan certainly does not imply any more direct morphing of a tool of one understanding into that of another, as, for example, Fettes (2006) does. In fact, Egan suggests that "it would be a mistake" to assume that particular tools of Somatic understanding "morph in some direct way" into the tools of Mythic understanding even though "there are important connections" that are "admittedly messy" (Chodakowski & Egan, 2008, pp. 7-8). Fettes, on the other hand, suggests a possibly more direct correlation between the tools of one kind of understanding and another than does Egan. For example, he suggests that the bodily senses of Somatic understanding may get stimulated in the creation of (including, but not limited to visual) images of Mythic understanding. This does not mean, however, that Fettes might not also concede that the connections between tools and kind of understanding are complex and messy. See Appendix A for a list of Fettes's (2006) tools of imaginative engagement and Appendix B for examples of how his tools of Somatic understanding might be used in the context of teacher education.

one's universe, some loss of integrating intellectual power. (1997, p. 202)[50] [51]

Egan emphasizes that, while these losses cannot be avoided—they are inevitable in the process of education—their effects can be minimized by our active use of the tools of earlier kinds of understanding: "Better [development of understanding] involves preserving, perhaps in a somewhat transformed way, the characteristics of the prior kind of understanding; worse involves the suppression of characteristics of [earlier kinds of understanding]" (p. 100). In other words, we can retain a good deal, although not all, of their vividness:

> The preservation of characteristics is, it seems to me, crucial to education. The imaginative energy of childhood, the romantic engagements of early adolescence, the search for regularity and generalizations of later adolescence are all qualities that enrich the Irony of educated adulthood. (1997, p. 194)

Unfortunately, the specific ways in which we can ensure the preservation of as much of the vitality of earlier kinds of understanding as is possible is not explored in great detail in Egan's work. In his chapter dealing with the implications of his theory for

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[50] In reference to the loss of the vividness of Somatic and Mythic understanding, Egan writes,

> One part of what fades involves a vividness of participation in the natural world and an enriching imaginative power to embody that world in our emotional experience; this power seems unable to survive in subsequent kinds of understanding as it can exist for children and in traditional oral cultures. In an ideal education, we would seek to preserve as much of this as possible in Ironic understanding, but what we would preserve seems at best only an ever-fading vision of what was once so bright. (1997, p. 192)

Put another way, the development of Romantic understanding can bring about a loss in "the intensity of participatory experience in an immediate life-world" (p. 98).

[51] This is but a brief summary. A much fuller account of the losses associated with the development of each kind of understanding is found in *The Educated Mind*.

teaching, Egan touches "only briefly on implications for continuing and elaborating one's own education in the various kinds of understanding" (1997, p. 241). For instance, he provides pithy examples for how each kind of understanding can be fostered throughout life. Somatic understanding "can be deliberately extended in small ways throughout life" (p. 242) by, for instance, learning a new physical skill such as diving in midlife. Similarly, Egan suggests that adults might stimulate their own Mythic understanding by such activities as making an effort to construct lively mental images and to use "fresh metaphors" in one's daily life (pp. 253-254). Romantic understanding might be fostered by choosing to include in one's adult life readings or experiences that stimulate awe and wonder, such as participating in "exploration holidays" that allow one to explore the "strange and exotic" of other lands and peoples (p. 263). Philosophic understanding can be stimulated in adulthood by reading texts that are framed around theoretic discourses (such as academic journals or "intellectual" magazines) (p. 273).[52] Yet there is no elaboration about the degree to which this kind of fostering is necessary in an educational setting, so that we might "preserve the best bits while shucking off the mutually incompatible and dysfunctional bits" of earlier kinds of understanding (p. 187).[53]

We can extrapolate from Egan's theory and from these brief examples that one can maximize one's ability to keep all kinds of understanding alive simply by using various tools in everyday life. For example, it seems that an individual with well-developed Philosophic understanding will best retain her ability to make sense of the

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[52] Obviously the means by which various kinds of understanding can be kept active will vary from one cultural context to another. These particular examples might be more relevant to a Western cultural context; other, more culturally-responsive examples, would perhaps be more appropriate in different cultural contexts.

[53] "We will always want to preserve as much as possible and lose as little as possible" (1997, p. 58).

world with Mythic understanding, in situations where it is warranted, by regularly practicing her image-making capacities, participating in drama and role play, playing with rhythm and rhyme in her oral language use, attempting to use more metaphors in her speech and attend more closely to the metaphorical nature of language, and so on. But how is this best done and to what degree is it necessary? Unfortunately, Egan's work provides no clear guidance—explanation or details—about the degree to which or the ways in which the tools of earlier kinds of understanding might best be kept active.

Yet the resolution of this issue has important implications for a teacher education program based on the theory of imaginative education. Specifically, clarity is needed to determine the kinds of pedagogical approaches teacher educators should use in their practice and those that pre-service teachers should be encouraged to experiment with and gain some sense of confidence using in their own teaching practice. How might teacher educators best keep alive the earlier kinds of understanding of pre-service teachers, who, we would assume, have, or at least have had, at least some ability to use the tools of Romantic and Philosophic understanding[54]? Following Egan's recommendation, all pre-service teachers will need to regularly engage the tools of Somatic, Mythic and Romantic understanding in order to keep these earlier kinds of understanding alive. While teacher educators will not need to attend to all kinds of understanding in every lesson they teach, in each lesson, they should certainly make an effort to engage at least one or two of the

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[54] As I will also suggest later, as a group, pre-service teachers are indeed likely to have some variety in terms of the flexibility with which they use the tools of different kinds of understanding. While it is entirely likely that some will be fluent in using the tools of Philosophic and Ironic understanding, this does not seem to be the case for the majority of pre-service teachers, as I will demonstrate in the examination of relevant research in Part Two. Of course, it is also possible that some pre-service teachers may still have rather underdeveloped Romantic understanding (at least in terms of how they understand particular subjects or topics) or that they have been 'educated out' of such understanding by regularly engaging the tools of later understanding but failing to keep alive those of earlier kinds.

tools of pre-service teachers' earlier kinds of understanding. In other words, teacher educators should attempt to attend to the tools of Somatic, Mythic, Romantic and Philosophic understanding in pre-service teachers' learning about subject matter (in language arts, for example, the structure of a story), pedagogy (such as various theories about learning) and contexts (consideration of their field experience). For example, and as I will elaborate more thoroughly later, in order to help keep pre-service teachers' Somatic understanding alive, teacher educators will need to assist pre-service teachers in considering and experiencing how they might both reinhabit their bodies differently and use their bodies in the development of their own and their students' understanding.

Clarifying the degree to which and the ways in which earlier kinds of understanding can be kept alive also determines the degree of familiarity and extent of experimentation with cognitive tools that pre-service teachers will need to have in their own teaching practice. Egan suggests, and I agree, that effective teachers need to have "abundantly and flexibly developed" various kinds of understandings and the cognitive tools of each (1997, p. 276). He further recommends that teachers begin the process of becoming imaginatively engaged—seeing their own learning and indeed the world from Somatic, Mythic, Romantic, Philosophic and Ironic perspectives—by beginning with "the rag-and-bone shop of [their] own hearts" (p. 264; see also Eisner, 1983, p. 12). The need to continually foster earlier kinds of understanding throughout all stages of life means that pre-service teachers will be expected to understand and incorporate into their teaching, in addition to those of the dominant understanding being fostered in their students, the tools of all previous kinds of understanding.

Pre-service teachers must also use tools of earlier kinds of understanding in their teaching practice because it is likely that at least some of their students will not have been entirely successful at keeping all earlier kinds of understanding as vital as possible. The teacher, then, must help these students in the process of 'retooling.' Even young students in the early grades of elementary school will be likely to have lost some of the acuity of Somatic understanding, especially so for those students who have limited direct experiences with the world—for example, if they spend little time outdoors or experimenting with their bodies and large portions of their day watching media. The requirement that teachers help students both keep their students' earlier kinds of understanding alive as well as help resuscitate earlier kinds of understanding that have not been kept vital means that pre-service teachers will need considerable pedagogical flexibility and mastery in their use of many different cognitive tools. For example, ideally, a secondary physics teacher will need to foster the development of his students' Philosophic understanding as well as help keep alive students' tools of Somatic, Mythic and Romantic understanding. This means that such a teacher will need to not only ensure that his own understandings are kept as alive as possible, but also spend time experimenting with the cognitive tools of Somatic, Mythic, Romantic and Philosophic understanding, be able to consider the topics he will teach from various perspectives, and have significant practice fostering the cognitive tools of his students' earlier kinds of understanding.[55]

Similarly, pre-service teachers preparing to teach the earliest grades will also both need to be familiar with and have some confidence in experimenting with the tools of

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[55] In Appendix B, I offer some suggestions for how teacher educators might encourage pre-service teachers to consider and foster their students' Somatic understanding.

subsequent kinds of understanding and consider the topics they are to teach from various frameworks. They should "be alert to introduce resonances of subsequent kinds of understanding in teaching any topic" (p. 241). This is because some introductory activation of later kinds of understanding can begin quite early:

> heavy emphasis on a subsequent kind of understanding before prior kinds are adequately developed will be pedagogically ineffective. But the fact that preliminary stimulation of later kinds of understanding can begin very early also means that we would be unwise to eliminate all interactions that involve later kinds of understanding until students are assumed to be 'ready' for them. (Egan, 1997, p. 179)

It is clear that keeping earlier kinds of understanding alive has significant implications for an imaginative teacher education program; the program, then must resolve how this might best be done and the extent of activation of earlier kinds of understanding that is required for both K-12 students and pre-service teachers.

3.3.3. Somatic understanding

The third theoretical issue needing resolution concerns the nature of Somatic understanding. Although I have briefly depicted Somatic understanding in the previous explanation of each of Egan's five kinds of understanding, it is worth giving a fuller account here before discussing implications for teacher education. An early description of Somatic understanding is found in *The Educated Mind* (1997). Here, Egan calls Somatic understanding "our bodily foundation in the natural world" (p. 171) characterized by an "instinctive, vivid, intimately participatory involvement with the natural world," or a "'oneness with nature' that is our birthright as animals" (p. 67). Egan suggests that

Somatic understanding "primarily results from the infant's mind discovering its body," as a "source of purposes," including as an instrument for social relations (p. 242).

Egan argues that "our body is the most fundamental mediating tool that shapes our understanding" (p. 5). Somatic understanding is both the first way in which we as humans learn to make meaning, and is the origin of all later kinds of understanding:

> all our understanding is ultimately rooted in our material being. Our body, then, is where we start from in our exploration of the world and experience. We begin, as it were, by our minds expanding throughout our bodies and then from our bodies out into the world. (p. 244)

This "general embodied kind of understanding… is somewhat distinct from the languaged and conceptual kinds [of understanding]" (p. 162); it is both "pre-linguistic" (p. 166) and beyond (p. 169). In other words, it is part of our essential humanity[56]: while we continue to develop other kinds of understanding, Somatic understanding "remains fundamental to our grasp on the world throughout our lives" (p. 35).

Egan also suggests that in 'our' culture, the "imagistic, concrete, vivid forms of thought" of Somatic understanding (p. 168)[57] is neither widely recognized nor highly valued: he calls it "a feature of our existence that our socialized experience tends to suppress" (p. 168). Egan argues that, while we have a tendency to validate language and concept-based thought, such as that which comes with Mythic, Romantic, Philosophic

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[56] Egan (1997) describes Somatic understanding as "a distinctively human but prelinguistic understanding of the world" (p. 35); "a knowledge from the body, beyond human words" (p. 168).

[57] Such forms of awareness or understanding have been explored by numerous theorists. For example, Tollifson (1997) describes a state akin to Egan's Somatic understanding as "unconceptualized sensate experience" (p. 21) and suggests that "Babies and animals automatically live this way…. They see the actual shape of what's in front of them without concepts and labels" (p. 22). As adults we may often try to recapture such a state; we hear of people attempting to 'get back to' a way of being that is often characterized as more direct and child-like.

and Ironic understanding, "We are human beings before we are languaged human beings" (p. 167): both our consciousness[58] and our individuality precede (and perhaps, in some situations, supersede)[59] our understanding and use of language. We are, he suggests, more accurately described as "largely linguistic" than as "essentially linguistic" (p. 166).[60] Somatic understanding remains, at least to some degree, "ineffable" (p. 170); it has a status distinct from subsequent kinds of understanding, all of which are mediated by language.

It is interesting to note that, despite the fact that Egan (1997) repeatedly argues for the importance of Somatic understanding,[61] he devotes far less space to exploring its nature than he does to that of the other four kinds of understanding. Specifically, he allocates thirty-eight pages to discussing Mythic understanding, thirty-two pages each to Romantic and Philosophic understanding, and over twenty-five pages to Ironic understanding. To explore the complexities of Somatic understanding, Egan devotes a mere nine pages. The brevity of his treatment means that certain educational implications of Somatic understanding are not considered, either at all or in sufficient depth as to be both clear and helpful for my purposes.

Egan's description of Somatic understanding is also noteworthy in another regard: in the thirty or so years since he originally formulated his theory, besides minor additions

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[58] Cohen (1997) describes the objects of consciousness as feelings, perceptions, sensations and thoughts (p. 11). Certainly by such a definition, it seems evident that very young children can be characterized as being conscious.

[59] Egan calls the Somatic "a consciousness… beyond language" (p. 168).

[60] Egan's description of Somatic understanding has a decidedly subterranean tone: "Consciousness of aging, as of toothache, goes all the way down, past language, concepts, and history, past multiple, decentred discourses" (1997, p. 169).

[61] For example, Egan states that the working title for *The Educated Mind* was *The Body's Mind* and that the body figures "prominently" in his conception of education (1997, p. 5).

or alterations, Egan has not substantially changed the tools of Mythic, Romantic,

Philosophic or Ironic understanding. Somatic understanding, however, is unique because

Egan has provided at least two significantly differing accounts of its tools.[62] In his 1997

description, he lists six tools: intentionality, generativity, communicativity, reference,

unlimited objects and autocueing.[63] The 2008 list includes five: bodily senses, emotions,

patterns and musicality, humour, and mimetic intentionality. Besides intentionality, these

latter tools are quite distinct from the earlier ones. This dramatic reconfiguration of

Somatic understanding, then, gives it a unique status.

Additionally, Egan has not described the tools of Somatic understanding as

extensively as he has done with those of the other kinds of understanding. For example,

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[62] Interestingly, Egan's *Primary Understanding* (1988), focusing on Mythic understanding, was part of a set of volumes whose goal was to describe a program for educating people from "about the age of four or five to maturity" (p. 7). As described in this book, the plan was to produce one volume each dealing with Mythic, Romantic, Philosophic and Ironic understanding. Tellingly, there seemed to be no plan to write a book addressing Somatic understanding (p. 7). Indeed, in this book, Egan suggests his conception of education "might best seen as layered…. Made up of four somewhat distinct layers, in each of which we develop a somewhat distinct form of understanding" (p. 7); he goes on to refer to Mythic understanding as the "foundational" layer (p. 151) or an "initial layer" (p. 178)— terms one might expect to be attributed to Somatic understanding. While he does suggest that there is some kind of understanding prior to Mythic, Egan further suggests that his initial educational conception might not have included a recognition of the educational significance of a pre-linguistic understanding when he writes: "Before we internalize language we are conscious. There is, one might say, a pre-Mythic understanding, whose characteristics—perceptual and cognitive—are the subject of intense research at present" (p. 162).

[63] 1) *Intentionality* is using gesture or making physical movements that require the understanding of another human's sense of intention (such as an infant learning to point, a gesture based on the assumption that the object of attention is in direct line from the eye to the finger of the pointer, and that another individual can interpret the relationship between gesture and context to locate the object of attention). 2) *Generativity* is the ability to reduce a complex action to component parts and rearrange them in novel ways (such as a child 'cooking' in a play kitchen where many individual actions are reassembled according to the child's notion of what needs to be cooked and served). 3) *Communicativity* is the public performance of actions or gestures for the purpose of transmitting information. 4) *Reference* is the use and understanding of the distinction between representation and reality (as when a stick is treated as a gun for the purposes of play, with the recognition that it does not do what a gun does). 5) *Unlimited objects* means that essentially anything can be represented through the body, including actions or events that have nothing to do with the normal range of human activity (flying, exploding, growing like a tree, etc.). 6) *Autocueing* is when a child can voluntarily recall mimetic representations without relying on external cues for assistance (such as a child knocking a doll and then immediately patting the doll's back for comfort). While Egan (1997) does not list humour as one of the Somatic tools, he does suggest that the genesis of humour is in Somatic understanding (p. 65).

in *The Educated Mind* (1997), while each of the Mythic tools receives approximately a four-page discussion, those of Somatic understanding average a five-line description. The general brevity of the discussion and the absence of details about how particular tools may be used for educational purposes pose further challenges. While Egan (1997) claims that, "Given the conception of education in this theory, which requires the fullest possible development of each kind of understanding, it becomes important to develop and preserve Somatic understanding, along with its sense of the uniqueness and loneness of our experience" (p. 168). We might ask, then, how Somatic understanding might be both developed and preserved, as Egan suggests, when it is rather poorly described and its educational implications not addressed at all.[64]

There are problems with both the 1997 and the 2008 tools of Somatic understanding. Egan's (1997) original explanation of the six tools, drawn significantly from Merlin Donald's (1991) description of Mimetic culture (cited in Egan, 1997, pp. 164-165), has at least two significant limitations. First, they are not comprehensive. While they may adequately explain some of the ways in which the body can be used as a socially communicative instrument—or how one can use one's body to communicate with other humans—they are essentially a description of body language and do not account for the important ways in which young children (and indeed the rest of us) take in meaning about the natural or non-human world—including the plants, animals and elements. In other words, Egan's description seems to be limited to children using their bodies to communicate with, or produce a kind of language for, other people. But what

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[64] In his chapter devoted to the implications of his theory to the curriculum, Egan writes, "I have nothing much to say about the curricula for Somatic understanding and for Ironic understanding, assuming that the former is constrained in ways that do not leave much room for curriculum content choices and the latter is unconstrained in ways that leave so much room that prescription would be pointless" (p. 207).

about the ways in which we take in information and understand by means of our bodies without the production of meaning for any audience? For example, when an infant feels her father's arms holding her, senses his regular breathing, sees his adoring face and knows that she is loved, without any movement at all on her part, is she not using her Somatic understanding? I would argue that she undoubtedly is. Or when a toddler greets a family dog—hears its welcoming bark, sees its wagging tale, buries her face into its fur, and smells its friendly familiarity? This also seems to be a clear manifestation of her "bodily foundation in the natural world" (p. 171). Yet none of Egan's six tools adequately explain how either child is taking in meaning about the beings in her world by way of her body.[65] Additionally, neither alone nor together do these tools seem to satisfactorily account for how we make meaning, below or beyond language, with the "imagistic, concrete, vivid forms of thought" (p. 168) that can occur in such experiences as grief or profound joy. Such manifestations of our Somatic understanding are not accounted for in Egan's 1997 description.

Second, it is unclear whether these tools are biologically or culturally-based. Egan's 1997 discussion seems to suggest the former. For example, he claims that Somatic understanding relies more on "evolutionary adaptation" (p. 175) than do other kinds of understanding and that, as is not the case with later kinds of understanding, children do not need to be taught how to understand the world somatically:

> So long as infants are fed and cared for physically they will develop those
> Somatic abilities [such as learning to walk or attending to rhythms], but

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[65] Egan (1997) alludes to the point I make when he writes: "Donald describes prelinguistic 'mimetic' thinking as 'basically a talent for using the whole body as a communication device, for translating event perceptions into action…. It is the most basic human thought skill, and remains fundamentally independent of our truly linguistic modes of representation" (p. 35).

language development requires also the deliberate influence on the young child of a language-using society. That is, some features of Mythic understanding are evolutionarily coded into our genes but their adequate development requires deliberate adult intervention. (1997, pp. 35-36)[66] [67]

However, this is not an altogether convincing argument for two reasons. First, his tools would seem to contradict this claim: it is hard to imagine how babies might acquire many if not all of Egan's 1997 tools of Somatic understanding without the deliberate input of a human community. Second, if babies do indeed come 'hardwired' to make sense of the world somatically, exactly how such 'hardwiring' is distinct from a kind of hardwiring for language (e.g. as argued by Pinker, 1994) is not clarified. If it is simply the predisposition to attain such understanding that is biological, then Somatic understanding's unique status is called into question, as is the claim that it is "somewhat distinct from… conceptual kinds [of understanding]" (p. 162). Certainly, humans may have a predisposition or 'hardwiring' to achieve particular methods of meaning-making. However, this need not imply that they have no need of communities or cultural experiences in order to develop such abilities, whether as babies (somatically—without language) or as older individuals (e.g. mythically or romantically—with language).

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[66] Of course, Egan does not go so far as to say the human community is unnecessary to the development of Somatic understanding. Rather, he highlights that caregivers should help to stimulate its development: "The infant's development of Somatic understanding… to be most adequately achieved, needs to be supported by parents and other caregivers…. In interacting with the infant we will attend selectively to stimulate and support the development of capacities that will optimally prepare the infant for an Ironic destiny" (p. 241).
[67] Elsewhere, Egan (1997) suggests that the tools of Mythic understanding also rely on evolutionary adaptations: "Literacy, theoretic abstractions, and refined reflexiveness rely on deliberate instruction, whereas somatic/mimetic and oral-language developments rely largely on evolutionary adaptations" (p. 175); Somatic and Mythic kinds of understanding "are genetically programmed as a result of our evolutionary history; they come with the human body, in its senses and brain, and with the development of an oral language. Thereafter our general learning capacity comes increasingly into play, enabling us, more laboriously, to develop Romantic, Philosophic, and Ironic kinds of understanding" (p. 277).

Additionally, the implication that the tools of Somatic understanding may have a strong biological basis calls into question whether this method of meaning-making actually comprises cognitive tools. If we think of cognitive tools as culturally-based, emotionally-laden, and able to be present or absent in teaching situations, then Egan's claim that the development of Somatic understanding does not require direct instruction suggests that it does not involve tools at all, at least not in the way in which this term is used in reference to other kinds of understanding. Egan's 1997 six tools, then, are problematic in two regards: they do not account for everything we might reasonably consider to be Somatic understanding, and their biological or cultural basis seems to be unclear.

While I did collaborate with Egan in the creation of the 2008 list of Somatic tools (Chodakowski & Egan, 2008),[68] I have since rethought the adequacy of our depiction. I have now concluded that these tools—bodily senses, emotions, patterns and musicality, humour, and mimetic intentionality—have two limitations.

First, it is difficult to understand how emotions and humour can be tools specific to Somatic understanding. Surely both are primary orientors of meaning with all kinds of understanding throughout our entire lives. For example, while what we find humourous seems to be quite different when we make sense of the world primarily with Mythic understanding, as opposed to with Philosophic understanding—the nature of the humour may change—humour itself seems to be a method of meaning-making with all kinds of understanding. Indeed, Egan acknowledges this when he writes that "while emotions are

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[68] Egan's tools of Somatic understanding are also found in Tyer's (2006) "A Brief Guide to Imaginative Education," although they are slightly different from the set cited above. Here, Egan outlines six tools of our earliest method of meaning-making: bodily senses, emotional responses and attachments, rhythm and musicality, gesture and communication, referencing, and intentionality.

essential to understanding by means of the body, they are clearly not specific to this type

of understanding" as they "will persist and develop as the most basic orientors and

organizers of our cognition throughout our lives" (Chodakowski & Egan, 2008, p. 5).

Egan also acknowledges the pervasiveness of humour when he writes that, while "No

doubt humor has a Somatic genesis" (1997, p. 65), it is "hardly limited to bodily

meaning-making" (Chodakowski & Egan, 2008, p. 6). Emotions and humour might be

more accurately characterized as more general categories, then, rather than as tools

unique to Somatic understanding. (See Appendix B for an exploration of how Fettes,

2006, has characterized humour as a more general category—for which each particular

kind of understanding has its unique manifestation—and for an elaboration of his

suggested tools of Somatic understanding.)[69] [70]

Similarly, it seems that we cannot rightly call bodily senses a tool either. There is

no doubt that babies use their bodily senses to understand the world. However, bodily

senses are more appropriately the means by which other tools are manifest—what Egan

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[69] Fettes (2006) calls the more general category grasping incompleteness and suggests that each kind of understanding has a particular tool within this category: For example, with Somatic understanding, one grasps incompleteness by way of incongruity and surprise; with Mythic, by jokes; with Romantic, through comedy; and with Philosophic, with irony and satire.

[70] As part of the recommendation for his Mythic curriculum, Egan suggests that students

observe silently for a sustained period of time [something in the natural world like a tree, a patch of grass, a spider's web, etc.] with no other aim than to feel their way into the nature of what they are observing. They will feel how the tree stretches its leaves out to the sun, how the rain trickles down it, and how the branches move in the various winds. Obviously this will require support and training, but perhaps less than many may assume; this kind of absorption occurs quite commonly and without tutoring in many children. A little ingenuity should enable us to encourage it in many more. The aim of this is a kind of dreamlike absorption into the object being absorbed or rather being participated in. The dreamlike mind will tie the object into emotions and half-formed stories. (1997, p. 214)

Introducing activities like this will, Egan hopes, help give us a science that is based on "a greater sensitivity to the natural world," one in which "its foundation in full human participation in the natural world" is recognized (p. 214). While Egan clearly sees this as the kind of activity that helps foster Mythic understanding, I would suggest that this kind of activity would appeal most to students' Somatic understanding. Interestingly, this is the kind of activity that Fettes (2006) might suggest would help students gain a sense of joyful participation (one of the categories he uses in his TIES or tools of imaginative engagement).

often calls a toolkit—rather than a specific tool. With Mythic understanding, we make sense of the world by using oral language. The tools of Mythic understanding, binary opposites, metaphor, drama and roleplay, and so on, are the specific ways in which we come to know with and use oral language. Similarly, with Somatic understanding, we use our bodies, comprised of our bodily senses, to make sense of the world. Specific ways in which we do so would more appropriately be called tools of Somatic understanding. Since all of the tools will be manifest through the senses of the body, bodily senses cannot be included as one of the tools of Somatic understanding.

Second, as with the 1997 tools, it is also unclear whether these five tools are biologically or culturally-based, and thus whether or not they are educable. Although I think they cannot rightly be called a tool, we can perhaps conceive of our bodily senses as relying to some degree on "evolutionary adaptations" (p. 175); however, it is hard to conceive of humour and intentionality as not being culturally-mediated.

Some might argue that resolution of these issues—the specific tools of Somatic understanding,[71] and their basis in biology or culture, and thus their educability—is unnecessary for an imaginative teacher education program to have a well-developed conceptual framework that is, according to Howey (1996) necessary for program coherence. For example, teacher educators might rightly believe that all of the tools of all kinds of understanding are debatable and that engaging pre-service teachers' Philosophic

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[71] The exploration of how children's sense of rhythm and rhyme, for example, develop in various cultures and whether primary caregivers in all cultures tend to foster infants' development of rhythm and rhyme in similar ways (for instance, through the use of infant directed speech, music, soundscapes, and so on) might be a productive area for research—and one that could shed light on the validity of the cognitive tools of Somatic understanding.

and Ironic understanding in their consideration of the theory is to be encouraged.[72] [73]

They might suggest that if Egan's provided tools are not entirely satisfactory, perhaps

there might be other, or additional, ones that are more convincing. They might also

question whether the notion of Somatic understanding itself is problematic and so any

tools that might be suggested would also be troublesome, or whether the construct of

tools itself is unhelpful.[74] Clearly, we will want pre-service teachers in an imaginative

teacher education program to be able to engage in this kind of theoretical critique.

Yet there are several reasons why an imaginative teacher education program

needs to have some resolution on these issues. First, pre-service teachers will need to

know what the tools of Somatic understanding are and have some degree of efficacy in

using them because they may need to use these tools while educating students whose

Somatic understanding has not been either adequately developed or kept vital while other

kinds of understanding have begun to develop (as I have discussed in the previous two

sections concerned with the development of adult understanding and keeping

understanding alive). Egan (1997) suggests that "The fullest use of new tools comes to

those who have most fully developed the earlier ones" (p. 182) and that "significant

development of a 'later' kind [of understanding] is unlikely to occur unless some degree

of preceding kinds have been developed" (p. 178). This means that in order to fully

develop Mythic, as well as other kinds of understanding, ideally students will first have

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[72] Teacher educators will no doubt want to supplement (and of course problematize) Egan's treatment of Somatic understanding with other theorists. Fettes (2006) provides one possibility.

[73] One could argue that this might be more appropriately seen as pre-service teachers' use of Ironic understanding (the acknowledgement that this theory, like all others, is also imperfect—as are the terms or categories suggested by it) rather than a significant limitation of the theory itself.

[74] The consideration of the validity of the tools of Somatic understanding might stimulate such questions as: Can anyone suggest tools? How stable are they? What implications does this have for curriculum planning and delivery?

well-developed Somatic understanding. Indeed, this may not always be the case. By the time they begin school, most children will, presumably, be making sense of the world, at least to a large degree, through oral language. However, not all students may have well enough developed Somatic understanding to support the full development of Mythic and later kinds of understanding. For example, some aspects of a vital Somatic understanding may already start to be diminished in some elementary students, such as those whose free time is spent with media instead of in direct unmediated experience of the world. Teachers will want to help foster, or reinvigorate, Somatic understanding in these students. Obviously, in order to do so, they will need to be familiar with and have flexibility in using the tools of Somatic understanding in their practice.

Second, at least in some areas, some school-aged children may still be making sense of the world in significantly somatic ways. In such cases, teachers will want to use the tools of Somatic understanding to foster the development of later kinds of understanding. This obviously requires that those teachers have clarity about and confidence in using such tools.

Third, as I have previously discussed, earlier kinds of understanding need to be fostered even after later kinds of understanding develop, to help prevent the desiccation of later kinds of understanding. Indeed, Egan chooses to emphasize this in his treatment of Ironic understanding in *The Educated Mind* (pp. 155-162). This means that for all people, at all stages of life and with all kinds of understanding, the engagement of the tools of Somatic understanding remains important: "Somatic understanding remains fundamental to our grasp on the world throughout our lives" (p. 35). Clearly, then, all pre-service teachers, whether they are preparing to teach elementary, middle or secondary

students, will need to be familiar with those tools and be able to effectively include them in their planning and teaching. Obviously this requires that teacher educators in the program have some degree of shared understanding about what those tools are. For themselves and their students, then, both teacher educators[75] and pre-service teachers will need to determine what the tools of Somatic understanding are and how, and how regularly, they need to be engaged.[76]

Clearly, some resolution regarding what the tools of Somatic understanding are, whether they are more biologically or culturally based, and thus educable or not, needs to be achieved by program directors and all involved teacher educators, and ultimately for pre-service teachers, for imaginative education's effective application to the context of teacher education.

Clarifying these three theoretical issues— how development occurs in adults who may not have all kinds of understanding adequately developed, how earlier kinds of understanding can be kept alive, and the nature of Somatic understanding—is important for an imaginative teacher education program to have a strong conceptual framework, and thus the kind of coherence that Howey (1996) argues leads to program effectiveness. The particular principles upon which the program should be based, which also emanate from the theory, is the topic to which I will now turn.

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[75] Of course, the need to continually attend to all kinds of understanding means that teacher educators will also need to spend more time teaching pre-service teachers about earlier kinds of understanding— especially Somatic understanding and its attendant tools.

[76] For example, can we become increasingly discriminatory in our bodily senses, such as smell? Is the ability to discriminate to some degree culturally-bound (and thus educable) while the sense itself is perhaps constrained by physiology (and thus non-educable)? Pre-service teachers could be encouraged to consider such questions by educating their own Somatic tools. For example, they could choose a particular sense and research it, investigate how they can become more attuned to it, experiment with their discriminatory use of it, and so on.

3.4. Principles of an imaginative teacher education program

There are four program principles that necessarily follow from Egan's theory of imaginative education: inquiry, reflexivity, sustainability, and reciprocity:

> *Inquiry*: a spirit of wonder in considering the nature of one's own practice, students, curriculum, teaching, and so on that is theoretically informed
> *Reflexivity*: deliberate, systematic and public reflection on coherence between the theory and practice of one's own and others' teaching, and program components
> *Sustainability*: commitment to exploring and supporting the development of teachers' imaginative teaching practice throughout their careers
> *Reciprocity*: on-going investigation of the dynamic needs of all program participants and systematic attempts to ensure that all relationships are based to a large degree on collaboration (power as being more equally shared) and are mutually beneficial to participants

Here, I will describe each of these principles as they apply to the program in its entirety and explain why, if we are true to the theory, an imaginative teacher education program must be based upon these four principles. In the recommendations sections of each of the upcoming chapters on the three cornerstones of teacher education, I will also discuss these principles specifically as they relate to the development of pre-service teachers' understanding of subject matter, pedagogy and contexts.

3.4.1. Inquiry

There are three reasons why an imaginative teacher education program must be inquiry-based. First, as I have suggested, central to Egan's theory of imaginative education is wonder, mystery, awe and curiosity: engaging one's imagination requires the engagement of these important emotions. Inquiring—wondering, exploring and investigating—is central to both imaginative engagement and imaginative teaching. This need not be undirected wondering about the world; rather, it can and needs to be fueled by and understood in a context informed by theory. The imagination is also open-ended

and questing: when wonder is central to one's purposes, one continually explores, challenges, investigates and inquires. Taking the imagination seriously also requires being open to the idea that other people, including children, have important ideas and perspectives that may be quite different than one's own—ideas and perspectives that might be exciting, troubling, puzzling or comforting—and thus worth investigating.

Fettes (2005c) argues that imaginative education is necessarily other-directed. He suggests that we view teaching as "a chance to revive imaginative encounters with the world that have long lain dormant under the weight of 'literal' thinking" (p. 8) and that "perhaps real other directedness implies taking [differences implied in children's developing various kinds of understanding] seriously" (p. 9). In other words, part of being an imaginative educator is the recognition that children's thinking is rich, varied, and changes significantly as they acquire various cultural tools. Fettes suggests that inquiry fuels this other-directness: he recommends that pre-service teachers investigate what engages children of different backgrounds and ages by paying close attention to the kinds of stories, images, games, roles and so on that captivate them, as well as by imagining themselves in the place of children again (p. 9). Because imaginative education is necessarily based in inquiry, a program that attempts to make the imaginative engagement of students and pre-service teachers (and, by extension, also teacher educators) central must also be inquiry-based.

Second, the goal of imaginative education is to help individuals develop what we might call a rich repertoire for thinking: flexibility and confidence using the cognitive tools of several kinds of understanding. As Egan puts it, effective teachers need to have "abundantly and flexibly developed" various kinds of understandings and the cognitive

tools of each (1997, p. 276). The culmination of this development, or the ability to both use and assess the appropriateness of various kinds of understanding in different contexts and for various purposes, is "a kind of Ironic understanding that is quite distinct from the traditionalist conception of the educated person" (p. 6). Ironic understanding is necessarily inquiry-based: those who can effectively use the tools of reflexivity, understanding the limitations of theory, and radical epistemic doubt question assumptions and claims to certainty. In other words, understanding ironically involves awareness of the fact that, as much as we seek to know the answers to questions, and as valuable as is their pursuit, it is impossible to ever know everything, or to know anything with complete certainty. This realization brings with it a certain degree of intellectual and emotional humility. Because the goal of imaginative education is to help develop in individuals the tools for the kind of self-questioning that characterizes Ironic understanding, a program attempting to achieve such a goal must be based on the principle of inquiry: it should attempt to reflect and manifest a spirit of inquiry in all its features and relationships.

Third, as I explained earlier, the theory of imaginative education is necessarily incomplete. Our understanding of the inadequacy of this scheme—like any other scheme—to accurately and completely capture and represent reality means that we recognize the internal tensions and gaps of the theory. An individual using the tools of Ironic understanding—in this case, teacher educators and hopefully, at least to some degree, pre-service teachers—will be continually exploring these spaces. In other words, the theory itself requires that it be approached with a spirit of inquiry. Because inquiry is central to imaginative teaching and learning, inquiry is fundamental to understanding ironically, and the theory of imaginative education is necessarily incomplete and

demands exploration, an imaginative teacher education program must be based on a spirit of inquiry and attempt to foster such a spirit in all of its participants and manifest that spirit in all of its features.

Clearly, an inquiry-based teacher education program implies, or is at least compatible with, a research orientation. Particular issues related to research will be addressed in chapters four, five and six. Here, I will elaborate upon some of the ways in which a spirit of inquiry will be central to the teaching and learning of the participants in an imaginative teacher education program and explore how the program can best support this orientation. I will specifically address how an inquiry-based program might impact the teaching and learning of teacher educators, pre-service teachers and cooperating teachers, keeping in mind that similar effects will be likely with other participants.

In more typical teacher education programs, teacher educators may tend to be considered the bastions of knowledge about how to teach, and thus be considered responsible for the dissemination of this knowledge to pre-service teachers in classes and through field experience supervision. Teacher educators in an imaginative teacher education program will be, in many ways, on a journey to explore the possibilities of imaginative education: a journey that will never be complete. They will be teaching, no doubt, but they will also be deeply interested in learning—about their pre-service teachers and their students, their own and others' teaching practice and how they relate to imaginative engagement, and so on. Teacher educators who regularly use the tools of Ironic understanding will focus more on investigating than knowing and will bring the humility that is a necessary part of understanding ironically into their teaching and indeed their lives. The kind of self-questioning that characterizes Ironic understanding, and that

teacher educators will strive to manifest, will move them to regularly question their own

educational values and practices, the relationship between them, their efficacy, and

consider the possibility that 'they know not what they do'—that there are potential

contradictory messages between their perception and the reality of what they actually

believe and do.[77] While there will still be some areas in which teacher educators have

greater expertise than those with whom they work, because they are on a never-ending

journey to explore the possibilities of imaginative education, teacher educators in an

imaginative teacher education program will, at least to a large degree, embody a spirit of

inquiry.

    Similarly, as I will substantiate in chapters four, five and six, in more typical

programs, pre-service teachers seem to be encouraged, in one way or another, to seek to

minimize risk and variability—and so maximize predictability and control—in their

teaching practice. To a large degree, seeking a good deal of certainty precludes inquiry.

In contrast, pre-service teachers in an imaginative teacher education program will need to

approach with curiosity the investigation of the students with whom they work, most

importantly, as well as their own educational beliefs and values, their teaching practice,

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[77] This focus on practitioner research, including action research, has gained considerable popularity in the last few decades, and constitutes a considerable body of research literature (Zeichner & Noffke, 2001; see also Grossman, 2005; Hensen, 1996). Hensen (1996) provides a simple definition of practitioner research as involving "the teacher purposefully engaging in inquiry" and action research as "a teacher being engaged in inquiry for the purpose of understanding and improving his or her own practice" (p. 61). Hensen lists four features of action research that distinguish it from more traditional types of research: "it assists participants in gaining *and increasing their own understanding* of personally experienced educational or curriculum problems"; it "focuses on problems of *immediate concern*"; it is geared toward "short-term solutions—thus, it is a form of *operational* or *applied* research"; it often encourages "*collaboration* of a number of participants on an equal footing. It is for equality of partnership" (McKernan, 1988, p. 155, cited in Hensen, 1996, p. 54 [italics in Hensen]). Imaginative education, then, shares with action research the first and fourth of these features: the goals of both increasing one's understanding of one's own practice and creating relationships that are more collaboratively-based. Imaginative education does not share the second and third features of action research: as imaginative education seeks to develop teachers' understanding (and therefore also their practice), it is not limited to problems of immediate concern or to seeking short-term solutions.

the program in which they are enrolled, the theory upon which the program is based, and so on. Clearly, the investigation and experimentation that a spirit of inquiry implies is likely to lead to greater engagement and understanding—both of pre-service teachers and their students—even at the cost of higher risk, and lower predictability and control. Pre-service teachers in an imaginative teacher education program based on a spirit of inquiry will need to be comfortable with letting go, at least to a large extent, the possibility of certainty in one's imaginative learning and teaching practice.

We will not expect beginning cooperating teachers to demonstrate the same degree of confidence and flexibility using the tools of various kinds of understanding that we will expect imaginative teacher educators to have—although, of course, this would be ideal. Like teacher educators and pre-service teachers, cooperating teachers are also on a kind of journey to investigate the nature of imaginative teaching and learning. This means that, in order to effectively mentor imaginative pre-service teachers, cooperating teachers will also need to approach their own practice, that of their pre-service teachers, and imaginative education with curiosity and wonder. Traditionally, cooperating teachers have received very little preparation for or on-going education as part of their position. However, as I elaborate in chapter six, cooperating teachers' education, and the development of their own understanding, is essential to their carrying out their roles and responsibilities successfully. In other words, the program should also attempt to help cooperating teachers gain "abundantly and flexibly developed" various kinds of understandings and the cognitive tools of each that effective teachers need (Egan, 1997, p. 276). An imaginative teacher education must design cooperating teachers' educational programs to help foster both the development of cooperating teachers' own

understanding and a spirit of inquiry so that the cooperating teachers might best support those of the pre-service teachers with whom they work.

An imaginative teacher education program must consider ways in which the continual investigation of program participants, and their developing understanding, can be best fostered. It must develop and implement policies and practices that enable teacher educators, pre-service teachers, cooperating teachers and other key players to approach their own practice, the subjects and topics they teach, the practice of others with whom they work, children, imaginative education, and indeed, themselves and their own lives with curiosity and wonder. One way in which a program might consider making such inquiry more systemic, by conducting action research, will be discussed in the section addressing program research. Other particular strategies will be discussed in chapters four, five and six.

An imaginative teacher education program based on a spirit of inquiry will need to clarify how to assess the understanding demonstrated by pre-service teachers. As I have tried to clarify, imaginative education is not simply a method—a teacher's use of particular cognitive tools to imaginatively engage her or his students in learning content. Egan (1986) seems aware of this possibility when he warns of his model becoming "a new mechanical planning device" (p. 65). The theory does not, and indeed cannot, dictate exactly how imaginative education will be manifest in practice. This means that there is the danger that pre-service teachers who do not have flexibility and some mastery of the tools of Philosophic understanding may simply use the terms of imaginative education as labels for methods and behaviour rather than as a way to understand teaching and learning differently. For example, pre-service teachers might use the terms of imaginative

education to defend a more transmissive approach to pedagogy.[78] We would certainly expect that an inquiry orientation might help to undermine this happening—as I will elaborate in the next section, in such a program, pre-service teachers will be encouraged and expected to question their assumptions and understanding. However, the program will have to consider how to assess pre-service teachers who, even by program's end, consider imaginative education as a description of what is done in the classroom rather than as a means of thinking about and exploring practice.

As I suggested in the section on the development of adult understanding, an imaginative teacher education program must try to help pre-service teachers develop various kinds of understanding as adequately as possible. However, even with such a goal, it is possible that not all pre-service teachers in the program will be able to adequately develop Somatic, Mythic, Romantic and Philosophic understanding of all the components of the three 'cornerstones' of teacher education: subject matter, pedagogy and contexts (the field experience).[79] The program will then need to determine, for example, how it will assess individuals who, by program completion, are able to teach an imaginative unit that has been developed for them, but are not able to reliably come up with imaginative approaches on their own, or how it will assess individuals who do not seem to demonstrate a rich understanding of imaginative education and of their own practice. Will such pre-service teachers fail the program? Or will the program fail them?

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[78] See Bartolome (1994) for an exploration of how this phenomenon is common in the education of students who have historically been oppressed.

[79] As I will elaborate in Part Two, pre-service teachers will need decidedly richer understanding of subject matter, pedagogy and contexts (the field experience) than they tend to have upon completion of more typical teacher education programs. In chapter four, for example, I argue that imaginative teachers need some degree of mastery of the tools of Philosophic understanding of their subject matter in order to be effective.

A related issue is pre-service teachers who have well-developed Philosophic or Ironic understanding and critique the principles and practices of imaginative education and experiment with and use practices other than those based in imaginative education[80] to such a degree that their resulting practices bear little resemblance to the program's theoretical basis. To what degree do pre-service teachers have to accept and practice the imaginative principles and practices upon which the program is based? Built into the theory itself is the requirement that teacher educators and pre-service teachers can and will challenge its foundations: presumably, those who are adept at using the tools of Philosophic and Ironic understanding will be able to consider the ways in which the theory is limited,[81] how or when the imagination might not be central or indeed even relevant to education, program inadequacies, and so on. Clearly, we will want imaginative pre-service teachers to assess the strengths and weaknesses of Egan's and other educational theories, as well as imagine and consider the merits of other possibilities[82]; we will not want teacher educators to encourage pre-service teachers to simply accept, without rigorous questioning, the premises upon which the theory is

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[80] As I suggest later, pre-service teachers should be aware that the theory upon which their program is based is neither the most widely accepted educational theory nor one that is likely to be known by the majority of their colleagues and administrators. To teach only Egan's theory in an imaginative teacher education program would be both shortsighted and unethical; in addition, it would defy the grounds of the theory itself, as it does not engage pre-service teachers' imaginations nor encourage Ironic understanding. Because of this, it is important that pre-service teachers have some degree of familiarity with more widely accepted educational theories, such as constructivism.

[81] Teacher educators will want to encourage pre-service teachers to consider some of the challenges to Egan's theory, such as its apparently developmental nature, its lack of empirical confirmation, and its potential to foster cultural elitism (for example, as found in Buckley, 1994; Cheney, n.d.; Egan, 1997; Egan, n.d.; Frawley, 1998; Lee, n.d.).

[82] Teacher educators will need to discuss other educational theories with pre-service teachers and should attempt to do so not simply as counterpoints to the theory of imaginative education, but with as convincing a sense of their validity as they can convey. This will no doubt be challenging. The program will need to clarify, in terms of focus and class time, the extent to which other educational theories will be considered.

based.[83] However, although such rigorous critiquing is essential, pre-service teachers

must still demonstrate some degree of theoretical adherence: while they will be

encouraged to deeply question the grounds upon which the program is based,[84] and use

other means of engaging students in their practice,[85] they will still need to demonstrate

that they have adequate understanding and are effective imaginative educators, according

to the program's criteria.

3.4.2. Reflexivity

I define reflexivity as the deliberate, systematic and public reflection on

coherence between the theory and practice of one's own and others' teaching and

program components. A program that attempts to develop and foster the imaginative

capacities of pre-service teachers (and, by extension, their students), as well as all other

program participants, will necessarily have a great deal of reflexivity. There are two

reasons why this is so. First, because the theory has reflexivity built into it, a program

that is based on this theory must attempt to be as reflexive as possible. The program will

attempt to give pre-service teachers access to the wide range of cognitive tools of various

kinds of understanding—including those of Philosophic and Ironic understanding. Using

the tools of these kinds of understanding, and helping pre-service teachers develop them

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[83] Obviously one can assess the theory's validity (and so determine its strengths and weaknesses) and still conclude that, despite flaws, it is worthwhile.

[84] Because there will be a fair degree of flexibility in the ways in which various pre-service teachers contest the theory, there will also need to be flexibility on the part of evaluating teacher educators.

[85] Egan (1997) suggests some methods of determining whether or not students are imaginatively engaged by the content (such as a willingness to investigate the topic on their own time and incorporation of ideas into conversations with peers) (pp. 250-251; p. 261; pp. 272-273). Other means include expression of positive emotional engagement (joy, excitement, concern), willingness to overcome an apparently unpleasant task for the achievement of a greater purpose, the expression of understanding of the value of the concepts, etc. In addition to experimenting with various ways in which students can be imaginatively engaged in their learning, pre-service teachers will also want to consider other ways in which students' imaginative engagement can be determined.

requires, among other things, that: attention be drawn to the theory of imaginative education and ways in which it is or is not manifest in the teacher education program; the particular pedagogical approaches used by teacher educators and classroom teachers be made explicit and critiqued; all participants take seriously the consideration that their own assumptions, beliefs and actions are inconsistent, misguided, or even flatly wrong; and so on. Reflexivity, then, acts as a safeguard against both the 'enemy' without and within: anti-imaginative habits of mind and practice, potentially held or manifest to some degree by us all, that work against the goals of the program. In other words, staying true to the theory requires that, at all levels, the program must maintain a great deal of reflexivity regarding the theory itself and the teacher education program (including towards both its pedagogy and program participants and their relationships).

Egan recommends that teachers of students developing Philosophic understanding "should have already developed significant Ironic understanding [themselves]" (p. 274). "Ironic teaching will casually use all of the kinds of understanding, moving from one to another as seems best to enrich and deepen understanding" (p. 275); this means that teacher educators need some mastery of the tools of Ironic understanding to effectively foster pre-service teachers' Philosophic understanding.[86] Teacher educators using and attempting to foster pre-service teachers' use of the tools of Philosophic and Ironic understanding will need to draw attention to, and examine, in a public way, their own practice. For example, teacher educators will need to make explicit the strengths and weaknesses of their own practice (such as ways in which pre-service teachers'

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[86] Unfortunately, however, as Egan points out, this may not always be the case: "'Philosophic' teachers, committed to their own general schemes, tend to see their teaching task as bringing students to recognize the truth of those schemes" (p. 271).

imaginations are routinely engaged as well as ways in which the teacher educator's practice may not be conducive to the imaginative engagement of pre-service teachers), and create an environment in which pre-service teachers' inquiry about and critiquing of the teachers educator's practice is genuinely encouraged and leads to deeper understanding, rather than fear and defensiveness. Yet teaching with this kind of pedagogical reflexivity, and trying to foster one's students' own reflexivity, is not an easy feat.

Egan describes the delicate task of a teacher attempting to develop the Philosophic understanding of her or his students:

> To be a teacher of 'Philosophic' students requires flexibility, sensitivity, and tolerance in abundance. The teacher needs to support the students' developing general schemes, even when those schemes seem simplistic or, perhaps, offensive. The teacher needs to be sympathetic with students' occasional overconfidence and must be ready to support them at those moments of fearful insecurity when the inadequacy of the general scheme threatens. The teacher must introduce anomalies and dissonance gradually, to encourage greater sophistication in students' general schemes. (1997, p. 131)

Applying this recommendation to the context of teacher education has several significant implications. The "developing general schemes" referred to include both entering conceptions of teaching and learning and the theory of imaginative education. Teacher educators, then, are to support, help pre-service teachers navigate through both overconfidence and "fearful insecurity," and introduce anomalies and dissonance to both

of these schemes.[87] A task such as this— "[moving] each student forward between the Scylla of overconfident belief in the truth of general schemes and the Charybdis of undermined schemes leading to a general cynicism and alienation" (p. 268)—requires incredible intellectual and pedagogical delicacy on the part of an effective imaginative teacher educator. Delicacy in one's pedagogical reflexivity is especially important, given the potential consequences of teacher educators' failure to effectively navigate pre-service teachers' pre-existing and newer general schemes.

Egan emphasizes that "when Philosophic understanding dominates the mind, it can work with powerful intensity" (1997, p. 125), an intensity that can be dangerous if not well-handled:

> This openness to 'possibility,' which is one feature of what I call general schemes, can leave students vulnerable. It has long been evident to those attempting to attract adolescents to some ideological position that intense commitment can be generated by convincing them of the truth of the view of the world it represents. (1997, p. 122)

Ultimately, as pre-service teachers gain more mastery of the tools of Philosophic understanding, we will hope that their thinking evidences "that the worm of irony is beginning to wriggle and chew into the grand edifices of the general schemes"—in particular, the theory of imaginative education (1997, p. 273).[88] Attaining such

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[87] Egan recommends that effective Philosophic teaching should "provide students with alternative general schemes to the one we, or they, have most prominently used" (1997, p. 269), because "considering a variety of general schemes contributes to a richer understanding of the topic" (p. 269).

[88] This is in fairly well-developed Philosophic understanding. We will obviously not expect those who are just beginning to use the tools of Philosophic understanding to be able to distinguish between truth and general schemes, and ruptures in general schemes—and so feed the "worm of irony": as Egan reassures, "unqualified commitment during the early period of Philosophic understanding should not be a cause of much worry" (p. 272).

understanding is only possible if reflexivity is central to the program's activities and the program participants' relationships:

> The aim here is not to destroy students' general schemes by confronting them with major anomalies. Rather, teachers must be sensitive to the degree to which students are committed to their general schemes and aim to make these more sophisticated. The longer-term aim is to change students' perceptions of the *status* of their general schemes—not exchange one general scheme for another—so that they see them eventually as not simply true or false but as more or less useful. (1997, p. 267)

A second reason why an imaginative teacher education program must be based on the principle of reflexivity is because the theory of imaginative education is both holistic and radical. It is holistic because it is not limited to school-based learning but attempts to view the whole learner within the broader cultural context and over the time frame of the human lifespan; it is radical because it derives guidelines for education from different assumptions about the relationship between learning and knowledge than are found in more popular educational practice and discourse. The holistic and radical nature of the theory requires that an imaginative teacher education program continually reflect on and challenge more widespread forms of educational discourse and practice. Reflexivity can help act as a bulwark against the potentials of dissolution or bastardization: a watering down or 'revamping' of the theory to explain what people are already doing in more common educational practice. In other words, the program needs to assure that the understanding and the practices upon which the program is based, as well as its communities, be self-sustaining. Reflexivity is needed to ensure this.

As I will elaborate in a later section, research is one very important way to systematize reflexivity and maintain intellectual and programmatic rigour.

3.4.3. Sustainability

By sustainability I mean a commitment to exploring and supporting the development of teachers' imaginative teaching practice throughout their careers. Currently, teacher education and professional development tend to be seen as fairly distinct: the former as comprised of preparation for teaching certification and the latter as comprised of the education one receives after becoming a practicing teacher.[89] Rather than considering teacher education as a short, fairly intense, and limited process, an imaginative teacher education program should see—and manifest—teacher education as a career-long process. There are two reasons why an imaginative teacher education program must be based on this principle of sustainability.

First, unlike more typical teacher education programs, an imaginative teacher education program is unique in that it actively seeks to bring about change in teachers' understanding and practice.[90] In other words, it presupposes an expectation or requirement for substantial change at a system-wide level. The process of change, however, will be emergent: what is needed in the program and in the larger educational community is likely to be different during the program's inception than after several

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[89] "It is… known that initial teacher preparation as it is practiced in most instances is an abbreviated endeavor; the formal aspects of learning to teach are seen as completed upon graduation and receipt of an initial license…. There is little support to continue teacher preparation in a sustained substantive manner into the early, critical, formative years of teaching" (Howey, 1996, p. 144); "programs of teacher preparation need to be extended in a relatively seamless fashion into the early years of teaching; teacher education as currently construed is very much an unfinished agenda" (p. 145); "preservice preparation simply does not continue in any articulated, substantive manner into the early years of teaching" (p. 168).

[90] Obviously there are teacher education programs that have an emancipatory focus and so share with an imaginative teacher education program an explicit orientation towards change.

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years of its existence. Recognizing the dynamic and emergent nature of change means that, rather than fixing goals before initiating a process of change and assessing whether particular goals have been achieved after the process of change is complete, goals, being significantly influenced by contextual factors, will necessarily transform, at least to some degree, and must be reviewed and assessed in an ongoing manner. In other words, change to the system means contextual factors also change; this induces and makes necessary other changes, which will emerge over time. Program goals, for example, are likely to change, at least somewhat, over time.

Recognition of the dynamic nature of change means that an imaginative teacher education program needs to work with teachers in an on-going manner. On-going work with practicing teachers will ensure the feedback from the changing context of practice that is needed to keep the program evolving and so increase the likelihood that the changes the program seeks to create are relevant and sustainable. An imaginative teacher education program should attempt to continue to sustain relationships with, research and support teachers at least into their first few years of teaching, if not beyond.[91] This kind of initiative is likely to help extend program coherence over time.

A second reason why an imaginative teacher education program must be based on the principle of sustainability is because a richly developed Ironic understanding of imaginative education requires immersion in practice coupled with ongoing Philosophic reflection. Some degree of mastery of the tools of these kinds of understanding allows one to recognize and respect the importance of larger contexts and relationships

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[91] Some specific factors an imaginative teacher education program should take into consideration while establishing and maintaining such long-term relationships will be explored in the sections on research in chapters four, five and six.

impacting systems, and their changing effects over time. Additionally, these kinds of understanding allow us to realize that the journey of imaginative teaching and learning is necessarily on-going: one does not learn to be an imaginative educator simply by completing an imaginative teacher education program. Rather, an imaginative educator continually interrogates her or his practice, explores new possibilities and imagines other alternatives, given the various students and contexts she or he encounter over time, adapting as well to new learning and subsequent changes in herself or himself. The long-term approach to teacher education I advocate will help pre-service teachers, teacher educators and practicing teachers develop and keep alive the kind of Philosophic and Ironic understanding of imaginative education they will most ideally have and use, and that we hope an imaginative teacher education will help foster. Thus, this approach is the only viable one.

3.4.4. Reciprocity

Inquiry, reflexivity and sustainability all change the nature of the relationships among participants, from the asymmetry and transience that tends to be typical of more transmission-type programs to something much more reciprocal, long-term and complex. This shift seems important enough that I have chosen to highlight it as a fourth principle of imaginative teacher education: reciprocity. I use this term to allude to on-going investigation of the dynamic needs of all program participants and systematic attempts to

ensure that all relationships are based to a large degree on collaboration (power as being more equally shared) and are mutually beneficial to participants.[92]

I suggested earlier that imaginative education is necessarily inquiry-based. The wonder exhibited by an imaginative learner or teacher is not limited to the stories of subject matter; it is also a directed towards oneself and other beings with whom one interacts. For example, imaginative teachers consider their students with a sense of wonder: marveling at their uniqueness, inquiring into their understanding, puzzling about what engages them most effectively. Similarly, those involved in the process of teacher education should exhibit this sense of wonder towards themselves, the subject matter, and the others with whom they teach and learn. If such a spirit of wonder is to characterize the relationships in the teacher education program, then they will necessarily be based, at least to a large degree, in reciprocity. Being open to others—their ideas, experiences, hopes and fears, differences and needs implies both a certain degree of humility (the recognition that one's own ideas, experiences, hopes and fears and needs, while important, are simply those of one human being)[93] and a recognition of the validity of and a respect for the other's perspectives. In other words, the wonder that characterizes imaginative education implies increased reciprocity in one's relationships: a shift in the

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[92] My recommendations in this section imply something related to communities of practice, or the recognition that the learning of the members of a community is situated: they learn as part of a social context of real practice (Lave & Wenger, 1991, cited in Viskovic, 2006, p. 326). Viskovic (2006), for example, identifies features of communities of practice that relate to this discussion: mutual engagement as a critical element, organic evolution and complex interactions among members (pp. 326-327). Communities of practice are "receiving growing attention" (p. 327); while they may be pursued on theoretical grounds other than that which I am arguing, their justifiable use in other areas suggests that some of their features may be worth emulating in the context of an imaginative teacher education program.

[93] A similar kind of humility also emerges from an imaginative understanding of knowledge. When one acknowledges that no one can ever know everything, or even anything with absolute certainty, and that all learning is, at least in one manner of speaking, simply a journey of investigation, one also realizes that one's status as an 'expert' (conferred by others, oneself, or both), is, at least to some degree, simply illusory. Such awareness is likely to lead to a shift in power dynamics with others (from knower/ non-knower to co-investigators) and to a certain degree of personal humility.

direction of more egalitarian power relations and an awareness and authentic respect for the needs and rights of others with whom one interacts. A program that is based on reciprocity will try to ensure that relationships are based to a large degree on collaboration (power as being more equally shared) and are mutually beneficial to participants by making systematic attempts to both investigate, in an on-going manner, the dynamic needs of all program participants as well as help sustain relationships based on reciprocity.

An imaginative teacher education program should also be based on the principle of reciprocity because this principle follows from the principles of inquiry and reflexivity. A program that effectively implements the principles of inquiry and reflexivity should have considerable consistency in the discourse and relationships that characterize the program and in the messages pre-service teachers receive in their classroom and field experiences.[94] Achieving this kind of consistency requires that teacher educators, as well as other key players, are clear about each other's understandings, practices and experiences, and the ways in which they change over time, and consider ways in which various understandings and practices are or are not consonant with program goals. Gaining such clarity requires both a spirit of inquiry (being open to investigating oneself, one's relationships, and others) and a commitment to share the results of such investigation, or considerable reflexivity. Additionally, achieving this kind of clarity requires that teacher educators and other program participants work together

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[94] I do not mean to suggest here that there is some kind of straightforward transmission of messages that teacher education programs impart and that pre-service teachers uncomplicatedly accept. I realize that messages 'sent' may not be received, perhaps at all, or possibly not in the same way, by all pre-service teachers. I also recognize that messages are both dialogical—pre-service teachers also send messages to teacher educators and other program participants (including other pre-service teachers) and dynamic—depending on particular messages sent or received, various participants may send or receive other kinds of messages.

and negotiate program goals, or conduct themselves professionally with a good deal of collaboration.[95]

The principle of sustainability also makes necessary the principle of reciprocity. Considering pre-service teacher education as the first step in a complex and long journey of professional development means that relationships with graduates must be sustained as they begin their teaching practice, at least into the first few years, and ideally well beyond. Establishing and maintaining such relationships over time requires that reciprocity (and the collaboration that I see as a key part of reciprocity) be foundational to these interactions. As pre-service teachers move from the teacher education program into their own classrooms, they will change in potentially significant ways; reciprocity implies that the dynamic nature of their practice, themselves as teachers, their needs, and their relationship with the program will be recognized and continually explored. It also implies that respect and more equal power relations will characterize these relationships. Finally, it is important that reciprocity is central to these on-going relationships for a more pragmatic reason: beginning teachers are notoriously busy, so ensuring that they both participate actively in the creation of these continuing relationships and benefit in substantial ways from them is imperative. Collaboration and reciprocity are also essential for the establishment and maintenance of similar, dynamic, long-term, mutually beneficial relationships with cooperating teachers.

Additionally, a program that is based on both reflexivity—attempting to act as a bulwark against the possibilities of dissolution or bastardization by more widespread

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[95] "Conceptually coherent programs enable needed and *shared* faculty leadership by underscoring collective roles as well as individual course responsibilities" (Howey & Zimpher, 1989, p. 242 cited in Howey, 1996, p. 146).

forms of educational discourse and practice—and sustainability requires sustained and rich relationships with many community members and organizations. The establishment and maintenance of such relationships over time necessarily requires a similar kind of reciprocity and collaboration as will be needed with program graduates and involved cooperating teachers. While there may be numerous ways in which various participants can benefit from program involvement, an obvious one of which is financial compensation, ideally, program participants and community members or organizations will work together to determine the best ways in which reciprocity can be guaranteed and so beneficial relationships sustained.

In sum, a teacher education program based on the spirit of wonder that characterizes imaginative education must be based on the principle of reciprocity. As well, the principles of inquiry, reflexivity and sustainability also make necessary the principle of reciprocity: the on-going investigation of the dynamic needs of all program participants and systematic attempts to ensure that all relationships are based to a large degree on collaboration (power as being more equally shared) and are mutually beneficial to participants.

3.5. Chapter summary

To briefly summarize, this chapter has identified a number of significant challenges, both theoretical and programmatic, that must be addressed in any coherent and long-term approach to imaginative teacher education. In the first part of this chapter, I reviewed the limited work relating Egan's theory to the context of teacher education. I then discussed three theoretical issues that need resolution in order for Egan's theory to be used effectively in the context of teacher education: the development of understanding

in adults whose schooling has not fostered the imagination, keeping earlier kinds of understanding alive, and the nature of Somatic understanding. In the chapter's second part, I addressed the program principles that necessarily follow from applying Egan's theory of imaginative education to the context of teacher education. I argued that effectively implementing the four principles of inquiry, reflexivity, sustainability and reciprocity is a theoretical necessity. This chapter completes Part One of the thesis: the elaboration of the program's clear conceptual framework or the theoretical rationale upon which the second part of this thesis is based.

PART TWO: INTRODUCTION

> The importance of knowledge, whether it be about subject matter, pedagogy, or implementation remains critical to how teachers learn to teach. (Wideen et al., 1993, p. 3)

A clear conceptual framework is necessary, but not sufficient, for a coherent and effective teacher education program. Indeed, while incoherence in teacher education programs seems common (Goodlad, 1994; Howey, 1996, p. 150), this is not solely attributable to the lack of a defensible conceptual framework. Many teacher education programs may have adequately developed conceptual frameworks, at least with respect to the general knowledge base in education (Christensen, 1996).[96] However, a program with a clear conceptual framework may not necessarily effectively implement program features that help pre-service teachers develop understandings that are largely *consistent*

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[96] Christensen (1996) examined reports submitted by forty-two teacher education programs in order to ascertain the degree to which the reports provided evidence of identified knowledge bases of teaching. She concluded that the majority of institutions who submitted reports *did* provide adequate evidence of the knowledge base informing the espoused structure and contents of their programs. Because the results were not triangulated (for example by classroom visitations carried out by external researchers), Christensen concluded that the "impressive evidence in the reports may not be reflected in the practices of the institutions" (p. 49).

with the framework. [97] This suggests that the remaining two components of Howey's

triadic program design and implementation are necessary to ensure program coherence:

derivative themes and program features *derived from* the conceptual framework.

In Part Two of the thesis, comprised of three chapters, I clarify these remaining

two components of Howey's (1996) triadic program design and implementation. Based

on the program's conceptual framework that I delineated in Part One, I describe the

derivative themes and programmatic structures of an imaginative teacher education

program. Specifically, I devote one of each of the three chapters to an examination of the

three cornerstones of teacher education: subject matter understanding, pedagogical

understanding and understanding of contexts. Derivative themes are the understandings

and abilities, emerging from the defensible conception of teaching, which the program

attempts to foster. Programmatic structures are the activities used to help pre-service

teachers achieve these understandings and abilities. In each of the chapters exploring

subject matter understanding, pedagogical understanding and understanding of contexts, I

describe the ideal of kinds of understanding that an imaginative teacher education

program will attempt to foster in its pre-service teachers. I then consider in some depth

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[97] For example, the Research About Teacher Education (RATE) study (1992) on "a broad sample of teacher preparation programs across the United States" found that, while 55.2% of the institutions showed "excellent" or "good" progress since the late 1980s in the development of a clear conceptual framework, 45.1% had made "excellent" or "good" progress towards the explication of a reasonable number of student goals thematically articulated across courses and related activities and only 23.3% had made "excellent" or "good" progress towards the achievement of a systematic design for research into and evaluation of the program (Howey, 1996, pp. 146-147). One might assume that research and evaluation would increase the chances of coherence between a program's clear conceptual framework, the implementation of activities designed to foster understandings consistent with the framework and the program's degree of success in effectively fostering such understandings. While it is possible that a program *could* effectively foster pre-service teacher understandings without effective research and evaluation, I would argue that the significant disparity between the percentage of programs who have a clearly articulated conceptual framework and those implementing effective research and evaluation is suggestive that there is at least the possibility of incoherence between what the program is proclaiming and attempting to achieve and what it is actually achieving in terms of pre-service teachers' understandings.

the relevant research literature on teacher education to determine the kinds of understanding that pre-service teachers in more typical teacher education programs tend to gain. Finally, I propose key design features of an imaginative teacher education program that reflect the program principles derived earlier and respond to challenges that have been identified by way of the research literature.[98] I open Part Two of this thesis with a brief description of the kinds of courses pre-service teachers take in more typical teacher education programs so that the reader may gain a clearer sense of what comprises the three cornerstones of subject matter understanding, pedagogical understanding and understanding of contexts. I then identify some of the significant limitations of the teacher education research literature, limitations that are apparent in research concerning all of the three cornerstones. Limitations that are particular to each cornerstones I address in the relevant chapters on subject matter understanding, pedagogical understanding and understanding of contexts.

The three cornerstones of teacher education

There are three areas that are widely considered fundamental to pre-service teachers' learning to teach: their understanding of subject matter, pedagogy, and contexts (e.g. Carter, 1990; *Eight Questions on Teacher Licensure and Certification*, 2005; *Eight Questions on Teacher Preparation*, 2003; Howey, 1996, p. 148; Wideen et al., 1993, p. 3; Wilson & Floden, 2003; Wilson et al., 2001, 2002). Most teacher education programs include courses that attempt to develop pre-service teachers' understanding of these three

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[98] In their chapter describing how teacher education programs of the future might best be altered to help create teachers who are strong professionals, Barone et al. (1996) follow a similar format: they clarify the domains of teacher education programs that they see as fundamental to their vision, they note the current problems in each of these domains, and, based on their assessment of the particular problems, they discuss alternatives for how future teacher education programs might help actualize their vision to create teachers who are strong professionals.

areas.[99] The majority of teacher education programs also include required or elective courses that do not fall under any of these three cornerstones, such as courses in school organization. While such courses are obviously important in preparing teachers for their professional roles,[100] across institutions, there tends to be more variety with these kinds of courses, in terms of those that are offered and those that are required. The cornerstones, in contrast, are found consistently in most typical teacher education programs. Well-prepared teachers, then, are expected to understand the subject matter they will teach, something about children and their development, and learning and teaching, and how this understanding is manifest in practice: in the contexts of real students and classrooms. Pre-service teachers are expected to gain an understanding of each of the three cornerstones in courses required for program admission and those courses and experiences required for graduation and certification.

Pre-service teachers are expected to gain necessary subject matter understanding prior to their admission to the program, typically through specific course requirements. While some teacher education programs do offer specific preparation for middle school teaching, more commonly, programs only distinguish between elementary and secondary teaching.[101] The kinds of university courses required for admission to teacher education programs vary considerably between these two streams and so each teacher education program specifies the type and number of subject matter courses required for particular

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[99] For example, as evidenced by the course offerings as described on the web pages of twenty major Canadian institutions that offer undergraduate programs in teacher education.

[100] Such courses are important for preparing pre-service teachers to understand wider contexts in which they may work (such as administrative organization of schools and school districts). However, because they are not considered as fundamental to teacher education, I will not address them in this thesis.

[101] Of course, other programs exist where pre-service teachers can choose other kinds of specialties, such as First Nations education, special education, and so on.

teaching streams. Generally, those prospective teachers planning to teach in elementary schools need to have completed (with a specified minimum grade), a number of courses within each of the core content areas that they will be teaching (math, language arts, science and social studies).[102] Secondary teachers' prerequisites are much more focused; usually, these candidates must have successfully completed several courses (a substantial number of which are at upper levels) of their primary teaching area, and in some cases, fewer (but still a significant number) in a secondary teaching area.

This first cornerstone of teacher education comprises familiarity with and understanding of the concepts covered in such prerequisite courses. Because of the expectation that (at least a significant degree of) pre-service teachers' subject matter understanding will be gained prior to program admission, teacher education programs do not aim to reteach all of the material that pre-service teachers are expected to have learned from undergraduate degrees. However, because there is wide variety across institutions and indeed even within departments in the same institution in terms of course content (including assessment and grading practices, depth of coverage of particular topics, and so on), and wide variety among beginning pre-service teachers' comfort with and understanding of subject matter (including particular topics covered in courses, how recently they completed their prerequisites, and memory of the material), it is fair to assume that some review of subject matter might be needed within teacher education

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[102] Many of these are often survey and introductory courses (Ball & McDiarmid, 1990, p. 439).

programs. Such review, along with the related pedagogical conceptual understanding[103]

generally occurs in methods courses. In other words, in methods courses, pre-service

teachers may review some of the concepts they will be responsible for teaching in their

future classrooms as well as learn and often practice various methods for teaching these

concepts to their students. Elementary pre-service teachers typically take methods

courses in teaching math, language arts, science and social studies. Secondary teachers

may take methods courses in one or two areas (their primary and possibly also secondary

area) and study the content in more depth. (In addition, secondary pre-service teachers

often have to take methods courses that relate to all secondary subject areas—such as

literacy in secondary contexts.) During these courses, pre-service teachers are expected to

become familiar with both the prescribed curriculum and various ways to teach and

assess student learning of it.[104]

The second cornerstone is pedagogical understanding: understanding of learning

and teaching. Courses in this cornerstone include introductions to teaching and learning,

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[103] What I call pedagogical conceptual understanding is more frequently referred to as pedagogical content knowledge in the literature. It is a tricky construct because it is linked to both subject matter understanding (as described above) as well as pedagogical understanding. Pedagogical conceptual understanding will be discussed in the section on teachers' sense of imaginative possibility (one component of the subject matter understanding I recommend that imaginative educators need to develop). *Eight Questions on Teacher Preparation: What Does the Research Say?* (2003) notes the difficulty in completely separating subject matter understanding from pedagogical understanding in terms of their roles in contributing to effective teaching (About the Eight Questions, Question Two, Significance of the Question, p. 2).

[104] "In terms of sequence, preservice students typically encounter a methods block midway through a three-step training cycle (i.e., foundations, then methods, then student teaching). In terms of quantity, methods courses are also central to most teacher education programs. Foundations courses and practicum experiences account for roughly 60% of the credit hours required for graduation or certification, with methods consuming the remaining 40%. In terms of time frame, traditional teacher education programs typically last four to six semesters, with methods coursework extending across two or three of them" (Barone et al., 1996, pp. 1116-1117).

educational psychology, courses on assessment and evaluation, and management.[105]

While such courses may be based on the same learning theories as those upon which

methods course are based, courses attempting to develop pre-service teachers'

pedagogical understanding tend to be broader in focus. For example, while pre-service

teachers in a course on teaching and learning might study child development and the

related learning and teaching approaches and activities for teaching children of various

ages, pre-service teachers in methods courses would consider much more particular

concepts and their applications (such as the sight words that grade one students are

expected to know and various ways in which those sight words can be effectively taught

and assessed).

The third cornerstone is understanding of contexts, known as the field experience,

the practicum, practice teaching, student teaching or clinical experience. This is a

significant component of the program and generally covers about twelve weeks. During

field experience, pre-service teachers are expected to gain a sense of the realities of

teaching and schools by gradually taking on most of the teaching and attendant

responsibilities of the classroom teacher with whom they are paired, in the subjects and

grade range for which they will receive certification. Field experiences can have various

configurations: for example, in some programs, but not all, they are connected to methods

courses; some programs have pre-service teachers do field experiences concurrently with

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[105] Certainly in the teacher education literature, courses such as the history of education, sociology of education and philosophy of education are not considered courses that focus on developing pre-service teachers' pedagogical understanding. However, depending on how they are taught, one could also consider courses such as these as also developing pedagogical understanding. (For example, if, in a constructivist program, a history of education course was organized in such a way that pre-service teachers were encouraged to understand how various historical traditions led to the development and acceptance of constructivism, one could argue that this might reinforce the pedagogical understanding gained in courses such as educational psychology and assessment, and thus be considered a historical/ philosophical justification of pedagogical understanding espoused by the program.)

university courses (such as teaching in the morning and taking courses in the afternoon, or teaching four days a week and taking courses for the fifth), while others tend to immerse pre-service teachers into the culture of the school for an extended period, and then later have them return to campus and coursework once the field experience is finished. The content and manner of learning in university courses can be quite different than that gained in the context of K-12 classrooms. In addition, while other courses in more typical teacher education programs tend to assign pre-service teachers letter grades, pre-service teachers are usually only awarded a pass/fail for field experiences. Many programs require that pre-service teachers pass the field experience in order to graduate from the program.

It is important to ascertain the kinds of understanding of the three cornerstones that pre-service teachers tend to gain from their participation in more typical teacher education programs. If, as I argue, teacher education should achieve the goals I outlined in chapter one, that is, the development of a breadth and depth of knowledge, a sense of agency and a moral compass, and if the imagination is central to achieving these purposes, then it is important to clarify that typical programs as they are currently run are inadequate for these purposes: If pre-service teachers in these programs already have an imaginative understanding of subject matter, pedagogy and contexts, then my argument that the design and implementation of an imaginative teacher education program needs to be dramatically different than those of more typical programs is a moot issue. On the other hand, if I can establish, by way of the research literature, that pre-service teachers in more typical programs have an inadequate understanding of subject matter, pedagogy and contexts, then I give stronger weight to my argument that an imaginative teacher

education program needs to both attempt to achieve different aims and use means that differ in some significant ways from those found in more typical teacher education programs.

A note on research

Before discussing the kinds of understanding of the three cornerstones that an imaginative teacher education program should attempt to foster in pre-service teachers, considering teacher education research on pre-service teachers' understanding of the three cornerstones in more typical teacher education programs, and proposing key design features of an imaginative teacher education program that reflect the program principles described earlier and respond to challenges identified in the literature, it is important to consider the research on teacher education in its entirety. As a body of knowledge, teacher education research literature is far from thorough, rigorous, and effectively theoretically grounded. Numerous reviewers have identified serious problems with this research; these limitations must be kept in mind in later discussions concerning research on each of the three cornerstones of teacher education. They are significant and sobering caveats.

Teacher education research suffers from numerous inadequacies, including:

1. It is limited in quantity (Executive Summary, *Studying Teacher Education*, 2005, p. 282; Clift & Brady, 2005, p. 310; *Eight Questions on Teacher Preparation*, 2003, A Summary of the Findings, p. 7; Floden & Meniketti, 2005, p. 282);
2. It is often limited to a single institution so generalization is difficult, if not impossible (Clift & Brady, 2005, p. 334; Wilson et al., 2001, p. 15, 2002, p. 194);
3. "[Terms] are often used interchangeably" (Carter, 1990, p. 295; Executive Summary, *Studying Teacher Education*, p. 32);

4.   There is "a distinct lack of coherence across studies" (Carter, 1990, p. 295; Floden & Meniketti, 2005, p. 286);

5.   Much of it has paid little or no attention to context (Carter, 1990, p. 295; Clift & Brady, 2005, p. 334; Executive Summary, *Studying Teacher Education*, p. 32; Wilson & Floden, 2003, p. 9; Zeichner & Conklin, 2005, p. 699);

6.   "[The] quality of data representations and reporting [can be] uneven" across studies (Wideen et al., 1998, p. 162);

7.   There is often minimal (or no) reference to the search for disconfirming evidence (Wideen et al., 1993, p. 5);

8.   It is often conducted by teacher educators (rather than outsiders), who may have a vested interest in validating the need for teacher education and who are often not self-critical (Clift & Brady, 2005, p. 315, p. 333; Wideen et al., 1993, p. 5; Wideen et al., 1998, p. 163; Wilson et al., 2001, p. 16; 2002, p. 194);

9.   "[There] is little research that includes the perspectives, questions and voices of cooperating teachers and prospective teachers" and supervisors (Executive Summary, *Studying Teacher Education*, 2005, p. 16; Wideen et al., 1998, p. 169) or includes a consideration of how the research may benefit the researched (Wideen et al., 1998, p. 167);

10.   Researchers often do not account for the possibility of the placebo effect, or finding what they were looking for simply because they expected to (Wideen et al., 1998, p. 164);

11.   It lacks "uniformity in what counts as measures of 'impact' or 'effectiveness'"[106] (Carter, 1990, p. 295; see also Wilson et al., 2002, p. 202; Zeichner & Conklin, 2005, p. 702);

12.   The issue of selection effects has not been satisfactorily addressed: what teachers learn in teacher education programs might be entirely due to program entry requirements (Wilson & Floden, 2003, p. 16; Executive Summary, *Studying Teacher Education,* 2005, p. 30; Zeichner & Conklin, 2005, p. 698);

13.   "[There] is relatively little research on teacher preparation that looks directly at the impact in which most policymakers are interested—the actual measured achievement of teachers' students" (*Eight Questions on Teacher Preparation*, 2003, Improving the Research on Teacher Preparation, p. 2; Executive Summary, *Studying Teacher Education*, 2005, p. 33);

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[106] Wilson and Floden (2003) suggest that "there is little agreement on what counts as measures of 'impact' or 'effectiveness' for teacher preparation" (p. 16) and that they are variously operationalized as "rates of attrition or retention; diversity of the teaching force; changes in teacher disposition, stance, beliefs, knowledge, or skill; teacher instructional practice; and student achievement. The technology for measuring these variables is weak and uneven. Researchers use proxies ranging from reported college major or degree on national surveys to locally developed measures of teacher knowledge, verbal ability, or instructional effectiveness" (p. 26).

14.   "[There] is vacillation and lack of precision in the research concerning indicators of teachers' knowledge and skill, particularly in large-scale surveys and correlational studies" (*Eight Questions on Teacher Preparation*, 2003, Improving the Research on Teacher Preparation, p. 1; see also Carter, 1990, p. 295; Executive Summary, *Studying Teacher Education*, 2005, p. 33); and

15.   While researchers often try to isolate and clarify particular kinds of understandings held by pre-service teachers, it may be difficult to do so, as various "kinds of skills and knowledge that contribute to effective teaching" may be interdependent and thus difficult to understand "in isolation from one another" (*Eight Questions on Teacher Preparation*, 2003, Question Two, Significance of the Question, p. 2).

In 1990, Carter claimed that a good deal of the research in teacher education was "in an early, formative stage" (p. 292; see also Feiman-Nemser, 1990, p. 212; Yarger & Smith, 1990, p. 39) and that, until recently, much of the research had been "fairly unproductive" (p. 291; see also Grossman, 2005). Thirteen years later, Wilson and Floden (2003) still claim that much more work is needed before we can make "any reasonable claims about the power of teacher preparation" (p. 16) because there is "little research that persuasively answers the eleven questions posed by [the Education Commission of the States]" (p. 26).[107] Wideen et al. (1993) conclude that the usefulness of much of the available research to inform our practice is "restricted" (p. 5; see also Wilson et al., 2002, p. 201). Many reviewers agree that the quality and quantity of research on teacher preparation needs dramatic improvement, a suggestion that is "strongly" supported by the authors of *Eight Questions on Teacher Preparation* (2003, Improving the Research on Teacher Preparation, p. 1). As experts have noted, the research's "relative thinness" (see also Executive Summary, *Studying Teacher Education*, 2005; Grossman, 2005) should be

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[107] Wilson and Floden (2003) reviewed studies about programs (which can vary widely) rather than particular courses. To know whether particular courses could help teachers become more effective would require a literature review beyond the scope of their work (p. 16).

a significant factor in considering the claims made by various proponents of different positions debating teacher education. Of course, the lack of high quality research does not necessarily mean these proponents are wrong; however, it casts doubt on the strength of claims which cite empirical evidence in favour of a single point of view (*Eight Questions on Teacher Preparation*, 2003, A Summary of the Findings, p. 7). Such significant caveats must be kept in mind when examining the relevant research as well as the recommendations that emerge from research findings in each of the three cornerstones, the first of which I will now consider.

CHAPTER 4: PRE-SERVICE TEACHERS' SUBJECT MATTER UNDERSTANDING

In this chapter, I describe the derivative themes and programmatic structures (Howey, 1996) of subject matter understanding. In describing the derivative themes, I clarify the kinds of understanding of subject matter pre-service teachers in an imaginative teacher education program will need. Next, I consider in some depth the teacher education research literature to determine the kinds of understanding of subject matter pre-service teachers in more typical teacher education programs tend to gain. Finally, I outline the programmatic structures of an imaginative teacher education program, or describe the key design features that will support pre-service teachers' development of the kinds of understanding of subject matter I argue are ideal, and which are quite different than those that tend to be gained by pre-service teachers in more typical teacher education programs.

4.1. Imaginative subject matter understanding

Few people would contest that successful teachers need to understand the fundamental concepts of subject areas in order to teach those subjects effectively. Yet imaginative educators will need a particularly rich and deep understanding of subject matter in order to teach effectively. I identify four kinds of subject matter understanding needed by imaginative educators, each of which is a necessary, but not sufficient, condition for educating imaginatively: conceptual understanding, Philosophic understanding, imaginative engagement, and a sense of imaginative possibility.

First, imaginative educators will clearly need a good understanding of the fundamental concepts of the subject, what I call conceptual understanding, but what is commonly referred to in the literature as content knowledge.[108] This includes the important facts and concepts of a particular subject, and its specialized language, and is what many of us may think of as "the very stuff of a subject" (Ball & McDiarmid, 1990, p. 440). An example of a concept fundamental to English is that grammar is a system used to explain how language works; grammatical rules (e.g. a complete sentence is comprised of a subject and a predicate) are descriptions of how language functions that tend to be used as prescriptions for how language should function or be used. Most of us may agree that understanding the fundamental concepts of a subject would be a minimum requirement to teach well; however, as I explain in the next section of this chapter, such understanding seems to be lacking in a good many graduates of more typical teacher education programs. Imaginative pre-service teachers, then, will need to gain adequate conceptual understanding of the subjects they are to teach.

Second, pre-service teachers will need to develop Philosophic understanding of the subject. They will need some understanding of how the concepts in a particular subject relate to one another (or are organized) and the 'story' of the subject, or its meaning to themselves personally, future students, our culture, and so on. For example, a Philosophic understanding of the subject would allow a history teacher to view (and convey to her or his students) history as more than particular facts or events, but as a method or methods of interpreting and understanding the past (and thus ourselves in the

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[108] As I will discuss in the next section, content knowledge is what almost all of the studies on subject matter understanding actually address. An exception is Ball and McDiarmid's (1990) chapter, which includes information on teachers' conceptual understanding, Philosophic understanding (more commonly referred to as substantive knowledge) and feelings and beliefs about subject matter.

present); similarly, Philosophic understanding of math allows us to consider it as a system of human thought, rather than as simply a fixed set of procedures (Ball & McDiarmid, 1990, p. 438). This kind of understanding of subject matter is commonly referred to in the literature as substantive knowledge, or understanding of the explanatory structures or paradigms of the field. In English, this includes such things as what constitutes literature, how authorship is determined, or theories about why we read. Pre-service teachers in an imaginative teacher education program will need to make explicit and critique the taken-for-granted story of the subject matter, as well as consider, and create, alternative stories.

Philosophic understanding of a subject also includes understanding the methods and processes by which new knowledge in the field is generated, or what is commonly referred to in the literature as syntactic knowledge. For example, in science, new knowledge is generated in the field by means of the scientific method. In an imaginative teacher education program, pre-service teachers' Philosophic understanding will allow them to be aware of as well as critique these methods and processes—an epistemological endeavour that is central to grasping the subject's story[109]—as well as other actual and methods and processes. While imaginative pre-service teachers will need to develop a Philosophic understanding of the subjects they are to teach, they will certainly benefit from Philosophic understanding of all subjects in the curriculum (even those they do not teach). Such understanding may help teachers develop confidence to plan and implement

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[109] In science methods courses, then, pre-service teachers might clarify the story of science by considering other means of knowledge generation in addition to the scientific method. For example, comparing the contrasting epistemologies of alternative and Western medicine can make explicit the means by which validity is ascertained according to Western science, and, thus, both challenge beliefs about the field as well as advance scientific understanding.

cross-curricular units, to engage their own students in reflection about various subjects and topics, and to consider education, teaching and learning with a greater richness and imaginative breadth.

Third, pre-service teachers in an imaginative teacher education program will need to be imaginatively engaged with the topics that they will teach. They will need to understand, on both a personal and transcendent level,[110] why particular topics should be taught and learned. The sense of mystery, beauty or wonder pre-service teachers will need towards particular topics requires an understanding of their own feelings and beliefs about these topics. As well, in order to understand how best to support the imaginative engagement of their future students, pre-service teachers will need some sense of common student responses to particular subjects and topics.[111] A premise of imaginative education is that most students and teachers will be able to feel some affective connection with most elements of the curriculum. So, while pre-service teachers will still be wise to be aware of common feelings and beliefs about the subject matter held by students (and which they may hold themselves), these will not be assumed to be fixed. Indeed, we would hope that imaginative educators might be able to help tackle beliefs such as "math is difficult" and replace them with other, more positive or hopeful beliefs such as "math is profound" or "math is beautiful." Most likely, the entering feelings and beliefs that pre-service teachers have about particular topics will need considerable attention in an

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[110] The transcendent level of understanding is not based on individual pleasure or interest; rather, it refers to a meaning beyond the self (see Fettes, 2006).

[111] Philosophic understanding of the subject will no doubt help pre-service teachers understand how the 'story' of the subject in our culture shapes students' experience and understanding of it.

imaginative education program.[112] As well, pre-service teachers will need to gain a sense of possible feelings and beliefs towards these topics—for both themselves and their students.

Fourth, pre-service teachers will need a sense of imaginative possibility for how subjects and topics might be taught. In other words, they need to be able to imagine subjects and topics very differently than they might have been encouraged to understand them in the past. This might involve consideration of how subjects and topics are understood in various cultural, historical, artistic, employment and personal contexts. Such imaginative understanding requires that pre-service teachers spend time observing and investigating outside of more traditional classrooms—in artists' studios, natural settings, alternative schools, cultural celebrations, and so on. This observing and investigating should include imaginative understandings of how these other individuals— not just traditional classroom teachers or subject matter experts —teach and engage with the subject and topics. Pre-service teachers' sense of imaginative possibility is enhanced by familiarity with a rich variety of resources; knowledge of songs, games, activities, books, artwork, films, resource people, field trip options, and websites relevant to particular topics can give pre-service teachers a richer sense of possibility in their imaginative planning and teaching. Finally, this kind of imaginative understanding requires considering the subject and topics with various kinds of understanding and using

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[112] Of course, there is likely to be quite a range of feelings and beliefs among pre-service teachers in terms of their responses to particular subjects and topics, with some individuals demonstrating quite positive feelings and beliefs. However, given that (many if not all of) these teachers will have had educational experiences that will not have emphasized the affective connections with curriculum, it is fair to assume that a significant number of them may have some degree of predictable (and indeed negative) feelings and beliefs.

a variety of cognitive tools in pre-service teachers' learning about and teaching those subjects and topics.

The kinds of subject matter understanding needed by pre-service teachers in an imaginative teacher education program include: deep understanding of the fundamental concepts of the subject; Philosophic understanding of the subject; imaginative engagement—of themselves and their students—with various topics and the related feelings and beliefs; and a sense of imaginative possibility for how subjects and topics might be taught.[113] In essence, the kinds of subject matter understanding they will need are significantly richer, and often quite different, than those demonstrated by graduates of more typical teacher education programs, as I will now demonstrate. In this next section, I will consider each of these four areas to determine what we know about the kinds of understanding that pre-service teachers graduating from more typical programs tend to have. Following this thorough discussion, I will propose key design features of an imaginative teacher education program (Howey's, 1996, programmatic structures) that respond to the challenges I have identified in the literature.

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[113] These recommendations are not entirely new; at least some have also been made by other theorists. For example, Ball's (1990) suggestions for the kind of subject matter understanding needed by pre-service teachers are similar to my first two components. She argues that their understanding of concepts and procedures should be correct, they should understand the underlying principles and meanings, and they need to appreciate and understand the connections among ideas in a subject area (p. 458). For example, in addition to conceptual understanding, she suggests that it is critical that pre-service teachers understand such things as how validity is established in the field, the origins of the disciple and what mathematicians, scientists, writers, geographers, and so on do (p. 458). Similarly, Schwab's (1978) conception of subject matter knowledge includes content knowledge (which I call conceptual understanding), substantive and syntactic knowledge (which I consider Philosophic understanding) and beliefs about subject matter (which I consider as part of imaginative engagement with subject matter).

4.2. Research on pre-service teachers' understanding of subject matter[114]

> [One] of the most troubling findings is that as important as strong subject-matter knowledge seems to be, teacher preparation programs do not appear to be doing an adequate job of ensuring that their graduates have it.… The findings of the twelve studies [reviewed for this report] were highly consistent with one another and lead, in the words of Wilson et al., 2001, to the sobering conclusion that 'the subject-matter preparation that prospective teachers currently receive is inadequate for teaching toward high subject-matter standards, by anyone's definition.' (*Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question One, What the Research Says, p. 3)

Most studies examining teachers' subject matter understanding actually predominantly, or solely, consider their conceptual understanding (and do not address the other three components I refer to). Because of this, my discussion of research on pre-service teachers' conceptual understanding will necessarily be more in-depth than the research related to their Philosophic understanding, imaginative engagement with subjects and topics and sense of imaginative possibility for how subjects and topics might be taught.

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[114] The major reviews consulted for this chapter are: Armento (1990), Ball, Lubienski and Mewborn (2001), Ball and McDiarmid (1990), Banks and Parker (1990), Brown, Coney and Jones (1990), Carter (1990), Clift and Brady (2005), Coble and Koballa (1996), *Eight Questions on Teacher Licensure and Certification* (2005), *Eight Questions on Teacher Preparation* (2003), Executive Summary, *Studying Teacher Education*, (2005), Fisher et al. (1996), Floden and Meniketti (2005), Grossman (1990), Grouws and Schultz (1996), O'Donnell (1990), Wideen et al. (1993), Wilson and Floden (2003), Wilson et al. (2001, 2002), Yager and Penick (1990) and Zeichner and Gore (1990). (See Appendix C for a brief description of these reviews.) Other relevant work also considered is: Ball (1990), Betts and Frost (2000), Feiman-Nemser (1990), Gess-Newsome and Lederman (1993), McNamara (1991), Monk (1994) and Morine-Dershimer (1989).

4.2.1. Conceptual understanding[115] [116]

As with the entire field of teacher preparation, reviewers of research on pre-service teacher's conceptual understanding call the research in this area scarce and spotty (*Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question One, Quick Answer, p. 1; see also Ball & McDiarmid, 1990, p. 437), and suggest that their summaries be viewed with caution, given the research's limitations (*Eight Questions on Teacher Licensure and Certification*, 2005, p. xx; see also Monk, 1994, cited in Wilson et al., 2002, p. 192) and the fact that research on subject matter preparation is "a relatively new domain of inquiry" (Ball & McDiarmid, 1990, p. 437).

Conceptual understanding refers to important facts and concepts of a particular subject. While understanding of the concepts they are to teach has generally been widely accepted as essential for pre-service teachers, there is disagreement about the conceptual understanding that is adequate for teaching (Ball & McDiarmid, 1990, p. 437; see also Ball, 1990, p. 450). Clearly, the many tasks that a teacher must perform to help her or his students learn the subject require that the teacher her or himself have good understanding of essential concepts (pp. 437-438; see also Floden & Meniketti, 2005, p. 274). Conversely, a teacher with limited understanding (such as erroneous facts about a subject) can significantly influence both how her or his students view the topic and what, or indeed whether, they learn (p. 438). In other words, if teachers do not understand

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[115] I use the term conceptual understanding, rather than content understanding (which is most commonly used in the literature), because I believe the latter implies a too limited notion of what a subject 'contains': knowledge of facts and concepts similar to that found in many textbooks, that does not necessitate a deeper understanding of the concepts (including a recognition of their imaginative scope).

[116] Generally, the literature on the understanding of subject matter in fact refers to what I call conceptual understanding. In the following discussion, I use the term conceptual understanding to refer to this construct—even if the authors of studies discussed used a different term (such as subject matter knowledge or content knowledge) but were indeed referring to the category of conceptual understanding.

concepts fundamental to the subject area (such as division in mathematics), they will be unlikely or unable to foster deep understanding in their students (as I will explain later, teachers' pedagogical conceptual understanding is dependent on conceptual understanding). Yet clarifying what teachers should and in fact do understand about various subjects is not a simple endeavor.

Teachers' conceptual understanding has been researched much more extensively in math than in other subject areas (Executive Summary, *Studying Teacher Education*, 2005, p. 11; Floden & Meniketti, 2005, p. 267; McNamara, 1991, para. 26), the research of which has been called scant at best (Executive Summary, *Studying Teacher Education*, 2005, p. 11; Floden & Meniketti, 2005). Because its research base has the most credibility, I will consider, in some depth, the research on in-service and pre-service teachers' conceptual understanding of mathematics, before briefly discussing pre-service teachers' understanding of concepts in other subject areas. The results of Floden and Meniketti's (2005), Ball, Lubienski and Mewborn's (2001), and Ball and McDiarmid's (1990) reviews of the research on pre-service and practicing teachers' mathematical conceptual understanding might best be described as bleak.

4.2.1.1. Teachers' conceptual understanding in mathematics

Ball et al.'s (2001) review of the literature on teachers' understanding of specific mathematical concepts included studies on both pre-service and practicing elementary and secondary math teachers' understanding of multiplication and place value, division, rational numbers, functions, geometry, and measurement and proof. Their findings are troubling. Their review revealed that a substantial proportion of teachers demonstrated limited (or in some cases, seemingly no) conceptual understanding of the topics or ability

to either perform or explain the procedural functions. In other words, they could provide no, incorrect, or limited explanations of concepts underlying rules, and had limited or no ability to translate functions into visual forms, etc. (pp. 444-448). The reviewers concluded that the mathematical conceptual understanding (of fundamental mathematical ideas and relationships) of both elementary and secondary pre-service and practicing teachers have "pervasive weaknesses" (p. 444).[117] Similarly, Brown, Cooney and Jones (1990) summarize several studies that show that most pre-service mathematics teachers have inadequate understanding of topics such as zero, story problems, division, proportion, and direct and inverse variation and geometry (p. 643). Their conclusion is similar to that of Ball et al.'s (2001): most pre-service elementary teachers do not possess the necessary mathematical understanding to teach the subject as recommended by various professional organizations (p. 643). Floden and Meniketti's (2005) finding echoes this assessment: prospective math teachers "who had completed some subject matter coursework had mastered basic skills in school subjects, but lacked deeper understanding of the concepts they would later teach" (p. 270). Ball and McDiarmid's (1990) review includes a summary of Ball's (1990) study (discussed briefly below) and other studies that "yielded similar findings" about prospective teachers' seriously limited understanding of school mathematical concepts including multiplication and division, zero, perimeter and area, place value and slope (p. 442).

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[117] Ball et al. (2001) claim that an "overwhelming majority" of the studies in this area have been on pre-service elementary teachers, but that research also "repeatedly reveals" that understanding of mathematical concepts is also a problem for secondary teachers (p. 444; see also Ball & McDiarmid, 1990, p. 442).

To look more specifically at one such study, Ball's (1990) study[118] (reviewed in Ball et al., 2001; Ball & McDiarmid, 1990; and Floden & Meniketti, 2005) examined prospective math teachers' understanding of division with fractions. She concluded that most of the pre-service teachers had "a narrow understanding of division" (p. 457) and that there was less difference in conceptual understanding between prospective elementary and secondary teachers "than one might expect (or hope)" (p. 463). The latter did not seem to have "substantial advantage in articulating and connecting underlying concepts, principles, and meanings" (p. 463). Indeed, neither group seemed to have much understanding of or ability to articulate mathematical concepts involved in division:

> The elementary candidates as well as the secondary students (who were majoring in mathematics) had significant difficulty "unpacking" the meaning of division with fractions. These results fit with evidence from other parts of the interviews and questionnaires that suggest that the teacher education students' substantive understanding of mathematics was both rule bound and compartmentalized. (p. 451)

Both elementary and secondary math majors had trouble remembering particular ideas and procedures; those who had learned to perform procedures could not make conceptual sense of them. The prospective teachers typically used rules, tricks and definitions to explain particular mathematical terms, procedures and concepts. Many did not seem to demonstrate meaningful understanding of the math (Ball, 1990; see also Ball & McDiarmid, 1990, p. 442).

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[118] This was part of a larger, longitudinal study, carried out by the National Center for Research on Teacher Education. Conducted on two hundred and fifty-two pre-service teachers enrolled in five different institutions, it examined the prospective elementary and secondary mathematics teachers' understandings of multiplication and division, zero, perimeter and area, place value and slope.

Ball and McDiarmid (1990) come to the somewhat distressing conclusion that students graduate from high school "with little more than basic whole-number computational skills" (p. 442) and that deeper conceptual understanding is not necessarily gained by completing undergraduate degrees in mathematics: a significant number of undergraduate students seem to hold serious misconceptions about concepts that are fundamental to their field (p. 443).[119] Similarly, Floden and Meniketti (2005) conclude that several studies point to the suggestion that "completion of advanced college-level mathematics courses with passing grades does not imply mastery of the concepts of the K-12 curriculum" (p. 272) and Brown et al. (1990) state that "[university] mathematics courses alone do not [seem to] address the apparent mathematical deficiencies that seem to characterize many elementary teachers" (p. 643). Grouws and Schultz (1996) call for an increased focus in teacher education on the development of understanding of mathematical concepts, including pre-service teachers' "knowledge of how one promotes conceptual and operational understanding in students" (p. 456). Studies such as those summarized in these reviews suggest that more typical teacher education programs do little to develop prospective teachers' significantly limited mathematical conceptual understanding.

Clearly, such research suggests that teachers' understanding of specific mathematical concepts seems to be dramatically limited. Given this distinct possibility, it is hard to imagine how teachers so lacking in basic understanding may help their students

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[119] For example, Evans (1989) found that "Although the concept of functions is central to both mathematics and the high school curriculum, many students [who were mathematics majors] had limited and inaccurate knowledge of functions" (cited in Ball & McDiarmid, 1990, p. 442). Similarly, Ball (1990) reports that math majors who are not planning to be teachers also "struggle to make sense of division with fractions, relating mathematics to the real world, and coming up with explanations that go beyond the restatement of rules" (p. 464).

engage with the subject in any manner beyond the mechanical. Unfortunately, the existing research on other subject areas suggests that this troubling conclusion might apply to teachers' understanding of concepts in other subject areas as well (Floden & Meniketti, 2005).

4.2.1.2. Teachers' conceptual understanding in other subject areas

As numerous scholars have pointed out (e.g. Executive Summary, *Studying Teacher Education*, 2005, p. 11; Floden & Meniketti, 2005, p. 283), research on pre-service teachers' understanding of concepts in areas other than math is scant. Interestingly, the *Handbook of Research on Teaching* (2001) dedicates one of eight sections to subject matter. Of the fourteen chapters therein, only six mention research on either pre-service or practicing teachers' conceptual understanding. Of these six, by far the most comprehensive is the chapter on mathematics by Ball et al. (comprising sixteen pages). The other five that address the topic of teachers' conceptual understanding do so in a cursory manner: the teaching of literature (two pages), history (two pages), social studies (two pages), physical education (one page), and health education (half a page). None of these presents information that might be helpful in determining what understanding of concepts teachers of these subject areas tend to possess, how this understanding was attained (for example by university courses completed or in-service training) or various methods for ascertaining the demonstration of this understanding (such as by answering subject-specific questions in an interview, classroom observation or student achievement). Those chapters dealing with science, writing, visual arts, second language acquisition, and vocational and occupational education contain no sections dealing with teachers' conceptual understanding. Since the research in other subject areas

is far less extensive than in mathematics, one can, at best, make cautious conclusions; at this point, it is impossible to definitively establish the degree of teachers' understanding of concepts based on less than comprehensive research. *Studying Teacher Education's* Executive Summary calls the research "small and inconclusive" (p. 12; see also Floden & Meniketti, 2005, p. 270); Floden and Meniketti (2005) caution that these studies are "no basis for general conclusions" (p. 272). That being said, what they suggest is certainly far from encouraging.

Floden and Meniketti (2005) conclude that "the studies of prospective teachers offered some support for the claim that college content courses, even when they constitute a typical major in a subject area, gave some prospective teachers a strong understanding of central concepts that support K-12 teaching, but left others with a weak command of their subject that remained at the level of memorized facts, rules, and principles, some of them inaccurate" (p. 275). In a similar vein, McNamara (1991) suggests that while the studies are few and indicative rather than conclusive, "The implications … are that student teachers, especially prospective primary teachers, may have a limited, sketchy or misinformed knowledge of the subject matter they are to teach children" (para. 15). Ball and McDiarmid (1990) conclude that recent research "reveals that [teachers and teacher candidates] often have misconceptions or gaps in knowledge similar to those of their students" (p. 446). This inadequate conceptual understanding of pre-service teachers is described by *Studying Teacher Education*'s Executive Summary (2005) thus: the "majority of [prospective teachers] studied" demonstrated only a "mechanical understanding" of subjects they will teach—comprising rules to follow, with limited or no understanding or explanation of the rationale for the rules (p. 12; see also

Betts & Frost, 2000, p. 39; Floden & Meniketti, 2005, p. 274; McNamara, 1991, para. 14).

In their research review of studies of teachers' conceptual understanding since the 1990s, Floden and Meniketti (2005) suggest there are significant similarities between teachers' conceptual understanding in mathematics and in other subject areas. For example, in English and language arts, the reviewers summarize one study that found pre-service English and language art teachers had "limited, and often inaccurate" understanding of the principles of grammar which K-12 students are expected to know (p. 273). While these teachers often knew many aspects of English, they "lacked the understanding of grammar principles that would allow them to move beyond simple statement of the principles as rules" (p. 271); similarly, many prospective teachers who had majored in literature were "without some of the knowledge… important to teaching high school English" (p. 275).

Teachers' conceptual understanding of science seems similarly weak. Coble and Koballa (1996) claim that "a central criticism in science education is that teachers do not know enough science content to teach it effectively" (p. 476) and that, regardless of specialization, pre-service teachers "tend to be inadequately prepared to teach about science…" (citing Barrow, 1987, 1988) (p. 470). The perception of the inadequate preparation of science teachers is shared by school principals, cooperating teachers, and science educators, according to Bethel's (1984) summary of research concerning science teacher education (pp. 143-150) (cited in Yager & Penick, 1990, pp. 670-671). McNamara (1991) summarizes Kruger et al.'s (1990a, 1990b) studies that suggested "primary school teachers are ill equipped to teach science since they hold views of

scientific concepts which are in conflict with accepted scientific theories" (para. 14).

Coble and Koballa (1996) claim that the "inaccurate picture of science" provided by

science courses programs is "well documented" (p. 479) and suggest that there is a

"critical [need] for reform" in university undergraduate education in courses in science

(p. 477). The authors cite the results of three large surveys of teacher education programs

and report that "All reported that the majority of institutions from which data were

collected failed to meet the NSTA's [National Science Teachers' Association] standards

for content preparation"; only 20% of the nation's teacher education programs "offer

science courses that are specifically designed to meet the needs of prospective elementary

school teachers as the NSTA recommends" (p. 470).

Pre-service teachers' limited conceptual understanding of social studies also

seems to be more the norm than the exception. Armento (1996) claims that most of the

research on pre-service teachers' conceptual understanding of social studies has been

conducted on secondary teachers' historical understanding (p. 489) and that there has

been very little research on elementary or middle school teachers' conceptual

understanding (p. 490). While Armento (1996) suggests that there appears to be wide

variety in pre-service teachers' conceptual understandings of social studies (including of

history) and in their ability to "generate instructional representations of subject matter"

(p. 490), Floden and Meniketti (2005) concluded that prospective history teachers lacked

significant understanding of concepts they would be responsible to teach (p. 270)—they

"had mastered basic skills in school subjects, but lacked a deeper understanding of the

concepts they would later teach" (p. 274):[120] only half of the teachers in the study they summarize "understood concepts underlying the discipline of history" (p. 272). Yet social studies teachers and principals do not seem to see conceptual understanding as problematic; in Russell and Morrow's (1986) survey of one hundred and thirty-eight secondary social studies teachers and ninety-six secondary principals, conceptual understanding was ranked least important on a listing of the most common instructional problems for teachers (cited in Armento, 1996, pp. 489-490).

Ball and McDiarmid (1990) suggest that most students seem to leave high school with only a mechanical understanding of many subjects (including writing, science and social studies) (p. 442). While the reviewers admit that our knowledge about what future teachers learn from specific university courses or subject areas is limited, they also conclude that many students who have mastered the mechanics of a subject have failed to develop any kind of conceptual understanding (p. 444).[121] It may be that many university graduates do not have a deep understanding of their subject matter by degree completion, and that more typical teacher education programs do little to help most pre-service

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[120] Carter (1990) also reviews research that suggests that teachers of secondary social studies and science often have to teach numerous topics outside their area of specialization (for example, a social studies teacher may have majored in geography but may have to teach history)—about which they have limited understanding—and so may tend to misrepresent information to their students (p. 306). Ball and McDiarmid (1990) also report that the "disciplinary lenses" can contribute to teachers skewing and misrepresenting concepts, and that these teachers' "inaccurate and thin" understanding of areas outside of their areas of specialization "is likely to be based on what they remember from elementary and high school classes" (p. 442).

[121] For example, in both mathematics and physics, the two more thoroughly studied areas in terms of undergraduate students' conceptual understanding, there is evidence that all students, not just those planning to become teachers, "can meet the expectations for satisfactory work without developing a conceptual understanding of the subject matter, the lack of which, we have argued, seriously inhibits teachers' capacities to help pupils learn in ways that are meaningful" (Ball & McDiarmid, 1990, p. 444). Students majoring in physics, science and engineering, for example, have been found to hold serious misconceptions about concepts fundamental to their field (such as force in physics and simple algebraic relationships in science and engineering) (p. 443). Yager and Penick (1990) confirm this: "as many as 80 percent of the physics majors at universities cannot relate the concepts and the problem skills they seem to know to any real-world situation. Even though successful as students, they hold naïve theories and misconceptions about the real world" (citing Champagne & Klopfer, 1984) (p. 666).

teachers develop it. Ball and McDiarmid (1990) argue that since it is rare for pupils to develop a deep understanding of the subject matter they encounter (because teachers are themselves graduates of the schools in which such deep understanding was not achieved), "we should not be surprised by teachers' inadequate subject-matter preparation" (p. 446). These reviewers suggest that "most prospective teachers have few, if any, opportunities in school, college, or the wider culture to come to understand the substance and nature of their subject matter or to develop dispositions that would enable them to teach in ways that enable their students, in turn, to develop meaningful and connected understandings" (p. 444).[122] They conclude that "If… we look at studies of what actually seems to be learned [in college and university liberal arts courses], instead of what faculty claim to teach, the picture that emerges is sketchy… and, for those concerned about the education of teachers, worrisome" (p. 443). Since the thorough subject matter preparation of pre-service teachers is not usually the focus of teacher education (Ball, 1990, p. 462, p. 464; see also Ball & McDiarmid, 1990, p. 439), as Ball (1990) suggests, the assumption that pre-service teachers' conceptual understanding happens "somewhere else," before or outside of teacher preparation programs, seems to be a decidedly dangerous one (p. 464; see also Feiman-Nemser, 1990, p. 228).

Wilson et al. (2002) conclude that "the subject matter preparation that [both elementary and secondary] prospective teachers currently receive is inadequate for teaching toward high subject matter standards, by anyone's definition. It appears that prospective teachers may have mastered basic skills but lack the deeper conceptual

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[122] For example, as has been pointed out by numerous researchers (e.g. Ball, 1990, p. 451; Ball & McDiarmid, 1990, p. 445), textbooks often do not explain the meanings of topics or procedures or suggest possible relationships between topics.

understanding necessary when responding to student questions and extending lessons beyond the basics" (p. 191). Indeed, pre-service teachers may not even be aware that their conceptual understanding of subject matter is inadequate: After assessing pre-service teachers' views about what they needed to know to teach successfully, Amarel and Feiman-Nemser (1988) concluded that pre-service teachers' main concern was with classroom management and with feeling comfortable in front of their students. The perception that they needed deeper conceptual understanding of subject matter or better understanding of student learning was rarely mentioned (cited in Carter, 1990, p. 294). Clearly, even given the significant caveats made earlier related to the limitations of the research in this area, discussed earlier, the evidence of pre-service teachers' inadequate conceptual understanding should be serious cause for concern. By any reasonable educational standards, pre-service teachers' conceptual understanding of subject matter, in all of the areas that have been studied, seems to be decidedly inadequate.

Most of the studies reviewed in the reports summarized in the preceding section attempted to ascertain pre-service teachers' conceptual understanding of subject matter by examining those teachers' understanding of specific concepts. However, there are two other methods by which researchers have attempted to ascertain pre-service teachers' conceptual understanding: by determining the connection between teachers' completion of university courses in particular subject areas and the related achievement of their students in these subjects; and by examining teachers' pedagogical conceptual understanding. As I elaborate more thoroughly in Appendix D, neither of these methods suggests a more hopeful conclusion about the conceptual understanding of pre-service teachers.

While there is some evidence of higher student achievement (for some students, in some subject areas) taught by teachers with more coursework in particular subjects, the connection is not straightforward. Perhaps the most troubling complexity with this first method is that course completion does not guarantee and is not equivalent to conceptual understanding. In other words, many pre-service teachers who have successfully completed a particular number of courses still have decidedly limited conceptual understanding, as I have already mentioned, and as many researchers have noted. The second method is also problematic. Since conceptual understanding seems to be a necessary but not sufficient condition for pedagogical conceptual understanding, the primary difficulty with determining pre-service teachers' conceptual understanding by means of their pedagogical conceptual understanding is that the proportion of pre-service teachers who demonstrate good pedagogical conceptual understanding would seem to be even more limited than the number who have deep conceptual understanding—as I have suggested, a troublingly small number indeed. (See Appendix D for a more detailed discussion of these two methods.)

4.2.2. Philosophic understanding

Conceptual understanding would seem to be a necessary but not sufficient condition for Philosophic understanding, as well as for effective teaching.[123] In order to understand the story of a subject,[124] the relationships between concepts in a particular field, the explanatory structures or paradigms of the field, and the methods and processes

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[123] For example, one can imagine a brilliant scholar who clearly has deep conceptual understanding but lacks the skills and ability to teach the concepts in a way that fosters student learning.

[124] Understanding the story of a subject might include its personal and possible meanings for the teacher and students, its historical and contemporary cultural significance, and so on.

by which new knowledge in the field is generated, one clearly first needs to understand the facts and concepts fundamental to the field.[125] Given the limited number of pre-service teachers who seem to demonstrate adequate conceptual understanding, we might hypothesize that those who have Philosophic understanding of the subjects they will teach comprise an even smaller group.

The research on pre-service and in-service teachers' Philosophic understanding (commonly referred to in the literature as substantive knowledge and syntactic knowledge) is limited in scope; we know far less about teachers' Philosophic understanding than we do about their conceptual understanding. This is perhaps unsurprising, given that most people would tend to consider a teacher's conceptual understanding essential, and thus far more important (for teachers to have and for researchers to investigate) than Philosophic understanding, which might be considered as preferable, but non-essential, for teaching. The dearth of research on Philosophic understanding may itself be telling. Is it generally considered unnecessary? Not worth researching? Important but far less so than conceptual understanding, given limited time and resources?

Of course there are those researchers who have clarified that such understanding should be an essential part of teacher education. For example, Gess-Newsome and

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[125] Ball (1990) also notes the relationship between conceptual understanding and Philosophic understanding: "ideas about mathematics do not exist separately from substantive understanding of particular concepts or procedures" (pp. 460-461). The importance of this relationship is also noted by Ball and McDiarmid (1990), who argue:

> Some of the ideas student develop about the subjects they study may not accord with the ways in which scholars who work in these fields think about their subjects. For example, students may come to view history as a factual account of the past or mathematics as a domain of clearly right and wrong answers. Students' beliefs about the nature of the subjects they study constitute a critical element of their subject-matter knowledge that also influences their [conceptual understanding]. (p. 441)

Lederman (1993) state that a teacher's Philosophic understanding[126] of a subject can influence her or his teaching in important ways, including decision-making about topics to include in the curriculum (p. 26), how these topics are taught, and students' sense of the coherence of the subject (p. 26; see also Brickhouse, 1990, cited in Coble & Koballa, 1996. p. 471). Ball (1990) also suggests that Philosophic understanding is necessary for effective teaching: "teachers should understand the subject in sufficient depth to be able to represent it appropriately and in multiple ways… they need to understand the subject flexibly enough so that they can interpret and appraise students' ideas, helping them to extend and formalize intuitive understandings and challenging incorrect notions" (p. 458). Others argue that teachers' Philosophic understanding[127] of the subject they are teaching is "a precondition for students to come to understand their subject matter in a new way for teaching" (Ball & McDiarmid, 1990, p. 445). Fisher, Fox and Paille (1996) claim that new teachers' absence of Philosophic understanding (more specifically, syntactic knowledge) limits their ability to learn new information (p. 420) and cite Grossman, Wilson and Shulman's (1989) recommendation that "discussion of frameworks [syntactic knowledge] should be integrated in education courses and courses in the major field throughout the program" (p. 420).[128]

Coble and Koballa (1996) also argue for the fostering of science teachers' Philosophic understanding of their subject and suggest that pre-service teachers study the

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[126] The researchers refer to substantive knowledge, the explanatory structures or paradigms of the field. As I consider this a component of Philosophic understanding, I use my construct, rather than the ones used by them in their article.

[127] This example also refers specifically to substantive knowledge.

[128] O'Donnell (1990) also mentions several studies (e.g. Lloyd-Jones & Lunsford, 1989, p. 33) in which pre-service teachers' Philosophic understanding was recommended by researchers (p. 712).

history and philosophy of science and that teacher education programs address pre-service teachers' Philosophic understanding of science (p. 471).

> All teachers, regardless of level, need to understand science as a human endeavor and something about how the history of science has contributed to the current understanding of the universe. (p. 463)

> teachers of science also need to recognize the thematic ideas that transcend the boundaries of the sciences, technology, and other school subjects…. All thematic ideas appear repeatedly no matter what science is studied…. They should be a part of the thinking and explanations of all teachers. Knowledge of these themes has lasting value for teachers and the students they teach. (p. 464)

Coble and Koballa's (1996) recommendations for science teacher preparation (for elementary, middle and secondary teachers) include pre-service teachers' understanding of the "interrelatedness of science disciplines and the connections between science and other areas of knowledge" (citing Glass, Aiuto & Anderson, 1993) (p. 469).

Yet placing such emphasis on Philosophic understanding in research seems to be more the exception than the rule. In general, most studies on subject matter understanding have paid little attention to pre-service teachers' Philosophic understanding. For example, Philosophic understanding is not systematically reviewed in the major reviews of subject

matter understanding consulted for this chapter.[129] Those that do refer to pre-service teachers' Philosophic understanding of subject matter are few, as are the number of related studies they summarize.

Of course, we must be very cautious when drawing any kind of conclusions from the available research, given the general paucity of research that does exist. Still, results from the small number of research studies can be valuable in laying the groundwork for further study and for helping to determine what needs to be investigated more thoroughly in terms of both more typical and imaginative teacher education programs. Once again, the research that is available tends to paint a somewhat disheartening picture: few pre-service teachers could be said to have Philosophic understanding of their subject matter.

Ball's (1990) study revealed that most of the pre-service mathematics teachers in her study had seriously limited (if not no) Philosophic understanding of the subject. The elementary candidates and mathematics majors planning to teach secondary math "tended to see mathematics as a body of rules and facts, a set of procedures to be followed step by

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[129] While some reviews, such as Ball, Lubienski and Mewborn (2001), do refer to studies on one element of Philosophic understandings—those exploring the explanatory structures of paradigms of a field (what is commonly referred to as substantive knowledge in the teacher education research), none of the eleven major reviews consulted for this chapter also referenced studies that dealt with pre-service or practicing teachers' understanding of the methods and processes by which new knowledge in the field is generated (what is commonly referred to in the literature as syntactic knowledge). Fisher et al.'s (1996) chapter on teacher education research in the English language arts and reading in the *Handbook of Research on Teacher Education* (2nd edition) does have brief sections on conceptual understanding, Philosophic understanding (separated into substantive and syntactic knowledge) and beliefs about subject matter. However, together, these comprise about one-and-a-half pages of twenty-six pages of text.

step, and they considered rules as explanations" (p. 464)[130]: "The prospective teachers'

ideas about what it means to know something in mathematics generally centered on

remembering rules and being able to use standard procedures" (pp. 460-461).[131] Most

pre-service teachers in Ball's study were far from being able to conceive of math as "a

creative human endeavor that is both a way of knowing and a way of thinking about the

world" (as it is viewed in Project TIME [Teachers Improving Mathematics Education])

(Grouws & Schultz, 1996, p. 451). Ball (1990) further observed that the candidates

neither seemed "dissatisfied with" nor "even seem[ed] to consider" their understandings

about mathematics (p. 460). Of course, considering that most pre-service teachers seem

to have little conceptual understanding that is more than mechanical, perhaps such

severely limited Philosophic understanding of mathematics, while disturbing, is not

surprising.

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[130] While some secondary candidates did not see math this way, all of the elementary candidates did. Ball et al. (2001) suggest that such an understanding of math is not particularly remarkable, given that, "despite its power, rich traditions, and beauty, mathematics is too often encountered in ways that lead to its being misunderstood and unappreciated"; they characterize the school mathematics experience of most American students as "uninspiring at best, and intellectually and emotionally crushing at worst" (p. 434). Ball (1990) similarly suggests that math is both "revered and reviled" in our culture (p. 460) and that the cultural image of math found in most elementary and secondary math classes is "a linear, rule-and-fact-filled body of knowledge in which perspective, interpretation, and argument are irrelevant" (p. 463; see also Ball & McDiarmid, 1990, p. 446). Brown et al.'s (1990) claim supports this interpretation of math as primarily a technical enterprise: in the common perception of math, "knowing *how* supersedes what appears to be the less important knowing *why*" (p. 648).

[131] Brown et al. (1990) make the similar claim that math is "perceived of as the discipline within which there is consensus regarding what it is that is true and what counts for appropriate and adequate evidence in an argument" (p. 646) and that

> Many [mathematics] teachers speak of the cut-and-dried nature of mathematics, as if the discipline were composed of many disparate and already prepared parts, and tend to conceive of teaching mathematics as showing or telling students the proper techniques in the clearest way possible, thereby helping the children to reach the 'correct' way of thinking of mathematics. (citing Kesler, 1985; McGalliard, 1983) (p. 648)

Grouws and Schultz's (1996) summary of the SummerMath program supports this: many teachers beginning the program "held the common belief that mathematics is an inert body of knowledge consisting of facts and rules to be memorized and passed from the expert to the student. The teachers felt their job was to tell these facts to the students" (p. 450).

Floden and Meniketti's (2005) review of a study on literature majors in teacher preparation showed that most of these pre-service teachers had decidedly inadequate understandings of what constituted literature.[132] Fisher et al. (1996) report one study (Amarel & Feiman-Nemser, 1988) in which most of the participants "favored a rather conventional view of their subject matter… prospective secondary English teachers thought that a knowledge of grammar to be 'more important than having language to describe the writing process' (p. 10)" (p. 426). Gomez's (1988) study on prospective teachers' background in learning writing showed that the pre-service teachers had limited understanding about what good writing was: they had "limited ways… of conceptualizing various features of the writing process," and those at both the elementary and secondary level "attended mostly to the surface features of the text in the student example" (cited in Carter, 1990, p. 293).

Pre-service teachers' Philosophic understanding of science also seems to be significantly limited: Coble and Koballa (1996) argue that it is "a concern across all levels of science teacher preparation" (p. 471).[133] Yager and Penick (1990) similarly conclude that "the research proves that effective science teachers must have a broader view of science and of education" than they tend to at present (citing Holdzkom & Lutz, 1984) (p. 665). Coble and Koballa (1996) claim that most high school graduates know scientific facts "without understanding the evolution of science ideas and how science

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[132] Most pre-service teachers in this study classified literature as: everything with plot, everything with words, everything fictional, or anything that was published (Holt-Reynolds, 1999, p. 37).

[133] Yager (1980b) found that, at nine largest universities that offered undergraduate teacher education programs in science education, "there was little agreement as to a definition for science education, a rationale or framework for the discipline, or a theory-base for research" and "there was little attention to goals for the discipline; there were few attempts at defining science education in any way other than the science that is taught in schools and the preparation of teacher for such efforts" (cited in Yager & Penick, 1990, p. 661). Yager and Penick (1990) and Coble and Koballa (1996) suggest that science teachers need to consider rationales for school science.

affects and is affected by world cultures and societies" (p. 459). Nor do most university

courses taken by prospective teachers promote a Philosophic understanding of science;

rather, the subject rarely seems to be emphasized as a process of inquiry but is more

commonly "presented as a body of facts to be learned" (Coble & Koballa, 1996, p. 471).

Unfortunately, most typical teacher education programs do not seem to make concerted

efforts to help pre-service teachers gain a Philosophic understanding of science either:

courses on the philosophy or history of science are not usually a part of elementary

teacher preparation programs (p. 470).[134] Coble and Koballa (1996) add that an enduring

criticism of American science teaching is that it has relied too heavily on textbooks that

stress facts and promote science as a completed body of knowledge (citing Yager, 1983)

(p. 476).[135]

One study (Galagher & Tobin, 1987) reported by Yager and Penick (1990)

suggest that Australian secondary science teachers' understanding of their subject is

primarily instrumental. The researchers found that the participants equated "task

completion (coverage of content) with student learning" and that they use examination

preparation (for both teacher-created and external examinations) as the purposes of

learning activities, including instruction, class and laboratory work and homework

(p. 555) (p. 665). Similar results were found with elementary science teachers, who tend

to place a high priority on content coverage and subsequent grade preparation (although

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[134] "Studies by Loving (1989), Yager (1991), and Bybee et al. (1989) indicate that little attention, if any, is given to the history and philosophy of science in science methods courses. Loving's findings led her to recommend that science teacher preparation programs include a course on the philosophy of science" (Coble & Koballa, 1996, p. 471).

[135] Similar concerns have been made about textbooks' portrait of math (as fostering an algorithmic approach to the subject), history (as fostering an understanding of accounts of the past as factual) and writing (e.g. Ball & McDiarmid, 1990, p. 445).

they tend to idealize hands-on activities) (Shymansky, Yore & Good, 1991, cited in Coble & Koballa, 1996, p. 476).

Like the other core subject areas, data on pre-service teachers' social studies Philosophic understanding is extremely limited: there has been very little work in social studies research besides on teachers' conceptual understanding, mostly of history (Armento, 1996, p. 490). While John's (1991) study revealed that geography teachers "had little overall conception of their subject matter" (cited in Richardson, 1996, p. 106), Armento (1996) suggests that "the dominant view of [precollege] social studies is… as… a factual, unidimensional, boring, and unimportant" subject (p. 485). Banks and Parker (1990) claim that most social studies methods courses promote an understanding of the social studies that reflects, rather than challenges, the status quo (p. 683) and that "few social studies teachers view the social studies as social science and critical inquiry" (citing Shaver, Davis & Helburn, 1979) (p. 678). Banks and Parker (1990) claim that the centrist position on citizenship education, which "promotes citizenship transmission and is characterized by a focus on factual recitation and a study of dominant institutions" is dominant in social studies education (p. 678), and that "teachers tend to view the social studies primarily as history, geography, and government and not as an interdisciplinary and decision-making subject that develops critical and reflective citizens of the commonwealth" (citing Wiley, 1977) (p. 683).

Researchers have also attempted to gain insight into pre-service teachers' Philosophic understanding by examining their subject matter structures. A subject matter structure is "an individual's conceptions and/or organization of a specified area of knowledge" (Gess-Newsome & Lederman, 1993, p. 26). The way in which teachers

organize the important concepts of a subject, explain the relationship of these concepts to each other and clarify the subject's meaning or themes can reveal the meaning (or lack thereof) of the subject to themselves, their students, society, and so on; absence of coherent and integrated subject matter structures may suggest pre-service teachers' ignorance of the importance or purpose of the subject—personally, for them or their students, or in the larger cultural/ social context. In other words, at least to some degree, subject matter structures can reveal the depth of pre-service teachers' Philosophic understanding of a subject.

The pre-service teachers in Gess-Newsome and Lederman's (1993) study[136] [137] seemed to demonstrate very limited Philosophic understanding of the subject they were preparing to teach—secondary biology.[138] Overwhelmingly, they had not thought about the topics that make up the field of biology or the possible relationships between the constituent topics (p. 31). In fact, the pre-service teachers in this study were unaware of the subject matter structures they possessed (p. 31) and acknowledged that these structures were "only tentatively delineated without any apparent rationale" (p. 35). In general, the subject matter structures that the pre-service teachers provided were "primarily listings of discrete biology courses taken at the university…. few connections

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[136] This study met the criteria for inclusion in *Eight Questions on Teacher Preparation* (2003), Wideen et al. (1993), and Wilson et al. (2001, 2002).

[137] This study examined the subject matter structure of ten biology teachers in their final year of teacher preparation to determine the nature or appearance of the pre-service biology teachers' subject matter structures, their sources and stability, and the relationship between subject matter structures and teaching practice (p. 26). The teachers were involved in field-based practicum, took three campus courses related to teaching of science and did student teaching during this study.

[138] While the researchers reported that the "extremely clear" results were "consistent across subjects" (p. 30), they also suggest that further substantiation of the results would require systematic classroom observations, as the results of the present study are based on self-report and are limited in their generalizability (p. 42).

or themes were evident between or within the listed topics" (p. 32).[139] Given that

undergraduate degrees generally tend to provide limited or perhaps no opportunities for

students to consider relationships between specific courses and constituent topics or to

make sense of their field and their own relationship to it, such similarities are perhaps

unsurprising.

While the limited degree of Philosophic understanding[140] demonstrated by

teachers in Gess-Newsome and Lederman's (1993) study is disconcerting,[141] there is

some evidence that teacher education can help to foster Philosophic understanding in pre-

service teachers. Gess-Newsome and Lederman found that subject matter structures may

be somewhat malleable, or "fairly easily influenced": they changed significantly as a

result of pre-service teachers' direct reflection on subject matter understanding, their

coursework in content specific education courses, and their teaching practice (p. 36).[142]

During the final session of this study, the teachers were able to provide a larger number

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[139] Researchers found that the sources of pre-service teachers' subject matter structures were high school and university courses; participants remembered the discreet courses they had taken or topics they had studied: "These students had only isolated memories of the content which they learned in high school biology and only a topical list of courses which might fall under biology as a result of their college coursework" (Gess-Newsome & Lederman, 1993, p. 35). The researchers concluded that arrangements and categories provided by the pre-service teachers showed similarity to both those found in the required content courses for majoring in biology and the organizational structure of many high school textbooks (p. 33). No affective connections or meanings were apparent in the pre-service teachers' subject matter structures.

[140] Gess-Newsome and Lederman (1993) argue that "a well-defined [subject matter structure] may not be in place prior to student teaching" (p. 31).

[141] The researchers call the results of their study "troubling" and recommend that the understanding of science communicated to students at both the secondary and university level should be seriously examined (p. 35).

> These findings suggest that college biology students are not being provided with a readily accessible explicit or implicit structure of biology as part of their content preparation. This is not surprising considering the manner in which college science courses are taught and presented as topics and courses disconnected from the knowledge potentially gained from total programs. (citing Cheney, 1990; Kennedy, 1990) (p. 35)

[142] Pre-service teachers partly attributed the change in their subject matter structures to their experiences of teaching the subject (as a result of student teaching, participants were able to view the subject as a teacher rather than as a student—which they had done prior to student teaching).

of terms in their structures;[143] the structures also seemed to have a greater degree of integration among the topics (p. 37).[144]

Similar results are reported in Morine-Dershimer (1989), as well as in Carter's (1990) summary of several studies examining pre-service teachers' Philosophic understanding before, during and after reading methods courses[145]: students' maps became "more cohesively connected and seemed to indicate that they had gone through a process of reconceptualizing their content" (p. 306). In other words, while most pre-service teachers in more typical teacher education programs may have very limited (or no) Philosophic understanding of the subjects they will teach,[146] the potential for its development[147] through teacher education (and even specific courses, such as methods courses) is a distinct possibility. Of course, we would hope that "teacher education students may learn to think differently about the subject matters that they teach as a result of participating in teacher education programs" (Wilson & Floden, 2003, p. 15; see also Grossman, 1990). Unless Philosophic understanding is valued, and thus made a focus of

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[143] "Students acknowledged that these additions were influenced by science related education courses. There is a general tendency for students to feel that little value has been gained from their time in education courses (Lanier and Little, 1986). This tendency often changes when the courses pointedly address the teaching of specific subject matter" (citing Grossman, 1987) (p. 38).

[144] "It does not appear that preservice biology teachers are cognizant of their SMSs or that these SMSs are stable. The structures which do exist are largely the result of college science coursework and are often vague and ephemeral with little evidence of coherent themes" (p. 42).

[145] After the pre-service teachers created representations of their conceptual understanding (before, during and after their reading methods instruction), researchers rated the representations for their arrangements, relationships, and integration of concepts and analysed them for their levels of complexity at different points (Carter, 1990, p. 306).

[146] Gess-Newsome and Lederman (1993) note that the development of Philosophic understanding (as evidenced by coherent subject matter structures) may not tend to be a focus of typical teacher education programs, and does not tend to happen spontaneously or be common in most science content courses (p. 36).

[147] It should be noted that some of the themes and meaning present in the final subject matter structures of pre-service teachers in Gess-Newsome and Lederman's (1993) study had been overtly taught in methods courses and two science specific courses (p. 38).

teacher education, however, its development in pre-service teachers seems highly

unlikely.

4.2.3. Imaginative engagement with topics and subjects/ feelings and beliefs about subject matter[148]

I found no research that directly addressed the imaginative engagement

experienced by pre-service teachers in more typical teacher education programs.

However, because imaginative engagement necessarily requires emotional engagement,

we gain some sense of the degree of importance placed on both teachers' and students'

affective connections with subject matter by exploring the research on their feelings and

beliefs about subject matter.

Feelings and beliefs about subject matter comprise a wide range of phenomena

and to some degree, it may be counterproductive to try to draw firm lines between them.

An important distinction I will draw here is between beliefs that I consider conceptual

understanding (such as the belief that zero is a number) and those that I would call

Philosophic understanding (such as the belief that literature is writing that pays deliberate

attention to aesthetic qualities and invites interpretation). Research that examines such

beliefs I address in the appropriate section. In this section, I include students' and

teachers' feelings, or "tastes and distastes" (Ball & McDiarmid, 1990, p. 441), towards

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[148] In the literature on teacher education, the term beliefs tends to be widely, and often vaguely, defined. Some authors categorize beliefs as a part of subject matter understanding, as do I; however, many studies that examine changes in pre-service teachers' beliefs and practices as a result of teacher education seem to focus on the change from a transmissive to a constructivist approach to teaching and learning. According to my categorization, this use of the term 'belief' would actually refer to pedagogical understanding. Other studies that claim to examine pre-service teachers' subject matter beliefs in fact refer to what I consider conceptual understanding (such as the belief that zero is a number) or Philosophic understanding (such as the belief that everything fictional is literature). Because I address such 'beliefs' in other sections, to do so again here would be repetitive.

particular topics and subjects.[149] As well as perceptions of topics and subjects that have a clear affective component ("I hate poetry"; "Science is fun"), I also include those that are neither so clearly subjective, nor emotional, but do not fall under either of the earlier two categories of conceptual understanding or Philosophic understanding (such as "math is only for people going to university" or "Shakespeare is irrelevant to contemporary life"). Also included here are students' and teachers' self-perceptions about being or not being adept at particular topics and subjects (p. 441).

Feelings are our personal connection to the subject or topic. To borrow Taylor's (1991) term, we might call feelings a horizon of significance: they give us a sense of orientation about the subject's or topic's importance. This sense that feelings are inextricably tied up with both what and how we understand has not been entirely overlooked by researchers. Ball (1990) argues that students' and teachers' feelings and beliefs are not separate from their conceptual understanding, although they tend to be treated this way in the literature (see also Brown et al., 1990, p. 643).[150] The results of her study suggests a close connection between pre-service teachers' feelings about both their own mathematical ability and about mathematics as a discipline and their understanding of mathematics:

> [the pre-service teachers'] approaches to figuring out problems were shaped by their self-confidence, their repertoire of strategies, what they were able to remember about related concepts, as well as what they

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[149] It should be noted that teachers' and students' feelings and beliefs about particular topics and subjects are not necessarily fixed: they may change over time or given various contexts. The thin research in this area makes limited or no reference to the possible changing or contextual nature of feelings or beliefs about subject matter.

[150] For example, a good deal of research has treated students' and teachers' interest in, enjoyment of and confidence with math as separate from their conceptual understanding (Ball, 1990, p. 461).

believed about the fruitfulness of trying to figure out a problem in the first place. (p. 461)

She concludes that feelings play a fundamental role in the way pre-service teachers participate in and understand mathematics (their conceptual and Philosophic understanding) and that feelings should be a "critical area of focus" in teacher education (p. 462). Ball and McDiarmid (1990) make a similar point. While they acknowledge that feelings and beliefs about particular topics or subjects are "often overlooked in considering what students learn from studying subject matter" (p. 441), they also emphasize that feelings and beliefs can shape subject matter understanding. Brown et al. (1990) also emphasize the need to consider the relationship between mathematical attitudes and mathematical understanding (p. 643).[151]

Feelings about subject matter can also influence teachers' and students' "propensities to pursue certain questions and kinds of study and to avoid others" (Ball & McDiarmid, 1990, p. 441). For example, while one teacher might be more inclined to learn everything she or he can about a topic that students dislike or find difficult, in the hopes of helping them find it more enjoyable and learn it more easily, another teacher might be influenced by, or indeed even share, this perception and tend to avoid both further study and attempts to view the topic more imaginatively, or indeed, spend less curricular time on it as a method of avoidance. As I explained in chapter two of this

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[151] Brown et al. (1990) also note the connection between beliefs about subject matter and educational beliefs (e.g. the role of the teacher). They claim that a "reliance on external authority tends to encourage a passive view of teaching and learning and can limit teachers' and students' beliefs about mathematics and about teaching mathematics" (p. 649).

thesis, the centrality of feelings in subject matter understanding is an important premise of imaginative education.

There are important reasons why teachers' and students' feelings are worthy of study: they are foundational for imaginative engagement, they may have a dialogical relationship with both conceptual and Philosophic understanding, and they can significantly influence teaching practice. Yet, this area has been largely overlooked in teacher education research. In the eleven major reviews consulted for this chapter, very little or, in most cases, no, reference is made to pre-service teachers' or students' affective responses to particular topics or subjects, or pre-service teachers' understanding of students' feelings about specific topics and subject areas.[152] To call the research on the latter 'thin' would be beyond euphemistic. Some of the reviews do refer to research on pre-service teachers' beliefs, but, in general, these studies seem to focus on beliefs about teaching or beliefs related to conceptual understanding.[153] [154] Ball and McDiarmid (1990) do refer to feelings and beliefs in their chapter addressing the subject matter preparation

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[152] For example, teachers' level of confidence or anxiety about teaching particular topics or subjects, or their (or their students') perception that a specific topic or subject is boring, exciting, important, and so on. As I explain, Ball (1990) and Ball and McDiarmid (1990) are exceptions to this tendency.

[153] For example, in math, whether pre-service teachers believe that division fundamentally concerns grouping.

[154] Some reviews, such as Wideen et al. (1993) and Floden and Meniketti (2005), refer to studies that considered pre-service teachers' beliefs about subject matter (one of Wideen et al.'s is Gess-Newsome & Lederman, 1993, referred to earlier; Floden and Meniketti refer to Emenaker, 1996) but make no reference to pre-service teachers' or students' affective responses to topics and subjects. [Wideen et al. note that Wubbels, Korthagen & Dolk's (1992) study included data on "student responses about teaching and mathematics, comparisons of views about mathematics between student teachers and practicing teachers…" (p. 16). It is possible that this study investigated pre-service teachers' affective responses to the subject of math and particular topics (and/or their students' related feelings). I was unable to locate this article to verify whether feelings were considered at all, or in any depth. Regardless, however, the reviewers do not refer to pre-service teachers' or students' feelings in their article. Similarly, Floden and Meniketti state that Enemaker's study considered pre-service teachers' beliefs about math, but do not clarify what "significant changes in beliefs" were reported, or whether feelings about math were examined as part of beliefs (p. 293).] Carter (1990) and Wilson et al. (2001) also refer to studies examining pre-service teachers' beliefs but do not clarify whether these studies addressed pre-service teachers' or students' feelings about subject matter.

of teachers in the *Handbook of Research on Teacher Education* (p. 441). Interestingly, though, information on this aspect of subject matter understanding is generally absent—or addressed in a cursory manner—in the other major reviews: those only addressing teachers' subject matter understanding (Ball et al., 2001),[155] and those dealing with this, as well as other issues related to teacher education (Executive Summary, *Studying Teacher Education*, 2005; Carter, 1990; Clift & Brady, 2005; *Eight Questions on Teacher Preparation*, 2003; *Eight Questions on Teacher Licensure and Certification*, 2005; Floden & Meniketti, 2005; Wideen et al., 1993; Wilson et al., 2001, 2002; Wilson & Floden, 2003). If it is present at all, it is neither addressed in any depth (only passing references to particular studies are made), nor given its own section (it is included with findings on conceptual understanding, etc).[156]

To look a little more closely at an example, in their summary of research on methods courses and field experiences from 1995-2001, Clift and Brady (2005) include sections called "What impacts do methods courses and field experiences have on preservice [English and reading/ mathematics/ science/ social studies] teachers' beliefs and practices?" However, very little information about studies examining beliefs (and

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[155] While Ball et al. (2001) claim that fifteen percent of the articles they reviewed focused on teachers' mathematical knowledge and beliefs and that "the history of research in the past 15 years reveals an overwhelming focus on teachers' knowledge and beliefs" (p. 434), it seems that a good deal of this research examines beliefs I would consider conceptual understanding and very little considers students' feelings and beliefs about particular subject and topics, pre-service teachers' understanding of these feelings and beliefs, and pre-service teachers' own feelings and beliefs.

[156] While some of these reviews, such as *Studying Teacher Education's* Executive Summary (2005), do allude to research on changing teachers' beliefs and relationship to teaching practice and identities (pp. 14-15), from my reading in this area, I have concluded that the bulk of this research seems to be concerned with moving pre-service teachers' beliefs from a transmissive model of teaching and learning to one that is based in constructivism. In other words, there seems to be little study done on the feelings and beliefs pre-service teachers have about particular topics and subject areas (and indeed the potential relationship to other kinds of subject matter understanding). Indeed, of the eleven major reviews consulted for this chapter, this is addressed explicitly (and still not to a very satisfying degree) only by Ball (1990) and Ball and McDiarmid (1990).

possibly feelings as well) is included. Specifically, in the section on English and reading, their references to studies reporting pre-service teachers' beliefs generally failed to clarify whether the beliefs referred to those about subject matter, children, or teaching and learning etc. (p. 315).[157] In the section concerning pre-service teachers' mathematical knowledge and beliefs, the reviewers do refer to some studies that examine this domain, but do not summarize what any of these studies found about such feelings or beliefs (p. 318). The same is generally true of the section on science: if references are made to studies that considered feelings and/or beliefs, findings were not reported (p. 320).[158] In the social studies section, cooperating teachers' attitude to service learning is referenced as well as one study reporting "no change in beliefs" (p. 323); again, it is not specified whether these are beliefs about subject matter, teaching and/or learning, students, etc. (p. 323). From what one can glean from such brief references, most of the studies referred to attempts to measure pre-service teachers' changes in beliefs and practices towards more constructivist-based instruction. Either there is a dearth of research in this area, or the reviewers failed to report (at least with any degree of helpful detail about) what the findings from such studies might indicate. Either way, their failure to address this is telling in itself: feelings and beliefs about subject matter may not be considered particularly relevant, and thus not worthy of much study, so are easily dismissed or overlooked as an understanding needed by pre-service teachers.

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[157] The reviewers do refer to two studies that reported changes (or lack of) in beliefs about learning and/or teaching and students (p. 316).

[158] Two exceptions are the study by Abell, Martini and George (2001), in which, Clift and Brady report, pre-service teachers made incomplete progress toward understanding the nature of science (unfortunately no further elaboration is provided); and that by Palmquist and Finley (1997), in which the majority of graduate students in secondary education "adopted a contemporary view of the nature of science" but again make no further explanation for what this means or might suggest (p. 321). Such fleeting references suggest that the beliefs examined are most likely Philosophic understanding, rather than affective feelings/ beliefs about subject matter or particular topics.

Students' and teachers' feelings towards and beliefs about topics and subjects (and teachers' understanding of students' feelings and beliefs) are also notably absent from the *Handbooks of Research on Teacher Education* (1990, 1996) chapters on the core content areas: math, English language arts, science and social studies. In Brown et al.'s (1990) chapter on mathematical teacher education, of fourteen pages of text, only three paragraphs are devoted to research that considered teachers', pre-service teachers' or university students' attitudes towards math. They report no studies that examined students' feelings towards or beliefs about math, or pre-service teachers' understanding of students' feelings and beliefs. While the literature to review does seem to be significantly limited, the brevity of the section is not, by any estimation, a thorough consideration of this topic. Similarly, in Grouws and Schultz's (1996) chapter on mathematical teacher education, only passing references are made to any studies that consider pre-service teachers' attitudes to math but few details are given about the studies or the findings. However, while the section on mathematical pedagogical content knowledge comprises over eight of the fifteen pages of text, the authors include no section that specifically addresses feelings or beliefs about subject matter (or indeed about conceptual understanding or Philosophic understanding, or the possible relationship between any of these constructs).

English language arts fares even worse. O'Donnell's (1990) chapter on English language arts teacher education contains no references to studies considering teachers' or students' feelings towards or beliefs about subject matter. Fisher et al.'s (1996) chapter on teacher education research in English language arts and reading contains only very

brief references to studies that consider students' or teachers' attitudes to language arts, but no details or findings are given (p. 424).[159]

Ironically, in their chapter on science teacher education, Yager and Penick (1990) argue for the value of students "developing positive attitudes towards science and science teachers," claim that "enhanced student attitudes are an important goal and worthy of serious and continuous assessment efforts" (p. 664) and suggest that pre-service teachers need experience with assessing the development of their attitudes and later assessing those of their students (p. 665)[160]; however, neither in Yager and Penick's (1990) nor Coble and Koballa's (1996)[161] chapter is significant attention paid to the research conducted or needed regarding students' feelings about or attitudes towards science: in both chapters, only passing references are made to studies that considered students' or teachers' attitudes to science, but no details on the research or the findings are given. Similarly, Coble and Koballa (1996) state that "Because teachers of science are responsible for the attitudinal development of their students, they must be knowledgeable about the types of attitudes that they are expected to promote" (p. 464). Attitudes teachers should have include an appreciation for the power of "'verifiable data, testable hypothesis, and predictability in science'" (citing Rutherford and Ahlgren, 1989, p. 134);

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[159] For example, the authors do refer to studies considering the connection between teachers' beliefs about subject matter and its influence on teaching practice (p. 426).

[160] Yager and Penick (1990) also suggest a significant criterion for excellent teacher education programs (as identified by the National Science Teachers' Association [NSTA]) as including the following features: "Teachers should display positive attitudes towards science and science education" and "With regard to preparation in science teaching approaches and strategies, the preservice teacher's preparation will provide the candidate with the knowledge and skills to develop a classroom environment that promotes positive attitudes toward science" (p. 668). Yet, in their chapter, no serious consideration is given to existing or needed research about pre-service teachers' attitudes to science, how their positive attitudes might be fostered in teacher education programs, and how pre-service teachers might learn of their students' attitudes to science and create classroom environments that promote students' positive attitudes towards science.

[161] Coble and Koballa (1996) do have a two-paragraph section on scientific attitudes (p. 464).

they should engender scientific attributes or attitudes associated with scientists, such as reliance on data, willingness to modify explanations, respect for reasons and cooperation; and a recognition of the strengths and weaknesses of science and maintenance of a positive outlook toward learning science and toward themselves (p. 464). Again, however, the authors do not discuss available or needed research about student attitudes to science, or how pre-service teachers might develop or sustain their own scientific attitudes and a positive outlook towards science.

Banks and Parker's (1990) chapter on social studies teacher education also makes only fleeting reference to a small number of studies that consider teachers' and/or students' attitudes to subject matter: no separate section is devoted to a discussion of the topic, including the relationship between feelings and beliefs and other components of subject matter understanding. Minimal or no details are given about the studies or the findings results, nor are the studies critiqued. In the 1996 chapter, while Armento does raise excellent questions that researchers need to examine about pre-service teachers' and students' attitudes and beliefs about social studies, she also acknowledges that our ability to answer these questions at present is extremely limited because of the paucity of research (p. 499).

Clearly, there is both relatively little research on students' and pre-service teachers' feelings and beliefs about subject matter (and pre-service teachers' understanding of their students' feelings and beliefs) and limited significance placed on this area, at least by many authors of major reviews. It is not surprising, then, that our understanding—of students' feelings and beliefs about subject matter, of teachers' understanding of these feelings and beliefs, and of teachers' own feelings and beliefs—is

seriously limited, often to single studies. Again, there seems to be more research in mathematics than in the other subjects; however, even in math, the research is scant. Therefore, to the degree to which they are based on these findings, the recommendations for how this aspect of subject matter understanding should be fostered in an imaginative teacher education program, which I address in the latter section of this chapter, will have to be considered in light of the significant limitations of the research in this area. I will now consider the slim extant research regarding students' and teachers' feelings and beliefs about subject matter.

Quilter and Harper (1988) investigated the reasons given by adults for their fears, difficulties, and inabilities to cope with mathematics on anything beyond a rudimentary level. The researchers found that "one-third of their informants 'cited instrumental learning as the most important factor during their schooling leading to dissatisfaction with mathematics. This dissatisfaction was commonly related also to their perception of mathematics as a rigid subject' (p. 125)" (cited in Brown et al., 1990, p. 648).

Students' self-perception of their mathematical ability was assessed in one study reviewed by Ball and McDiarmid (1990). The reviewers report that "65 percent of third graders think they are good at mathematics; by the end of high school this proportion has dropped to roughly half" (p. 441). (Ironically, such confident assertions may be somewhat misguided—at least according to earlier reports about high school graduates' remarkably limited understanding of fundamental mathematical concepts. Of course, the fifty percent of the graduating student population may indeed be fairly "good" at performing mechanical functions without understanding the rationale behind them—

which may itself be a telling explanation of students' understanding about what math is about or their beliefs about what it means to be good at math.)

Brown et al. (1990) cite one study in which more than half of the university student participants (those enrolled in both first year undergraduate math courses and math teacher education courses) had "at best, a lukewarm attitude towards mathematics" (citing Galbraith, 1984) (p. 643). The same researchers found that the more university students studied math, the less they liked it (citing Galbraith, 1984) (p. 643). Ball's (1990) study (cited by Brown et al., 1990) however, suggests a connection in the opposite direction. She found "considerable variation ["the biggest difference between the two groups" (p. 464)] among the [elementary and secondary] teacher candidates regarding their feelings about mathematics" (p. 461): the elementary candidates were "more anxious and more convinced that they did not know mathematics…. they tended to blame their gaps in knowledge on the arbitrariness of the subject and on their own inadequacies" (p. 464).[162] In contrast, those with more background in math were more confident, calmer and more sure of themselves and their responses, thought mathematical ability was mostly a matter of effort and motivation, and thought math was a body of knowledge (p. 462).[163]

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[162] "substantial variation was apparent between elementary and secondary candidates' responses. Only half of the elementary teacher candidates said that they enjoyed and were good at mathematics; over a third of them felt that they were not good at math and said that they tried to avoid it. In contrast, all of the secondary candidates enjoyed mathematics and thought they were good at it. The secondary candidates all believed they were capable of understanding even 'advanced' math; almost half of the elementary majors believed they were not [yet secondary candidates understood advanced math as calculus and group theory while elementary candidates understood it as algebra and geometry]" (p. 461).

[163] Ball's (1990) study also includes pre-service teachers' feelings about specific mathematical concepts. For example, the researchers found that many pre-service teachers in the study were uncomfortable with or did not like fractions (p. 455, p. 457).

To elaborate the earlier point about the connection between feelings about subject matter and conceptual and Philosophic understanding, Ball (1990) found that:

> teacher candidates' feelings about mathematics and about their own mathematical capabilities were interwoven with how much mathematics they felt they knew, their views of the subject, and what they believed about mathematical ability in general. It is not surprising that the most anxious teacher candidates also had taken the fewest mathematics courses in high school and college and thought of mathematics as a collection of arbitrary facts. They generally also viewed mathematical ability as innate. This combination of ideas was accompanied by intense feelings of dislike, fear and anxiety. (p. 462)

Grouws and Schultz (1996) also note the connection between teachers' limited conceptual understanding of math and an aversion to the subject. Many of the teachers who began the SummerMath program expressed feelings of incompetence and anxiety about math (see also Silverman & Creswell, 1982, cited in Richardson, 1996, p. 108). These teachers were not proficient in mathematics even at the elementary level and understood math as "an inert body of knowledge consisting of facts and rules to be memorized and passed from the expert to the student" and that it was their responsibility to convey these facts to their students (p. 450).[164] While this is a correlational, rather than a causative connection, it is certainly an interesting line of inquiry to pursue in more depth, as Ball (1990) suggests.

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[164] Such an understanding of mathematics seems to be effectively conveyed to students:
Most often, children associate mathematics with certainty, knowing it, and with being able to get the right answer quickly. Doing mathematics is associated with following teachers' rules. Knowing mathematics means remembering and applying the correct rule and having the answer ratified by the teacher. These beliefs are acquired by students through years of watching, listening, and practicing (citing Lampert, 1990) (Grouws & Schultz, 1996, p. 447).

The fact that several of these studies suggest that a significant proportion of math teachers may feel dislike, anxiety and even fear about math and teaching the subject is even more troubling given the results of Evans's (1988, 199) studies: students were often able to discern their teachers' dispositions towards subject matter and tended to share their teachers' conceptions (cited in Armento, 1996, p. 491). Such findings give further weight to the importance of researching students' and teachers' feelings and beliefs about subject matter and investigating how to foster positive feelings towards particular topics and subjects in both teachers and students. One way in which positive feelings might be accomplished is through inservice, as was found with Project TIME (Grouws & Schultz, 1996, p. 451).[165] Another that I discuss in more detail in the following section is through imaginative engagement with subject matter in teacher education.

In other subject areas, the research is far thinner, but any implications are also troubling. Yager and Penick (1990) claim that "most students see their science teachers as information sources" (citing NAEP, 1978; Yager & Bonnstetter, 1984; Yager & Penick, 1986) (p. 663), apparently implying that they see science as an established body of facts, rather than a means of inquiry. One study (Druva & Anderson, 1983) reviewed by Floden and Meniketti (2005) showed a positive relationship between the number of science courses a teacher had taken and students' positive attitudes towards science: the higher the number, the more positive the attitude. A stronger association was found as grade levels increased (p. 268). In social studies, Armento (1996) reported one study (Stodolsky, Salk & Glaessner, 1991) on sixty fifth grade students' (from eleven different classrooms) perception of social studies. These students perceived the subject as a

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[165] Researchers found that both students' attitudes towards math and teachers' confidence in teaching it improved as a result of teachers' participation Project TIME (Grouws & Schultz, 1996, p. 451).

173

"horizontal arrangement of various topics, many of which are approached in a similar fashion." They tended to see social studies as an "enrichment" subject: one that carried less importance than subjects such as math, and so were not concerned about their performance in social studies (p. 491).

Clearly, the imaginative engagement, and more specifically the emotional engagement, of students and pre-service teachers with the subjects and topics of the K-12 curriculum is an area deserving of more extensive research. As Newman (1987) maintains, "changing what we do in the classroom in any meaningful way involves changing attitudes and beliefs" but "before we can change our attitudes and beliefs, we have to know what they are" (p. 736) (cited in Fisher et al., 1996, p. 427). Changes recommended to help an imaginative teacher education program foster this kind of understanding in its pre-service teachers will be made in light of the limited research available to us at this time in this area. Of what we know, we can surmise that a fair number of pre-service teachers who graduate from more typical teacher education programs may have significantly negative feelings towards at least some of the subjects and topics they will be teaching, that their understanding of their students' feelings towards the topics and subjects they will be teaching is also severely limited, and that, in general, teacher educators most likely have very limited understanding of both their pre-service teachers' feelings towards particular subjects and topics, and the feelings of their pre-service teachers' students.

174

4.2.4. Sense of imaginative possibility[166]

Research on pre-service teachers' sense of imaginative possibility would most likely be included in a section on what is commonly referred to in the literature as pedagogical content knowledge, but what I call pedagogical conceptual understanding. In general, this construct is used to refer to teachers' understanding of how to teach specific topics and teachers' acquisition of the necessary abilities to do so. Grossman's (1990) description of pedagogical content knowledge comprises four parts: "knowledge and beliefs about the purposes for teaching a subject at different grade levels"; "knowledge of students' understandings, conceptions and misconceptions of particular topics in a subject matter"; "curricular knowledge… knowledge of curricular materials available for teaching particular subject matter, as well as knowledge about both the horizontal and the vertical curricula for a subject"; and knowledge of "instructional strategies and representations for teaching particular topics" (pp. 8-9).[167] Of her four categories, most relevant to the fostering of pre-service teachers' sense of imaginative possibility are the last two: their understanding of curricular materials available for teaching and of possible instructional strategies and representations effective in fostering students' imaginative engagement, or their understanding of various ways in which numerous cognitive tools can be used for instructional purposes. As I suggested earlier, in an imaginative teacher

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[166] I call this category sense of imaginative possibility rather than resourcefulness, as some authors (e.g. Jagla, 1994) have done because I see the latter as associated with a too limited notion of traditional curricular materials (textbooks, videos, and so on) used in more typical lessons and units. I see a sense of imaginative possibility as encompassing a vaster sense of individual and cultural resources; the development of this kind of understanding would give pre-service teachers actual examples of how one can imaginatively engage with the subject or topic in many contexts, as well as experience with imagining new ways in which they and their students might approach the subject and topic imaginatively.

[167] Shulman and Sykes's (1986) description of pedagogical content knowledge is slightly different and includes: the central topics, core concepts, and skills and attitudes that the topic has the potential to convey to students; challenging aspects of the topic [for students to understand]; and various student perceptions that can inhibit learning (p. 9) (cited in Carter, 1990, p. 305).

education program, pre-service teachers' sense of imaginative possibility might be fostered by their exposure to numerous ways in which subjects and topics are understood and engaged with in a variety of contexts, including in cultural celebrations, the arts community, employment contexts, and so on, as well as in alternative schools or classrooms. One would hope that such exposure, coupled with dialogue about purposes, relevant contextual factors, efficacy etc. as well as the encouragement to experiment with some of these tools and materials in their own planning and teaching might help pre-service teachers develop both a theoretical and a practical sense of imaginative possibility for their own teaching practice.

Many of the reviews consulted for this chapter do contain summaries about studies on teachers' pedagogical conceptual understanding. However, the literature is by no means vast; in fact, Carter (1990) calls it a "neglected aspect of knowledge about teaching" (p. 306) and claims that there is "concern" that pre-service teachers have limited understanding of this domain (p. 305). The existent studies on pre-service teachers' pedagogical conceptual understanding tend to consider things such as whether the teaching and modeling of a particular strategy (such as cooperative learning) in teacher education programs, or more commonly particular courses, affects pre-service teachers' teaching practice in their field experience placement or (more rarely) in the first years of teaching. None of the studies included in the major reviews considered such things as the connections between the teaching and use of particular imaginative practices and principles in teacher education programs, pre-service teachers' subject matter understanding, and their teaching practices (in field experiences and in classrooms), for example. In fact, in the eleven major reviews consulted for this chapter, as well as in the

other significant work (for example, the chapters on the core subject areas in the first and second editions of the *Handbook of Research on Teacher Education*[168]), I found no research that specifically addressed pre-service teachers' exposure to and experimentation with various imaginative approaches to different subjects and topics. One would assume that if such approaches were part of teacher education programs, they would be researched and the findings about their efficacy would be included in such reviews. Alternatively, if pre-service teachers' exposure to and experimentation with imaginative approaches to different subjects and topics was seen as important, but there was no available research, one would assume that reviewers might recommend this as a needed area of research. Unfortunately, neither is any such research reviewed nor mention made of this as a needed area of research in teacher education. The absence of research in this area and recognition of its importance might lead us to conclude that most pre-service teachers graduating from more typical teacher education programs have significantly limited understandings of the imaginative possibilities of the subjects and topics they will teach. Obviously, we must keep in mind the paucity of research findings in this area when we consider, as I do in the next section, how pre-service teachers sense of imaginative possibility might best be fostered.

4.3. Program features that foster imaginative subject matter understanding

In this last section of the chapter, I will explain the ways in which an imaginative teacher education program might be designed to help foster in pre-service teachers the imaginative understandings of subject matter I described in the chapter's opening: deep

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[168] Armento (1996); Banks and Parker (1990); Brown et al. (1990), Coble and Koballa (1996); Fisher et al. (1996); Grouws and Schulz (1996); O'Donnell (1990); Yager and Penick (1990).

conceptual understanding, Philosophic understanding, imaginative engagement, and a sense of imaginative possibility. Or, to use Howey's (1996) terms, the programmatic structures I clarify here emerge from these derivative themes, as well as from the challenges I have just identified in the research literature on pre-service teachers' subject matter understanding. As will become evident, the design features I propose reflect the program principles I derived in chapter three: inquiry, reflexivity, sustainability and reciprocity.

The preceding review of research demonstrates, at least, a lack of evidence that typical teacher education programs are able to adequately develop pre-service teachers' imaginative understanding of subject matter (comprised of their conceptual understanding, Philosophic understanding, imaginative engagement and a sense of imaginative possibility). Where the evidence is somewhat stronger, as in the case of mathematics teacher preparation, it appears to confirm that these programs, indeed, provide inadequate grounding in any aspect of subject matter understanding. It follows that an imaginative teacher education program must incorporate design features that allow for a much more thorough development of the kinds of imaginative subject matter understanding I have described.

In the following section I will consider three primary changes to program design and delivery that will help achieve this goal: replacing methods courses with curriculum courses and implementing the necessary shifts in the courses' focus and time allotment; incorporating various kinds of understanding and the cognitive tools of each in pre-service teachers' teaching and learning; and on-going research about the subject matter understanding of all participants in an imaginative teacher education program. While

most of the changes I recommend could be made at the onset of the program, their implementation is likely to bring about some long-term changes in how schools themselves function. Such potential future changes will be briefly addressed in the final chapter of this thesis.

4.3.1. Curriculum courses

Before concluding that an imaginative teacher education program needs to teach subject matter understanding directly, we might ask whether entrance requirements could be changed to guarantee that potential pre-service teachers begin their programs with the kinds of subject matter understanding that is necessary for them to become effective imaginative educators. By creating more specific entrance requirements, we might succeed in limiting the tasks of the program somewhat. However tempting this option may seem,[169] it is not the panacea we might be searching for. As I explain in more detail in Appendix D, we have no reliable ways of measuring subject matter understanding achieved in courses, whether through GPA or other existing means. Requiring that minimal grades be achieved in particular courses does not seem to guarantee that pre-service teachers have necessary subject matter understanding;[170] as I explained earlier, it seems that many students can excel in university courses without having either rich conceptual or Philosophic understanding of the subject. The authors of *Eight Questions*

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[169] "Observers are tempted to think that the solution is to recruit 'smarter' people into teaching rather than to appreciate the subtle and complex content knowledge required for teaching (and to acknowledge the fact that most adults—not just teachers—find these subject matter questions [mathematical problems used in research to assess teachers' subject matter and pedagogical conceptual understanding] given to teachers difficult to answer)" (Ball et al., 2001, p. 449).

[170] For example, one student with a high GPA could be a graduate of an institution that provided an inferior education in comparison to another student, with a lower GPA, from an institution that provided a superior education. In addition, students may be able to take easier courses to raise their GPA to gain admission to teacher education programs (*Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question Six, Significance of the Question, p. 2).

on Teacher Preparation (2003) suggest that "raising GPA requirements does not necessarily ensure more talented teacher candidates" (About the Eight Questions, Question Six, Significance of the Question, p. 2) and that the evidence for whether setting more stringent entrance requirements or conducting more selective screening of program candidates will ensure that prospective teachers are more effective is "inconclusive" (A Summary of the Findings, p. 5).[171] Similarly, the authors of *Eight Questions on Teacher Licensure and Certification* (2005) claim that there is only "limited evidence" to suggest that more rigorous program selectivity produces greater teaching effectiveness" (p. vii).[172] While Wilson and Floden (2003) do suggest that raising admission standards would improve the academic quality of prospective teachers, they also warn that since there is "limited research in this field… much more research needs to be done before policy makers can safely assume that we know how admissions standards are related to ensuring higher quality in the teaching force" (p. 25).[173] Wilson et al. (2002) add that the evidence for mandating additional coursework or requiring a subject matter major is "thin" (p. 197).

Perhaps a more compelling possibility is to implement entrance exams, require portfolios or conduct interviews to guarantee pre-service teachers have adequate subject matter understanding before they begin their teacher education. The authors of *Eight*

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[171] It should be noted that two of the three studies that dealt with this question did find a correlation between the strength of teachers' academic success and increased student achievement. The third study suggested that raising admission standards would make the pool of teacher candidates, especially for minority teachers, reduced (A Summary of the Findings, p. 5).

[172] Gess-Newsome and Lederman (1993) also raise the possibility that simply requiring more subject matter background for pre-service teachers could, in fact, increase the strength with which their subject matter structures are "typified by linear relationships among fragmented and isolated concepts" (p. 42); in other words, minimize the likelihood of candidates having Philosophic understanding of their subject.

[173] The reviewers also note that raising admissions standards would also "exacerbate already existing problems with teacher supply and minority representation in the teaching force" (p. 25).

Questions on Teacher Preparation (2003) claim that entrance exams or portfolios are "the most surefire way to determine competence" (About the Eight Questions, Question One, Quick Answer, p. 2). This option clearly has its appeal: for example, thorough entrance exams and interviews and effective portfolio requirements might help clarify which potential teacher education candidates have the conceptual and Philosophic understanding (if not the imaginative engagement with topics and sense of imaginative possibility about how subjects and topics might be taught) needed for effective teaching. However, such a policy may be problematic in that it would seem likely to eliminate a large number, and perhaps even the majority, of the candidates who are presently accepted into teacher education programs. A more viable option, and one that I advocate, is to attempt to develop the kinds of subject matter understanding required to imaginatively and effectively teach the K-12 curriculum *within* teacher education programs. A similar recommendation is also made by Betts and Frost (2000) who suggest that we need to pay more attention to the background knowledge of candidates entering teacher education programs *as well as* emphasize both subject matter understanding and pedagogical understanding in such programs (p. 39).

How might this best be done? Methods courses, which have traditionally been the place for pre-service teachers to become familiar with and/or review the K-12 curriculum and learn various methods for teaching it, will need to be substantially reconfigured, in terms of both their focus and the time they are allotted. Indeed, since they will no longer be dedicated to teaching pre-service teachers various methods for teaching K-12 concepts that they already (supposedly) understand, these courses should no longer be called 'methods' courses at all. They might more appropriately be called 'science education,'

181

'math education,' and so on, or simply curriculum courses.[174] Many, if not most, pre-service teachers in an imaginative teacher education program will need much richer subject matter understanding than they are likely to have upon program entry; the development of this understanding, and the engagement of their imaginations in the process, will be the focus of these new courses.

Obviously, teacher educators teaching these curriculum courses cannot assume that pre-service teachers' adequate performance of the procedures and apparent knowledge of the concepts of the K-12 curriculum provides a good indication of their conceptual understanding. Teacher educators will need to pay close attention to pre-service teachers' conceptual understanding and make deliberate attempts to develop it in these curriculum courses. This means that the focus of these courses will need to be on depth more than on breadth of coverage of the concepts of the K-12 curriculum (as tends to be the case in methods courses in more typical teacher education programs).[175] [176] [177]

Curriculum courses that focus on pre-service teachers' development of deep subject matter understanding (depth) rather than on breadth and their acquisition of application skills will also need to help pre-service teachers develop their Philosophic

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[174] Unlike 'math education' or 'science education' courses, curriculum courses might allow for a greater degree of cross-curricular thinking and planning for teaching (e.g. cross-curricular lessons and units organized thematically).

[175] The recommendation that programs attempt to familiarize pre-service teachers with all, or at least a good deal of, the topics of the curriculum they will teach is still a popular one (for example, see Betts & Frost, 2000, p. 39).

[176] The more common focus on breadth over depth has most likely been based on the erroneous assumption that pre-service teachers have adequate understanding of the key concepts of the subjects they will teach, and so simply need to learn various methods for teaching these concepts.

[177] With the assumption that pre-service teachers have the necessary subject matter understanding (and need to focus on how to teach the concepts to future students) may also come the assumption that pre-service teachers have the same story of the subject matter—believe in its value and understand, or at least function according to, its central paradigms. Such assumptions may fuel the further assumption that the development of Philosophic understanding of subject matter is not necessary in teacher education.

understanding of subject matter.[178] One way in which this might be done is by continual reflection on subject matter structures; Gess-Newsome and Lederman (1993) suggest that pre-service teachers continually reflect on their subject matter structures (for example, several times in a full-year course) to help them gain a clearer sense of the components of their subject area (the topics taught), the relationship between them, and the themes or meanings of the subject (to themselves and their students, and in the wider cultural context, and so on) (p. 43).[179] Pre-service teachers' Philosophic understanding of subject matter can also be fostered by reading and discussing research and theory that highlights different stories of the subject and topics, from various personal, cultural, historical, and artistic perspectives.

These curriculum courses will also need to foster pre-service teachers' imaginative engagement with the K-12 curriculum. We can assume that many pre-service teachers will have at least some negative feelings towards particular subjects and topics. A goal of these courses will be to replace a significant proportion of negative feelings with more positive ones. Pre-service teachers will also need a rich sense of the potential to imaginatively engage themselves with any topic. While it is impossible that all pre-service teachers will be emotionally engaged in all topics at all times, teacher educators should strive to engage pre-service teachers' imaginations, and necessarily their

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[178] Clearly, there is likely to be a wide range in each of the four components of pre-service teachers' subject matter understanding. As I explained earlier, the research suggests that few pre-service teachers have Philosophic understanding of their subject matter. We might assume that the majority of pre-service teachers would have a somewhat Romantic understanding of their subject; it is also entirely possible that at least some pre-service teachers may have Mythic understanding of their subject (or some of its constituent topics).

[179] The authors do not suggest that it was only the reflection on subject matter structures that caused the transformations in study participants' Philosophic understanding—they claim that other important influences were student teaching and (science) education courses—in which pre-service teachers were enrolled at the same time (and which also directly addressed the Philosophic understanding of science) (p. 38).

emotions, as much as possible. In order to increase their own reflexivity, teacher educators should also, fairly frequently, clarify for pre-service teachers the ways in which they attend to feelings and beliefs in how they structure and teach their own lessons and units. Teacher educators should acknowledge when pre-service teachers' engagement is minimal, and make explicit their attempts to re-engage their pre-service teachers' imaginations in other ways. Explicitly addressing pre-service teachers' imaginative and emotional engagement[180] does not mean that classes turn into counseling sessions where the expression of personal feelings consumes most of the class; rather, consideration of feelings and beliefs should be clearly related to pre-service teacher learning. Such reflexivity can benefit pre-service teachers in numerous ways, including helping them understand themselves as teachers more thoroughly, giving them a range of ways in which their own and their students' feelings and beliefs can be clarified and changed, and increasing their understanding of the complexity of imaginative practice.

Curriculum courses will also need to focus on pre-service teachers' understanding of the importance of students' imaginative, and affective, connections with the curriculum. There are numerous ways in which this might be done. For example, pre-service teachers might read literature about common student responses to particular topics and subjects and the role of feelings and beliefs in learning. Pre-service teachers do not need to understand common student responses to all topics; rather, the goal is for them to gain a sense of both particular feelings and beliefs of individuals and the fundamental nature of feelings and beliefs to learning. During field experience, pre-

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[180] Teacher educators can elicit information directly and indirectly from pre-service teachers about their feelings and beliefs about the K-12 curriculum as well as help pre-service teachers more thoroughly understand and articulate their own feelings and beliefs.

service teachers might interview their students to clarify their feelings and beliefs about particular topics and subjects they are teaching, and to determine the kinds of things that tend to emotionally engage students at various ages. Pre-service teachers might also consider other ways in which students' feelings and beliefs about subject matter can be determined. Teacher educators should discuss with pre-service teachers their students' feelings and beliefs about subject matter, various ways in which pre-service teachers can ascertain them and how pre-service teachers attempt to imaginatively engage their students in the subject matter. Again, this kind of reflexivity can increase pre-service teachers' understanding of their own practice and of the centrality of the imagination and emotions in teaching and learning.

Teacher educators can also encourage pre-service teachers' consideration of the role of the imagination and emotions in learning by discussing various explanations for common student responses to subjects and topics. Pre-service teachers might have internalized the popular belief that negative feelings towards particular topics and subjects are somewhat unavoidable and that teachers can do little to change this reality. An imaginative teacher education program will encourage pre-service teachers to inquire into beliefs such as these and to consider various explanations for students' negative feelings and beliefs about subject matter. For example, negative feelings towards particular topics and subjects may be due, at least in part, to students' lack of emotional engagement in their past experience with the subject or various topics in the subject, a missing sense of the story of curricular units, or past teachers' failure to use appropriate cognitive tools to effectively engage students' emotions and appeal to, and further develop, their predominant kind of understanding. Pre-service teachers in an imaginative

teacher education program may also be encouraged to consider various explanations for why particular concepts, topics and subjects are considered important; in other words, the development of Philosophic understanding of subject matter, and in this case the consideration of various forms of justification, may also help pre-service teachers themselves gain new feelings about particular topics and subjects, as well as increase their belief that students can develop more positive feelings towards the curriculum.

Curriculum courses will also need to attend to the development of the fourth component of imaginative subject matter understanding: pre-service teachers' sense of imaginative possibility. Pre-service teachers might gain a greater sense of the range of possibility for how subjects and topics might be imaginatively taught if these curriculum courses included a visitation component in which pre-service teachers observed many kinds of teachers using imaginative principles and practices in various learning contexts. Ideally, these visitations would occur regularly throughout the year and would reflect a wide range of imaginative learning situations, including cultural and artistic centres, natural settings, alternative schools, as well as public school classrooms. Because we would want such experiences to give pre-service teachers a rich source of imaginative possibility, the more and greater the variety of these visitations, the better. Such visits would likely be most beneficial if, before visitations, pre-service teachers are given an opportunity to learn about the context in which the lesson is situated: the practicing teacher's understanding of subject matter, and specifically, of the topic being taught; her or his perceptions of and relationship with the students; his or her perceptions of imaginative education, and his or her goals for the lesson or unit, and so on.[181]

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[181] This could be communicated either in person or by text.

186

Afterwards, the teacher could be invited to discuss the lesson with the pre-service teachers to reflect on its efficacy, the students' imaginative engagement, how it might be made more effective, etc. Such visits could help to broaden pre-service teachers' repertoire of imaginative possibilities for the subject and topic, develop their understanding of the complexity of imaginative education, and help them understand the important relationships between theory and practice. The teacher educators teaching these courses should ensure that pre-service teachers experience and understand the wide range of cultural resources that can be drawn upon in imaginative teaching. Therefore, these courses should be full of a rich array of resources, with pre-service teachers' attention being continually drawn to their potential to help develop imaginative understanding of subject matter.

Of course, there are also drawbacks to my recommendation that methods courses be replaced with curriculum courses that focus on depth over breadth of subject matter understanding. One potential limitation is that such a focused approach could leave pre-service teachers unfamiliar with many topics of the curriculum they are to teach, for which they may not have rich subject matter understanding. Beginning teachers typically have many stresses in their first years in the classroom; it may be overwhelming for such teachers to have to familiarize themselves with concepts they will be responsible for teaching (and on which their teacher education program has not focused) as well as to plan and teach these topics imaginatively. As I suggested earlier, it seems that the current norm is for pre-service teachers to have familiarity with, but largely mechanical understanding of, most of the K-12 curriculum they will teach. I believe that pre-service teachers' experience of attaining strong subject matter understanding about a smaller

number of topics, by way of a course that focuses on depth over breadth, is more likely to inspire their later acquisition of such understanding in new areas as well as to support their use of imaginative principles and practices in units and lessons they develop later in their career. To help support these beginning teachers, an imaginative teacher education program could aim to continue its relationship with them at least a few years into their practice, to offer peer support, teaching resources, unit ideas, and so on as they develop and implement new imaginative units and lessons. Helping new teachers develop rich subject matter understanding in new curricular areas is one way in which an imaginative teacher education program can manifest the principle of sustainability.

In an ideal situation, these curriculum courses would be allotted significantly more time than they are at present. More time would obviously allow pre-service teachers greater opportunity to more thoroughly develop their subject matter understanding. More time would also make the breadth versus depth argument a moot issue: teacher educators would likely be able to teach at least as many concepts and topics as are now covered in more typical methods courses, but be able to do so in ways that more thoroughly develop all four components of pre-service teachers' subject matter understanding. Yet even given present time constraints, teacher educators will be able to help foster pre-service teachers conceptual understanding, Philosophic understanding, imaginative engagement and sense of imaginative possibility for subject matter in these curriculum courses not by simply trying to teach more, but by teaching differently. Specific ways in which teacher educators' pedagogy can foster pre-service teachers' rich subject matter understanding is the second design feature that I will describe shortly.

Clearly, teacher educators will need a sense of the conceptual understanding, Philosophic understanding, kind and depth of imaginative engagement, and sense of imaginative possibility that individual pre-service teachers have about particular subjects and topics in order for those teacher educators to effectively support the development of pre-service teachers' imaginative understanding of subject matter. In other words, assessment is central to the process of effective development of imaginative understanding of subject matter, both upon program entrance and throughout the duration of the program. Pre-service teachers should be included in significant ways in the assessment process. Making assessment explicit will help to foster pre-service teachers' Philosophic understanding, increases program and participants' reflexivity and is likely to foster increased reciprocity.

4.3.2. Teaching and learning with various kinds of understanding

I argued in chapter three that an imaginative teacher education program needs to foster and help keep various kinds of understanding alive in pre-service teachers, as well as support pre-service teachers' ability to foster and keep alive these kinds of understanding in their own students. In chapter two, I explained Egan's suggestion for the ways in which units can be structured to best foster different kinds of understanding, which he summarizes in the form of 'frameworks' designed to guide teachers in their planning of imaginative units and lessons. The integration of these frameworks and the accompanying cognitive tools in the curriculum courses is the second key design feature

that will help pre-service teachers develop imaginative understandings of subject matter

and simultaneously help them keep various kinds of understanding alive.[182]

Pre-service teachers should have experience with the full range of imaginative

frameworks because they will encounter, and seek to develop, an equally wide range of

understandings among the diverse populations of learners in a typical school setting. This

means that during their field experiences and later when they are teaching in their own

classrooms, pre-service teachers should be able to use cognitive tools of more than one

kind of understanding in any given lesson or unit. If they are given this experience as part

of their curriculum courses, pre-service teachers are likely to gain increased pedagogical

flexibility (for example, an ability to use different stories and tools to engage different

students in the topic), and improved confidence in their ability to plan and teach

imaginatively and so meet the needs of a diverse student population, including the needs

of those students who are functioning below or beyond grade level. Such a practice will

allow future elementary teachers to become familiar with and reflect on ways concepts in

the early grades relate to more complex concepts at later grades and how these concepts

might best be taught;[183] prospective middle school teachers to consider relationships

between earlier and later related concepts and topics and various stories for them; and

future secondary teachers to understand where concepts in the high school curriculum

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[182] Ball et al. (2001) similarly suggest that pre-service teachers might be helped to more thoroughly understand subject matter, or "untangle the… complexities" that arise in a typical lesson, by experiencing both an outstanding lesson on the subject (as students) in addition to extending and making more explicit the central concepts underlying the lesson (p. 443).

[183] For example, the relationship between writing sentences, paragraphs and essays. This is not to suggest, of course, that elementary and middle school students do not write stories and arguments, etc. but that, conceptually, the notion of a complete thought in a sentence (with its constituent parts of a subject and predicate) is related to a developed paragraph (with a topic sentence, body and closing sentence) which further expands to the essay (with its introductory paragraphs, body paragraphs and conclusion).

have their origins and various imaginative ways in which these concepts might be effectively taught.

Teaching and learning using various frameworks and the cognitive tools of each will help foster in pre-service teachers the first component of imaginative subject matter understanding: conceptual understanding. Developing and teaching lessons and units using various frameworks and their accompanying cognitive tools will help pre-service teachers develop deep conceptual understanding of the topic they are investigating. Creating an effective story for a unit or lesson is difficult, if not impossible, without adequate understanding of the concepts fundamental to the topic; a mechanical understanding might help one teach rules and procedures, but it will do little to clarify what, about a particular topic, is wonderful, mysterious or powerful, help one select (and therefore employ appropriate criteria in the assessment of) learning experiences that will help students to understand the curriculum's story, or assess whether such understanding has been achieved. Teacher educators may have to teach particular concepts or pre-service teachers may have to engage in independent or group research to gain adequate understanding of the concepts fundamental to the topics they will plan and teach. These lessons and units should be shared with and critiqued by classmates and the teacher educator. The process of researching, creating, teaching and critiquing imaginative units based on the concepts in the K-12 curriculum, then, will help pre-service teachers acquire, or refine, conceptual understanding that they may not already have, but that is fundamental to adequate imaginative subject matter understanding. Similarly, pre-service

teachers' experience of effective imaginative lessons taught by teacher educators should help them gain richer conceptual understanding of subject matter.[184]

The second component of subject matter understanding, Philosophic understanding of subject matter, will also be fostered by pre-service teachers' and teacher educators' teaching using various frameworks and their accompanying cognitive tools. Pre-service teachers will need to reflect on the imaginative units and lessons they have planned and taught, as well as those planned and taught by others, including the teacher educator; they will need to consider (and discuss with others) the lessons' or units' degree of success in imaginatively engaging learners, the value of the particular concepts to be learned and appropriateness of cognitive tools chosen, and the validity of the chosen meaning, or story, of the topic, and so on. Consideration of such issues requires contemplation about relationships between various concepts, judgment about which stories of particular subjects and topics are most ideal in various contexts, as well as explicit justification for such decisions. In other words, this kind of reflection and critique requires, and so gives pre-service teachers good opportunity to develop, their Philosophic understanding of subject matter.

Teaching and learning by way of various frameworks, and the cognitive tools of each, will clearly help develop the third component of imaginative subject matter understanding: pre-service teachers' imaginative engagement with topics and subjects. Creating and teaching imaginative lessons and units based on the frameworks requires that pre-service teachers clarify what about the topic is wonderful, puzzling, beautiful,

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[184] This would help pre-service teachers develop what Ball et al. (2001) describe as "a refined and explicit understanding of the meaning of the topic being taught" (p. 438).

and so on; in other words, in order to create effective imaginative lessons or units, pre-service teachers will need to clarify their own feelings about the topic, and, if those feelings are negative, find ways in which they can re-envision the topic in a way that is based on authentic engagement. Imaginative teacher educators will attempt to increase their pre-service teachers' engagement with the topics and subjects that those teacher educators teach, be aware of pre-service teachers' imaginative engagement (or lack thereof) with the lessons and units the teacher educators teach, and encourage pre-service teachers to become increasingly attentive to their own and others' imaginative engagement, all of which are likely to increase pre-service teachers' imaginative engagement and awareness of imaginative engagement with subject matter—both in themselves and their students.[185]

The fourth component of imaginative subject matter understanding, pre-service teachers' sense of imaginative possibility for how particular subjects and topics might be taught, will also be fostered by teaching and learning using various frameworks, and the cognitive tools of each. Obviously, when pre-service teachers experience imaginative lessons and units taught by teacher educators they will gain a greater sense both of the various ways in which these topics might be imaginatively taught and also of effective resources that might be utilized therein. Similarly, in their own planning and teaching of imaginative lessons and units, pre-service teachers will gain awareness of the rich array of resources that they might use in different contexts and for various students, and experiment with various ways in which particular topics might be taught imaginatively. Both Jagla (1994, p. 88) and Fettes (2005b, p. 7) suggest that one possible challenge to

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[185] We would expect that pre-service teachers' understanding of their students' imaginative engagement with subject matter will be significantly developed during the field experience.

pre-service teachers' imaginative planning and delivery of curriculum may be their lack of confidence in their own subject matter understanding;[186] indeed, another may be their limited exposure to a range of imaginative possibilities.

Of course, one topic can be taught in several imaginative and effective ways. In the process of creating and critiquing—both their own and others'—lessons and units, pre-service teachers will need to determine the fundamental concepts of a topic and how best to teach it to particular students in specific contexts. In doing so, pre-service teachers will need to consider at least two (and hopefully more) imaginative aspects of the topics. Such consideration might also foster contemplation about various stories of the subject area itself. As the course progresses and pre-service teachers gain more experience creating and critiquing imaginative lessons and units, their conceptual and Philosophic understanding of the subject should deepen. In addition, as they have more opportunities to experience the wonder, beauty and mystery of various topics, their feelings and beliefs about the subject matter in general and in particular curricular areas may become more positive (as well as their belief in the potential of their students to become imaginatively, and therefore emotionally, engaged). In other words, we would expect that all four of the components of pre-service teachers' imaginative understanding of subject matter will

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[186] Ball (1990) noted that the pre-service teachers in her study were not aware that their subject matter understanding was inadequate. As pre-service teachers gain deeper subject matter understanding, and thus more confidence regarding it, their ability to take intelligent planning and pedagogical risks will most likely increase. (In other words, the acquisition of pre-service teachers' deeper subject matter understanding is likely to enhance or improve their pedagogical conceptual understanding.)

develop over time and will deepen given pre-service teachers' continual opportunities to explore it.[187]

Some researchers have suggested that pre-service or beginning teachers need to develop strong management skills before they can attend to subject matter understanding. I see the relationship as somewhat more dialogical. More confidence in one's teaching clearly allows one to focus more on student learning and less on technical or strategic issues in the classroom. Interestingly, rich subject matter understanding tends to foster more confidence and may enable one to be better at classroom management. With increased confidence in oneself as a teacher and in one's understanding of subject matter may come a greater flexibility in considering how students conceptual understanding can best be fostered, a better ability to attend more closely to students' interests, strengths and weaknesses, as well as a wider variety of strategies to draw on—in short, a greater ability to engage students more fully—so that management concerns naturally diminish.[188]

4.3.3. Research on subject matter understanding

A program that aims to develop the kinds of subject matter understanding I have described, and one that is based on the principles of inquiry, reflexivity, sustainability and reciprocity should make research on subject matter understanding an integral feature of

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[187] This is, of course, not likely to be a speedy process. As Grossman (1990) suggests, "If the focus of subject-specific methods courses is on innovative practices, the courses will need to overcome the knowledge and beliefs teachers have already developed though the apprentice of observation" (p. 16).

[188] However, one can clearly have strong subject matter understanding and limited pedagogical understanding or pedagogical conceptual understanding and still be weak at classroom management. In other words, strong subject matter understanding may be a necessary but not sufficient condition for good management by an effective educator. (A teacher with limited subject matter understanding could conceivably have few management concerns for other reasons. For example, while most people would not consider a teacher who impressed her or his students with charm and humour to be educating effectively, such an individual may indeed have minimal issues with management.)

its design and implementation.[189] Because the curriculum courses I have proposed will be attempting to develop a kind of subject matter understanding that is barely hinted at in the literature, these courses, and the pre-service teachers who take them and the teacher educators who teach them, will have the potential to contribute something new and valuable to our understanding. An imaginative teacher education program should attempt to make research on subject matter understanding as comprehensive as possible, investigating the perspectives and experiences of all participants, and doing so on a continual basis. Good documentation is a necessity to effective research: a database on such courses could be developed using various on-line tools. Continual assessment by individual participants and others, as I suggested earlier, is both a key data-gathering tool as well as a pedagogical necessity. There are three key times during which research should be conducted: during the curriculum courses themselves, during pre-service teachers' field experiences, and once graduates have entered the profession. I will briefly address some of the key issues that will need to be attended to during each of these phases of the research.

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[189] Obviously, researchers should attempt to avoid the many problems suffered by much of the research on teacher education in general (as described at the beginning of Part Two of this thesis) and subject matter understanding in particular (as described at the beginning of this chapter). For example, researchers will want to search for disconfirming evidence. One way in which this might be done is to attempt to systematically investigate such things as the way in which the program reinforces more typical understandings of subject matter, ways in which pre-service teachers do not gain a richer sense of subject matter as a result of their teacher education, ways in which the feelings and imaginations of learners are overlooked or disvalidated, and so on. Researchers will also want to pay close attention to the role of context in subject matter understanding. For example, contexts such as the backgrounds of pre-service teachers, the values and atmosphere of the institution in which an imaginative teacher education program exists, the particularities of various teacher educators' instructional styles, values, personalities, and so on, the field placement context (including overall values and atmosphere of the school and community, instructional styles, values, personalities of cooperating teachers and supervisors), as well as the particular subjects, topics and grades in which subject matter teaching and learning is investigated should all be examined and included in research findings. Researchers should similarly make concerted efforts to avoid the other common limitations described earlier.

Clearly, the program will want to conduct research on pre-service teachers'

subject matter understanding upon program admission. Gaining a portrait of pre-service

teachers' entering conceptions of subject matter is necessary to map any changes that

might occur as a result of particular course or program influences. Initial subject matter

understanding (and its possible origins) can be assessed in a variety of ways, by both pre-

service teachers themselves and others, using interviews, written responses to research

questions, tests, subject matter structures, and so on. The initial subject matter

understanding of teacher educators will also need to be investigated, especially those

teaching the curriculum courses, but, ideally, all those participating in the program. Data

about teacher educators' subject matter understanding (and its possible origins) can be

collected using similar sources and should be comprised of both the self-reports of the

teacher educators as well as the observations and interpretations of others who work,

teach and learn from and with them (researchers, other teacher educators, subject matter

specialists and pre-service teachers). As the courses and the program progress, it will be

important to continue to collect information about the subject matter understanding of

both pre-service teachers and teacher educators, and map both changes as well as

potential sources of any changes. As pre-service teachers begin to use the principles and

practices of imaginative education, researchers (as well as pre-service teachers and

teacher educators) will be able consider how pre-service teachers manifest their subject

matter understanding in their planning, teaching and critiquing of imaginative lessons and

units; obviously, researchers will also want to determine teacher educators'

manifestations of their subject matter understanding in their teaching practice as well

(and include their own and their pre-service teachers' perspectives on this). Research on

pre-service teachers' and teacher educators' subject matter understanding should also include their (and others') interpretations of the relationships between the various components of subject matter understanding, subject matter understanding and pedagogical understanding and various program activities and components, and so on.

The second key time during which subject matter understanding should be investigated is during pre-service teachers' field experiences. Researchers (including pre-service teachers researching themselves) will want to consider how pre-service teachers' subject matter understanding might develop as a result of encountering the dynamics of real classrooms and the challenges of teaching real students. Specifically, the relationships between pre-service teachers' subject matter understanding and their pedagogical conceptual understanding is worthy of investigation. Cooperating teachers play an important role in the pre-service teachers' field experience and can influence them in significant ways. Because of this, it is essential that an imaginative teacher education program also research the subject matter understanding of cooperating teachers. Both pre-service teachers' and cooperating teachers' subject matter understanding should be assessed continually during the field experience; it is possible that the experiences of working together in the planning, teaching and assessment of imaginative lessons and units might bring about changes in pre-service teachers' and/or cooperating teachers' subject matter understanding. An imaginative teacher education program will also want to investigate the subject matter understandings of students taught by imaginative pre-service teachers during their field experience. Important questions that deserve investigation about students and their learning include: Does the experience of imaginative education help students conceive of particular topics in the subject matter

and the subject matter itself in a richer and more affectively satisfying way? Does their achievement improve: do they have richer conceptual understanding, Philosophic understanding, and a greater sense of imaginative possibility about the subject? How do the students characterize their relationships with the pre-service teacher and the cooperating teacher and how might this impact their subject matter understanding?

Subject matter specialists' understanding of subject matter should also be researched. Their understandings are useful against which to compare the subject matter understandings of other program participants, especially those of pre-service teachers. As I explained earlier, curriculum courses should have a visitation component in which pre-service teachers observe and discuss various ways in which a wide range of people understand and teach subject matter; these individuals might be artists, professors, professionals, and community members who use their subject matter understanding in their work. To the degree that they participate in the investigation of subject matter understanding in an imaginative teacher education program, and help pre-service teachers and others develop deeper conceptual understanding, Philosophic understanding, imaginative engagement and a sense of imaginative possibility, subject matter specialists should be included in research, in ways similar to those I have described for the other participants. Obviously research on subject matter specialists should occur at the onset of their involvement in the program as well as throughout, to map any potential changes that might have occurred as a result of their participation in the program.

The third key time during which research on subject matter understanding should be conducted is once pre-service teachers have entered the profession.[190] Researchers will want to investigate how pre-service teachers' subject matter understanding may be influenced by or altered as a result of teaching practice (as well as how such understandings may influence teaching practice). Ideally, this research would be on-going; however, it seems that the first few years are especially important to monitor.[191] Collection of longitudinal data could help map the possible long-term effects of an imaginative teacher education program on teachers' understanding of subject matter. Research conducted on practicing teachers should also investigate their professional development and investigate the kinds of support that graduates require as they begin their teaching practice, how the program, school and community can best challenge and support the development of their imaginative teaching practice, and so on. The program's commitment to both supporting its graduates and researching how it might do so most ideally manifests the program principles of sustainability and reciprocity.

The program will also want to consider doing more longitudinal research on cooperating teachers who continue with the program. In the program's early years, there is likely to be a fair number of cooperating teachers who will be somewhat new to imaginative education; they may, at least initially, have more typical understandings of subject matter. We might assume that cooperating teachers' involvement in the program and in working directly with pre-service teachers and teacher educators may help them

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[190] It is rare for change research to follow graduates into their classrooms to investigate how their understandings shift once they have become practicing professionals.

[191] See Barone et al. (1996) for a discussion of teachers' process of professional development and an explanation of why the first few years of teaching tend to involve a great deal of professional growth (pp. 1131-1133).

develop a richer understanding of both imaginative education and subject matter. The program will want to map any changes in cooperating teachers' understanding and practice, and the understandings of their students, consider how cooperating teachers' understanding might impact both pre-service teachers and their students and include their perspectives on program strengths and weaknesses, recommendations for change, and so on. Of course, after several years, the profile of imaginative cooperating teachers is likely to change: those who continue to mentor imaginative pre-service teachers will most likely have deeper, and perhaps more varied, understanding of their own practice, subject matter and imaginative education. Longitudinal research on cooperating teachers' subject matter understanding will also need to be conducted on any graduates of an imaginative teacher education program who may choose and be selected to become cooperating teachers in the program. Researching this process, its efficacy, and the perspective of imaginative teacher education graduates who go on to become imaginative cooperating teachers will also be important to investigate.

Because an imaginative teacher education program is likely to evolve over time, as the results of research suggest changes in direction for policy and practice, the kinds, extent and focus of research will also likely evolve somewhat. Because of this, future emergent research may look quite different than what might be necessary or ideal for a program in its infancy. While securing funding for such research often seems to be a challenge, the widespread identification of both pre-service teachers' limited subject matter understanding and the need for research on how to better develop it may be convincing reasons for why research in an imaginative teacher education program—one that has serious potential for significantly deepening the subject matter understanding of

its graduates and determining how this might best be done in other programs as well—deserves to be adequately funded.

4.4.   Chapter summary

This chapter was the first of three in the second part of the thesis—that which focuses on the three cornerstones of teacher education: understanding of subject matter, pedagogy and contexts. I began this chapter by describing the kinds of understanding of subject matter needed by pre-service teachers in an imaginative teacher education program. I argued that imaginative subject matter understanding is characterized by deep conceptual understanding, Philosophic understanding of the subject area, understanding of one's own and one's students' imaginative engagement with topics and the subject matter, and a sense of imaginative possibility for how topics and subject might be taught. I then reviewed the recent teacher education research literature to ascertain what kind of understanding of these four components graduates of more typical teacher education programs tend to have, and concluded that, despite less than exhaustive literature, enough evidence exists to suggest that graduates of more typical teacher education programs tend to have significantly limited understanding in all four of these aspects of subject matter understanding. Finally, I outlined three main program design features that I consider central to fostering in pre-service teachers an imaginative understanding of subject matter: replacing methods courses with curriculum courses that aim to develop pre-service teachers' conceptual understanding, Philosophic understanding, imaginative engagement and sense of imaginative possibility; pre-service teachers' teaching and learning using various kinds of understanding and the cognitive tools of each; and

comprehensive and continual research about the subject matter understanding of all

participants in an imaginative teacher education program.

CHAPTER 5: PRE-SERVICE TEACHERS' PEDAGOGICAL UNDERSTANDING

In this chapter, I consider the second cornerstone of teacher education, pedagogical understanding. I begin by briefly describing pedagogical understanding and the kinds of courses offered in more typical programs that aim to foster pre-service teachers' pedagogical understanding. I then describe the kinds of understanding of pedagogy ideally developed by pre-service teachers in an imaginative teacher education program, or, to use Howey's (1996) term, I clarify the derivative themes of imaginative pedagogical understanding. Next, I examine the research to consider what we know about the kinds of pedagogical understanding we might say pre-service teachers tend to gain in more typical teacher education programs. Finally, I suggest key design features, or outline the programmatic structures (Howey, 1996), of an imaginative teacher education program that will foster in pre-service teachers the kinds of imaginative pedagogical understanding I suggest are ideal.

Pedagogical understanding is understanding of learning and teaching. Pre-service teachers are not usually expected to have taken courses on teaching and learning prior to program admission. However, they inevitably have ideas about teaching and learning and how children's development occurs—ideas both based on their own experiences in schools and universities (as students and as observers of numerous teachers), as well as gleaned from popular culture (see Lortie, 1975). In other words, while teacher education program attempt to help pre-service teachers develop their pedagogical understanding,

they also must contend with the fact that teacher candidates begin programs with some notions of what pedagogy entails, even if those notions are not well developed.

Teacher education programs require that pre-service teachers take specific courses to develop their pedagogical understanding. Typically required courses include introductions to teaching and learning, educational psychology, courses on assessment and evaluation, and management.[192] These courses tend to be fairly broad in focus; for example, they might address child development and the related teaching approaches and activities for learning at various ages. In contrast, how theories of child development apply to particular subjects and topics at various grade levels is more likely to be considered in methods courses.

In courses such as those listed above, pre-service teachers will be introduced to a range of general pedagogical ideas and strategies. Pre-service teachers generally learn particular teaching strategies that are considered relevant to learning at various ages and in various subject areas. However, the ideas and strategies they encounter are not limited to those taught in courses that focus specifically on developing pre-service teachers' pedagogical understanding; pre-service teachers will also encounter various manifestations of pedagogy throughout the program, including in school visits and in field experiences. Some examples of "core [pedagogical] abilities" that are considered

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[192] As I explained in the introduction to Part Two of the thesis, one could also consider courses such as the history of education, sociology of education and philosophy of education (generally categorized as foundations of education courses) as developing pedagogical understanding, depending on how they are taught. (For example, in a constructivist program, if a history of education course were organized in such a way that pre-service teachers were encouraged to understand how various historical traditions led to the development and acceptance of constructivism, one could argue that this might reinforce the pedagogical understanding gained in courses such as educational psychology and assessment, and thus be considered a historical/ philosophical justification of pedagogical understanding espoused by the program.)

"transcendent in their applicability"[193] are "staples of direct instruction from overview, advance organizers, and introduction to soliciting feedback and summarizing," "active listening, appropriate wait time, clarifying and extending an idea, paraphrasing, and perception check" (Howey, 1996, p. 156).[194] Examples of other "more encompassing" pedagogical strategies that pre-service teachers may learn that "can be pursued thematically over time… in a number of contexts and with a variety of topics" (p. 156) include cooperative learning and reciprocal teaching (p. 156).

Additionally, because they are themselves also students, pre-service teachers are exposed to particular kinds of pedagogy in their teacher education programs; the pedagogical understandings enacted in the program and by specific teacher educators can also influence pre-service teachers' pedagogical understanding. In the section following the immediate one that explains the kinds of pedagogical understanding needed by imaginative educators, I explore the kinds of pedagogical understanding pre-service teachers tend to gain as a result of participating in more typical teacher education programs. There, I consider research that explores these various ways in which pedagogical understanding may be developed in teacher education programs: by pre-service teachers taking particular courses, experiencing and using teaching and learning strategies in various aspects of their program, and by the pedagogical understanding they experience themselves as students enacted in the pedagogy of their teacher education programs.

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[193] Howey does note that such activities are "obviously adapted to a given situation" (p. 156).

[194] Howey describes these activities as "hardly wholly indigenous to types of learner, topics, or subject under discussion" (p. 156).

5.1. Imaginative pedagogical understanding

In an imaginative teacher education program, pre-service teachers' pedagogical understanding comprises five components. The first is understanding of children's development. Pre-service teachers will need to understand that children learn in some distinctive ways; their learning is both complex and abstract. For example, unlike how development occurs according to the classic Piagetian scheme, children's thinking does not necessarily proceed from the concrete to the abstract. Rather, children can learn and understand abstract concepts beginning at a very young age. Pre-service teachers in an imaginative teacher education program will need to understand the distinctiveness of children's learning, and also that, while necessarily shaped by culture, it is also particular to individuals. In other words, pre-service teachers will need to understand that there are diverse learning style and strengths among different children.

Second, pre-service teachers will need to understand the nature of mediation: children's development does not proceed in some pre-determined way, regardless of the contexts in which they live. Rather, it is mediated by their social environment: by the people with whom and the symbol systems with which they interact. In other words, learning is a culturally embedded phenomenon, mediated both relationally (with people) and symbolically (primarily by language but also by other forms of symbol systems such as math and music). In order for pre-service teachers to understand the ways in which learning is mediated by relations and symbols, the educational psychology they encounter in their program will also need to be culturally based. Traditionally, the focus of psychology has been on the individual; but in an imaginative pre-service teacher

education program, psychology will need to be understood in a cultural context.[195] We might call this second component of pre-service teachers' pedagogical understanding, the mediated nature of learning, a 'Vygotskian backdrop.'

Third, pre-service teachers in an imaginative teacher education program will need to understand the contexts within which children's imaginative understanding can develop. This requires that pre-service teachers have a well-developed sense of the principles and practices of imaginative education: what is meant by imagination and its relationship to teaching and learning. They will need to understand different kinds of understanding (how each kind of understanding is distinct as well as how it may relate to other kinds of understanding[196]), the cognitive tools of each and their potential to enhance learning, various planning frameworks that can be used to help foster children's imaginative understanding, and various imaginative approaches to planning, delivering and assessing lessons and units. This third aspect of pedagogical understanding is set within a broader cultural context than is the second, that of the mediated nature of learning.

It is worth noting that, in order for pre-service teachers to understand the contexts within which imaginative learning can develop, they will need a sense of the ways in which the theory of imaginative education is tentative. In other words, they will need to understand that the theory is somewhat malleable and necessarily self-reflexive: there are various ways to grapple with some of the same concepts. Pre-service teachers'

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[195] Given this understanding of mediation, a cultural psychology approach is the only viable model because it is impossible to understand learning outside of a cultural context: this backdrop is always present.

[196] For example, pre-service teachers will need to understand why it is important to continue to foster Somatic and Mythic understanding in students who may be primarily concerned with developing Romantic and Philosophic understanding.

Philosophic or Ironic understanding of the pedagogy of imaginative education necessarily

includes an understanding of other theories, and thus other ways pedagogy can be

understood.[197] Graduates of an imaginative teacher education program are likely to get

jobs in a variety of schools and communities. In order to understand the beliefs and

assumptions of numerous people in their future educational communities (including their

colleagues, administrators, students and students' parents), as well as the ways in which

their own educational beliefs and assumptions may differ in significant ways from those

that are more widely accepted, pre-service teachers will need to be familiar with those

more widely accepted beliefs about teaching and learning that are found in more typical

programs. For example, pre-service teachers should be familiar with, be able to articulate

the educational values and assumptions informing, debate the merits and debits of, and

indeed be given opportunities to experiment with other popular approaches to lesson

planning, such as the Tylerian method. Such experimenting with alternative ideas and

practices should help foster imaginative pre-service teachers' Philosophic understanding

of pedagogy.

Additionally, pre-service teachers' understanding of the principles and practices

of imaginative education can be further supported by their experiential understanding of

imaginative pedagogy. As I suggested in the chapter on subject matter understanding, an

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[197] This means that an imaginative teacher education program cannot only teach pre-service teachers about the principles and practices of imaginative education, but must also familiarize them with the pedagogical principles and practices manifest in more typical teacher education programs. In other words, an imaginative teacher education program cannot function as if the theoretical grounds upon which it is based is the truth: it must make clear to program participants that, while the theory is hopefully a convincing one, it is neither the only nor the most widely accepted theory of teaching and learning. Because we will want pre-service teachers to have a healthy degree of understanding—and, indeed, skepticism—about any theory of teaching and learning they become familiar with, they will need to demonstrate Philosophic understanding about imaginative education as well as about constructivism, for example. Of course, such Philosophic understanding does not preclude that, in order to complete the program successfully, pre-service teachers will need to demonstrate both an understanding of imaginative principles as well as an ability to use imaginative practices effectively in their teaching, coursework, discussions, and so on.

imaginative teacher education program must ensure that its pedagogy is based on an imaginative approach to teaching and that pre-service teachers' imaginative engagement is fostered in program courses and experiences. This means that pre-service teachers must be given numerous opportunities to explore, examine and continue to develop their own Somatic, Mythic, Romantic and Philosophic, and, ideally, Ironic understanding, especially as it relates to particular subjects and topics, education, children, their own practice, and so on. In order for pre-service teachers to develop their imaginative pedagogical understanding as much as is possible, their imaginative engagement must be a regular, and deeply valued, part of their program experience. Palmer (1998) asks, "Could teachers gather around the great thing called 'teaching and learning' and explore its mysteries?" (p. 141). An imaginative teacher education program would provide opportunities for pre-service teachers to 'gather around' and 'explore the mysteries' of pedagogy, as both students and teachers.

Fourth, an imaginative understanding of pedagogy requires that pre-service teachers understand themselves as teachers and learners. They will need to understand that pedagogy is much more than simply the application of techniques or activities teachers do with or to students. Because all of the interactions teachers have with students (and that students have with each other and with various symbol systems) are a part of a total pedagogical system, pre-service teachers will need a clear sense of how they play a key role in what pedagogy can be. As Palmer (1998) argues, knowing ourselves is crucial to teaching well because we teach who we are (p. 2); this is especially true of imaginative educators. Pre-service teachers' self-understanding is critical in two ways: first, they must have a good degree of reflexivity about their own teaching (understand their own

educational beliefs and values, their imaginative engagement, how their own teaching strengths can be used to develop students' imaginative understanding and how they can improve the areas in which they are weak); second, they must recognize the relevance of the ways in which they connect with students (e.g. how they can use humour to establish rapport, how their relationships with particular students are fostered) as a central part of effective pedagogy. Palmer (1998) suggests that good teaching comes from both the identity and the integrity of a teacher (p. 10).[198] In other words, the second element of pre-service teachers' pedagogical understanding—a sense of how learning is mediated relationally—requires pre-service teachers' understanding of themselves and their crucial role in the learning of their students.[199] Becoming a good teacher is not simply learning particular methods to apply, because one technique does not apply to all teachers or to all students; becoming a good teacher fundamentally involves learning about oneself, including finding coherence between one's method and oneself (p. 24).[200]

As I argued in the previous chapter on subject matter understanding, it is important for pre-service teachers to understand their own imaginative engagement. As they investigate the prescribed curriculum, and explore ways in which topics and units can be taught imaginatively, they are likely to quickly realize that some topics and subjects resonate more with them than do others: it is inevitable that there will be topics and subjects about which they feel far more excitement and emotional engagement. It is

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[198] Palmer describes identity as lying "in the intersection of the diverse forces" that constitute one's life, and integrity as "relating to those forces in ways that bring [one] wholeness and life rather than fragmentation and death" (p. 13).

[199] Tomkiewics (1991) also argues that understanding oneself is essential for effective teaching and strong pedagogical understanding. Tomkiewics "believes that when students are asked to consider themselves as scientists, readers, and writers, they are able to reconceptualize all three fields and to consider how they could be taught under a new paradigm" (cited in Fisher et al., 1996, p. 431).

[200] "The 'right' method to use… is one that emerges from the identity and the integrity of the teacher" (Palmer, 1998, p. 136).

important for pre-service teachers to understand the importance of their own imaginative engagement in their pedagogy: they are likely to teach much more effectively topics and subjects that they feel stronger emotional engagement with. This also extends to their interests and passions beyond the school curriculum: the kinds of books they are drawn to, hobbies they pursue, movies they watch, and so on are all relevant to their efficacy as teachers. The same situation exists for their students: pre-service teachers will need to understand how the rapport they will naturally feel with some students, but not others, will influence their teaching, and attempt to understand, and perhaps see as mysterious, those students who are quite unlike themselves and with whom they feel less rapport.

Fifth and finally, pre-service teachers will need to develop at least some Philosophic understanding of pedagogy. Understanding pedagogy philosophically involves recognizing that pedagogy is much vaster than simply teachers, their students and the curriculum they teach: in fact, it relates to all of humanity, in various historical contexts and cultures. Developing such an understanding involves considering various models of pedagogy, perhaps by examining the ways in which pedagogy is understood in various schools and school systems in particular communities, as well as in larger contexts such as quite different cultures and civilizations.

As I will demonstrate in the upcoming section on the research on pre-service teachers' understanding of pedagogy, pedagogical understanding as comprised of these five components is significantly different than the more common way in which pedagogy seems to be understood in most educational contexts (including in teacher education programs). More commonly, pedagogy seems to be understood as the translation of general knowledge of teaching and learning and children's development—knowledge

212

that is isolated from and external to the self—into specific activities that teachers can use to promote student learning, applicable in a wide variety of contexts. Such a notion of pedagogy seems to be based largely on the "enduring and familiar metaphor of the school" as a factory (Barone et al., 1996, p. 1112); according to an industrial model, education is a non-organic, technical process, applicable anywhere, and separable from the context (the place and people involved, and so on) in which it exists. According to more typical ways of conceiving of pedagogy, pre-service teachers' pedagogical understanding results from their learning how the world is, how children learn and what activities teachers can use to promote their learning, and how to implement this knowledge for specific and predetermined outcomes. Such an understanding of pedagogy is far more restricted than the pedagogical understanding I argue imaginative pre-service teachers need.[201] An imaginative understanding of pedagogy is based on a sense of knowledge as our interaction with the world; pedagogy then can be understood as organic, and as a sense of possibility.

Before I discuss how an imaginative teacher education program might best foster pre-service teachers' understanding of children's development, how learning is mediated, the contexts within which imaginative learning can take place, themselves as teachers and learners and Philosophic understanding of pedagogy, I will consider the research on pre-service teachers' pedagogical understanding to determine what we know about the kinds of pedagogical understanding we might say pre-service teachers tend to gain as a result of

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[201] My conception shares some similarities with Grossman (2005), who acknowledges that pedagogy can be defined quite broadly to include tasks and assignments as well as classroom instruction and interaction (including interactions among teacher educators, pre-service teachers, and content during classes and "the more relational aspects of teaching and learning such as the relationships established among teachers and students and how they shape what prospective teachers learn") (p. 426).

their participation in more typical teacher education programs. In order to discuss this, though, I must first address some of the limitations of this body of research.

5.2. A note on pedagogical preparation research

The research on pedagogical preparation shares many of the limitations of the research on teacher education in general, addressed in the introduction to Part Two of the thesis. There are additional problems related to this particular body of research:

1. The term pedagogical preparation can mean several things, including learning theories, educational psychology, instructional methods, management, educational measurement and testing, the sociology and philosophy of education and responding to student diversity (Wilson et al., 2001, p. 12; 2002, p. 193);

2. Pedagogical preparation can vary considerably from one institution to another, in terms of course content and sequencing, so that it is "nearly impossible to generalize across research studies that focus on a particular teacher preparation class" (Wilson et al., 2001, p. 12; Wilson & Floden, 2003, p. 16);

3. Research on pedagogical preparation "has remained at a high level of aggregation, giving little information about possible differences across grade level or subject matter" (Wilson et al., 2001, p. 12; 2002, p. 193; see also Executive Summary, *Studying Teacher Education*, 2005, p. 16);

4. What is taught is not necessarily what is learned or what is applied in practice (*Eight Questions on Teacher Licensure and Certification*, 2005, p. xviii);

5. It can be difficult to study pedagogical understanding as entirely separable from subject matter understanding (*Eight Questions on Teacher Preparation*, 2003, Question Two, Significance of the Question, p. 2);

6. "The line between the research on pedagogical coursework and the research on field experience is difficult to draw" (*Eight Questions on Teacher Preparation,* Question Two, What the Research Says, p. 1);

7. The effects of important variables such as student background and prior achievement (selection effects) are often not controlled in studies (*Eight Questions on Teacher Licensure and Certification*, 2005, p. xviii); "the studies… generally do not account for the differences prospective teachers bring to their preparation programs in the first place" (Executive Summary, *Studying Teacher Education*, 2005, p. 13);

8. There is variety in the terms and measurements used for the same variables (*Eight Questions on Teacher Licensure and Certification*, 2005, p. xix); for

example, the terms 'education major' and 'certification' can be used vaguely, unreliably, and sometimes inaccurately (Wilson et al., 2001, p. 16); "a more precise, commonly shared vocabulary is needed, which can highlight features with the greatest promise for influencing teachers' learning" (Executive Summary, *Studying Teacher Education*, 2005, p. 14; see also Grossman, 2005, p. 448; Wideen et al., 1998, p. 162); and

9. Most of it does not examine impact on teaching practice over time (Executive Summary, *Studying Teacher Education*, 2005, p. 16; see also Wideen et al., 1993, p. 8).

Again, these significant limitations must be kept in mind when we consider both what the research literature suggests about pre-service teachers' pedagogical understanding, as well as any programmatic changes that are based, at least to some degree, on these research findings.

5.3. Research on pre-service teachers' understanding of pedagogy[202]

While both the quality and quantity of research on the other two cornerstones of teacher education are indeed troubling, the research on pre-service teachers' pedagogical understanding might be more aptly described as startling. After consulting seven major sources for research in teacher education,[203] three observations become clear. First, there is no substantial research that clarifies, in any degree of helpful specificity, what understanding of pedagogy pre-service teachers tend to gain as a result of more typical

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[202] The major reviews consulted for this chapter are: Barone et al. (1996), Carter (1990), Christensen (1996), Ducharme and Ducharme (1996), *Eight Questions on Teacher Licensure and Certification* (2005), *Eight Questions on Teacher Preparation* (2003), Feiman-Nemser (1990), Floden and Meniketti (2005), Freiberg and Waxman (1990), Ginsburg and Clift (1990), Grossman (2005), Howey (1996), Jones (1996), Pintrich (1990), Richardson (1996), Tom and Valli (1990), Wideen et al. (1993, 1998), Wilson and Floden (2003), Wilson et al. (2001, 2002), Yarger and Smith (1990), Zeichner (2005), and Zeichner and Conklin (2005). (See Appendix C for a brief description of these reviews.) Other relevant works also considered are: Anderson (2001), Brookhart and Freeman (1992), Goldstein (2002), Goldstein and Lake (2000), Hollingsworth (1989), Lortie (1975), Pajares (1992), Patrick and Pintrich (2001), and Zeichner and Gore (1990).

[203] *Handbooks of Research on Teacher Education* (1990, 1996), *Studying Teacher Education* (2005), *Eight Questions on Teacher Preparation* (2003), *Eight Questions on Teacher Licensure and Certification* (2005), Wilson et al. (2001, 2002), and Wilson and Floden (2003).

teacher education programs, or indeed clarifies what more typical teacher education programs attempt to teach about pedagogy. Of the major research reviews consulted for this chapter, most do not, in any systematic way, review the research in this area. Second, the absence of research in this area is largely overlooked: most of the major research reviews do not acknowledge that there is a dearth of research about pre-service teachers' pedagogical understanding and that this is an area needing immediate attention. Third, any conclusions one might draw about pre-service teachers' pedagogical understanding must come from indirect sources: related research on changing pre-service teachers' beliefs as a result of program intervention, and research on the pedagogy of teacher education. Clearly, recommendations for changes in programmatic design and delivery that are, at least in part, based on such conclusions must be made tentatively.

5.3.1. The absence of data about pedagogical understanding

To illustrate the degree to which research on pedagogical understanding is absent from the literature, I will examine, in some detail, several reputable sources on teacher education research. For the first of these, the first edition of the *Handbook of Research on Teacher Education* (1990), I will describe each chapter whose contents relate in some ways to pedagogical understanding to illustrate the ways in which a discussion of this cornerstone could have been included. I will not go into such detail for the remaining reviews of teacher education research I discuss (the *Handbook of Research on Teacher Education*, 1996; *Studying Teacher Education*, 2005; *Eight Questions on Teacher Preparation*, 2003; *Eight Questions on Teacher Licensure and Certification*, 2005; Wilson et al., 2001, 2002; and Wilson & Floden, 2003). Rather, I will identify what each of these sources clarifies about our knowledge of pre-service teachers' pedagogical

understanding to demonstrate that, taken together, they reinforce what an examination of the first source reveals.

5.3.2. *Handbook of Research on Teacher Education* (1990)

A highly regarded source for teacher education research, the *Handbook of Research on Teacher Education* (1990) is divided into nine sections[204] and forty-eight chapters, and has eight hundred and seventy-six pages of text. While there is one chapter devoted to the subject matter preparation of teachers (and eleven on education in particular curricular areas) and one dealing with student teaching and school experiences (as well as a related chapter on supervision), there is no equivalent chapter devoted to the third cornerstone: pre-service teachers' pedagogical preparation. There are six chapters whose titles suggest that they might, at least in some ways, address or refer to pre-service teachers' pedagogical understanding: Chapter 2: Issues in Research on Teacher Education; Chapter 13: Teacher Preparation: Structural and Conceptual Alternatives; Chapter 17: Teachers' Knowledge and Learning to Teach; Chapter 21: Professional Knowledge for Teachers; Chapter 26: The Hidden Curriculum of Preservice Teacher Education; and Chapter 47: Implications of Psychological Research on Student Learning and College Teaching for Teacher Education. Yet none of these chapters includes any research on this significant area in teacher education or highlights this as a needed area of research. This omission is remarkable in such a reputable handbook. I will now summarize the contents of each of these six chapters to indicate where a discussion of

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[204] Teacher education as a field of inquiry; governance of teacher education; contexts and models of teacher education; participants in teacher education; curriculum of teacher education; processes of teacher education; evaluation and dissemination; teacher education in the curricular areas; and broadened perspectives of teacher education

pre-service teachers' pedagogical understanding might have been appropriate, and to clarify whether or not any allusions are made to it as an area requiring research.

The goal of Yarger and Smith's "Issues in Research on Teacher Education" is to specify a direction for future research in teacher education (p. 25), in terms of the way in which research should be conducted (e.g. the kinds of methodological issues researchers should attend to, rather than the specific areas in which research is needed). In other words, their focus is not on describing a research agenda for teacher education (p. 39), nor on delineating in what areas of teacher education research has been most limited (and therefore is now most needed). Of course, given such a chapter focus, the absence of any attention to pre-service teachers' pedagogical understanding, or this as a specific area needing research, is understandable.[205]

The goals of Feiman-Nemser's "Teacher Preparation: Structural and Conceptual Alternatives" include clarifying what is known about different program structures and institutional arrangements, examining various conceptual orientations that have shaped teacher education and introducing "promising research-in-progress designed to illuminate different ideas about and approaches to preparing teachers" (p. 212). Given these goals, we might expect to find some research about specific program structures designed to foster particular kinds of pedagogical understanding—programs in which the conceptual orientation is clearly articulated and the entering and exiting pedagogical understandings of pre-service teachers are clarified, or programs whose goals are to help pre-service teachers develop "different ideas about and approaches to" teaching and learning.

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[205] The authors do recognize that there are "major gaps" in the research conducted and in the recommendations for what should be studied regarding the teacher education process (p. 25), but they do not address the absence of research on pedagogical preparation or recommend it as a focus of future research in teacher education programs.

Disappointingly, the chapter elucidates no helpful research in any of these areas. Feiman-Nemser acknowledges that the data on the curriculum of teacher education is decidedly limited (p. 228), as is our knowledge of various program structures [such as four year undergraduate versus five year graduate or alternative certification programs] (p. 219).[206]

Feiman-Nemser's chapter does contain some brief allusions to pedagogical understanding. For example, she acknowledges that "Foundational knowledge comes mostly from educational psychology" (p. 217), describes five teacher education conceptual orientations (academic, practical, technological, personal and critical/ social) and makes brief references to programs that (apparently) manifest each orientation.[207] However, while this program section does include a concise description of pedagogical values or focus, there is not enough detail given to clarify exactly what is taught or learned about pedagogy in these or more typical teacher education programs. While the author does recommend further research examining "what different programs are like as educational interventions" (p. 228) and describes several current initiatives aimed at acquiring data about the identified areas of limited or absent research, she makes no references to the specific areas in which more research is needed—including that of pre-service teachers' pedagogical understanding. This second chapter, then, while seemingly potentially helpful, does not provide any information about the pedagogical understanding of pre-service teachers in more typical teacher education programs.

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[206] The author suggests that, since the research trend has been on focusing on structure alone, rather than on the content of programs with various structures, our knowledge of various program structures does not increase our understanding about how pre-service teachers spend their time while enrolled in such programs (p. 220; see also Zeichner & Conklin, 2005).

[207] Feiman-Nemser recognizes that conceptual orientations are not necessarily tied to specific kinds of programs (e.g. more than one orientation can exist in the same program) (p. 220).

Since pedagogical understanding is certainly considered essential to teaching, one might infer from Carter's chapter, entitled "Teachers' Knowledge and Learning to Teach," that the pedagogical understanding of pre-service teachers would be addressed in some depth. For example, we might expect such a chapter to include a discussion of the research on the kind of pedagogical understanding pre-service teachers in more typical programs tend to have, or what pedagogical understanding is considered fundamental to learning how to teach. Yet, once again, the purpose of this chapter is not related to the treatment of either of these areas: Carter's goal is not to create "another compilation of discouraging findings" on the research on learning to teach (p. 291) but to "construct an intellectual context" within which the process of learning to teach can be understood (p. 291). As such, attention is directed to inquiry about teachers' knowledge and its acquisition (p. 292) with an emphasis on emerging conceptions of teachers' knowledge as it relates to or is grounded in classroom practice (p. 291).[208] Discouragingly, Carter claims that the existing research is largely unhelpful in clarifying "the actual conduct of teacher preparation" (p. 295). Although the author does briefly explain relevant studies that exemplify one of the three areas of knowledge addressed, there are no studies reviewed on pre-service teachers' pedagogical understanding.[209] Nor is this absence of attention to pedagogical understanding addressed in Carter's suggestions for further inquiry in research. So, as with the first two chapters examined, this chapter does not, in any way, give us any information about the pedagogical understanding gained by pre-service teachers from their teacher education programs.

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[208] Carter suggests that the chapter's focus reflects the field's refinement of concepts and research methods (p. 292).

[209] Carter does have one section on practical knowledge, but none of the studies referred to in this section addresses what understanding of pedagogy pre-service or practicing teachers tend to have.

The fourth chapter, Tom and Valli's "Professional Knowledge for Teachers" is

equally disappointing: its goal is not the clarification of the substance of professional

knowledge but rather the explanation of the major epistemological traditions from which

professional knowledge has been derived and an exploration of the various ways in which

knowledge, according to each tradition, is related to practice. Because of this, the authors

do not in any way address the kinds of pedagogical understanding pre-service teachers

have or should be expected to have: there is no report of research on their pedagogical

preparation, mention made of the absence of such research, or recommendations made for

further research in this area.

The treatment of pedagogical understanding in Ginsburg and Clift's "The Hidden

Curriculum of Preservice Teacher Education" is, again, brief and largely unhelpful. The

authors believe that, while pre-service teachers learn about pedagogy through both the

official curriculum and the hidden curriculum[210] and the messages conveyed in each are

often contradictory (p. 453),[211] the chief impact of teacher education programs is in their

hidden curriculum.[212] This claim, however, is not convincingly supported by research.

Additionally, since, as the authors rightly note, there can be significant variety in the

hidden curriculum "within and across programs, over time, and cross-nationally" (p. 458)

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[210] The authors suggest that the interdependence of the official curriculum and the hidden curriculum requires that they not be treated independently (p. 459).

[211] For example, the authors describe one potentially contradictory message about pedagogy received by pre-service teachers regarding teachers' emotional engagement with students: although many teacher educators may claim that good practice requires being emotionally engaged with students, emotional engagement with pre-service teachers is often not modeled by these same teacher educators (p. 453); in fact, some teacher educators may reinforce pedagogical strategies that "avoid emotionally engaged, caring occasions" (p. 454). Ginsburg and Clift also suggest that pre-service teachers may receive another potentially contradictory message: that teaching is an activity that is fundamentally concerned with reflection as well as a technical enterprise.

[212] The authors do concede that all messages 'delivered' may not be received—and if received, may not necessarily be received in the same way or be internalized—by all pre-service teachers (p. 458).

and "the research on hidden curriculum in teacher education does not support definitive conclusions regarding content or effects at this time" (p. 458), the authors' conclusions are perhaps based more on observation, opinion or speculation than they are on a rigourous body of research. Ginsburg and Clift conclude that "no reform of education or of teacher education will eliminate undesirable messages in the hidden curriculum…. the messages will likely remain contradictory or mixed" (p. 459). In sum, this chapter gives no specific information about the kinds of pedagogical understanding pre-service teachers gain as a result of their teacher education program, as evidenced by research,[213] or makes explicit reference to this as an area needing further research.

The final chapter whose title suggests it might be helpful in identifying what kinds of pedagogical understanding pre-service teachers in more typical teacher education programs tend to have is Pintrich's, on the implications of psychological research on student learning and college teaching for teacher education. The goal of this chapter is to review the psychological literature on post-secondary learning and teaching and clarify the implications of this research for teacher development and teacher education (p. 826). As well as summarizing the research on several psychological theories of development and explaining how they can be used to understand the changes (or absence of changes) in thinking and behavior of pre-service and practicing teachers, Pintrich's chapter includes a three-page section on the research on college teaching. One might expect to find some information regarding the pedagogical understanding of pre-service teachers here; unfortunately, however, this section is a description of the

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[213] The authors mention four researchers who noted "students' low expectations for theoretical knowledge about pedagogy": Book et al. (1983), Grossman and Richert (1988), Lanier and Little (1986), Thies-Sprinthall and Sprinthall (1987) (p. 454).

characteristics of college classrooms and academic work that might facilitate pre-service teachers' active involvement in learning so that their cognition and motivation can be improved (p. 846). In other words, it does not provide any information about studies assessing pre-service teachers' pedagogical understanding.

Admittedly, Pintrich does make some brief references to pedagogical understanding. For example, he argues that teacher educators should know what pre-service teachers' entering conceptions of teaching and learning are and "work to change them" (p. 837)[214]: a surprising recommendation since he does not address the fact that there seems to be no research clarifying specifically what pre-service teachers tend to learn about pedagogy in more typical teacher education programs. He also suggests that pedagogical approaches used by teacher educators can be significant determiners in pre-service teachers' pedagogical understanding,[215] and offers some pedagogical strategies that teacher educators can use to "improve the level of cognitive complexity of the classroom" (p. 849). Of the four areas the author identifies as requiring further research (teachers' knowledge, thinking and problem-solving, metacognition and self-regulation, and motivation), we might expect the need for research on pre-service teacher's pedagogical understanding to be identified in the first. However, while several of Pintrich's recommendations are directly or indirectly related to pedagogical

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[214] Pintrich's own pedagogical understanding seems to be decidedly constructivist. For example, he suggests that in future research "a general constructivist paradigm could be the most fruitful approach to pursue" (p. 850).

[215] the "instructional methods that are used to convey content information [to pre-service teachers] can have a major influence on what students learn in college classrooms" (p. 848); "what the instructor actually says and does in the college classroom is also important" (p. 849).

understanding,[216] again, somewhat disappointingly, this chapter author does not acknowledge the absence of information about pre-service teachers' pedagogical understanding and makes no specific recommendations for further research in this area (such as examining the relationship between pedagogical understanding espoused by a teacher education program, and pre-service teachers' experience of various pedagogical styles in their program, their entering pedagogical understandings, motivation and exiting pedagogical understandings).

Clearly, a handbook as reputable as this should directly address this cornerstone of teacher education. Of course, given the dearth of research, it is understandable that a discussion of pre-service teachers' pedagogical understanding might simply be a short section embedded in a related chapter, with its brevity noted and the need for further research emphasized by the chapter author. Puzzlingly, however, its importance seems to have been overlooked by the handbook's editors: nowhere in the handbook is pre-service teacher's pedagogical understanding treated distinctly or the argument made for this as a crucial area needing immediate research. Even more surprising is that pedagogical understanding is also given very little attention in the handbook's second edition.

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[216] For example, he suggests that research is needed to understand how "teachers' general epistemological beliefs about learning and teaching and their self-beliefs influence their acquisition of new knowledge on learning and teaching and their willingness to use this knowledge in the classroom" (p. 850). He acknowledges that "there is a great deal of curricular and instructional development work that remains to be done" regarding pedagogical approaches used in teacher education "that foster active engagement in the task of becoming a teacher" (p. 850). Pintrich also suggests that "much more research… is needed on the relationships between the content of teacher education programs and the logical structure of this content and teachers' cognition and motivation" (p. 847). Finally, the author states that "teachers' knowledge of their content area, their knowledge of pedagogical practices, and their knowledge of issues in child development, learning, and motivation develops over time" (p. 849), and that further research is needed to understand expert teachers' acquisition and use of knowledge.

5.3.3. *Handbook of Research on Teacher Education* (1996)

The second edition of the *Handbook of Research on Teacher Education* (1996)

has 1149 pages of text, divided into seven sections[217] and forty-eight chapters. There are

eight chapters devoted to research on teacher education in particular curricular areas/

particular age groups and one on field and laboratory experiences, but again, none

specifically devoted to this third cornerstone. There are six whose titles suggest they

might offer some information about the kinds of pedagogical understanding pre-service

teachers tend to gain from more typical teacher education programs: Chapter 3: The

Professional Knowledge-Research Base for Teacher Education; Chapter 6: The Role of

Attitudes and Beliefs in Learning to Teach; Chapter 8: Designing Coherent and Effective

Teacher Education Programs; Chapter 24: Classroom Management; Chapter 46: Needed

Research in Teacher Education; and Chapter 48: A Future for Teacher Education:

Developing a Strong Sense of Professionalism. Of these six, Richardson's chapter on the

role of attitudes and beliefs in learning to teach is the most closely related to my area of

inquiry. Four of the others do,[218] in some ways, refer to pre-service teachers' pedagogical

understanding, but none gives thorough consideration to it or directly and extensively

examine the research related to this area. To the degree to which they are relevant, I will

discuss these remaining chapters in the upcoming sections on what we can infer about

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[217] Teacher education as a field of study; recruitment, selection, and initial preparation; contextual influences on teacher education; teacher education curriculum; continuing professional growth, development, and assessment; diversity and equity issues; and emerging directions in teacher education
[218] See fn 278 for a description of the contents of Christensen's "The Professional Knowledge-Research Base for Teacher Education."

pre-service teachers' pedagogical understanding from the research on teacher belief change and the pedagogy of teacher education.[219]

Richardson's chapter examines the role of attitudes and beliefs in learning to teach in two areas: as they relate to how pre-service and in-service teachers process new information, react to change and teach; and as the focus of pre-service teacher change in teacher education programs.[220] We might expect, then, to find some details about pre-service teachers' pedagogical understanding in the chapter's second foci. Because Richardson's discussion mostly deals with the research on teacher belief change, I will delay consideration of this chapter and discuss it later, in relation to the research on changing pre-service teachers' beliefs. Suffice to say at this point that Richardson's discussion of any research that has direct bearing on this question is quite brief;[221] the research on what is taught and learned about pedagogy in more typical teacher education programs is not systematically reviewed in this chapter; nor is this area in particular identified as one requiring immediate and extensive research.

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[219] Ducharme and Ducharme's chapter on needed research in teacher education will be briefly considered at the end of this section, where I further document the absence of attention to pedagogical understanding in reviews that identify those areas in teacher education most in need of further research.

[220] Richardson's treatment of changes in pre-service teachers' beliefs as a result of program participation comprises less than two of the fourteen pages of her chapter; unfortunately, the topic is not explored to a very satisfying degree.

[221] Richardson's discussion includes less than half a page on teachers' pedagogical understanding. Only six studies (by five authors) are reviewed in this section; four were published in 1987 and 1988, two were published in 1990 and 1993. Most of these are very limited case studies (from one to six participants) and do not explore the notion of pedagogical understanding in any depth. While such studies are somewhat helpful in giving us some basic information about the experiences and understanding of the pre-service teachers involved in the studies (e.g. in terms of their development of pedagogical conceptual understanding) they give us next to no *details* about these pre-service teachers' pedagogical understanding, or, more importantly, about that of most pre-service teachers completing teacher education. For example, limited case studies such as these give us no depth of understanding about the possible distinctions between pre-service teachers' espoused and enacted pedagogical understanding, particulars about what pre-service teachers understand about how children learn, or the specific strategies teacher education programs use and promote and whether these are used by pre-service teachers in their field experiences as well as once they become practicing teachers.

As was the case with the first edition of the *Handbook*, examination of the chapter contents of the second edition reveals that the importance of knowing what pre-service teachers understand about pedagogy seems to have been overlooked. While several chapters do contain numerous allusions to pedagogy as well as discussions related to pre-service teachers' pedagogical understanding, and these are both interesting and important, direct attention to this cornerstone of teacher education is largely absent, as is a clarion call for immediate research to gain more information about what pre-service teachers currently understand. Perhaps more clarity can be gained from examining other sources, to which I will now turn.

5.3.4. *Studying Teacher Education* (2005)

Another hopeful avenue to pursue to ascertain whether there is any research on pre-service teachers' pedagogical understanding, and if there is, what it reveals, is the AERA's *Studying Teacher Education* (2005). This book has seven hundred and sixty pages of text and is divided into twelve chapters. Four of these may be promising in their potential to clarify what kind of pedagogical understanding pre-service teachers might be said to gain as a result of their teacher preparation: Chapter 5: Research on the Effects of Coursework in the Arts and Sciences and in the Foundations of Education; Chapter 6: Research on Pedagogical Approaches in Teacher Education; Chapter 11: Teacher Education Programs; and Chapter 12: A Research Agenda for Teacher Education. Floden and Meniketti's chapter on the effects of coursework in the foundations of education is the most directly relevant to my area of inquiry. (Grossman's chapter on the pedagogical approaches in teacher education will be addressed in the later section on research on the pedagogy of teacher education programs; Zeichner's chapter on a research agenda for

227

teacher education will be discussed in the section examining the status of pedagogical

understanding in theorists' and researchers' recommendations).[222]

Floden and Meniketti (2005) note that the research on what teachers learn from

foundations courses (including educational psychology) is "scant" (p. 262): the authors

found five studies that examined the effects of individual courses on pre-service teachers.

Four of the studies examined particular approaches used in educational psychology

classes and the fifth considered the use of a psychological test in the context of a general

foundations course. The results of the five studies indicate that "focused interventions

had a positive effect on prospective teachers' knowledge" (p. 281).[223] Once again,

however, these studies do not consider what pedagogical understanding pre-service

teachers gain from their teacher education programs: "Overall, the little research

conducted on the effects of foundations courses on teachers' knowledge has shown the

potential[224] of particular instructional modules or methods, rather than give any insight

into what prospective teachers typically learn from such courses" (p. 282).[225] [226] The

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[222] See fn 262 for a description of the contents of Zeichner and Conklin's chapter on teacher education programs.

[223] "the studies [on education foundations courses] document cases in which prospective teachers learn content intended by the instructors in special course modules… or from particular instruction methods" (p. 284).

[224] Floden and Meniketti suggest that "the benefit for those outside the institution [in which the particular course exists] is largely a source of promising practice, where promise is based on success in one context and on the practical judgment of the college faculty members who invested in the development and study of these approaches" (p. 284).

[225] The results of the five studies "support the impression that current research on education foundations courses concentrates on particular approaches or exercises within courses, rather than asks questions about the overall impact of foundations courses" (p. 281).

[226] Because the research on the impact of foundations courses (including educational psychology) is "extremely thin" (p. 13) or "scant" (p. 12), the authors of the Executive Summary conclude that "the studies offer evidence about the effects of a small set of instructional practices used in the context of foundations courses, but do not provide evidence about the overall effect of foundations coursework" (p. 12). In other words, the absence of "explicit information about teachers' education and good measures of the outcomes of that education" (p. 13) means that "across the board, the work has limited implications for major policy questions such as the coursework that should be required for teacher certification or the

228

authors suggest that, since there is "a dearth of information about teachers' own education" (p. 287) and because "the evidence about the effects of… coursework [such as educational psychology] on teachers' knowledge is extremely thin" (p. 287),[227] future research should focus on "specific questions about… how the study of concepts from psychology, sociology, and other arts and sciences can be taught in ways that make them most valuable for the practice of teaching" (p. 287). Again, while the authors recognize the need for more and better research to determine the content of teacher education courses (including those relating to pedagogy), as well as what pre-service teachers learn in them, they devote very little attention to this area; they do not insist that there is a critical and urgent need for such research and that its absence is deeply troubling, if not somewhat of an embarrassment, to the teacher education research community.

Thankfully, the need for further research on the nature of pre-service teachers' pedagogical understanding *is* recognized by the authors of the Executive Summary: in their recommendations entitled "unexplored topics related to teacher preparation," they identify that

> research is needed that systematically explores the relationships among teacher candidates' beliefs, attitudes, skills, and practices and pupil's [*sic*] learning opportunities, attitudes, achievement, and growth. In addition, research is needed on the impact of subject matter and general education preparation of teachers, the role of psychological and social foundations, and the impact of these on teachers' and pupil's [*sic*] performance. (p. 35)

value of additional arts and science or educational foundations courses" (p. 14).

[227] There is an "absence of strong empirical support for arts and science foundations (especially psychological foundations) requirements" (p. 287).

As well, they suggest that research be conducted on "the nature of the instructional interactions that occur in coursework… and the impact of these on teachers' learning and performance and on pupils' learning" (p. 34). Finally, the panel recommends

> that more research be conducted about the conditions under which different conceptual and structural arrangements within teacher education programs are connected to various outcomes. In particular, we need research about the nature of the instructional interactions that occur in coursework and fieldwork contexts and the impact of these on teachers' learning and performance and on pupils' learning, including the impact of the racial and ethnic composition of participants. (p. 34)

However, in terms of its potential to clarify pre-service teachers' pedagogical understanding, *Studying Teacher Education* is largely unhelpful as a source.

5.3.5. *Eight Questions on Teacher Preparation* (2003), *Eight Questions on Teacher Licensure and Certification* (2005), Wilson et al. (2001, 2002), and Wilson and Floden (2003)

Another area to examine that might help clarify the kinds of pedagogical understanding pre-service teachers tend to have are reports that attempt to determine the kinds of pedagogical preparation that lead to effective teaching. One might expect that knowledge of the pedagogical understanding that pre-service teachers tend to gain in more typical programs might provide a helpful context in which to interpret findings about the relationship between pedagogical preparation and teacher efficacy. There are three such sources that address pedagogical preparation and teacher effectiveness: *Eight Questions on Teacher Preparation* (2003), *Eight Questions on Teacher Licensure and Certification* (2005), and Wilson et al. (2001, 2002) and Wilson and Floden's (2003)

addendum to their original report. I will look at each of these sources to see whether they help us gain a clearer sense of pre-service teachers' pedagogical preparation as a result of program participation.

The authors of *Eight Questions on Teacher Preparation* (2003) claim that "one of the most heated debates concerning the quality of teachers and teacher preparation is the extent to which pedagogical preparation is necessary for teachers to be effective" (Question Two, Significance of the Question, p. 1). Most of the research that was reviewed for this report that addressed the extent to which pedagogical coursework contributes to teacher effectiveness focused on teacher preparation programs, rather than on the content of the related coursework (Question Two, What the Research Says, p. 1).[228] [229] While the authors claim that "the research related to this question makes it quite clear that some mastery of pedagogy is necessary for effective teaching,"[230] they also state that "the specific pedagogical skills and knowledge vital to effective teaching

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[228] Therefore, there is no information in this report about the understanding of pedagogy pre-service teachers in more typical programs might gain as a result of taking courses in educational psychology or classroom management, for example (as opposed to that they might gain as a result field experience or other program components, either separately or in concert). The authors determine that "On the whole," there is "limited support to the conclusion that coursework in education can contribute to effective teaching, but precisely what that coursework is and how much it contributes is uncertain" (Question Two, What the Research Says, p. 2). In other words, they are unable to determine the kind of pedagogical coursework that might contribute to teacher effectiveness and the possible extent of this contribution.

[229] The authors reviewed studies that compared certified and uncertified teachers in terms of their effectiveness (often measured by teacher test results or student achievement). While such studies may include conclusions about the relative importance of the pedagogical preparation of teachers, they do not necessarily examine or describe the kinds of pedagogical preparation these teachers received or the pedagogical understanding they have.

[230] The authors conclude that there is "limited support for the conclusion that preparation in pedagogy can contribute significantly to effective teaching, particularly subject-specific courses… and those designed to develop core skills, such as classroom management, student assessment and curriculum development" (A Summary of the Findings, Question Two, p. 2).

231

aren't easy to discern" (Question Two, What the Research Says, p. 1).[231] Indeed, there is

no reference in this report to any research that attempts to determine what pre-service

teachers might learn about pedagogy from their teacher education programs.[232]

The second of the three sources examining the relationship between pedagogical

preparation and teacher effectiveness is the related publication, *Eight Questions on*

Teacher Licensure and Certification (2005). Like the 2003 report, the authors of this

report also attempted to determine the kinds of pedagogical understanding and practice

that are related to a teacher's ability to promote student achievement. However, none of

the three reviewed studies that were related to this question addressed what kind of

pedagogical understanding teachers have (or the origin of this understanding); rather,

they focused on teachers' *use* of particular pedagogical techniques and their possible

effects on student achievement as evidenced on standardized tests (p. 6).[233] The authors

consider the research inconclusive for several reasons[234] and suggest that "any policy or

requirement that directly addresses pedagogical techniques should be developed and

implemented with great caution" (p. 8). While the authors do recommend that improved

quality in additional research "could further the field" (p. 8), they do not directly address

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[231] For example, the authors conclude that the research is unable to clarify the extent to which a teachers' understanding of learning theory or child development contributes to her or his effectiveness (Question Two, What the Research Says, p. 1) or whether understanding of pedagogy is best acquired through coursework, field experience or on the job, and what the impact is (if indeed there is any) of "other kinds of pedagogical coursework, such as classes in child development or learning theory" (A Summary of the Findings, Question Two, p. 2). In other words, no research demonstrates a causal connection between a teacher's understanding of classroom management, student assessment and other skills and student achievement (Question Two, What the Research Says, p. 2).

[232] With the exception of one, the studies examined in this section of the report are not specifically identified; they are listed as part of the general, eleven-page long reference list.

[233] For example, the use of small groups and problem solving, teachers' amount of time on "active teaching formats" (such as "presenting or explaining material, leading discussion and providing feedback") and hands-on learning (p. 7).

[234] The three studies used differing variables, the findings varied, and research limited to one grade level may not be generalizable to different grades (p. vi).

the lack of research related to pre-service teachers' pedagogical understanding. In other words, neither the 2003 nor this report gives us any further information about the kinds of pedagogical understanding pre-service teachers tend to have as a result of participating in more typical teacher education programs.[235]

The last of the three sources that consider the relationship between teachers' pedagogical preparation and their teaching effectiveness (and so might also refer to research on pre-service teachers' pedagogical understanding) is Wilson et al. (2001, 2002), who draw similar conclusions to the *Eight Questions* authors. Although the authors attempted to determine the effects of pedagogical preparation,[236] they found no research "that directly assesses what teachers learn in their pedagogical preparation and then evaluates the relationship of that pedagogical preparation to student learning or teacher behavior" (2002, p. 193; see also 2001, p. 12). Like *Eight Questions on Teacher Preparation* (2003), Wilson et al.'s (2001, 2002) reports examined two kinds of relevant research: that comparing certified and uncertified teachers and that considering the value added by education coursework. The authors reviewed five studies in the first category and concluded that "unfortunately, these studies offer little insight into the specific aspects of pedagogical preparation that are critical" (2001, p. 13; 2002, p. 193). From the nine studies that met the criteria for inclusion in the second category, the authors determined that, "in general, the research suggests that there is value added by teacher

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[235] As I mentioned earlier, while this was not the stated goal of either report, one might expect that an understanding of the kinds of pedagogical understanding that pre-service teachers tend to gain in more typical programs might provide a helpful context in which to interpret the kinds of pedagogical preparation that lead to effective teaching. Therefore, it is somewhat surprising that the absence of research in this area is noted in neither report.

[236] In the 2001 report, Wilson et al. "Focused on research that explores the impact of pedagogical preparation across several components of a teacher preparation program" (p. 12; see also Wilson et al., 2002, p. 193).

preparation" but that it is "difficult to determine specifically what prospective teachers

learn in education coursework" (2002, p. 194).[237] In other words, while the research they

reviewed does suggest a positive benefit (to students) of teachers' pedagogical

preparation, it does not specify what kind of pedagogical preparation the pre-service

teachers in these studies received, and/or what kind of pedagogical understanding they

have.[238]

For Wilson and Floden's (2003) addendum to this report,[239] the authors found

thirteen articles, books and reports that spoke to the issues of the extent to which

knowledge of pedagogical theory, learning theory, or child development contributes

significantly to teacher effectiveness and what pedagogical knowledge is the most

important.[240] The authors state that there are "inconsistent results" concerning the

relationships between teacher preparation and both student achievement and instructional

practice or competence (p. 15). For example, while some studies they reviewed showed

significant differences between teachers with and without education coursework in terms

of how they think about and teach subject matter to their students, other studies showed

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[237] The authors suggest that the difficulty in determining specifically what pre-service teachers learn in their teacher education coursework is due to the research methods used in the studies and the limited sample sizes in the interpretive research (2002, p. 194; 2001, p. 14); for example, since "a teaching credential is admittedly a crude indicator of professional study" (2001, p. 13; 2002, p. 193), it is difficult or impossible to ascertain from these studies "what aspects of the coursework taken for regular certification matter" (2002, p. 193).

[238] The authors explain that it is difficult to know "what the local pedagogical preparation entailed" (2002, p. 194).

[239] This addendum elaborates on several questions posed in the original report, and provides summary statements on several questions that were not addressed in the original report (pp. 4-5).

[240] The research Wilson and Floden reviewed for this as well as the original report focused on teacher education programs, not the impact of particular courses or experiences. The authors explain that to thoroughly answer the question about the extent to which understanding of pedagogical theory, learning theory, or child development contributes significantly to teacher effectiveness and what pedagogical understanding is the most important, they would also need to review literature on the impact of such individual courses. However, the authors suggest that even if they had conducted a thorough review of this research, they suspect that "the results would have remained inconclusive" (p. 16).

no significant differences.[241] The authors state that "We concluded our original report by noting that the research on the impact of pedagogical knowledge or preparation was spotty and inconclusive. The research we reviewed for this addendum has not led us to change that assessment" (p. 16). Indeed, in one or more of these studies, there may be some information about the courses that pre-service teachers take in particular teacher education programs, the espoused and enacted orientation of such programs, as well as the entering and exiting pedagogical understanding of pre-service teachers. However, this addendum, like the other major teacher education literature reviews previously discussed, does not systematically review research on pre-service teachers' pedagogical understanding, adding further evidence to the conclusion that this area has not been studied in depth.

Happily, Wilson et al.'s (2001, 2002) report differs from the 1990 and 1996 *Handbook* chapters and the 2003 and 2005 *Eight Questions* reports in that the authors *do* seem to recognize the importance of research that directly addresses what pre-service teachers learn in various components of their teacher education programs, including in their pedagogical preparation. For example, as well as their recommendation that further and better research in this area be conducted to "clarify these confusing results" (2001, pp. 14-15; 2002, pp. 193-194), the authors also suggest that future teacher education research should be pursued in five domains, one of which involves

> The contribution of particular components of teacher education, by themselves or in interaction with one another, to prospective teachers'

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[241] Wilson and Floden do refer to some studies examining changes in teachers' thinking (regarding subject matter, pedagogy in particular curricular areas and general educational values) with positive results; however, as I will explore in further detail in the discussion of the teacher belief change literature, these results should be viewed with caution.

knowledge and competence. Exploring the relative contributions of education method and education foundation courses on prospective teachers is especially important…. both to describe the variety of experiences that go on under these rubrics and to understand their effects on prospective teachers, alongside and in interaction with other components such as clinical experience and subject matter preparation. (2001, p. 35)

The authors suggest that future research on pedagogical preparation should attempt to clarify skills and knowledge pre-service teachers gain from their education coursework and gain "systematic and comparative results on the content of pedagogical preparation (beyond lists of course titles) and on the instructional methods best suited for professional teacher preparation," to help us understand more about "what teachers learn in subject matter education courses [including pedagogical content preparation]" and "the relationship between components of pedagogical preparation and teacher effectiveness" (2001, pp. 16-17).

Clearly, none of these final sources I examined (*Eight Questions on Teacher Preparation,* 2003; *Eight Questions on Teacher Licensure and Certification*, 2005; Wilson et al., 2001, 2002; and Wilson & Floden, 2003) provide us with useful information about the pedagogical understanding gained by pre-service teachers in more typical teacher education programs or what these programs attempt to teach about pedagogy. Obviously, there is an immediate need for thorough research on pre-service teachers' pedagogical understanding. Surprisingly, however, this need has not been identified in many of the research reviews that were consulted for this chapter. Nor is pre-service teachers' pedagogical understanding given the attention it deserves in either of the

chapters on needed research in teacher education in the *Handbook of Research on Teacher Education* (1996) or *Studying Teacher Education* (2005), which I will now briefly consider.

5.4. Failure to identify pedagogical understanding as an area of needed research

5.4.1. "Needed Research in Teacher Education"

Ducharme and Ducharme's (1996) chapter attempts to determine what teacher educators want and need to know, upon which they have the capacity to act (p. 1030). Their chapter includes a description of the changing practices in and perspectives on teacher education research and the identification of areas of teacher education requiring further research. Of the fifteen questions the authors believe "need additional research" (p. 1034), none deals directly with clarifying pre-service teachers' pedagogical understanding,[242] yet adequately answering at least four of these questions requires determining the understanding of pedagogy pre-service teachers tend to gain as a result of participating in more typical programs. For example, the authors recommend additional research to determine what changes occur in teachers as they age and mature, regarding their pedagogy, attitudes toward learners, and self-concepts (p. 1041). Clearly, answering

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[242] Admittedly, there are a few that are potentially related. For example, Ducharme and Ducharme recommend that "researchers consider what portions of professional study and skill that undergraduates can profitably study and acquire" (e.g. understanding gained in foundations courses) (p. 1036) but discuss this in relation to the generally young age of the majority of pre-service teachers; the authors speculate that individuals with more life experience might be more effective in developing such understanding. The authors also suggest that research attempt to determine how prospective and practicing teachers can best demonstrate what they know and what they can do; unfortunately, their pedagogical understanding is not specifically addressed in the brief discussion or in the suggestions for needed research (p. 1038). A third area is distinctive teacher education programs and characteristics related to their distinctiveness (e.g. what might help such programs produce "teachers of extraordinary quality"). Ducharme and Ducharme suggest that knowledge in this area "remains limited" (p. 1038); the role of pedagogical understanding in such distinctive programs is not discussed as an area requiring further research.

this question requires first determining what kinds of pedagogical understanding pre-service teachers have when they first enter the workforce. Yet Ducharme and Ducharme do not mention the dearth of research or call for further research in this specific area.[243]

A second such question is, "Are there differences that relate to teacher performance between teaching graduates of NCATE member institutions and graduates of nonmember institutions otherwise similar in size, type, and scope?" In this question's commentary, the authors ask, "Are there discernable differences in content knowledge, rapport with students, social commitment, methods of instruction, and/or effectiveness in multicultural settings?" Again, the importance of understanding the larger arena in which rapport with students and methods of instruction exist—pre-service teachers' pedagogical understanding—seems to be overlooked by the authors; they fail to identify both our almost complete ignorance about this area and how pre-service teachers' pedagogical understanding informs their own research question (and thus the need to thoroughly research the topic).

Two of the authors' identified questions concern pedagogical approaches used in teacher education programs;[244] the authors' concern is with the widespread adoption of such approaches without any significant documentation of their contribution to pre-service teachers' learning or influence on their teaching practice. However, while these two questions do rightly point to our need to ascertain whether such practices indeed should be adopted in teacher education programs, again, the authors fail to address the larger contexts in which they exist—that is, the pedagogical understanding such programs

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[243] Rather puzzlingly, the authors suggest answering this question is important to give pre-service teachers more realistic career expectations (before entering the profession).

[244] Regarding the efficacy of pre-service teachers keeping journals and learning with cases

are attempting to foster in their pre-service teachers and the degree to which they are successful. Ducharme and Ducharme conclude their chapter by suggesting that readers will notice areas needing research that the authors have overlooked. Perhaps by this point in our review of teacher education research, we should no longer be surprised that, like so many others, these authors have also failed to notice or emphasize the need for research on pre-service teachers' pedagogical understanding.

5.4.2. "A Research Agenda for Teacher Education"

Zeichner's chapter in *Studying Teacher Education* (2005) is somewhat different: while he does not emphasize the dearth of research on pre-service teachers' pedagogical understanding in particular, Zeichner does make several more general recommendations for needed research that do include this area. For example, two of the six important topics or issues that he believes research in teacher education needs to address are: the curriculum, instructional practices and social relations of teacher education; and other neglected topics. In the former, Zeichner states that there has been very little work documenting "the nature and quality of the teacher education curriculum, the variety of requirements, the content of preparation programs at different levels… and in different subject areas" and that "we know very little about the nature of instructional interactions between teacher educators and their students in teacher education classrooms" (p. 748). He suggests two questions about instructional interactions and social relations that need to be explored, both of which relate directly to pre-service teachers' pedagogical understanding: "What views of knowledge and level of academic demands are evident in classroom discussions in teacher education programs? To what extent do teacher educators teach prospective teachers in ways consistent with what they advocate in their

classes?" (p. 748). Zeichner suggests that we need more research "to elaborate and refine our understanding of the characteristics of teacher education programs related to their success in accomplishing program goals" (p. 749).

In discussing the other neglected topics of teacher education that need to be thoroughly researched, Zeichner rightly claims that "there are whole aspects of teacher education that remain virtually unexplored by researchers that need careful study. These include the nature and impact of subject matter and general education preparation of teachers, the role of psychological and social foundations…" (p. 749). He also claims that "research on teacher education has largely ignored the role of the general education and subject matter preparation of teachers" (p. 749). Zeichner suggests that one way in which teacher education research should proceed is in the creation of "national databases detailing information about… the curricular requirements in [various teacher education] programs" (p. 756). In other words, while Zeichner certainly does not highlight our lack of knowledge about the kinds of pedagogical understanding teacher education programs attempt to foster, and the kinds of pedagogical understanding pre-service teachers tend to gain as a result of participating in these programs to the degree that I believe is important, thankfully, his more general observations about needed research do encompass areas related to pedagogical understanding.

Obviously, one could continue to consult additional reports and reviews in an attempt to answer these questions: Does any research exist on the kinds of pedagogical understanding more typical teacher education programs attempt to foster in their pre-service teachers and the kinds of understanding graduates gain as a result of participating in such programs? If so, what does such research indicate? One could also continue to

accrue evidence that pre-service teachers' pedagogical understanding has not been identified as an area requiring immediate research in major reviews and reports. However, the seven sources I have examined, the *Handbooks of Research on Teacher Education* (1990, 1996), *Studying Teacher Education* (2005), *Eight Questions on Teacher Preparation* (2003), *Eight Questions on Teacher Licensure and Certification* (2005), Wilson et al. (2001, 2002) and Wilson and Floden (2003) do adequately illustrate that no substantial body of research exists addressing this question.[245] Perhaps even more troubling is that the significance of this absence itself is not acknowledged in many of these major research reviews. One might assume that if the reason for the absence were simply a lack of data, reviewers would emphasize the importance of our understanding of this area, lament our ignorance about it, and strongly recommend immediate research. Sadly, this does not generally seem to be the case.

What could be some possible reasons for this omission? It seems clear that many reviewers are focused on the kinds of pedagogical understanding that can lead to teacher effectiveness, and certainly this is important to clarify. However, surely understanding what teacher education programs are currently doing, and their relative success or failure, gives important contextual understanding to the consideration of how such programs might best foster particular kinds of pedagogical understanding that are related to teacher effectiveness. Could it be that the kind of pedagogical understanding pre-service teachers are expected to gain as a result of their teacher education is so taken-for-granted that it is neither questioned nor studied? Are the beliefs about learning, teaching, and child

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[245] Certainly, there is the possibility that studies that address the questions I seek to answer do, in fact, exist; however, the reliability of any such studies may be questionable if they were not considered for inclusion in any of the most definitive reviews on teacher education research.

development so thoroughly accepted that, collectively, we fail to imagine alternatives? Is it possible that there are no teacher education programs that are based upon alternative conceptions of pedagogy that are studying, in rigorous ways, the entering and exiting pedagogical understandings of their pre-service (and later practicing) teachers and publishing the results of their studies?

Clearly, attempting to determine what understanding of pedagogy pre-service teachers tend to gain from their participation in more typical programs by examining reputable research reviews seems to be largely unproductive. However, there are two other, admittedly rather indirect, methods we might use to gain some sense of pre-service teachers' pedagogical understanding. The first is by considering the literature on teachers' belief change. The second is to consider the research on the pedagogy of teacher education programs to determine the way pedagogy tends to be understood in the educational community, and, by extension, perhaps also by the new teachers entering that community.

5.5. Research on teacher belief change

Considering the literature on the more general area of teacher belief change may reveal some helpful information about pre-service teachers' pedagogical understanding. Is there any evidence that there are substantial changes in pre-service teachers' beliefs, including those about pedagogy, as a result of their participation in teacher education programs? If examination of this body of research reveals that most teacher education programs seem to have little or no impact on pre-service teachers' beliefs, including those about teaching and learning, then we can be fairly confident that pre-service teachers' pedagogical understandings when they enter the workforce are quite similar to those they

had upon program entry. Research supporting the more hopeful alternative, that there is substantial evidence of significant changes in beliefs, would give us an indication of the nature of the pedagogical understanding pre-service teachers might have after participating in programs that have successfully implemented interventions. As part of the consideration of this literature, I will briefly sketch what is known about pre-service teachers' entering pedagogical understandings. I will then discuss the research on program or course interventions aimed at changing these conceptions, including what we can conclude about this body of research, given its limitations.

5.5.1. Pre-service teachers' pedagogical understandings upon program entry

Entering candidates' pedagogical understandings tend to be described in the literature on teacher belief change in rather general terms. While more specificity would certainly be desirable, there is a substantial body of research that suggests their entering conceptions of teaching and learning are simplistic and transmissive (Richardson, 1996, p. 108; see also Wideen et al., 1998, p. 143).[246] For example, Richardson (1996) characterizes pre-service teachers' beliefs about teaching as a process in which "teachers hand out knowledge to students"[247][248] and beliefs about learning as a process of "memorizing the content of the curriculum" (p. 108; see also Brookhart & Freeman, 1992, p. 50; Patrick & Pintrich, 2001, p. 120). Richardson (1996) suggests that pre-

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[246] Wideen et al. (1993) cite Johnston (1992) as suggesting that, during their teacher education programs, the pre-service teachers she studied had "narrow views of what constitutes learning" (p. 8).

[247] For example, Hollingsworth (1989) found that a number of the fourteen pre-service teachers she studied "held strong beliefs that the role of the teacher is to hand knowledge to students in a direct instruction manner" (p. 109).

[248] Interestingly, though, pre-service teachers do not seem to consider the 'handing out of knowledge' relevant to them in their own learning to teach process: they "believe that there is not much they can learn in preservice teacher education except during their student teaching experiences (Book, Byers & Freeman, 1983) and they hold strong beliefs that learning to teach can only be accomplished through experience" (citing Richardson-Koehler, 1988) (Richardson, 1996, p. 108).

service teachers' "conceptions of the content of the curriculum reflect a positivistic view…. that one correct answer exists for every question and that the teacher's responsibility is to get all students to learn the propositions presented to them or develop strategies for obtaining the correct answer" (p. 108). The most prevalent image of teachers pre-service teachers are said to hold is the traditional didactic teacher (Mitchell, 1996, and Hollingsworth, 1989, cited in Wideen et al., 1998, p. 143),[249] and the most common qualities associated with being "a really good teacher" are not deep understanding of subject matter and the processes of teaching and learning, as we might expect, but rather nurturance, understanding, warmth and an ability to relate to children (Weinstein, 1990, cited in Wideen et al., 1998, p. 142; see also Brookhart & Freeman, 1992, p. 51; Goldstein, 2002; Goldstein & Lake, 2000; Pajares, 1992, p. 323; Patrick & Pintrich, 2001, p. 120); researchers claim that pre-service teachers value the importance of "teaching personality" more than they value either pedagogical understanding or subject matter understanding (Sugrue, 1996, cited in Wideen et al., 1998, p. 143).[250] This rather positivist sense of pedagogical understanding (Richardson, 1996, p. 108) is claimed to originate in pre-service teachers' own personal experiences as students, with formal knowledge (including subject matter instruction at university), through interaction with parents, and by means of exposure to archetypes of teaching found in the culture

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[249] Richardson (1996) suggests that pre-service teachers beginning their programs "hold strong images of teachers, both negative and positive, and their images strongly influence how they approach their teacher education program" and that their "philosophies of teaching are loosely formulated" (p. 108).

[250] Anderson (2001) notes that all of the pre-service teachers who partook in the three studies she summarizes had clear notions about what it means to teach and that teacher education programs would support and develop, rather than challenge, these notions (p. 196). In other words, in terms of their immutability, the pre-service teachers in these studies shared similar entering conceptions of teaching and learning (p. 196) and in how they experienced the course (p. 201).

(Lortie, 1975; Pajares, 1992, p. 316; Patrick & Pintrich, 2001, p. 119; Richardson, 1996, p. 105; Wideen et al., 1998, p. 142).

5.5.2. Teacher education programs' success in changing these understandings

Richardson (1996) calls the debate about whether or not and to what degree educational beliefs such as those I have described are amenable to change "perhaps the greatest controversy in teacher change literature" (p. 110). Indeed, numerous researchers support the position that pedagogical understanding is the most difficult to change (in contrast to subject matter understanding, for example) (e.g. Wubbels et al., 1992, Roberts & Chaatsko, 1990, and Stoddart et al., 1992, cited in Wideen et al., 1993, p. 7). Yet this is certainly a contentious issue: some researchers conclude that it is "extremely difficult" to change pre-service teachers' pedagogical understanding, while others remain "optimistic" (Richardson, 1996, p. 110). In the former group, for example, Pajares (1992) suggests that change is infrequent; Patrick and Pintrich (2001) claim that belief change is "difficult and challenging" (p. 139). Wideen et al.'s (1998) review of ninety-three empirical studies on learning to teach "supports the findings of others that many traditional programs of teacher education have little effect upon the firmly held beliefs" of pre-service teachers (p. 130).[251] Richardson (1996) also suggests that attempts to change pre-service teachers'

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[251] A major focus of this review was to examine the interventions occurring during teacher education programs (p. 135).

beliefs through teacher education programs[252] are less than hopeful: "except for the student-teaching element, preservice teacher education seems a weak intervention… sandwiched between two powerful forces—previous life history… and classroom experience as a student teacher and teacher" (p. 113[253]; see also Wideen et al., 1993[254]).

Some researchers argue that, rather than undergo any transformation in understanding due to their teacher education programs, pre-service teachers simply use their previous understanding (including of pedagogy) to understand new learning (Stofflett & Stoddart, 1992, and Weinstein, 1990, cited in Wideen et al., 1998, p. 142; see also Holt-Reynolds, 1992, cited in Richardson, 1996, p. 109; Zeichner & Gore, 1990, p. 337). According to this view, prior understanding is claimed to act as a filter "to screen out program experiences that are cognitively incompatible" (Wideen et al., 1998, p. 145;

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[252] Richardson's discussion of pre-service teachers' belief changes as a result of program and course participation has a very broad focus. While the author does briefly summarize numerous studies that showed no significant changes in pre-service teachers' beliefs as a result of program interventions (pp. 111-112), besides the very general sense that most programs seem to be unsuccessful in producing significant changes in pre-service teachers' pedagogical understanding, the chapter gives us no clear sense of the pedagogical understanding of pre-service teachers who have completed their teacher education programs. Richardson (1996) suggests that pre-service teacher education "poses challenges" for changing pre-service teachers' pedagogical understandings (p. 113), especially considering their limited teaching experience, and thus their opportunity to reflect upon the connections between their pedagogical beliefs and teaching practices (p. 113).

[253] Richardson's (1996) position is in fact more nuanced than this particular quotation might imply. While she suggests that the reason for less than extensive success in this area is largely attributable to the strength of pre-service teachers' entering pedagogical understanding, developed from their previous school and life experiences (p. 109), she also recognizes that the results of studies on the efficacy of changing pre-service teachers' beliefs are "complex" with some programs effecting change and others failing to do so, some types of students being affected while others are not, and some beliefs being more amenable to change than others (p. 111; see also Wideen et al., 1998, p. 159).

[254] Wideen et al. (1993) suggest that the findings of their reviewed studies

support the common view about the difficulty in changing the beliefs about teaching that beginning students bring into the program. All the studies that took a constructivist perspective talked about these strongly held views (mainly emphasizing views about subject matter structure and about teaching and learning). There was a tendency for students to accept new ideas that agreed with their existing views and reject those that conflicted. (p. 7)

see also Anderson, 2001, p. 189).[255] The view that "students' predispositions stand at the core of becoming a teacher, exerting a much more powerful socializing influence than either preservice training or later socialization in the workplace"[256] (Zeichner & Gore, 1990), a position argued by Lortie (1975), has been, at least some theorists argue, largely unchallenged by a significant segment of the educational community (Wideen et al., 1998, p. 166; see also Anderson, 2001, p. 191).

Certainly, the number of theorists who believe that pre-service teachers' pedagogical understanding is resilient should give us pause. Yet there are also those who at least question such conclusions. For example, Brookhart and Freeman (1992) claim that there is "contradictory evidence" about teacher education's potential to change pre-service teachers' understanding (p. 51; see also Anderson, 2001, p. 212). Zeichner and Gore recommend that one must be "cautious" in accepting the research findings of the many studies suggesting that teacher education courses have a low socializing impact (p. 338). Wideen et al. (1998) similarly suggest that, although it is not what is suggested by "a first reading of this research" (p. 159), there are "some encouraging hints" about the potential flexibility of pre-service teachers' beliefs and that the "fixed nature of prospective teachers' beliefs should remain an open question" (p. 144). In addition, there is evidence of some diversity of beliefs (e.g. Anderson, 2001; Calderhead & Robson, 1991, cited Richardson, 1996, p. 108; Mertz & McNeely, 1992, cited in Wideen et al.,

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[255] As Wideen et al. (1998) note, the situation is more complex than this brief summary suggests, as much more research is needed that takes into account the specific beliefs of pre-service teachers and how such beliefs may interact with and filter particular program experiences (p. 145). Wideen et al. (1998) also note that some studies suggest the process of change can be subtle (p. 148)—a possibility that many researchers have not accounted for in their estimation of whether change does or does not occur.

[256] Richardson (1996) also argues that preservice teachers' entering pedagogical understanding seem to have a significant influence in what they learn in their teacher education (pp. 109-110).

247

1998, p. 143), variety in their character and strength (Richardson, 1996) as well as indications that some beliefs are more amenable to change than others.[257]

Part of the reason for the debate is the uncertain quality of the research used in many of these studies, owing to weaknesses that have been noted by numerous theorists. For example, Patrick and Pintrich (2001) describe the literature on pre-service teachers' beliefs "large, fragmented, and not easily summarized" (p. 119). Wideen et al. (1998) find so many problems with this body of literature that they stress "the need for critical intellectual standards" (p. 163). My own examination of this research has led me to conclude that the validity of the conclusions is often questionable because so much of the research suffers from numerous problems, including: problematic methodology; its atheoretical nature, inappropriate generalizations and the failure to take programmatic and institutional factors into consideration;[258] limitation to a single institutional context;

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[257] Richardson (1996) notes that the studies she reviewed suggest "that entering candidates should not be considered as an undifferentiated group, but that attention should be paid to individual and group differences in conceptions and developmental levels" (p. 109), a practice that has not commonly been followed in this area of research (see also Wideen et al., 1998, p. 143).

[258] For example, in their review of fifteen empirical studies on learning to teach, Wideen et al. (1993) note that thirteen occurred in programs with a constructivist orientation. The authors call constructivism the "new enlightenment" (p. 6) of teacher education but question many of these programs' success in consistently implementing practices based on constructivist principles:

in some of the programs, prescription has been built into the notions of constructivism… [in which] students are led step-by-step through procedures designed to facilitate conceptual chance and to promote construction of meaning. In many cases the type of meaning that they are to construct is specified…. Are we in the process of replacing dogma with dogma? (p. 6)

The authors suggest that contradictions in espoused and enacted pedagogy in programs that advocate constructivist teaching practices but use and reinforce more traditional teaching practices are "a classic case of 'Do as I say, not as I do'" (p. 160). Five years later, in their review of ninety-three empirical studies on learning to teach, spanning nine years, Wideen et al. (1998) conclude that most of the pre-service teachers who participated in the studies were enrolled in programs based on the positivist tradition (p. 133), although the studies generally attempted to move pre-service teachers' educational beliefs away from positivist leanings. The authors describe such programs as based on the view that learning to teach is a process of acquiring knowledge about teaching (p. 160). In other words, many studies involved innovative courses or year-long approaches embedded within larger structures based upon opposing (or at least divergent) understandings (p. 133).

Similarly, Ginsburg and Clift (1990) suggest that the hidden curriculum of many teacher education programs may be more positivistic than constructivist in orientation: they argue that the conception of

failure to recognize variation among pre-service teacher populations; and difficulty in determining whether the findings account for significant longer term changes in beliefs (Brookhart & Freeman 1992; Pajares, 1992; Richardson, 1996; Wideen et al., 1998; Zeichner & Gore, 1990).

In other words, it is entirely possible that pre-service teachers beliefs, including those about teaching and learning, are, in fact, more amenable to change than this rather flawed body of research might initially suggest.[259] However, even given this distinct possibility, the fact that the majority of courses and programs attempting to change pre-service teachers' beliefs seem to fail in this endeavour (Richardson, 1996, pp. 111-112)[260] does suggest that the pedagogical understandings of most pre-service teachers in most teacher education programs (including those in more traditional programs as well as those implementing innovative interventions attempting to change beliefs, but failing to do so) are, upon program completion, quite similar to those upon program entry: simplistic and

knowledge communicated via the hidden curriculum in most teacher education programs is public, rather than personal, molecular, rather than holistic, and given, versus problematic (p. 455; see also Zeichner & Gore, 1990, p. 338). Because many more recent studies that attempt to change pre-service teachers' pedagogical understanding aim to do so from the conception of knowledge as public, molecular and given towards the conception of knowledge as personal, holistic and problematic, and because larger programmatic structures may, in fact, reinforce the former, it is possible that, despite an apparent espoused constructivist understanding of pedagogy, such programs may, in fact, enact an understanding that is actually more transmissive, and reinforce such notions in their pre-service teachers.

[259] Of course, there is certainly some evidence that teacher education programs have the potential to change (at least some if not all) pre-service teachers' pedagogical understanding. For example, Hollingsworth (1989) found evidence of changes in pedagogical understanding of some of the pre-service teachers in her study, especially those who were both encouraged to confront their beliefs and placed with cooperating teachers with contrasting understandings. Similarly, Feiman-Nemser, McDiarmid, Melnick and Parker (1989) found evidence of changes in beliefs about teaching and learning in their study of ninety-one pre-service teachers (cited in Richardson, 1996, p. 111). My point, however, is that such studies often seem to give us few details about the kinds of pedagogical understanding of those pre-service teachers who are said to change. As well, there is certainly no evidence that the majority of pre-service teachers substantially change their pedagogical understanding as a result of participating in teacher education.

[260] "A number of studies indicate that the particular teacher education program being studied (and in which the researchers are often working as teacher educators) has little effect on students' beliefs and conceptions. Most of these studies involved programs designed to help preservice students become more reflective and/or to develop a constructivist learning theory" (Richardson, 1996, p. 112).

transmissive (Richardson, 1996, p. 108), characterized by teachers handing out

information to students and students largely engaged in "memorizing the content of the

curriculum" (p. 108; see also Brookhart & Freeman, 1992, p. 50; Patrick & Pintrich,

2001, p. 120).[261] The sense of pedagogy as the translation of general knowledge of

teaching and learning and children's development into specific activities that teachers can

use to promote student learning, applicable in a wide variety of contexts, bares little

resemblance to the pedagogical understandings that I described at the opening of this

chapter, which I suggest should be fostered in an imaginative teacher education program.

5.6.   Research on the pedagogy of teacher education programs

A second way in which we can attempt to ascertain what kinds of pedagogical

understanding pre-service teachers tend to gain as a result of participating in more typical

programs is to examine what we know about the pedagogy of teacher education

programs. As with the first method, this one is also admittedly indirect; however, it does

seem likely that pre-service teachers might pick up significant understanding of pedagogy

from the ways in which they experience the pedagogy of their own programs, and from

the ways in which pedagogy is conceptualized in the larger educational community that

they are entering. In this section, I will consider two sources: *Studying Teacher*

Education (2005) and the *Handbook of Research on Teacher Education* (1996). *Studying*

Teacher Education (2005) includes a chapter devoted to the research on the pedagogical

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[261] Of course the small proportion of programs successfully bringing about changes in pre-service teachers'
pedagogical understandings would obviously produce at least some graduates with understanding
significantly different than they had upon program entry. Clearly, though, this would represent only a
fraction of the population of pre-service teachers.

approaches used in teacher education (Grossman).[262] The *Handbook of Research on Teacher Education* (1996) has three chapters that I will discuss: one on designing coherent and effective teacher education programs (Howey) that includes a discussion of the pedagogy of teacher preparation programs; a related chapter on classroom management (Jones); and a chapter on a future for teacher education (Barone, Berliner, Blanchard, Casanova & McGowan) that includes some useful information about teacher education pedagogy.

5.6.1. *Studying Teacher Education* (2005)

The goal of Grossman's (2005) chapter on the research on pedagogical approaches in teacher education[263] is to summarize the research on both how we teach pre-service teachers and how various approaches used in teacher education might affect what pre-service teachers learn about teaching (including their knowledge and beliefs about teaching as well as their teaching practice) (p. 425).[264] Grossman rightly acknowledges that attention to pedagogy is critical in teacher education because "*how*

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[262] Zeichner and Conklin's chapter on teacher education programs in *Studying Teacher Education* (2005) contains no data that clarifies either what more typical teacher education programs attempt to teach about pedagogy or what pre-service teachers completing those programs tend to learn about pedagogy. The authors acknowledge that "the program information provided in most studies [they reviewed] was based on either descriptions of the programs by those associated with them or an analysis of program documents, not on close study of the implementation of the programs" (p. 649). The chapter does refer to research that examined, among other things, graduates' satisfaction with their teacher education, as well as case studies of specific teacher education programs. The results of the case studies are not reported in Zeichner and Conklin's chapter. While examining particular studies may reveal that some do indicate something about the pedagogy of the teacher education program that was examined, in this chapter there is neither an overview of nor summary statements about teacher education pedagogy. For this reason, it was not helpful for this discussion.

[263] An extensive search of the empirical research literature between the years of 1985 and 2001 was conducted for this chapter (p. 427).

[264] The panel's intention was to "review the literature on pedagogical approaches in teacher education, particularly the teaching methods, strategies, instructional approaches, assignments, and learning opportunities common to teacher education programs and projects at many institutions and within many program types" in order to determine the contributions particular pedagogical strategies made to teacher preparation outcomes (Executive Summary, *Studying Teacher Education*, 2005, p. 17).

one teaches is part and parcel of what one teaches" (p. 425). According to Grossman, pedagogy can be defined quite broadly to include tasks and assignments as well as classroom instruction and interaction (including interactions among teacher educators, pre-service teachers, and content during classes and "the more relational aspects of teaching and learning such as the relationships established among teachers and students and how they shape what prospective teachers learn") (p. 426); indeed, the author believes that all of these aspects of pedagogy are important. However, because the U.S. research literature has been largely focused on the uses of particular pedagogical approaches or instructional strategies, Grossman's chapter focuses on five broad pedagogical approaches commonly used in teacher education programs (p. 426): laboratory experiences (including microteaching and computer simulation), case studies,[265] video and hypermedia materials, portfolios,[266] and practitioner research.[267] [268]

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[265] Grossman claims that "we cannot make strong claims about the use of cases" since "more descriptive work exists on what people are doing in teacher education classrooms than do systematic studies of the outcomes of various aspects of case-based pedagogy" (p. 442). A good deal of the research on the use of case studies investigates the relationship between the use of cases and pre-service teachers' cognitive ability to reason through complex teaching situations: "there is no evidence that the use of case-based pedagogy affects preservice teachers' classroom practice" (p. 442).

[266] Despite the popular conception that portfolios help pre-service teachers become more reflective about their practice, there is next to no evidence to support this belief. Most of the reviewed studies on the use of portfolios in teacher education look at pre-service teachers' "perceptions of the process of constructing portfolios" (p. 443); only one of the studies reviewed by Grossman "carefully looked at how the structure of a portfolio assignment might affect the content" of pre-service teachers' reflections (p. 445).

[267] Practitioner research is broadly defined, in some cases as action research (the goal of which is to change practice), in others as teacher research; in other words, some researchers use practitioner research to help pre-service teachers achieve particular outcomes, while others use it to assist them in gaining a deeper understanding of the nature of inquiry itself (p. 445). Again, since there were few empirical studies in this area that met the criteria for inclusion, "there is little empirical evidence about the outcomes of engagement in practitioner research during preservice teacher education" (Executive Summary, *Studying Teacher Education*, 2005, p. 19), including how it "affects dimensions of the actual classroom practice of preservice teachers" (Grossman, 2005, p. 448). Grossman does identify this pedagogical approach as most often connected to an understanding of teaching as an inquiry-based practice (p. 445).

[268] "that are both prevalent in teacher education programs and about which there are a number of systematic studies that met the criteria established by the Panel" (p. 426).

Even given this much more limited definition of pedagogy, Grossman found only a small number of empirical studies that met the criteria for inclusion (p. 426).[269] [270]

Grossman's chapter provides us with several examples of the ways in which pedagogy tends to be conceptualized in the research on teacher education pedagogy, from which we can make some cautious inferences about the ways in which pre-service teachers may understand pedagogy. First, Grossman claims that there is virtually no research being conducted using the broader definition of pedagogy she provides (and thus probably very little work that has been done investigating the relationship of complex phenomena such as the effects of teachers' relationships on student learning in relation to particular pedagogical approaches). From this we might infer that there are few programs that are based on, and are rigourously investigating the effects of, such broader understandings of pedagogy. The predominance in the research literature of studies investigating the use of specific pedagogical approaches for particular outcomes suggests that a more technical notion of pedagogy might also be the one commonly enacted in teacher education programs.

Second, Grossman claims that many of the studies on the use of laboratory experiences seem to be based on behaviourism[271] and that a good deal of the research on microteaching and video technology has lacked a strong theoretical framework (p. 438).

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[269] Grossman's review "focuses more on outcomes of instructional strategies for the preservice teachers themselves, rather than for their students. These outcomes include changes in preservice teachers' beliefs, knowledge, attitudes, or classroom practice" (p. 427).

[270] The author also acknowledges that the pedagogy of arts and science course are also a part of the pedagogy of teacher education, but any such studies examining this (of which there are few) are not considered in her chapter.

[271] The majority of studies have focused on training pre-service teachers to use specific skills that researchers suggest are related to effective teaching; few studies have looked at teachers' cognition—most have examined behaviour (Executive Summary, *Studying Teacher Education*, 2005, p. 18).

We might infer from this that, in both research areas, pedagogy is considered the use and teaching of particular skills to produce desired outcomes justified by what works in the classroom rather than on theoretical grounds. In other words, the research is based on a primarily technical understanding of pedagogy.

Third, Grossman claims that the conceptions of teaching and learning to teach upon which various pedagogies of teacher education are based are often left tacit.[272] If as Grossman suggests, attention to pedagogy is critical in teacher education because "*how* one teaches is part and parcel of what one teaches" (p. 425), then pre-service teachers may be learning powerful messages from the unexamined conceptions of teaching and learning in their teacher education programs: at least Grossman's claim suggests that pre-service teachers are certainly not being encouraged to make explicit and critique the pedagogy which they are experiencing and which their program is enacting.

Fourth, Grossman suggests that many of the research studies on the research on the pedagogy of teacher education fail to pay attention to context: "few [research] designs look at the pedagogy of programs as a whole or try explicitly to disentangle the power of particular pedagogies from overall program effects"(p. 448).[273] This 'vacuum-based'

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[272] "although the pedagogical activities of teacher education are linked implicitly to conceptual orientations toward teaching, learning, and learning to teach, the goals of particular pedagogies and the ways they are tethered to particular conceptual orientations are often left tacit" (p. 429). Part of Grossman's review involves identifying these underlying conceptions of teaching and learning to teach. Grossman suggests that there is a "plethora" of pedagogies used in teacher education, that reflect, "in part, the different conceptions of teaching practice that exist" since various conceptions of teaching lead to particular forms of pedagogy in teacher education (p. 429). "Teaching has been described as a set of techniques of behaviors, as a form of clinical decision making, as a cognitive apprenticeship based in disciplinary understanding, as a therapeutic relationship, and as a process of continuing inquiry" (p. 429).

[273] "The outcomes investigated in these studies range from shifts in perceptions, changes in knowledge and beliefs, changes in the ability to reflect or identify issues—all cognitive outcomes of one form or another—to attitudes toward the pedagogy or feelings of self-efficacy—more affective outcomes. Few, if any, of these studies attempted to investigate the difficult problems of the relationship among pedagogy used in teacher education, the practices of beginning teachers, and the learning of their students" (Executive Summary, *Studying Teacher Education*, 2005, p. 19).

research is one that "haunts" the research literature on teacher education pedagogy, according to Grossman (448).[274] Relatedly, most studies fail to take into account the context of social relationships: although we know that the relationships between teacher educators and pre-service teachers "affect the quality of student experiences" as they do "in every educational program," most of the studies of pedagogical approaches do not clarify features of these relationships "that might either intensify or dilute the power of a particular approach" (p. 448). Teacher education pedagogy researchers' failure to consider either the larger programmatic or social contexts might lead us to infer that their understanding of pedagogy tends to be technical and molecular: as the techniques that a teacher learns, a teacher educator uses and teaches, or a researcher studies, that are separate from and uninfluenced by the other systems in which it exists (such as the teacher's understanding of particular children and classes, her or himself, the researchers' understanding of the influencing variables of other classes, program goals, and so on).[275]

While much of Grossman's discussion of teacher education pedagogy is somewhat disheartening, happily, she does identify a need to investigate the relationship of pedagogies used in teacher education programs and their numerous possible effects (including on pre-service teachers' practice and cognition—or their pedagogical understanding). Grossman also recognizes that we need better theory in the research on

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[274] "The studies generally examine only one pedagogical approach… and seldom compare the effectiveness of different pedagogical approaches. The studies in this area generally do not provide extensive information on how particular pedagogical approaches are implemented, or on how an approach used in a specific course relates to approaches used in other parts of the curriculum" (Executive Summary, *Studying Teacher Education*, 2005, p. 19).

[275] "Although recent studies nod more to theory [than did older and more atheoretical research], often the theory invoked covers only the specific pedagogy under investigation, not the larger problem of the relationship between how we teach in teacher education and what our students learn" (p. 450).

teacher education pedagogy,[276] theory that "would go beyond the particulars of a specific

pedagogical approach to help us understand more broadly the relationship between the

pedagogies of professional education and features of professional practice" (p. 450).[277]

She suggests that others have tried to articulate such a theory of teacher learning that can

"cut across a range of pedagogical approaches" (p. 451).

5.6.2. *Handbook of Research on Teacher Education* (1996)

The second source I will examine, the *Handbook of Research on Teacher*

Education (1996), has three chapters (Howey; Jones; Barone, Berliner, Blanchard,

Casanova & McGowan)[278] that directly or indirectly address the pedagogy of teacher

education, from which we can make some inferences about the way pedagogy tends to be

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[276] "As a field, research on teacher education has expended relatively little effort in building the tools of the trade. Yet… having the right tools for investigating complex phenomena can make all the difference in what we are able to see" (p. 451).

[277] The authors of the Executive Summary suggest that such programmatic research could "investigate interactions between particular pedagogical approaches and characteristics of either the prospective teachers or the programmatic contexts in which the approaches are used" (Executive Summary, *Studying Teacher Education*, 2005, p. 20).

[278] The title of Christensen's *Handbook of Research in Teacher Education* (1996) chapter, "The Professional Knowledge-Research Base for Teacher Education," suggests that it might provide some evidence of the pedagogy of teacher education programs. However, the aim of this chapter was to ascertain the degree to which identified knowledge bases of teaching were directly impacting the design and delivery of the forty-two teacher education programs (which voluntarily provided evidence of the knowledge base of their program) (p. 39). The author concludes that the majority of the institutions who submitted reports about their policies and practices did provide adequate evidence of the knowledge base informing the structure and contents of their program: "In each case it seemed clear that the knowledge base was carefully designed and provided a solid basis for the models and program rationales" (p. 49). Yet, interestingly, far below half of the institutions (only sixteen of forty-two) were successful in meeting the NCATE (National Council for Accreditation of Teacher Education) knowledge base standards. A significant limitation of this finding is that the data was self-reported. Since reports were not triangulated (for example, by classroom observations carried out by external researchers), there is no verification that the knowledge bases that are claimed to be being used by teacher educators actually do inform practice in the ways in which they are assumed to do so: "it is possible, therefore, that the impressive evidence in the reports may not be reflected in the practices of the institutions" (p. 49). Zeichner and Conklin (2005) similarly note that "a program as described by teacher educators may be different from the one experienced by teacher education students" (p. 648). The chapter includes no specific information regarding the understanding of pedagogy espoused or enacted in the forty-two institutions (or even in the three that are profiled in some detail) that would be helpful to determine, if even indirectly, what these institutions aim to teach (and/or what pre-service teachers learn) about teaching and learning by participating in their teacher education programs.

understood in the educational community, and, by extension, perhaps also by the new teachers entering that community. The first of these is Howey's chapter on designing coherent and effective teacher education programs, which includes a discussion of the pedagogy of teacher preparation programs.

Howey suggests that the pedagogy experienced by most pre-service teachers in their teacher education programs is generally reflective of a positivist orientation:

> Obviously the staples of teacher preparation for many years have been activities and practices reflective of behaviorism, behavioral analysis, and, consistent with a strong research tradition, applied behavioristic psychology. (p. 155)

He laments that "fundamental conceptions and components of instruction have in many respects remained the same [since the 1940s]…. teachers still mostly lecture and students still mostly listen" (p. 168) and argues that

> There has been no coordinated or concerted effort to 'break the mold' in teacher education. For professors, courses—lecture and discussion— remain the coin of the realm. The abstract nature of much of this activity tends to reinforce in prospective teachers, and in a relatively nondiscriminating manner, the belief that P-12 classrooms are *the* place to learn to teach. (p. 166)

> [A challenge of great proportions] is the question of how to fundamentally transform the character of much of what now passes for teaching and learning in all school contexts and at all levels. Teaching in far too many instances, and certainly far too often in the halls of academe, remains largely a lecture-recitation activity. 'Learning,' in turn, remains basically a

passive and largely individual activity…. A vicious cycle of mediocrity continues in teaching wherein teachers continue to teach as they are taught. From this perspective, the challenge in designing more potent programs of teacher preparation is… coming to agreement … [on how the] curriculum is represented to and engaged in by prospective teachers in pedagogically powerful ways, that is, in contexts that are, in fact, conducive to learning to teach. (p. 145)

Howey suggests that the pedagogy of teacher education programs needs to be "altered in a dramatic fashion" since the character of the pedagogy that pre-service teachers experience in their teacher education programs becomes the one they "eventually take on" (p. 145). While many of Howey's descriptions are not supported by research studies, his characterization certainly strongly suggests that, despite espoused support of new, primarily constructivist, approaches to teaching and learning, most teacher education programs still enact a largely technical notion of pedagogy. Certainly, we cannot regard Howey's descriptions as 'hard evidence'; however, they do seem to reinforce what other reports have suggested: taken together, they begin to paint a portrait of the pedagogy experienced by pre-service teachers in their teacher education programs as far, indeed, from the ideal I described at the beginning of this chapter.

The second related chapter in the *Handbook of Research on Teacher Education* (1996) is Jones's chapter on classroom management.[279] Classroom management is clearly

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[279] Jones suggests that the goal of his chapter is more than to compile the current research on classroom management; it is also to examine "the role classroom management plays in the lives of teachers and students and the connection between classroom management and the goals of public education in [the United States]" (p. 503).

considered an important component of teachers' pedagogical understanding.[280] Therefore, a chapter exploring the research in this area may give us valuable insight into the model of classroom management underlying teacher education programs and research studies, from which we may be able to infer possible effects on pre-service teachers' pedagogical understanding.[281]

Jones argues that "student discipline is still viewed largely as providing rewards and consequences to students" (p. 505) and that "classroom management has too often focused on mechanical methods rather than on viewing the classroom environment as a complex, interactive system of personal, social and cognitive demands" (p. 514). A behaviouristic model of management seems to underlie many teacher education programs, a phenomenon that has been noted by several researchers, whom Jones cites. For example, Doyle (1985, 1990b) suggests that teacher education in classroom management has tended to overemphasize instruction in particular strategies and that pre-service teachers have been encouraged to see management as "'a collection of tricks and specific reactions to behavior'" (1985, p. 33) (p. 513). Goodlad (1990) similarly argues that classroom management tends to be presented in teacher education programs as "'bits and pieces of good counsel' (p. 248)" (p. 513). Jones (1982) also criticizes the "patchwork [compartmentalization]" of teacher education programs' approach to classroom management (p. 513).

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[280] Jones suggests that classroom management is commonly perceived as being "intended to serve the end of increasing time-on-task" (p. 510). Like Jones, I agree that management involves more than simply understanding how to maximize students' engagement in their academics and minimize their disruptive behaviour (as well as deal with disruptive behaviour when it occurs)—it is more than "a means to effective instruction"; it is also "a vehicle for providing students with a sense of community and with increased skills in interpersonal communication, conflict management, and self-control" (p. 503).

[281] Unfortunately, the section on teacher education in classroom management is quite brief: one-and-a-half pages of Jones's thirteen pages of text.

Taken together, Carter's (1992) argument that reflection should be a central element in pre-service teachers' classroom management education (cited in Jones, 1996, p. 514), Doyle's (1985, 1990b) suggestion that teachers need "a solid understanding of the relationships between management decisions and decisions related to curriculum and instruction" (cited in Jones, 1996, p. 513) and that pre-service teachers should be supported to consider management within "'an intellectual framework for understanding classroom events and consequences'" (Doyle, 1985, p. 33) (cited in Jones, 1996, p. 513), as well as Jones's (1996) support of this goal[282] suggests that the fostering of pre-service teachers' Philosophic understanding of classroom management is perhaps not currently the norm in teacher education programs. Clearly, it would be challenging for pre-service teachers to do so in programs that tend to have a predominantly methods-based approach to teaching management.

Jones notes the inadequacy of the current research on classroom management. For example, he observes that most classroom management research "has involved elementary and junior high school classrooms (Evertson & Harris, 1992) and whole-class instruction and seatwork within traditional instructional formats (Brophy, 1988)" (p. 503) and that there has been little research investigating the "most effective methods of educating teachers in classroom management" (p. 515).[283] The author rightly claims that student misbehaviour is minimized when students are "actively engaged in interesting

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[282] Jones (1996) recommends that pre-service teachers' development of a more philosophical understanding of management can be supported by their reflection on the relationship between management and teaching and learning, power and authority, their beliefs about children and their own educational values, their teaching practice, etc. (p. 514).

[283] Jones supports teacher education programs expanding and improving the ways in which they educate pre-service teachers about classroom management (p. 514).

work at which they can be successful" (p. 510).[284] However, he also concludes that there is almost no research that examines the relationship between teachers' instructional goals and strategies and student behaviour/ classroom management (p. 510; p. 515).[285] [286] This is an especially sad omission, given the fact that pre-service and practicing teachers, administrators, policy developers and the general public all have serious concerns about the degree to which student misbehaviour seems to directly impact, or indeed, impede, effective teaching (Jones, 1996, p. 504; p. 512).[287] It is also telling when we consider that imaginative education seeks to increase students' engagement with their learning, and so has the potential to seriously diminish student misbehaviour: a potential that, apparently, has not been acknowledged or explored in most teacher education programs or in the teacher education research community.

Although Jones' treatment of research on teacher education programs' approach to classroom management is brief, the examples he supplies suggest that programs that have such a behavouristic, bits-and-pieces approach to classroom management might tend to foster in pre-service teachers an understanding of pedagogy as primarily technical: the teachers' knowledge of behaviour and management translated into effective

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[284] "Studies suggest that student motivation and behavior may be influenced by the fact that many students spend a large portion of the school day engaged in activities that require only lower level cognitive tasks and for which students cannot clearly articulate the meaning" (p. 510); "behavior is more positive in schools… in which instructional activities engage [students] in meaningful ways" (p. 508).

[285] "It is interesting that a method as widespread as Lee Canter's 'assertive discipline' has placed absolutely no emphasis on examining classroom curriculum and instruction as a factor influencing student behavior" (p. 511).

[286] "Greater research emphasis needs to be placed on examining the curriculum and instructional methods associated with such outcomes as student achievement, on-task behavior, and positive student attitudes about school" (p. 511).

[287] Two studies reviewed for Wilson and Floden's (2003) addendum give us some sense of the kinds of pedagogical skills most valued by educators. In both studies, knowledge and skills related to managing classes were seen as the most important. Other pedagogical skills, in order of descending importance, were: human development and the learning process, and planning for instruction; curriculum planning and design, and evaluating student learning and instructional effectiveness; assessment and the learning process; and professional issues related to teaching and learning (p. 15).

methods to be implemented in the classroom. This is far indeed from the kinds of pedagogical understanding I outlined at the beginning of this chapter that I argue are ideal in an imaginative teacher education program.

The third and final related chapter in the *Handbook of Research in Teacher Education* (1996) is that by Barone, Berliner, Blanchard, Casanova and McGowan, entitled "A Future for Teacher Education: Developing a Strong Sense of Professionalism." This chapter does not include a summary of any research on the pedagogy of teacher education programs. Rather, the authors' conclusions are based on numerous conversations with countless pre-and in-service educators, spanning many years, "about teaching and the journeys they have taken to understand their craft and their role in the educational system" (p. 1109). Their recommendations are based on "the feedback [they] have received from student and veteran teachers over the years and on [their] own reflections about what they have said" (p. 1109). In other words, the following characterizations of the pedagogy of teacher education programs do not result from the compilation of rigourous educational research; they might best be seen as the observations of experienced professionals who have, in various forms, been investigating numerous dimensions of teaching over the span of many years. What Barone et al. note, however, only further reinforces the conclusions of other researchers and theorists, cited earlier, who suggest that many teacher education programs tend to be based on a model of pedagogy as primarily technical.

Most of Barone et al.'s (1996) comments about teacher education pedagogy are in reference to methods courses. While we may not be able to generalize and apply their comments to the pedagogy in other components of the program, what they conclude is

certainly disheartening.[288] The authors claim that pre-service teachers in methods courses tend to "witness a reductionist pedagogy in which teaching is something trivial, mechanical, and manipulative" and that pre-service teachers are "inculcated in a simplistic, linear framework for making instructional decisions" (p. 1118).[289] [290] Barone et al. also state that pre-service teachers tend to be "exposed to pedagogical methods and materials in random and piecemeal fashion" and that the way in which pre-service teachers are taught in methods courses "ensures that pedagogical content remains incoherent and repetitive" (p. 1122).

Barone et al. also suggest that there is a significant rift between the pedagogy espoused by most methods professors and that which is enacted in their own practice:

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[288] The conclusions the authors draw about teacher education in general tend to reinforce those more specific ones they make about methods courses. For example, they suggest that "most teachers [with whom they have dialogued] recall finishing a form of educational 'basic training' rather than an initiating a process of becoming professional educators" (p. 1109) and that teacher education programs frequently produce "scatterbrained practitioners who cannot formulate a coherent vision of their professional selves" (p. 1116). In the two fictitious stories Barone et al. present, which are intended to be composite professional life histories of two teachers, the authors claim that many of the program deficiencies they identify are common (p. 1111). Specifically, they describe typical programs as "disconnected," characterized by "fragmentation," with "discrete and independent" or "unrelated" program elements (p. 1109). The authors portray teacher education programs, perhaps rather too scathingly, as often being no more than "a thoughtless rush of coursework, disconnected from classroom practice and context, without a theoretical framework of set of beliefs about teaching" (p. 1110) that is merely "a pseudoscience of tactical decision making" (p. 1109); an experience that can be "terrifyingly mindless and antagonistic to… rich professional life" (p. 1110).

[289] The authors argue that this kind of reductionist pedagogy "prevails beyond the walls of most methods classrooms.… Methods coursework resembles the objectives-driven, assessment-led instruction so common across the elementary and secondary grades" (p. 1118).

[290] "Typically, methods students have focused considerable energy on formulating individual responses to some pretty basic pedagogical questions. What strategy works most effectively? How should it be implemented? When should the test be given? Where should potential troublemakers be seated? Such questions delimit class discussion and force preservice teachers to accept a scientific management view of teaching. If methods students are to articulate a pedagogical vision, they must ask and be asked much deeper and better questions" (p. 1123).

most methods professors champion an alternative pedagogy[291] that contrasts markedly with the structured, textbook-dominated, direct instruction practiced in the schools. Yet, their actions rarely speak as loudly as their words…. Methods courses, despite their insistence on ideal practice, are taught in ways that mirror the real instruction in our nation's schools. (p. 1118)[292]

The authors argue that methods professors "seem to view pedagogical knowledge, skills, and dispositions as commodities to be dispensed or delivered" and use expository instruction "almost exclusively" (p. 1118):

[Methods professors] feed course content in great spoonfuls, reinforcing the stereotype that students should sit, listen, and record important information in a notebook so that it can be memorized, then recalled for a test. (p. 1118)

Of course, given this dismal conclusion about teacher education pedagogy (at least in methods courses), Barone et al. conclude that "More concern about the means of instruction in teacher education programs is needed" (p. 1125).[293] They recommend that the pedagogy of methods classes must change dramatically, from the mechanistic and

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[291] Barone et al. provide a synthesis of contemporary theory about learning and learners that is decidedly constructivist. Because they suggest that "these contemporary principles of psychology are vastly different from those that are used to guide education and teacher education" (p. 1127), we can infer that most contemporary teacher education programs do not enact a form of pedagogy that would be characterized as constructivist. While suggesting that future teacher education programs should be based on these principles, Barone et al. heatedly argue that "Programs of teacher education that do not acknowledge these changes are old-fashioned, if not wrong-headed and harmful!" (p. 1127).

[292] For example, by arguing that future teacher education programs need to give pre-service teachers opportunities to practice with various pedagogical strategies such as cooperative learning or reciprocal teaching, the authors imply that current programs do not give pre-service teachers adequate opportunities to practice such pedagogical strategies (p. 1128).

[293] Barone et al. come to the perhaps rather too bleak conclusion that most teacher education programs train pre-service teachers "to be weak technicians, not strong professionals" (p. 1125).

hypocritical to a pedagogy that is noble and purposeful, integrative and holistic, based in constructivism, and active and engaging (p. 1121). The authors note that "The pedagogical knowledge that teachers need to be able to articulate and operationalize [which they see as fundamental to being a strong professional] is not taught well now" (p. 1133) and that "what is modeled is as important as what is transmitted" (p. 1122). Unlike Barone et al., I would emphasize that a significant part of what is transmitted *is* what is modeled. Like Grossman (2005), Howey (1996) and Jones (1996), Barone et al. (1996) also seems to suggest that teacher education programs tend to enact a model of pedagogy that is primarily technical: a bits-and-pieces approach in which general knowledge of teaching and learning and children's development is translated into specific activities that teachers can use to promote student learning, applicable in a wide variety of contexts. A portrait of pre-service teachers' pedagogical understanding is beginning to take shape, and it is one that is far, indeed, from that I described as needed by imaginative educators.

To this point, this chapter has established three things. First, the current research on pre-service teachers' pedagogical understanding is so limited that it tells us next to nothing about what pre-service teachers understand about pedagogy upon program completion, or even about the kinds of pedagogical understanding most teacher education programs attempt to foster in their pre-service teachers. Second, the absence of research on pedagogical understanding has not been seriously acknowledged by the educational research community. Third, any conclusions we might make about pre-service teachers' pedagogical understandings must come from indirect sources: two such areas are research on teacher belief change and research on teacher education pedagogy. From the research

on teacher belief change, we can infer that the majority of teacher education programs seem to be largely unsuccessful in significantly changing the pedagogical understandings of most of their pre-service teachers. Upon program completion, their pedagogical understanding may be quite similar to that upon program entry: simplistic and transmissive. The research related to the pedagogy of teacher education programs also suggests that the pedagogy of many teacher education programs may be based on models that are primarily technical. Obviously, as I stated at the beginning of this chapter, these conclusions are made cautiously. Lacking adequate research, we can do little more than make inferences from related research areas. However, taken together, the research that does exist certainly suggests that the pedagogical understanding of pre-service teachers in more typical teacher education programs may bear little resemblance to that which I suggest imaginative pre-service teachers need. The particular ways in which programs might be altered to help foster such understandings is the topic to which I will now turn.

5.7. Program features that foster imaginative understandings of pedagogy

In the following section I will consider the possible changes to program design and delivery that an imaginative teacher education program might implement to help pre-service teachers develop the kinds of pedagogical understanding I argue are ideal: pre-service teachers' understanding of children's development, how learning is mediated, the contexts of imaginative education, themselves, and Philosophic understanding of pedagogy. These changes are: imaginative teacher education pedagogy; 'sheltered' space and time for pre-service teachers to integrate their pedagogical understanding, apart from particular courses and teacher educators' interpretation of theories; a particular course

devoted to the exploration of the relational aspect of social mediation (a space in which to explore pre-service teachers' and other educators' understandings of self and relations and the role of culture in such understanding); and continual and comprehensive research on pedagogical understanding.

5.7.1. Imaginative teacher education pedagogy

Howey (1996) identifies the "most fundamental" or "bedrock" problem of teacher preparation "the manner in which teachers are taught": "a narrow, relatively unexamined form of pedagogy that sustains a vicious cycle of mediocre instruction at all levels" (p. 168). In order for pre-service teachers to develop the kind of pedagogical understanding I am advocating, it is essential that their own experience of pedagogy in teacher education be imaginative. This means that teacher educators must be able to teach their courses in ways that support pre-service teachers' imaginative engagement. For example, in their planning and teaching, teacher educators will need to ensure the imaginative engagement of pre-service teachers' Somatic, Mythic, and Romantic understanding, in addition to their Philosophic understanding, as is perhaps more commonly the focus. Of course this does not mean that every lesson must incorporate pre-service teachers' learning with their bodies, oral language and symbol systems (as well as theoretic thinking), but that all of these kinds of understanding are regularly attended to in every course and program experience.

As I suggested earlier, pre-service teachers should also be given numerous opportunities to practice and observe a wide variety of pedagogical practices. For example, they will need familiarity with and an ability to effectively use numerous

cognitive tools, from all kinds of understanding, and various kinds of planning frameworks. They should be encouraged to experiment with, adapt as necessary to fit various purposes, or create their own alternative frameworks. Obviously, pre-service teachers' familiarity with a wide variety of pedagogical practices will not be presented as a 'grab bag' with new teachers being encouraged to justify their choices based on the practical consideration of 'what works'; in an imaginative teacher education program, pre-service teachers should have a more thoroughly developed overarching theory to draw on in order to understand pedagogical challenges and successes. In other words, the randomness of a technical/ practical approach toward pedagogy should be replaced with a more Philosophic understanding of imaginative pedagogy.

An imaginative teacher education program must also expose pre-service teachers to possibilities about what pedagogy can be, rather than simply what it is: pre-service teachers must be given numerous opportunities to observe and experience pedagogy in varied contexts (as well as imagine alternatives, of course). The kind of experience of pedagogy I am advocating here is much wider than that which seems to be the norm in more typical teacher education programs. For example, pre-service teachers' educational observation could occur in all sorts of environments—community drop in centres, university classes, early childhood education facilities, camps and clubs, on-line communities, and so on. Ideally, such an exploration would involve consideration of the various ways in which learning is a culturally-based phenomenon: pre-service students will be able to study pedagogy in various cultural contexts. While some of these kinds of experiences might involve guest speakers being invited to address a group of pre-service teachers (perhaps in preparation for an on-site visit), the majority of ways in which pre-

service teachers in an imaginative teacher education program can have a wider experience of pedagogy is by their participation in these other culturally-based educational contexts. Active participation gives pre-service teachers opportunities to creatively investigate directly children's learning, various understandings of teaching and learning, and so on, as opposed to learning about them by more abstract means, such as through textbooks. Clearly, pre-service teachers will need to reflect upon and discuss such observations and experiences; perhaps the best umbrella under which such experiences could be understood would be the two courses I will describe next: one that acts as a sheltered space dedicated to the integrative development of pre-service teachers' pedagogical understanding, the other one that examines the social aspect of relational mediation. A wider experience of the contexts of schooling should help pre-service teachers develop a Philosophic understanding of pedagogy; it also manifests the program principles of inquiry and sustainability.

Pre-service teachers' Philosophic understanding of pedagogy will allow them to explain particular practices according to various educational theories. They will need to be familiar with several educational theories, including imaginative education, and be able to discuss the strengths and weaknesses of each. Clearly, we will want pre-service teachers to think imaginatively about teaching, themselves, their students, the curriculum, and imaginative education. This means that they must be supported to critique and challenge the theory of imaginative education in numerous regards.[294] However, in order to maintain a certain degree of program consistency, pre-service teachers who complete the program will need to have a certain degree of adherence to imaginative principles and

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[294] Barone et al. (1996) make a similar point: pre-service teachers' reading of both proponents and critics of various educational philosophies is necessary in an honest teacher education program (p. 1125).

practices. To simply accept the theory without question is antithetical to a Philosophic understanding of it, and, indeed to the spirit upon which it is based. Because we might expect that pre-service teachers will be negotiating their uncertainties and doubts towards the theory and the principles and practices of imaginative education and seeking a richer synthesis of understanding, teacher educators will need to clarify the relationship between individual pre-service teachers' success in becoming imaginative educators and the degree to which they adhere to (or challenge and pursue alternative practices) the principles and practices of imaginative education.

Assessment is an important aspect of any pedagogy, including imaginative pedagogy. Imaginative assessment should be a crucial part of the teacher education pedagogy that pre-service teachers engage with. They should experience ways in which their own teacher educators use various forms of imaginative assessment, be encouraged to experiment with a wide variety of assessment tools, adapt them to fit their purposes and create their own assessment tools for use in their own practice, and be given numerous opportunities to develop a Philosophic understanding of assessment. Obviously, this includes assessment of imaginative engagement and imaginative pedagogy (as well as conceptual understanding of the content of the curriculum). In other words, pre-service teachers will need numerous opportunities to consider the assessment of: their own imaginative engagement in their teacher education program and that of the students they teach[295]; their own conceptual understanding of the content of the teacher

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[295] Consideration of individuals' imaginative engagement might also include assessment of their mastery of specific cognitive tools (and so influence the teacher's choice of ideal cognitive tools to use in future contexts).

education program and their students' conceptual understanding of the curriculum,[296] and their own imaginative pedagogy[297] and that of their teacher educators. Systematizing such practices should lead to increased reflexivity on the part of both pre-service teachers and teacher educators.

5.7.2. Creation of sheltered space for pedagogical understanding

As I explained at the beginning of this chapter, traditionally, pre-service teachers have had to take several courses to develop their pedagogical understanding, such as an introduction to teaching and learning, educational psychology and classroom management. Pre-service teachers in an imaginative teacher education program might also take several courses that together, share the goal of developing pre-service teachers' pedagogical understanding, but, individually, are based on inquiry related to each of the five areas described earlier. For example, one course might be primarily concerned with exploring how children learn, a second with investigating the relationship between learning and culture, a third with exploring the principles and practices of imaginative education, and so on. One possible drawback of pre-service teachers taking several courses that, while each obviously addresses distinct areas, they also relate in some important ways, is that the pre-service teachers have few opportunities to integrate the learning from different classes and contexts. Commonly, teacher educators have fairly little input into (and, in some cases, even awareness about) the content of other

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[296] For example, pre-service teachers might consider various ways in which students' understanding of a particular mathematical concept might be assessed using oral language.

[297] This might include consideration of the strengths and weaknesses of their use of particular cognitive tools for teaching (for example, various ways in which they can use storytelling techniques, such as voice [pacing, intonation, etc.], body language [gestures, facial expressions], cultural references, props, text, etc.) and their potential educational effect on particular students.

instructors' courses in the same program.[298] In order to maximize the likelihood that there is commonality between courses and in the kinds of pedagogical understanding that is being explored and fostered, this sense of instructor and course isolation should be directly addressed and minimized as much as possible. Manifesting the program principle of reciprocity (and the collaboration that I see as central to reciprocity) should help to minimize such isolation.

One way in which a more collaborative approach to developing pre-service teachers' understanding might be implemented is with the use of team teaching. Successful team teaching requires that teacher educators work together to meet course goals, understand and respect the ways in which each teacher educator's philosophy and approach is distinct from the others', and thus comprehend the ways in which various theories and discussions will naturally be shaped somewhat differently by each teacher educator, and so be able to help pre-service teachers make sense of various interpretations and understandings (e.g. of an article author's perspective, both teacher educators' and their own response to the article, and so on). Certainly, the benefits of team teaching apply to whatever structural option is chosen for an imaginative teacher education program: it requires both reflexivity and reciprocity and is likely to increase program coherence.

A second option might be for pre-service teachers to take one year-long course on pedagogy (e.g. every morning) taught by one teacher educator. Such a course would attempt to address all the major questions raised in each of the five areas described

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[298] As I discussed earlier, this kind of lack of program coherence (and, in some cases, perhaps contradictory goals and messages in various program components and classes) may be a significant factor in why so many studies seem to fail in substantially changing the pedagogical understanding of so many of their pre-service teachers.

earlier. A benefit of such a structure would be that one teacher educator could help pre-service teachers' understand and navigate the concepts addressed in each of these areas; in other words, pre-service teachers will not have five different instructors (with their various values, interpretations and goals) to contend with.[299] An obvious drawback is that such a configuration puts enormous pressure on the one teacher educator who teaches such a course: both in terms of the time and energy required to teach such a significant component of the program, as well as in the responsibility to ensure that her or his teaching is continually consistent with program goals. (For example, such an individual must be conscious of, and make concerted efforts to avoid, the possibility of encouraging pre-service teachers to adopt her or his own understanding of pedagogy.)

A third means by which pre-service teachers might be given an opportunity to integrate their learning from several contexts (and so, hopefully, develop a deep sense of pedagogical understanding), and the option which I most fully support, is for them to have a 'sheltered' space and time in which to do so, one that has an extended timeframe and is integrative in focus. For example, pre-service teachers in an imaginative teacher education program might take numerous courses to develop their pedagogical understanding (as in the examples given earlier), but also take another course whose goal is to help them integrate the various theories, interpretations and approaches they have encountered in all of the courses, negotiate their own understandings, and make clear connections between these theories and their own practice. This resembles the previous

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[299] Clearly, if numerous teacher educators work collaboratively, understand and respect the distinctions of each other's educational philosophies and approaches, and regularly ensure that they are maintaining program coherence, then they will most likely be largely successful in supporting pre-service teachers' developing imaginative pedagogical understanding, rather than impeding it. In this case, pre-service teachers would no doubt benefit from the opportunity to explore these complex concepts with five unique teacher educators, rather than find such an opportunity burdensome, as might be the case if such a collaborative approach were not implemented.

option in that it helps support the development of understanding over the full length of the program, but, importantly, removes some of the pressure from the instructor to be responsible for all aspects of pedagogical understanding. While no doubt helpful in most teacher education programs, such an opportunity might be even more crucial in an imaginative teacher education program, as many of the ideas the pre-service teachers will be encountering will be new to them and not necessarily widely understood or accepted in the larger educational community. Pre-service teachers will be working through complex ideas; the process of deeply understanding them and their own responses to them—developing a new kind of pedagogical understanding—is not likely to be an easy or a fast process. A sheltered time to consider these complex ideas, as well as a facilitator to help them understand the significant relationships between ideas, interpretations, courses, and so on would no doubt increase the likelihood of pre-service teachers developing deep imaginative understanding of pedagogy. A course that provides a sheltered space and time for pre-service teachers to integrate their pedagogical understanding manifests the program principles of inquiry and reflexivity.

5.7.3. Course exploring the social aspect of relational mediation/ the self

If we want pre-service teachers to richly consider how the interactions they have with students is a component of their pedagogy, then an imaginative teacher education program must create a space in which they can do so. As I suggested at the beginning of this chapter, pre-service teachers' self-understanding is critical in two ways: first, they must have a good degree of reflexivity about their own teaching (understand their own educational beliefs and values, their imaginative engagement, how their own teaching strengths can be used to develop students' imaginative understanding and how they can

274

improve the areas in which they are weak); second, they must recognize the relevance of the ways in which they connect with students (e.g. how they can use humour to establish rapport or how their relationships with various students can be fostered) as a central part of effective pedagogy. A course especially devoted to these goals need not be an exercise in self-absorption; rather, pre-service teachers will be pursuing a deep understanding of the social aspect of relational mediation. To use Palmer's (1998) metaphor, the question, "How do my relationships shape and how are they shaped by my pedagogy?" stands at the centre of the circle of inquiry. In order for pre-service teachers to develop Philosophic self-understanding in response to this question, they will need to peer out (towards the world and others) as well as peer in (towards their own feelings, beliefs and behaviour in response to the world and others). This will necessarily also involve an exploration of how culture shapes and is shaped by our understanding of self and others.[300] Numerous educators—from both formal and informal educational contexts—could be invited to address this question, pre-service teachers can read and discuss related literature, and share reflections from their own teaching experience. While such a course would ideally continue over the duration of the teacher education program, it would be especially relevant 'nestled' around the field experience: clearly, we want pre-service teachers to spend some time considering how our relationships are a fundamental part of our pedagogy before they begin teaching in classrooms; once the field experience is underway, pre-service teachers will have direct and sustained contact with students, so their opportunity to reflect on such concerns is crucial during, as well as directly

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[300] Because culture shapes and is shaped by our understanding of self and others, its role will also need to be considered in the integrative and longitudinal sheltered space discussed earlier.

following, this time. Obviously, a course such as this manifests the principles of inquiry and reflexivity.

5.7.4. Research on pedagogical understanding

An imaginative teacher education program will want to make research on pedagogical understanding fundamental to its program design and implementation. The research literature suggests that the kinds of pedagogical understanding I am advocating are not systematically (if at all) being developed by pre-service teachers in typical teacher education programs. Because of this, the program can make a unique contribution to our understanding of pedagogy. As with research on subject matter understanding, research on pedagogical understanding should occur at three key times: during the pedagogy courses, during field experience, and once graduates have entered the profession.

It will be important to ascertain pre-service teachers' pedagogical understanding upon program admission. As I explained earlier, while most pre-service teachers will not have formally studied pedagogy before beginning their programs, they are likely to have conceptions about teaching and learning and how children develop from a variety of life experiences (from being school and university students, from the popular culture, and so on). It is important to have some sense of their entering pedagogical understanding in order to map any changes that might occur as a result of program or particular course experiences. Researchers should assess initial conceptions of pedagogy using a variety of methods, including interviews, responses to teaching and learning scenarios, written responses to prompts, etc. It is also important to determine the pedagogical understanding of teacher educators involved in the program; data can be collected using a similar variety

of sources and should include both self-reports and the observations and interpretations of others (researchers, other teacher educators and pre-service teachers). Once the program is underway, it will be important to continually investigate pre-service teachers' and teacher educators' pedagogical understanding; obviously, pre-service teachers' pedagogical understanding will not develop only as a result of their taking those courses that are devoted to exploring this cornerstone of teacher education. Researchers will want to attend to any evolutions in understanding and explore possible reasons for any changes, congruency between espoused and enacted pedagogical understanding, the possible relationships between various aspects of pedagogical understanding, and relationships between pedagogical understanding and subject matter understanding.

It will also be crucial to collect information about pre-service teachers' pedagogical understanding during the field experience, especially to map how it might change as a result of the influence of teaching real students in real schools and classrooms, and of working closely with cooperating teachers and supervisors. Because of the potential of these last two triad members to significantly influence the pedagogical understanding of pre-service teachers, it is essential that their pedagogical understanding also be investigated. Researchers will also want to attend to the relationships between the subject matter understanding and the pedagogical understanding of all participants in the field experience. As I explained with research on subject matter understanding, encouraging all participants to research themselves is important; triangulating results with others' observation of teaching practices is also necessary. Finally, researchers might also explore whether the experiences of imaginative education change students' understanding of what teaching and learning are and can be.

The third key time during which research should be conducted is once graduates have entered the teaching profession. Data should be collected to help understand whether the kinds of pedagogical understanding that were developed during the teacher education program change in significant ways once teachers are thoroughly immersed in the world of practice. This research would ideally continue over several years, but should at least monitor the first crucial years of teaching. Researchers should also gather data about the kinds of support that practicing teachers need in order to manifest a pedagogy that is closest to their imaginative ideal.

As I suggested with research on subject matter understanding, the program might also consider conducting more longitudinal research on the pedagogical understanding of cooperating teachers who continue with the program, and with graduates of an imaginative teacher education program who go on to become cooperating teachers in the program, to map changes to their pedagogical understanding, program efficacy, and so on.

5.8. Chapter summary

This chapter has been an examination of the second cornerstone of teacher education, pedagogical understanding. I began by briefly describing pedagogical understanding and the kinds of courses offered in more typical programs that aim to foster pre-service teachers' pedagogical understanding. I then described the kinds of understanding of pedagogy ideally developed by pre-service teachers in an imaginative teacher education program, or, to use Howey's (1996) term, I clarified the derivative themes of imaginative pedagogical understanding. I identified five components of imaginative pedagogical understanding: understanding of children's development,

understanding the mediated-nature of learning; understanding the contexts within which

children's development occurs, including the principles and practices of imaginative

education; understanding themselves as teachers and learners; and a Philosophic

understanding of pedagogy. Next, I examined the research to consider what we know

about the kinds of pedagogical understanding pre-service teachers tend to gain in more

typical teacher education programs. I documented the absence of research on teachers'

pedagogical understanding by considering seven major sources. Based on the lack of

direct research, and the fact that the importance of this area has tended to be

unrecognized, I argued that our understanding of pre-service teachers' pedagogical

understanding must be gleaned from indirect sources: research on teachers' beliefs

change and research on teacher education pedagogy. An examination of these two

sources led to the conclusion that the pedagogical understanding of pre-service teachers is

largely mechanical and technical: pedagogy seems to be understood as the translation of

general knowledge of teaching and learning and children's development into specific

activities that teachers can use to promote student learning, applicable in a wide variety

of contexts. Based on the ideal kinds of pedagogical understanding I described at the

beginning of the chapter, and the research that indicates that pre-service teachers'

pedagogical understanding bares little resemblance to the kinds of imaginative

pedagogical understanding I described, I proposed key design features, or outlined the

programmatic structures (Howey, 1996), that will help an imaginative teacher education

program foster in pre-service teachers the kinds of imaginative pedagogical

understanding I suggest are ideal. These design features are: imaginative teacher

education pedagogy; a 'sheltered' space and time for pre-service teachers to develop their

pedagogical understanding, apart from particular courses and teacher educators'

interpretations of theories; a particular course devoted to the exploration of the relational

aspects of social mediation; and continual and comprehensive research on pedagogical

understanding.

CHAPTER 6: PRE-SERVICE TEACHERS' UNDERSTANDING OF CONTEXTS: THE FIELD EXPERIENCE

In this chapter, I consider the third cornerstone of teacher education:

understanding of contexts, or what is commonly referred to as the field experience.[301] I

begin by sketching the structure and content of more typical field experiences. I then

describe the kinds of understanding ideally developed by pre-service teachers in field

experiences within an imaginative teacher education program (derivative themes as

described in Howey, 1996). Next, I consider the current research to ascertain the kinds of

understanding that tend to be fostered in more typical teacher education programs' field

experiences. Finally, I suggest key design features (or programmatic structures as

described in Howey, 1996) of an imaginative teacher education program that will foster

in pre-service teachers the kinds of understanding of contexts I argue are ideal.

6.1. The structure of field experiences and triad members

In more typical teacher education programs, there are three key players

comprising the field experience triad: the pre-service teacher, the cooperating teacher and

the university supervisor. In general, field experiences last about twelve weeks (Guyton

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[301] Other terms used to refer to this component of teacher education include the student placement, field placement, the practicum, clinical experience, student teaching and practice teaching. While field experience tends to be used to refer to both the shorter and more extensive experiences pre-service teachers have in schools, I use the term here in reference to the extended time in schools that pre-service teachers spend, during which time they undertake substantial teaching responsibilities. (The variety of terms used to describe this key component of teacher education may be suggestive of the lack of a clearly articulated and commonly held understanding about its purposes.)

& McIntyre, 1990, p. 518; Wilson et al., 2001, Question 3, para. 5).[302] Usually, pre-service teachers begin their field experience by initial visits to the classroom to meet and observe the cooperating teacher and the students with whom they will be working. Their initial duties are usually non-instructional, such as the 'housekeeping' duties of taking attendance and collecting homework. Once they are familiar with the cooperating teacher, the students and the routines of the class, they begin assuming instructional responsibilities. Initially, pre-service teachers usually teach short lessons; as the field experience continues, they assume more teaching responsibilities in terms of length and frequency. Near the middle of the field experience, pre-service teachers typically undertake about 75-80% of the classroom teacher's responsibilities for several continuous weeks. Towards the end of the field experience, their responsibilities again diminish as they 'phase out' of their instructional responsibilities.

Duties for which pre-service teachers are responsible of course vary to some degree from one cooperating teacher, school and district to another, but generally include: lesson planning and delivery; assignment and marking of homework; writing, delivery and marking of tests; report writing; participating in parent-teacher conferences; planning and overseeing class trips; and administrative duties such as taking attendance, and overseeing resources and classroom materials.[303] Outside of particular classroom duties, pre-service teachers may be expected to attend professional development sessions and

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[302] There are, of course, numerous variations to this structure. Some programs have pre-service teachers complete shorter and longer field experiences; others have several short field experiences at different sites (together totalling about twelve weeks); some have field experiences near the beginning or middle of the program; others have pre-service teachers complete the bulk of their course work before beginning their field experience; some have pre-service teachers teach 'mini lessons' immediately; others have pre-service teachers observe for a period before assuming any instructional responsibilities. The goal here is to give a general picture of a typical experience.

[303] The conditions and context of pre-service teachers' work tends to be similar in most field experiences (Guyton & McIntyre, 1990, p. 522).

participate in school-wide events such as conducting playground duty, invigilating provincial exams, leading study sessions, monitoring detention, and participating in school-wide sports, arts or cultural events. While all of these activities do constitute the pre-service teacher's curriculum during the field experience, for the purposes of this thesis I will limit the discussion to activities related to instruction.

Pre-service teachers work most closely with the classroom teacher with whom they are paired, called the cooperating teacher.[304] While there can be some degree of variety from one school, district, university and province to another, generally, cooperating teachers carry out, at least officially, somewhat similar responsibilities. They are expected to: show the pre-service teacher 'the ropes'—act as a mentor and liaison between the pre-service teacher, the students, and the school staff; allow the pre-service teacher to assume increasing responsibility for instruction; offer help and suggestions with instructional planning and resource creation; possibly provide materials or lesson and unit plans; give feedback on teaching strengths and weaknesses; write reports on the pre-service teacher's progress; meet with the supervisor and pre-service teacher in conferences; and write a final report.

The third member of the triad is the university supervisor. Commonly, supervisors have numerous responsibilities, including: (in some cases) participation in recruiting and selecting cooperating teachers; observing the pre-service teacher's teaching at several

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[304] While the term supervising teacher is also common, the term cooperating teacher is most frequently used in the teacher education literature.

times throughout the field experience[305]; writing observation reports; providing feedback to the pre-service teacher about his or her teaching strengths and weaknesses; offering suggestions or advice to the pre-service teacher as needed; meeting with the cooperating teacher to discuss the pre-service teacher's progress; liaising between the pre-service teacher and the cooperating teacher in the event of conflict; (usually in consultation with the cooperating teacher) providing the final evaluation of the pre-service teacher, and (in some cases) providing seminars throughout the placement. Supervisors are most typically university professors who also teach in the faculty; as such, they tend to have demanding schedules.[306]

While cooperating teachers oversee the day-to-day activities of the pre-service teacher, the supervisor tends to have less regular contact. Conferences,[307] also known as post-lesson debriefing or feedback sessions, occur between cooperating teachers and pre-service teachers and between supervisors and pre-service teachers; less frequently all three members of the triad meet. Generally, while both the cooperating teacher and the supervisor are involved in the pre-service teacher's evaluation, the cooperating teacher tends to give more informal feedback and evaluation and the supervisor tends to be more responsible for regular, formal feedback and evaluations of the pre-service teacher's

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[305] The frequency of supervisory visits varies to some degree. Freiberg and Waxman (1988) have a fairly low estimation of their frequency: three to four visits per pre-service teacher per semester (p. 8). Richardson-Koehler (1988) claims that supervisory visits may be as rare as once every two weeks (p. 33). Bowman (1978) estimates their frequency at 30 to 90 minutes per pre-service teacher per week (cited in Glickman & Bey, 1990, p. 560) and Power and Perry (2002) as one to two hours per pre-service teacher each week (p. 4).

[306] "University supervisors reported that they believed themselves pressed for time and overtaxed with a range of responsibilities" (McIntyre, Byrd & Foxx, 1996, p. 179).

[307] Guyton and McIntyre (1990) report that conferences are "common but not frequent" (p. 524).

teaching. As well, in most cases, the final evaluation of the pre-service teacher is completed by the supervisor.[308]

The understanding of contexts developed by pre-service teachers through the field experience is clearly influenced by the other two members of the triad, both through direct feedback and the kinds of values and beliefs that may be apparent in their words and actions. An imaginative understanding of contexts therefore is needed on the part of all three members of the triad, not just one. In the following section of this chapter, I will explain the kinds of understanding needed by imaginative pre-service teachers; later, in the program design section, I will clarify the kinds of understanding needed by cooperating teachers and supervisors so that the imaginative understanding of pre-service teachers can best be supported.

6.2. Imaginative understanding of contexts

Field experience is unique and important in teacher education because it is the most integrative component of the program: field experience provides pre-service teachers the opportunity to gain a situated and experiential understanding of the imaginative possibilities of subject matter (the curriculum), and of pedagogy (the particular children with whom they work and their own practice). In other words, field experience is a time during which pre-service teachers can integrate and extend the subject matter understanding and pedagogical understanding they have been developing throughout the program. The 'context,' then, that is the third cornerstone of teacher education is where prior learning can be applied, examined, extended and adjusted in the

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[308] "In more that 50% of the cases the university supervisors award the final grades while the cooperating teachers are expected to be consulted but do not have the deciding vote (citing McIntyre & Norris, 1980; Williams et al., 1995) (Ramanathan & Wilkins-Canter, 1997, p. 3).

dynamic environment of real teaching situations. In the field experience of an imaginative teacher education program, we will want pre-service teachers to gain a deep sense of the imaginative possibilities of education. This means that upon completion of their field experience, pre-service teachers in an imaginative teacher education program should be convinced that the curriculum of the subjects they teach can be much vaster than they had originally thought, and that children and they as teachers are capable of more than they had originally supposed, even given the various constraints one necessarily encounters in educational settings (e.g. constraints regarding time, schools, communities, particular children, curriculum, and so on). A situated and experiential sense of the imaginative possibilities of education should allow pre-service teachers to have an increased sense of professional agency.

What does pre-service teachers' situated, experiential understanding of the imaginative possibilities of curriculum look like? As I discussed in chapter four, an imaginative understanding of subject matter comprises deep conceptual understanding, rich Philosophic understanding, a grasp of one's own and one's students' imaginative engagement with subject matter and a sense of imaginative possibility for how subjects and topics can be taught. Pre-service teachers' situated, experiential understanding of the imaginative possibilities of curriculum means that the subject (not the teacher or students) is the centre of attention in teaching and learning (Palmer, 1988, p. 116); students and teachers are both "continually [called]… deeper into its secret" (p. 105). In other words, pre-service teachers should have a sense of the subject's transcendence, so that they can "give it the respect and authority that we normally give only to human beings"

(p. 103).[309] Such a connection with the curriculum requires that pre-service teachers make significant affective connections with the topics they will teach.[310]

Pre-service teachers' situated, experiential understanding of the imaginative possibilities of pedagogy means that they have a rich sense of the imaginative potential of both the particular students they teach and themselves as teachers. During the field experience, pre-service teachers will be attempting to foster in their students a deep understanding of the topics and subjects they are teaching. As I explained in chapter five, a good deal of the success of pre-service teachers' imaginative teaching depends on the degree to which they take the specific children with whom they work into consideration. What made this lesson appeal to Carlos? Why was Sunil zoning when I was trying to engage him in a topic I thought he would find fascinating? What element of this topic could I use to fire up Bethany's imagination? Can I use some of the ideas that worked so well in music last week in my unit on math this week? Pre-service teachers completing their field experience should understand that familiarity with the imaginations of the particular individuals with whom one is working is necessary for effective imaginative engagement. This means that, during the field experience, pre-service teachers will be learning to become experts on their students' imaginations and the potential resources they can use for engaging students' imaginations in learning. Clearly, understanding

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[309] Palmer (1998) also makes they following evocative points: The "passion for the subject propels that subject, not the teacher, into the center of the learning circle—and when a great thing is in their midst, students have direct access to the energy of learning and of life" (p. 120); "students often describe great teachers as people who 'bring to life' things that the students had never heard of, offering them an encounter with otherness that brings the students to life as well" (p. 120).

[310] As I mentioned in chapter four, there will obviously be some degree of variety in terms of the degree of affective connections pre-service teachers will have with the curriculum; some units and lessons will be more emotionally engaging than others. Nonetheless, pre-service teachers should be able to demonstrate with some degree of frequency in most areas genuine affective connections with the topics and subject so that they can give the topics they teach "an independent voice… in terms that students can hear and understand" (p. 118).

students in this way, being experts on both their imaginations and potential resources for imaginative engagement, requires not only that pre-service teachers study their students, but that they also have sincere affective connections with them, or genuinely care for them—including students who they initially find difficult to teach.

Pre-service teachers' situated, experiential understanding of the imaginative possibilities of pedagogy also means they have a real sense of the imaginative possibilities of their own practice. In the field experience of an imaginative teacher education program, pre-service teachers will develop a rich sense of what teaching can be and what they can be and do as teachers that should be both more vast and sophisticated than their ideas about teaching before beginning the program. As I discussed in chapter five, the development of imaginative pedagogy requires numerous opportunities to experiment with and explore the role of the imagination in planning and teaching, its role in reflections on students' learning and on one's own and others' teaching and learning, and its role in one's thinking about and discussions of educational issues. In order to have a situated, experiential understanding of the imaginative possibilities of pedagogy, pre-service teachers will need be familiar with a wide variety of tools to draw on to pursue imaginative practice, including many excellent lessons or units to use in teaching or in the fostering of their own imaginative planning, and various cognitive tools and frameworks and an understanding of appropriate contexts for their use. Specifically, this means that, if we take seriously the notions that pre-service teachers should have a sense of how Somatic understanding should continue to be fostered in all levels of education, then pre-service teachers should have as part of their field experience a sense of how children's bodies can be made central to their learning. (And obviously similarly so with

Mythic understanding: pre-service teachers should be supported to incorporate in their field experience various oral language media—such as storytelling by students, themselves, or an expert—so that they might consider how they can be an important part of their students' educational activities.) While I have recommended (in chapter five) that pre-service teachers be given the opportunity to witness and even experience in their own learning these elements of imaginative pedagogy, they can only truly appropriate them for themselves by putting them into action in field experiences.

An important component of pre-service teachers' sense of imaginative possibility of their own practice comes from their consideration of when thoughtful imitation is appropriate and when risk-taking is valuable. Central to this aim is pre-service teachers' ability to critically analyse their own and others' teaching practice. While a solid understanding of imaginative principles and practices will enhance the ability to make sound pedagogical decisions, it will not guarantee it, as other factors, especially ones such as appropriateness for particular students and settings, are also most relevant. Risk-taking necessarily involves the possibility of failure, so it is important that pre-service teachers give thoughtful consideration to, and discuss with others (when possible, both before and after taking risks) the suitability of particular pedagogical risks; pre-service teachers must be able to justify their pedagogical choices and make alterations in future planning and decision-making based on critical analysis of past decisions.

In addition to the situated and experiential understanding of the imaginative possibilities of curriculum and pedagogy, the field experience in an imaginative teacher education program should also give pre-service teachers an understanding that the taken-for-granted nature of school culture can indeed be revisioned and that they can be active

participants in the creation of more effective alternatives (rather than simply perpetuate current norms). This means that the field experience will need to give pre-service teachers an experience of teaching as more than an isolated endeavour based on an "egg-crate mentality" (Power & Perry, 2002, p. 6; see also Barone et al., 1996, p. 1112; Ginsburg & Clift, 1990, p. 454; Stanulis, 1995, p. 332), and to disrupt the common perception of teaching as entirely distinct from research (Richardson-Koehler, 1988, p. 33). The field experience of an imaginative teacher education program will give pre-service teachers an opportunity to participate in professional and collaborative communities. They will witness and participate in at least one, and ideally several, models of how various participants in education can work collaboratively and of how teaching can fundamentally be an process of imaginative inquiry. We will want pre-service teachers to experience teaching as a vocation greater than the ways in which it is commonly conceived and experienced.

As I will demonstrate through an examination of the current teacher education literature, pre-service teachers completing the field experience of more typical teacher education programs do not develop a situated and experiential understanding of the imaginative possibilities of curriculum and pedagogy or an understanding of their own professional agency in creating what teaching and schools can and should be.

6.3.   A note on field experience research[311]

Educational researchers' understanding of field experiences is disappointingly limited.[312] Much of what one might like to know about the nature of field experiences, including details about their structure and content, and the effects of various policies and practices, is currently unknown. The dearth of research has been noted by most reviewers.[313] For example, Guyton and McIntyre (1990) conclude that that there are few studies examining what content is or should be included in field experiences (p. 517). In their review of studies published from 1995 to 2001, Clift and Brady (2005) state that they "did not find answers to structural or comparative questions such as: Does it matter if there are no field experiences as opposed to intensive field experiences? Does it matter where methods courses are located or positioned within the curriculum?" (p. 330). Wilson and Floden (2003) claim that "there is simply not a sufficient body of literature to make claims that we know anything about the features of a high-quality field experience…. [these studies] do not offer any definitive answers to the question of how to create and offer prospective teachers field experiences that will make them better

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[311] The major reviews consulted for this chapter are: Clift and Brady (2005), *Eight Questions on Teacher Preparation* (2003), Executive Summary, *Studying Teacher Education* (2005), Freiberg and Waxman (1990), Guyton and McIntyre (1990), McIntyre, Byrd and Foxx (1996), Wideen et al. (1993), Wilson and Floden (2003), Wilson et al. (2001, 2002) and Zeichner and Gore (1990). (See Appendix C for a brief description of these reviews.) Other relevant articles also considered were: Anderson and Radencich (2001), Becher and Ade (1982), Bowman and McCormick (2000), Brink, Laguardia, Grisham, Granby and Peck (2001), Bruckerhoff and Carlson (1995), Denyer and Florio-Ruane (1995), Fairbanks, Freedman and Kahn (2000), Freiberg and Waxman (1988), Gratch (2000), Grisham, Laguardia and Brink (2000), Kent (2001), Nolan, Hawkes and Francis (1993), Northfield (1994), Power and Perry (2002), Ramanathan and Wilkins-Canter (1997; 1999/2000) Richardson-Koehler (1988), Sandholtz and Wasserman (2001), Slick (1997, 1998) and Talvitie, Peltokallio and Mannisto (2000).

[312] Zeichner (1988) claims that "we know very little about what goes on inside teacher education courses at all beyond what students or faculty tell us or what foundations-sponsored studies report on the basis of the same sort of secondhand reports. Clearly, more direct study… is needed" (cited in Zeichner & Gore, 1990, p. 338).

[313] Surprisingly, in Carter's (1990) chapter on teachers' knowledge and learning to teach in the *Handbook of Research on Teacher Education* (1st ed.), very little attention is devoted to field experiences; minimal research (some of which is quite dated) is reported that addressed how pre-service teachers' field experience affects their understanding.

teachers" (p. 17). The authors of *Eight Questions on Teacher Preparation* (2003) conclude that "It remains unclear… what constitutes effective field experience and what impact it has relative to other components of teacher preparation programs" (About the Eight Questions, Question Three, Significance of the Question, p. 1) and that the research about the extent to which high-quality field experiences contribute to teacher effectiveness is "inconclusive"[314] (About the Eight Questions, Question Three, Quick Answer, p. 1). McIntyre, Byrd and Foxx (1996) call both the qualitative and quantitative research on the effects of various components and modifications of field experience "minimal" (p. 174).

The research we do have is also problematic; many reviewers have noted its limitations, including:

1. Research tends to be small in scale, unique to particular programs at particular institutions and generally descriptive and interpretive, factors that make generalization difficult or impossible (Carter, 1990, p. 295; *Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question Three, What the Research Says, p. 1; Wilson & Floden, 2003, p. 17; Wilson et al., 2001, Question 3, para. 15-17; Wilson et al., 2002, p. 195, pp. 196-197);
2. Studies are often "unsophisticated in their designs or analyses" (Wilson & Floden, 2003, p. 17); there is "inconsistency of design and data collection" (Wideen et al., 1993, p. 9);
3. There is an absence of reliable and valid measures of impact (relatively unreliable measures, such as self-reporting, are frequently used) (Wilson et al., 2001, Question 3, para. 15-17; Wilson et al., 2002, p. 196); outcomes are variously designated as knowledge, attitudes, orientations, dispositions, perspectives, concerns and commitments (Carter, 1990, p. 295);
4. Methods are often not thoroughly explained (Wilson et al., 2002, p. 201);

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[314] While high-quality field experiences can bring about changes in pre-service teachers' beliefs and attitudes, research is not conclusive that this necessarily makes them more effective teachers: "[the research] fails to support any confident conclusions about the effectiveness of different kinds of field experiences" (*Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question Three, What the Research Says, p. 1).

5. Little attention has been paid to the ecology of the school, or the context in which pre-service teachers' teaching occurs[315] (Guyton & McIntyre, 1990, p. 518; see also Zeichner & Gore, 1990, p. 338; Clift & Brady, 2005, p. 313, p. 331);

6. There is often a conflict of interest of researchers; those conducting the research are often instructors of the classes being studied or otherwise part of the system being investigated (Wideen et al., 1993, p. 9);

7. "The voices of university-based White male and female researchers predominate; voices of cooperating teachers are heard only occasionally; voices of prospective teachers are seldom heard. What is less obvious, and quite troubling, is the absence of school administrators and children and adolescents" (Clift & Brady, 2005, p. 334; see also Follo, 1999, p. 4, cited in Wilson, 2006; Wideen et al., 1993, p. 9);

8. Much of the research lacks "well-conceived theoretical bases for field experience" (McIntyre et al., 1996, p. 187; see also Carter, 1990, p. 295; Guyton & McIntyre, 1990, p. 514, p. 529);[316]

9. Most of the early research focused on pre-service teachers' and cooperating teachers' attitudes about field experiences (rather than on what they learned) (McIntyre et al., 1996, p. 177; Wilson et al., 2001, Question 3, para. 2, para. 15-17; Wilson et al., 2002, pp. 196-197); and

10. Generally research appears in two teacher-education specific journals (Wilson et al., 2001, Question 3, para. 15-17).

There are also several challenges to studying field experiences and their impacts.

First, there is some diversity in how field experiences are structured and connected to

other program components, and in their timing and purpose (Wilson et al., 2002,

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[315] Since contextual factors such as the intellectual and emotional atmosphere of the school, the teaching assignment, and the experience and pedagogical approach of the cooperating teacher can be significant variables in research results, the research on field experiences has been called of the "black box" variety; the context of the experience itself becomes an "undefined and mysterious" variable (Guyton & McIntyre, 1990, p. 524).

[316] McIntyre et al. (1996) have noted that the continual modifications to teacher education programs are rarely based on clear theoretical bases and sound research:

Teacher educators continue to add to the length of field experiences without knowing if more is better, continue to modify programs without knowing if one type of program produces more effective teachers than others, and continue to modify the context of field and laboratory experiences without knowing if one method is more effective than another. Briefly, teacher educators need to continue to improve their research methods and the questions they ask to validate what they do in field and laboratory experiences. (p. 188)

Guyton and McIntyre (1990) also bemoan the lack of clear goals for field experience's development and implementation (pp. 514-516).

p. 195).[317] [318] Second, it is difficult to isolate field experiences (and their effectiveness) from the larger program of which they are a part (and the program's general effectiveness) (Carter, 1990, p. 295; *Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question Three, Significance of the Question, p. 2; Wilson et al., 2002, p. 196). Third, other factors, such as pre-service teachers' subject matter understanding, beliefs about children and learning, and individuals' experiences, personalities and abilities, significantly influence what pre-service teachers learn in field experiences (*Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question Three, Significance of the Question, p. 2; Wilson et al., 2001, Question 3, para. 12).

Wilson and Floden (2003) call the results of the studies they reviewed "thin and inconclusive" (p. 17). Carter (1990) cautions that "few conclusions can be drawn from these studies" (p. 295) and Wilson et al. (2001) suggest that generalizations based on the research "would be unwise" (Question Three, para 11). Since our understanding of the current structure and content of field experiences is limited (as is our understanding of how field experiences should be conducted [Guyton & McIntyre, 1990, p. 527]), conclusions drawn, as well as suggestions for improvements made (as those made in the following section) must be considered in light of this absence, and be made tentatively.

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[317] "Little is known about the relative merits and limitations of these varied structures and characteristics. It is only clear that fieldwork that is poorly conceptualized, implemented or structured will be less effective" (*Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question Three, p. 1).

[318] Yet Guyton and McIntyre (1990) claim that there appears to be a significant similarity of field experiences "in all settings," regardless of the particular university of which the teacher education program is a part or the public school in which the pre-service teacher's field experience is located (citing O'Neal, Barnes & Edwards, 1986) (p. 519).

6.4. Pre-service teachers' understanding of contexts: the research

6.4.1. Field experience: a significant learning experience

While Wilson et al. (2001) call the research on what pre-service teachers learn in field experiences "scant" (Question 3, para. 9), there are some clear indications about the kinds of understanding we might say they learn from these experiences. The authors of *Eight Questions of Teacher Preparation* (2003) claim that "there is relatively little disagreement" that field experience is "extremely important in learning to teach" (About the Eight Questions, Question Three, Significance of the Question, p. 1). Guyton and McIntyre (1990) call the field experience "the most widely accepted component of teacher preparation" (p. 515: see also McIntyre et al., 1996, p. 186). Certainly, pre-service teachers seem to consider field experiences both an important and popular part of teacher education: "Study after study shows that experienced and newly certified teachers alike see clinical experiences as a powerful—sometimes the single most powerful—component of teacher preparation" (Wilson et al., 2002, p. 195; see also Brookhart & Freeman, 1992, p. 47; Guyton & McIntyre, 1990, p. 516; McIntyre et al., 1996, p. 175; Patrick & Pintrich, 2001, p. 121; Richardson, 1996, p. 108; Wilson et al., 2001, Question 3, para. 3; Zeichner & Gore, 1990, p. 336).

Field experiences seem to be so influential that pre-service teachers often attribute their shifts in learning to powerful school experiences rather than to their university courses (Northfield, 1994, p. 5). Indeed, the speed at which pre-service teachers attribute the origins of their classroom teaching decisions to cooperating teachers or personal experience is quite startling: Richardson-Koehler (1988) found that within two weeks of beginning field experiences, pre-service teachers were "discounting the influence of most

of their previous formal pedagogical instruction on their classroom practice" and that within one month, they cited the origins of specific practices used in the classroom as coming from the cooperating teacher (80%), from methods class (15%) and from themselves (5%) (p. 30). Interestingly, though, while field experiences are widely recognized as popular, important, and influential, there is also evidence that, often, they may also be "the most difficult" part of the program for pre-service teachers (Wideen et al., 1993, p. 7).

The cooperating teacher plays a significant role in the field experience's powerful effect. The role of the cooperating teacher has been cited as "influential, important and essential to the teaching experience of student teachers" (Glickman & Bey, 1990, p. 558, p. 559; see also Bunting, 1988, and Griffin et al., 1983, cited in McIntyre et al., 1996, p. 178; McIntyre et al., 1996, p. 173; Richardson-Koehler, 1988, p. 28; Wilson, 2006; Wilson et al., 2002, p. 195). The "extremely strong" influence of the cooperating teacher is acknowledged by pre-service teachers (Karmos & Jacko, 1977, and Manning, 1977, cited in McIntyre et al., 1996, p. 177; Talvitie, Peltokallio & Mannisto, 2000, p. 83) and university supervisors (RATE findings, and Koehler, 1984, cited in Zimpher & Sherrill, 1996, p. 292). However, the cooperating teacher's influence on the context, behaviour and educational beliefs of the pre-service teacher is often depicted in negative terms (Guyton & McIntyre, 1990, p. 518). Indeed, Zimpher and Sherrill (1996) assert that "the shortcomings of the traditional cooperating teacher role have been well documented" (citing Goodlad, 1990; Richardson-Koehler, 1988; Zeichner, 1990; Zimpher, 1987) (p. 292). Research explains, at least in part, some of the reasons why the cooperating

teacher's influence may often be less than ideal, and may dramatically contribute to the understandings pre-service teachers gain as a result of field experience.

6.4.2. Imitate to succeed

Field experiences in more typical teacher education programs seem to give pre-service teachers an experiential sense that successful teaching, or at least learning to teach successfully, is mostly a matter of unexamined imitation, and rarely one of considered innovation. Sedlack (1987) concludes that typical field experiences "[emphasize] imitation and subservience to the cooperating teacher rather than emphasizing investigation, reflection and problem solving" (cited in McIntyre et al., 1996, p. 173). Wideen et al. (1993) found that pre-service teachers felt frustrated about "the need to follow the practice of the cooperating teacher" and that the cooperating teacher "(the 'real' teacher in the eyes of the pupils) was still in charge even though they sat at the back of the room" (p. 6). Power and Perry (2002) go so far as to suggest that the large body of research indicates that pre-service teachers "tend to become clones" of their cooperating teachers during field experiences (p. 5).

The degree to which pre-service teachers are encouraged to thoughtlessly imitate their cooperating teachers is especially troubling when we consider the kinds of teaching activities (including what lessons or units are taught, how they are planned, delivered and assessed, and the kinds of resources used) research indicates most cooperating teachers seem to be implementing. Goodman (1983) found that pre-service teachers were placed with cooperating teachers who demonstrate "conservative attitudes and practices" and whose approach to curriculum and teaching was "highly structured, predetermined and

mechanistic" (cited in Guyton & McIntyre, 1990, p. 518). Griffin et al. (1983) found that the typical teaching pattern of field experiences was "small group, teacher-led instruction followed by seatwork; emphasis was on basic skills" and that both the cooperating teachers and pre-service teachers "demonstrated little variation in teaching practice (cited in Guyton & McIntyre, 1990, p. 519). Tabachnick, Popkewitz and Zeichner (1979) also describe pre-service teachers as tending to be "involved in a narrow range of classroom activities over which they had little control…. Their teaching was routine and mechanical and became equated with moving children through prescribed lessons in a given period" (cited in Guyton & McIntyre, 1990, p. 518; see also Wilson et al., 2001, Question 3, para. 1, para. 8; Wilson et al., 2002, p. 195). Howey (1986) describes the experiences of many pre-service teachers as lying "more in the direction of largely unchallenged pedestrian activities than in well-conceived activities" (p. 174) (cited in McIntyre et al., 1996, p. 186).[319] Carter (1990) similarly observes that field experiences "[do] not provide for much experimentation" (citing Calderhead, 1987) (p. 295; see also Richardson-Koehler, 1988).

This commonly observed phenomenon seems to suggest that pre-service teachers learn that being a successful teacher, or at least a successful pre-service teacher, involves apprenticing with, and imitating, an experienced classroom teacher in her or his planning and teaching decisions, rather than taking considered pedagogical risks and implementing teaching strategies based in one's own sense of imaginative possibilities. In other words, at least in more typical teacher education programs, field experiences tend to encourage

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[319] Interestingly, innovative teaching seems to be more valued by pre-service teachers than by cooperating teachers or supervisors (Guyton & McIntyre, 1990, p. 523).

pre-service teachers to thoughtlessly imitate the rather mechanical and circumscribed teaching activities of their cooperating teachers.

6.4.3. Teaching is fundamentally a practical concern

Another understanding that pre-service teachers appear to gain from their field experiences is that teaching is mostly concerned with practical, rather than analytic, considerations. Numerous researchers have noted that pre-service teachers are not given ample opportunities to analyse their own and others' teaching and that analysis does not tend to be a regular expectation of pre-service teachers during their field experience (e.g. Calderhead, 1987, cited in Carter, 1990, p. 295; Griffin, 1983, cited in Slick, 1998, p. 823; Richardson-Koehler, 1988). McIntyre et al. (1996) suggest that the current evaluation criteria of pre-service teachers does not include that they base their decisions and actions on reasons that they can explain and justify (p. 187). Wilson et al. (2002) state that pre-service teachers "tend not to rock the boat in classrooms in which they are placed and thus do not always engage in critical conversations about their own teaching or their collaborating teachers' practice" (p. 195). Richardson-Koehler (1988) concluded that, rather than being apprenticed into making the decisions or theories underlying their practice explicit, pre-service teachers are apprenticed into justifying these decisions based on what works and based on their own experience. She suggests that criteria for successful practice tends to be based on "'what feels right to the individual teacher'" (p. 33), especially "related to management and efficiency concerns: whether or not the students were engaged and getting through a task as quickly as possible" (p. 32). Richardson-Koehler concludes that the norms most prevalent in schools are that both

learning to teach and learning as a teacher are not based, at least in any significant way, on analysis, but rather on experience (p. 33).[320]

Cooperating teachers do not seem to adequately model analysis of their own or their pre-service teacher's teaching. Receiving a significant degree of quality feedback about their teaching is a key way in which pre-service teachers can learn to teach more effectively (Freiberg & Waxman, 1988, p. 9). Yet most cooperating teachers seem to give feedback that is inadequate in terms of quality or quantity, or both. Zimpher, deVoss and Nott (1980) found that cooperating teachers seem to have an "uncritical relationship" with pre-service teachers, failing to provide them "with feedback and critical analyses of their teaching" (cited in McIntyre et al., 1996, p. 178; see also Johnston, 1993, cited in Talvitie et al., 2000, p. 86; Kettle & Sellars, 1996, cited in Talvitie et al., 2000, p. 84; Griffin, 1983, cited in Slick, 1998, p. 823). Griffin et al. (1983) found that cooperating teachers provided few statements of reasons or evaluation of behaviour for doing what was suggested (cited in Richardson-Koehler, 1988, p. 28).[321] An unwillingness, on the part of cooperating teachers, to self-examine their practice was also noted by Richardson-Koehler (1988): she found that many cooperating teachers became quite defensive when their own classroom routines (and the reasons for implementing them) were raised as topics of discussion, and perceived the consideration of their routines as a potential criticism (p. 32).[322] [323]

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[320] And by extension, that cooperating teachers also tend to rely on their own personal experiences to shape their role conception, as Stanulis (1995) suggests (p. 331).

[321] In Anderson and Radencich's (2001) study, none of the thirty-four pre-service teachers questioned the cooperating teacher's decisions (p. 74).

[322] Yet most pre-service teachers were expected to, apparently unquestioningly, follow these established routines.

[323] "Discussion of teaching philosophies and methods are seen as potential sources of disagreement and

Observing a variety of teachers, students, and learning contexts could broaden pre-service teachers' range of educational possibilities and give them opportunities to make comparisons about and analyse various teaching approaches and educational values. But cooperating teachers may not always encourage this kind of learning among pre-service teachers. Richardson-Koehler (1988) noted among cooperating teachers in her study a lack of interest in encouraging or allowing pre-service teachers to visit other classrooms (p. 31). In fact, several cooperating teachers in this study "fought against" the supervisor's recommendation that the pre-service teacher observe other teachers (p. 31). Such behaviours may result from cooperating teachers' belief that learning to teach is accomplished "by experience and not through observations and analysis," as Richardson-Koehler suggests (p. 31).

The research on cooperating teacher and pre-service teacher conferences[324] also suggests that they seem to be remarkably lacking in any content we might consider analytical and so contribute to pre-service teachers' understanding that analysis is not necessary when reflecting on teaching. Conferences can provide an important opportunity for cooperating teachers to help pre-service teachers thoughtfully consider their teaching, an essential component of becoming a more effective teacher, and one that can improve pre-service teachers' own sense of professionalism[325] (Talvitie et al., 2000, p. 82). For example, during conferences, the two might discuss educational successes and failures

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negative judgments and are, therefore, avoided as threats to solidarity" (Hatch, 1999, p. 231). Richardson-Koehler (1988) suggests that "the contexts of most schools does not provide a supportive environment for rigorous analysis of teaching" (p. 33). Stanulis (1995) states that "collaboration… is not a natural aspect of a school culture. A more common culture is isolation, a culture that encourages teachers to keep their wisdom tacit rather than shared with others in the school community" (p. 332).

[324] Conferences may also be called post-lesson debriefings.

[325] Interestingly, conferences also provided opportunity for cooperating teachers (more so than supervisors) to increase the motivation of their pre-service teacher (Cuff, 1978, cited in Glickman & Bey, 1990, p. 559).

(e.g. in planning or instructional delivery of a particular lesson), consider how teaching

decisions relate to educational goals and values, or reflect on educational issues most

relevant to a specific teaching situation. The literature on cooperating teacher and pre-

service teacher conferences shows that these opportunities are rarely taken up.

Cooperating teachers tend to dominate conferences,[326] and focus attention on procedural,

rather than substantive concerns (Guyton & McIntyre, 1990, p. 525; see also Glickman &

Bey, 1990, p. 559; Richardson-Koehler, 1988, p. 30).[327] It seems to be rare for conference

discussion to focus on analyzing the pre-service teacher's instruction: "Directions,

procedural issues, and classroom management were predominant cooperating teacher

activities and topics, with no serious reflection on or analysis of teaching" (Guyton &

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[326] Chandler's (1971) study showed that without training, cooperating teachers tended to dominate over 60% of talk in conferences (cited in Glickman & Bey, 1990, p. 559). O'Neal and Edwards' (1983) in depth study of conferences showed cooperating teachers doing 72% of the talking (cited in Guyton & McIntyre, 1990, p. 525). Western, Zahorik, Kritek and Smith (1987) found that cooperating teachers' supervisory experience positively related to the degree to which they were proactive and allowed pre-service teachers more verbal interaction (cited in Glickman & Bey, 1990, p. 559).

[327] Guyton and McIntyre (1990) report that during conferences, "most (67 percent) operational talk was descriptive, 17 percent was prescriptive, and 16 percent was focusing (calling attention to a particular substantive area)" (p. 524); that "The great majority of conferences focused on… methods and materials of instruction" (p. 525); and that

> descriptions and direction-giving interactions predominate. Analysis and reflection on teaching are not common; the substantive issues of conferences tend to focus on teaching techniques, classroom management, and pupil characteristics. Craft and experiential knowledge and efficiency are rationales for most recommendations. (p. 525)

Glickman and Bey (1990) come to a similar conclusion: 79% of talk between cooperating teachers and pre-service teachers during conferences focused on classroom events or activities (citing O'Neal, 1983b) (p. 559). The cooperating teacher's feedback to the pre-service teacher "tended to be particularistic and not tied to research and general aims about teaching" (p. 559). "Actual analysis of the student teacher's instruction was seldom the major thrust of a conference discussion. Koehler (1986) found that conference dialogue focused on noninstructional tasks and classroom occurrences, rather than on analysis of instruction" (p. 559).

McIntyre, 1990, p. 525).[328] [329] When they did talk in conferences, pre-service teachers mainly addressed classroom events, referred to their own teaching activities, and acknowledged the supervisor's talk (O'Neal & Edwards, 1983, cited in Guyton & McIntyre, 1990, p. 525 and in Glickman & Bey, 1990, p. 559). The passive role that pre-service teachers take during these conferences (Guyton & McIntyre, 1990, p. 525) certainly does not encourage the kind of critical reflection and examination of educational issues that most teacher educators would hope would be part of pre-service teachers' learning to teach process.

The fact that the content of conferences is primarily related to procedural concerns is especially troubling when we consider that the level of cooperating teachers' thinking may be reciprocated by pre-service teachers (see Chandler, 1971, cited in Glickman & Bey, 1990, p. 559). In other words, if cooperating teachers engage in analysis, pre-service teachers tend to as well; if, however, cooperating teachers fail to exhibit any analytic tendencies, most pre-service teachers will not do so either—their

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[328] Copeland (1980) and Copeland and Atkinson (1978) found that generally, pre-service teachers initially preferred a directive, versus a non-directive, approach to supervision. The researchers inferred that novice pre-service teachers perceived themselves as lacking in experience to resolve their instructional problems. In a follow-up study, Copeland (1982) found that while novice pre-service teachers preferred a directive approach to supervision, with more experience, they came to favour a nondirective approach (cited in Glickman & Bey, 1990, p. 560). Vukovich (1976) found that the pre-service teacher's preference related to self-concept: those with lower self-concept preferred a more directive approach, while those with a higher self-concept preferred a non-directive approach (cited in Glickman & Bey, 1990, p. 560). While no one supervisory style works for all pre-service teachers, Desrochers (1982) found that, in general, pre-service teachers rate supervisors who use a directive approach as more credible than those who use a non-directive approach (cited in Glickman & Bey, 1990, p. 560).

[329] Richardson-Koehler (1988) reports that two cooperating teachers in her study who were rated as highly reflective (defined as the degree to which a teacher could provide an articulate analysis of his or her own teaching) resisted sharing their analysis with their pre-service teachers for one of two reasons: either they believed that the pre-service teacher should "learn by experience" or they thought that, once the pre-service teacher started practicing in her or his own classroom, she or he would simply try to implement the routines of the cooperating teacher (which would not necessarily be possible) (p. 32).

discussion may be limited to "low levels of thinking."[330] Perhaps this is one reason why

pre-service teachers tend to avoid substantive discussion with their cooperating teachers

(Killian & McIntyre, 1986, cited in McIntyre et al., 1996, p. 178).

Cooperating teachers also fail to consider or discuss the curriculum analytically

with their pre-service teachers. In fact, discussion of curriculum is essentially non-

existent: "virtually nothing is said about the curriculum. What is taught is either not

noticed or is taken for granted in the given situation. Little is said between cooperating

teacher and student teacher about instructional strategies" (Applegate, 1986, cited in

McIntyre et al., 1996, p. 174; see also Ginsburg & Clift, 1990, p. 455; Talvitie et al.,

2000). This conveys the message that successful teaching requires neither analysis of the

current curriculum's merits nor debate about or advocating for curricular revision. There

are numerous possible reasons why cooperating teachers may not engage in analytic

discussions with their pre-service teachers; one may be related to the frequently noted

perception by cooperating teachers that the theoretical knowledge of universities is

irrelevant to actual classroom experiences (Hatch, 1999, p. 236; Bullough, Kauchak,

Crow, Hobbs & Stokes, 1997).

Perhaps surprisingly, supervisors may also foster pre-service teachers'

understanding that teaching is mostly concerned with practical, rather than analytic

considerations. While we might expect that university professors would help pre-service

teachers critically analyse their own and other's teaching, it seems that a good deal of the

supervisor-pre-service teacher interaction also lacks an "atmosphere for rigorous inquiry,

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[330] Chandler (1971) considered evidence of higher level categories of thinking/discussion such things as divergent or evaluative dialogue (cited in Glickman & Bey, 1990, p. 559).

which may limit the potential for increasing student analysis" (Griffin et al., 1983, cited in McIntyre et al., 1996, p. 178; see also Johnston, 1993, cited in Talvitie et al., 2000, p. 86; Griffin, 1983, cited in Slick, 1998, p. 823). Although we might expect that supervisors would place a relatively high degree of importance on providing pre-service teachers with feedback on their teaching (and so help foster their critical abilities), this does not seem to be the case: Koehler (1984) found that feedback to pre-service teachers was rated by supervisors as the second to least important on a list of nine priorities (cited in McIntyre et al., 1996, p. 179).

Research indicates that supervisors' attention to practical concerns related to teaching is evident in both supervisor–pre-service teacher conferences and seminars.[331] Guyton and McIntyre (1990) assert that conferences tend to "emphasize teaching techniques and classroom management. What [is] to be taught and for what purposes [is] seldom discussed. Not evident [are] program goals for student teachers: to be reflective, autonomous, self-fulfilled, and actively involved" (p. 525). Guyton and McIntyre (1990) report that seminars also tend to have a narrow focus that reflects the immediate needs and concerns of pre-service teachers: "critical thought, analysis, and reflection [are] not facilitated" (p. 525); seminars tend to "encourage an emphasis on mastery of technique and classroom management, rather than on theory and reflection" (citing Lanier & Little, 1986) (p. 525).[332] Surprisingly, supervisors' awareness of this situation seems to be fairly

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[331] Seminars, which tend to involve one supervisor and a number of pre-service teachers, are "quite common," but tend to be "minimally researched" (Guyton & McIntyre, 1990, p. 525).

[332] Of the three kinds of roles for seminars, Guyton and McIntyre (1990) state that the collaborating role (that which "supported practices and beliefs found in schools and was characterized by a focus on management problems, a sharing of techniques, an emphasis on what worked, and no questioning of assumption") of seminars was the most predominant. The other two (the liberalizing role and the inquiry role) were infrequent (p. 525).

limited: they perceive that they use seminars to address substantive issues related to teaching (Guyton & McIntyre, 1990, p. 525).

6.4.4. Teaching communities are not reflexive

Pre-service teachers might also gain an understanding that successful teaching does not require analyzing teaching or educational assumptions because significant professional relationships in which they are involved do not tend to be characterized by reflexivity. For example, the roles and responsibilities of triad members are rarely (if ever) discussed or contested. While open communication between triad members is generally supported in principle, it is not necessarily practiced in reality; nor are the expectations for triad members generally made explicit (McIntyre et al., 1996, p. 177, p. 179). Evaluative practices may also contribute to pre-service teachers' understanding that successful teaching does not require reflexivity about one's own practice. For example, Freiberg and Waxman (1988) suggest that "the tools to assess accurately one's effectiveness with a class are rarely provided for the neophyte or even the experienced classroom teacher" and that almost exclusive reliance on external evaluation, rather than a fostering of analytic self-evaluation practices, helps foster "the roots of teacher dependency" (p. 10) in pre-service teachers.[333]

The poor way in which most programs tend to handle conflict among triad members also may contribute to pre-service teachers' sense that teaching is not characterized by reflexivity; it mostly involves practical, rather than analytic

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[333] Freiberg and Waxman (1988) state that pre-service teachers' reliance on others to provide answers for important questions about one's practice such as "How am I doing? "What am I doing?" and "How can I improve?" discourage the development of an independent and analytically reflective approach to their practice.

considerations. Numerous researchers (e.g. Guyton & McIntyre, 1990, p. 523; McIntyre et al., 1996, p. 176) have noted that conflict among the pre-service teacher, cooperating teacher and supervisor is common, if not pervasive. Since its occurrence is well-documented,[334] and its potential effect significant, one might expect that programs would provide triad members with knowledge of its likelihood, understanding of the reasons for its occurrence and specific strategies for its resolution. This approach does not seem to be followed in more typical teacher education programs. Well-handled, conflict can be a poignant way both to clarify for oneself and others unexamined assumptions and to make explicit, and learn to negotiate, the educational beliefs and values that often underlie differences. Teacher education programs could encourage pre-service teachers, cooperating teachers and supervisors to use conflict as a learning opportunity, rather than support their avoidance of it.

To summarize, it seems that pre-service teachers in field experiences of more typical programs tend to gain the understanding that successful teaching (or at least successful learning to teach) is mostly a matter of imitation, and is primarily concerned with practical considerations, and that teaching communities are not characterized by reflexivity. These understandings seem to be fostered by cooperating teachers and supervisors, and reinforced by common program practices. Of course, this suggests that field experiences in more typical programs tend to give pre-service teachers very different understandings of subject matter and pedagogy than the ideals I described. For example, it is hard to envision how pre-service teachers would be able to gain any

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[334] For example, while pre-service teachers tend to perceive the cooperating teacher as the most significant source of conflict during the field experience (Webb, 1979, cited in Glickman & Bey, 1990), pre-service teachers tend to avoid conflict with their cooperating teachers (Killian & McIntyre, 1986, cited in McIntyre et al., 1996, p. 178).

experiential sense of the imaginative possibilities of subject matter if the curriculum is not even discussed during the field experience (McIntyre et al., 1996, p. 174; Talvitie et al., 2000). Similarly, while we do not seem to have research that directly addresses what kind of understanding of students pre-service teachers gain as a result of field experiences in more typical teacher education programs,[335] one might suppose that if student interests and imaginations were considered in any depth by pre-service teachers and their cooperating teachers and supervisors, this would at least be referred to in the research. Since students seem to be notably absent from the research on field experiences, one might conclude both that much like the taken-for-granted curriculum, they are rarely (if ever) the focus of imaginative or analytic attention, and that pre-service teachers gain the understanding that students do not need to be. Finally, the understanding of practice that pre-service teachers tend to gain by means of the field experience of more typical teacher education programs—that it is mostly a matter of imitation, is primarily concerned with practical considerations and is not characterized by reflexivity—are contrary to the understanding of their own practice I am suggesting pre-service teachers should gain: an experiential understanding of imaginative principles and practices, an analytic understanding of their own and others' teaching, and a sense of an alternative models of teaching, including one that is collaborative and inquiry-based.

Guyton and McIntyre (1990) suggest that pre-service teachers' shift in orientation from the practical to the analytical would so contrast with the current orientation that it

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[335] I think we can infer that pre-service teachers and their cooperating teachers and supervisors do consider and discuss students in terms of their relationship to learning outcomes and classroom procedural concerns; however, the way in which I am suggesting that students should be considered (putting them as individuals—including their imaginations—and potential imaginative resources as the subject of study) seems to be absent.

would actually be "a newly created norm for teaching" (p. 520). In the next section, I will consider how an imaginative teacher education program might begin to create "a new norm for teaching," directed towards fostering pre-service teachers' situated, experiential understanding of the imaginative possibilities of subject matter, pedagogy, and their active participation in the creation of what schools and education can do and be.

6.5.   Program features that foster an imaginative understanding of contexts

In the following section, I will consider the changes to program design and delivery that an imaginative teacher education program should implement to help pre-service teachers develop the understanding of contexts I described at the beginning of this chapter: a situated, experiential understanding of the imaginative possibilities of subject matter, pedagogy, and professional agency. The key program features are: a shift in focus on field experience from teaching performance to educational inquiry; triad members' relationships significantly based on reciprocity; sustainable roles for cooperating teachers and supervisors (primarily brought about by means of selection criteria and education); and a reflexive focus on imaginative engagement. These features reflect the four program principles identified in chapter three. Because field experience is the most integrative aspect of teacher education, the program principles of inquiry, reflexivity, reciprocity and sustainability can be manifested most effectively within it. Relevant research that further explains the current state of the field of these four areas will be discussed as necessary.[336]

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[336] The kinds of understanding of contexts pre-service teachers in more typical teacher education programs tend to have was discussed in the earlier section on field experience research. In this section, I will clarify the kinds of understanding cooperating teachers and supervisors tend to have (as evidenced by the literature) and those they need, so that the imaginative understanding of pre-service teachers can best be supported.

I will end the chapter with a brief consideration of the research that should be conducted on field experience (research that is distinct from that discussed in the chapter four and five discussions of research on pre-service teachers' subject matter understanding and pedagogical understanding during the field experience).

6.5.1. Shift in focus to from teaching performance to educational inquiry

In more typical teacher education programs, pre-service teachers' field experiences seem to primarily, if not solely, involve teaching and related responsibilities. As I pointed out earlier when examining the current research, pre-service teachers' success in the field experience is judged largely by whether they can effectively carry out the tasks that a teacher is expected to perform. These tasks do not (at least not frequently) seem to involve what we might call theoretically-informed educational inquiry: an ability to critically examine one's own and others' teaching, the culture of the school, the relationship between various aspects of students' education, and so on. Of course, in an imaginative teacher education program, pre-service teachers will still need to demonstrate that they can adequately manage the numerous challenges of teaching the curriculum to real students. However, the focus of the field experience will shift from teaching performance to educational inquiry. In other words, what teachers and pre-service teachers will be expected to do (and so be evaluated on) will be broader and richer. Can pre-service teachers think imaginatively about educational problems? Can they reflect on their own practice using the numerous tools available to them? Are they able to consider different educational issues from various perspectives, such as their own, children's, other teachers', principals', parents', etc. as well as while using some tools from various intellectual communities (sociology, anthropology, history and so on)? Pre-service

teachers who successfully complete the field experience will be able to effectively engage the imaginations of their students using various cognitive tools; but they will also, importantly, be able to participate in educational inquiry and demonstrate an ability to imaginatively consider (including analyse) a wide range of educational issues at work in the context of their field experience.

A shift from teaching performance to educational inquiry requires that pre-service teachers teach less during the field experience and spend more time understanding teaching and learning in various educational contexts. Zeichner and Teitelbaum (1982) make a similar recommendation: the amount of time pre-service teachers spend teaching during field experiences be significantly reduced and "a greater proportion be allocated to studying the culture of the school and its relationship to the surrounding community through participant observation" (cited in Guyton & McIntyre, 1990, p. 519; see also Bruckerhoff & Carlson, 1995). Northfield (1994) similarly argues that pre-service teachers study schools as systems, not simply classes, so that they can "become teachers who do not merely accept, and conform to, the present situation" (p. 4), as does Hatch (1999), who recommends that "new teachers should experience socialization into the profession *by design*, as opposed to *by default*" (p. 229).[337] During field experience, pre-service teachers should be given many opportunities to observe and reflect on student learning and their and other teachers' teaching, in a variety of contexts, so that they are exposed to and consider, using the theoretical tools they are developing, a rich repertoire

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[337] Rather than let pre-service teachers have more practice teaching, some researchers argue that what is needed is less time teaching, and more time critiquing schools and educational decision-making. Numerous researchers who have identified the potential for field experiences to socialize pre-service teachers into the current school milieu (rather than critically examine it or potentially challenge it) have suggested that field experiences should be limited in length (citing Hoy & Rees, 1977; Liston & Zeichner, 1988; Popkewitz, 1985; Zeichner 1986b, 1989) (McIntyre et al., 1996, p. 175).

of educational possibilities.[338] This should help pre-service teachers witness and envision schools as exciting places and also support their educational inquiry.

In chapters four and five, I suggested that an imaginative teacher education program should foster pre-service teachers' subject matter understanding and pedagogical understanding by ensuring that they visit, watch and discuss the learning occurring in several different contexts, such as public and private schools, outdoor education, Waldorf schools, home schooling, and so on, and that part of the selection for such experiences should be the degree of variety they offer, and their potential for imaginative engagement (e.g. there should be significant contrast in grade levels, subject matter, student composition, class configuration, educational approaches, understanding of curriculum and the degree of integration with the community.) Similarly, in field experiences, pre-service teachers' understanding of their own practice should be continually considered in relation to their understanding of these other educational possibilities. Certainly, pragmatic factors may limit the number of classrooms in which pre-service teachers teach, but exposing them to a carefully selected range of learning situations should enrich their situated and experiential understanding of the imaginative possibilities of subject matter and pedagogy and foster their understanding of their own professional agency to participate in the creation of what schools can and should be.[339]

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[338] *Eight Questions on Teacher Preparation* (2003) also recommends that, ideally, teacher education programs offer a variety of field experiences (About the Eight Questions, Question Three, What the Research Says, pp. 3-4).

[339] For instance, if pre-service teachers visit and study schools that utilize alternative models (e.g. that are more collaborative and inquiry-based), pre-service teachers should be able to gain a greater experiential understanding of the future possibility of working to create a school culture they choose, rather than one they feel they have to conform to.

Especially at the beginning of their field experience, pre-service teachers may have "limited cognitive schemes for making sense of their observations in the field and hence from learning from them" (McIntyre et al., 1996, p. 175); therefore, supervisors overseeing the field experience, and where possible, cooperating teachers as well, should accompany pre-service teachers on these visits and, in subsequent discussions about them, use them as a way to deepen pre-service teachers' understanding of the field experience. The triad members should consider the educational values and goals evident in various educational contexts, how the curriculum is understood, the physical and emotional environment of the classroom, the engagement of the students and the teacher, and the imaginations of both, the degree of divergence from 'typical' educational settings, goals, and so on.[340] If possible, triad members should also discuss some of these issues with students as well. Such experiences are also useful because they help to create common experiences, language and references for future discussion among triad members and help them more thoroughly understand their own and each others' interpretations of the principles and practices of imaginative education and the kinds of things that can be attended to in the classroom.[341] Continual observation and critiquing of a variety of teaching and learning contexts will most likely positively affect pre-service teachers' ability to effectively analyse and adjust as necessary their own teaching practice.

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[340] To make such changes the least interruptive, the program might consider what was implemented in the Power and Perry (2002) study: one half day (the same day) every week was devoted to the education of pre-service teachers and cooperating teachers. If cooperating teachers attend, funds for covering the costs of substitute teachers will need to be found.

[341] Of course we would expect that such discussions between the triad members would not be limited to particular classrooms and educational contexts but would also include consideration of larger educational issues—such as the extracurriculum, the school as a physical location, media, power, and so on, including their relationship to the imagination, culture and learning.

Teaching less and spending more time focused on educational inquiry is also necessary for pre-service teachers to develop the kind of understanding of the imaginative possibilities of students that I argue is central to an imaginative understanding of pedagogy. In more typical teacher education programs, by the end of their field experience, pre-service teachers certainly can get to know students fairly well, and no doubt also care for them. (Of course, this is probably more commonly true in elementary or middle school than in secondary classrooms.) However, when pre-service teachers begin their field experience, they are likely to have no more than a general familiarity with the class. This means that, at least initially, it is almost impossible for them to take the interests and imaginations of the students into consideration in their planning and teaching.[342] Ideally, in an imaginative teacher education program, pre-service teachers will be able to spend significant amounts of time getting to know students as thoroughly as possible before planning and teaching lessons to them. Pre-service teachers should attempt to become experts on all of their students: by closely observing behaviour, asking questions, working together on shared tasks, and so on with each student, as well as talking to the cooperating teacher and, where possible, parents and caregivers to discover what each student finds imaginatively engaging, both in and out of school (e.g. to learn

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[342] This may be an oversimplified to some extent. Pre-service teachers may gain a great deal of information about the class dynamics and about particular students from their initial classroom visits and discussions with their cooperating teacher. However, as pre-service teachers are often expected to complete their unit plans (and often many of their lesson plans as well) before even beginning the field experience, it is next to impossible for them to base such planning on the interests and imaginations of the particular students they will be teaching. In addition, in field experiences of more typical teacher education programs, while pre-service teachers are not usually expected to teach immediately (at least not more than 'mini lessons') and so have significantly more time available to them than later in their field experience when they take up about 80% of the cooperating teachers' instructional load, they may be helping with non-instructional tasks (such as homework collecting) or indeed, be told to 'get to know the students.' However, what might be meant by 'getting to know the students' is significantly different than what I am advocating: that pre-service teachers understand all of the students as thoroughly as possible, including their imaginations and potential imaginative resources, so that these may be taken into consideration in their later planning and teaching.

about her or his hobbies, extra curricular activities, sense of humour, etc.). Such study would require a significant amount of time, especially at the beginning of the field experience. But pre-service teachers should also continue to investigate the imaginative capacities of her or his students throughout the entire field experience, especially in regards to what engages (or fails to engage) particular students about specific lessons and units. Of course, as I discussed in chapter five, pre-service teachers will be unable to know and care for all students to the same degree; there will necessarily be some variety in terms of similar interests, dynamics and compatibility. However, pre-service teachers knowing their students well increases the chances that those teachers will be able to develop good relationships with them, genuinely care for them, as well as take them as individuals more thoroughly into consideration when planning and teaching. Such focused study of children should help pre-service teachers develop both a deep understanding of the particular children with whom they work as well as foster a sense of wonder about children, childhood and their learning in general; in other words, the situated, experiential context of field experience can significantly deepen their pedagogical understanding.

Educational inquiry might be more effectively manifest in the field experience if triad members were to conduct action research. Action research has the potential to increase participants' understanding of the imaginative possibilities of subject matter and pedagogy, as well, clearly, as of their own professional agency. Either alone or in collaboration with their cooperating teachers, pre-service teachers might be encouraged

to explore a particular feature of their teaching practice.[343] Cooperating teachers and supervisors might choose to investigate their supervisory practice. All members could share their findings with each other (and discuss their relationships to educational goals, imagination and possibility, and so on). Ideally, the practice of investigation, self-reflection, academic humility and collaboration will give all triad members a lived sense of a kind of professional development that is possible—one in which teaching is both a process of inquiry and a collaborative endeavour.

6.5.2. Relationships based on reciprocity

In order to foster the kinds of understanding I suggest pre-service teachers will need to gain as a result of their field experiences—an understanding of the situated and experiential imaginative possibilities of subject matter, pedagogy and professional agency—the nature of the relationship between triad members will need to shift significantly to become far more reciprocal. Of course, a triad is only one of several viable models for the field experience; others might be equally effective (or indeed, perhaps even more effective).[344] Arguably, however, the structure itself is not counterproductive to the education of imaginative pre-service teachers. It is instead the

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[343] Depending on the age and focus of the action research project, the students themselves might be invited to participate.

[344] An imaginative teacher education program could also consider reconfiguring the traditional triad structure in numerous ways. For example, it might consider implementing a supervisory structure somewhat similar to that used in Wilson's (2006) study. The greater degree of collaboration or teamwork in this model was considered "one of the most positive aspects" by participants. Clinical Master Teachers were each responsible for one pre-service teacher, but as a group, they oversaw all pre-service teachers. The CMTs met regularly as a group to discuss the progress of all the pre-service teachers at the school; half of the twelve observations were carried out by the assigned CMT and the other half by six different CMTs. Such a model might increase pre-service teachers' and cooperating teachers' exposure to various values and approaches, and therefore increase their sense of imaginative possibilities about subject matter and pedagogy. As well, as in this study, such collaboration might increase the chances of developing "a community built by the participants" (para. 25).

way in which the triad is conceived and enacted that needs to change: in an imaginative teacher education program, it will need to be based on reciprocity, "involving a combination of equality of effort, an exchange of benefits" and a respectful acknowledgement of the dynamic needs of various participants (Little, 1981, cited in Richardson-Koehler, 1988, p. 33).[345]

In more typical teacher education field experiences, cooperating teachers may be considered 'experts' about their practice. However, in an imaginative teacher education program, while they may be very experienced and have a great deal of expertise in certain areas of teaching, in others they are likely to be as novice as the pre-service teachers they are overseeing. For example, while cooperating teachers' understanding of imaginative education in general and of the imaginative possibilities of subject matter and pedagogy can be expected to deepen significantly over the duration of the field experience, at the beginning of the field experience, these understandings may be somewhat limited. Therefore, cooperating teachers will be unable to apprentice the novice teacher in the ways of her or his successful practice, as is done in more typical teacher education programs. This will cause the cooperating teacher's role in the triad to shift considerably. The cooperating teacher's inexperience with imaginative principles and practices creates a unique, and, at times, potentially delicate dynamic: the cooperating teacher and the pre-service teacher will be, in many ways, exploring the complexities of practice together. As a result, their relationship is likely to be, and will be more effective if it is, more

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[345] Slick's (1998) claim that "no studies have addressed the potential for the supervisor being a part of a reciprocal learning-to-teach or teaching-to-learn negotiation" (p. 824) highlights the novelty of a suggestion such as this.

reciprocal.[346] For example, it is unlikely that pre-service teachers in an imaginative teacher education program will be replicating the lessons or units of those previously taught by cooperating teachers. Yet imaginative pre-service teachers will still need significant support in planning, locating or creating teaching resources, and in assessing their lessons—support that their relatively inexperienced cooperating teacher will not be as suited to provide. Because the pre-service teacher and the cooperating teacher will both be in positions of relative inexperience, they will need to work together on a more equal footing and rely on the collaborative input of the supervisor to a greater degree than is done in the more traditional triad relationships.

Cooperating teachers will need to negotiate this more collaborative role with wisdom, confidence and humility. The cooperating teacher is likely to be learning a great deal about imaginative principles and practices, how to supervise an imaginative pre-service teacher and how to effectively work in a new triad configuration. Her or his reflections on such learning—for example, explanations of reasoning about the pedagogical risks taken and of their success or failure—could be valuable to the pre-service teacher. However, making the cooperating teacher-pre-service teacher relationship one that is able to manage such complexities is not likely to be an easy endeavour. Cooperating teachers will need to effectively oversee pre-service teachers, while also, as novices, experience and, at least at times, reveal their own teaching vulnerabilities. The supervisor's judgment and input about wisely negotiating the

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[346] Of course I am oversimplifying the situation somewhat as the cooperating teacher's expertise will be in numerous areas that also apply to imaginative practice. For example, they will be experienced and hopefully confident in such things as developing satisfying relationships with students and their parents over one or perhaps several years, working effectively with colleagues and administrators, considering and implementing both short term and long term planning, dealing with diverse students, etc.

dynamic between confidence and humility in this more reciprocal relationship will no

doubt be helpful.

The supervisor's participation in the triad will also need to be characterized by

reciprocity.[347] In the field experience of an imaginative teacher education program, some

of the tasks that have traditionally been carried out by cooperating teachers will need to

be performed by the supervisor. For example, supervisors will likely play a more

instrumental role in planning imaginative lessons and units than they tend to do in more

typical programs.[348] Yet all triad members will need to draw on their imaginations,

experiences and expertise to contribute to effective planning and assessing of imaginative

teaching. Supervisors must negotiate their role in such tasks, adeptly encouraging the

increasing autonomy of pre-service teachers and cooperating teachers. Since planning

and teaching based on imaginative principles and practices will be relatively new to both

cooperating teachers and pre-service teachers, and since three people will be involved in

some capacity in planning and assessing, time might need to be set aside for the building

of these dynamic and more reciprocal relationships and for the triad's collaborative work.

Supervisors' more extensive participation in the triad and their increasingly

reciprocal relationships means that they will need to be in very regular contact with the

other two members of the triad throughout the field experience. Supervisors will need a

good understanding of their pre-service teachers' and cooperating teachers' daily

teaching lives during field experience than they tend to have in field experiences of more

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[347] One can understand the supervisor's role as a liaison between the university and the school and between an 'ideal' and an emergent imaginative practice.

[348] For example, supervisors will have to guide both the pre-service teacher and the cooperating teacher about possible risks to take, and how to make sense of those risks once lessons are taught (clarifying whether they were successful or not as well as suggesting ways to improve in the future).

typical programs.[349] This means that supervisors will need to spend substantially more time in schools, working and meeting with both pre-service teachers and cooperating teachers (both alone and together): They can no longer visit only occasionally for fear of being perceived as "outside interference" (Daane, 2000, p. 97; see also Slick, 1998, p. 822).[350] Clearly, these added demands on the role of the supervisor requires that more time be allotted for this important contribution to the field experience of an imaginative teacher education program.[351]

Triad relationships characterized by reciprocity will necessarily entail changes to pre-service teachers' roles. Specifically, pre-service teachers will become more active in the triad and take on more responsibility. For example, more reciprocal triad relationships mean that pre-service teachers will play a much more central and active role in conferences (such as by actively reflecting on and analyzing their own and others' imaginative understanding of subject matter and pedagogy, raising issues to discuss, and so on). Pre-service teachers might also be given increased responsibilities in other aspects of the field experience. They could have instructional responsibilities in the ongoing educational sessions for cooperating teachers; alone, with another pre-service teacher, or working with the supervisor, pre-service teachers could be in charge of teaching

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[349] It is possible that supervisors may be able to phase out some of their support nearer the end of the field experience as cooperating teachers become more able to take on more of it.

[350] Estimates for the frequency of supervisory visits varies to some degree: as frequent as thirty minutes to two hours per pre-service teacher, per week (Bowman, 1978, cited in Glickman & Bey, 1990, p. 560; Power & Perry, 2002, p. 4); as infrequent as once every two weeks (Richardson-Koehler, 1988, p. 33) or three to four visits per pre-service teacher per semester (Freiberg & Waxman, 1988, p. 8).

[351] Northfield (1994) notes that the structures of universities make the development of more extensive roles for supervisors difficult because they often have to teach other courses, publish papers, etc. (p. 3) and suggests that faculties of education may need to be willing to give up some professors' time for the achievement of this goal: "To address these issues will certainly require a major increase in time and commitment" (p. 4). Without a new configuration, supervisors carrying out a more extensive role could possibly jeopardize their academic careers (p. 6).

particular material, about which they felt quite confident. Pre-service teachers might also

be made responsible for leading discussions about or preparing presentations based on

one or more of the classroom visits they participate in with other triad members. Pre-

service teachers could also teach at least a part of any workshops organized to inform

parents and community members about the imaginative teacher education program and

the various ways in which it is distinct from more typical programs. Increasingly

reciprocal relationships, and the resulting increased responsibility and more active

participation of pre-service teachers, should help foster the latter's situated and

experiential understanding of subject matter and pedagogy and contribute to their

developing sense of professional agency.

6.5.3. Sustainable roles for cooperating teachers and supervisors

Since all those involved in the education of imaginative pre-service teachers

should be able to help foster in them the kinds of understanding I argue are essential, it is

imperative that all key players be adequately educated in how to do so. In more typical

teacher education programs, neither cooperating teachers nor supervisors receive

education that is substantial: in most cases, they may receive brief training but no kind of

preparation that is both specific to their role in the field experience and educative.[352]

Before explaining how an imaginative teacher education program can use selection

criteria and education to make the roles of cooperating teachers and supervisors

sustainable, I will summarize the current research on the existing selection criteria and

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[352] Numerous researchers assert that neither cooperating teachers (e.g. Glickman & Bey, 1990, p. 561; Guyton & McIntyre, 1990, p. 520) nor supervisors (e.g. Glickman & Bey, 1990, p. 561; Ramanathan & Wilkins-Canter, 1997, p. 18) are adequately educated for their positions.

preparation of cooperating teachers and supervisors so that my later description of program features will be better understood within the current context.

6.5.3.1. Current selection criteria and preparation of cooperating teachers

In many teacher education programs, the criteria for the selection of cooperating teachers seem to be rather flexible. Guyton and McIntyre (1990) reported that only eighteen of the fifty states in the U.S.A. *had* criteria for cooperating teachers (p. 521). In more typical teacher education programs, cooperating teachers do not usually have to complete any coursework (Habermas & Harris 1982, and Kingen, 1984, cited in Ramanathan & Wilkins-Canter, 1997, p. 4).[353] Since programs for the preparation of cooperating teachers are generally unavailable, "they are not expected" (Ramanathan & Wilkins-Canter, 1997, p. 4).[354]

Many directors of field experience are "dissatisfied" with the qualifications and preparation of cooperating teachers (Guyton & McIntyre, 1990, p. 520); Zimpher and Sherrill (1996) describe the standards that have been used for their selection as often having been "minimal" (citing Zimpher & Howey, 1992).[355] Typically, a cooperating

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[353] In Ramanathan and Wilkins-Canter's (1997) study, only two of the eight cooperating teachers had received training for the position (and that training was more than fifteen years old) (p. 6).

[354] Zimpher and Sherrill (1996) report that that "few institutions have offered comprehensive staff development to cooperating teachers or student teaching supervisors" (citing Goodman, 1988) (p. 291).

[355] Interestingly, in this same article, Zimpher and Sherrill (1996) cite RATE IV: "about one third [of cooperating teachers] report that they are engaged in any kind of coursework or extended formal degree programs relative to preparation for their role" (p. 292).

teacher is identified by the administrator as an effective classroom teacher[356] and she or he is willing to take on a pre-service teacher.[357] The training that most institutions offer is minimal and usually comes in the form of an introductory meeting lasting between thirty and forty-five minutes (Ramanathan & Wilkins-Canter, 1997, p. 7;[358] see also Zimpher & Sherrill, 1996, p. 292; Kent, 2001, p. 228). These meetings usually attempt to familiarize cooperating teachers with the purpose of field experience and their supervision roles and responsibilities (Ramanathan & Wilkins-Canter, 1997, p. 9). Typically, during these meetings cooperating teachers are provided with some materials (such as manuals) that review their roles in the field experience (RATE IV, 1990, cited in Zimpher & Sherrill, 1996, p. 292).[359] These supplementary packages may include

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[356] Kuehl (1976) found that both teachers and administrators thought a competency considered important for cooperating teachers was being exemplary role models of good teachers (cited in Glickman & Bey, 1990, p. 558). Cooperating teachers also seem to perceive their effectiveness as role models as very important: "Drummond (1990) reports that cooperating teachers tended to be highly concerned with being proper role models, anxious about their performance, introspective, and analytical about their behaviour. Primarily, they were concerned about their effectiveness in helping student teachers become teachers" (Glickman & Bey, 1990, p. 558). However, the results from at least one study suggest that the relationship may not be so straightforward. Becher and Ade (1982) found that "there was a lack of a strong relationship between the modeling of good practice [by cooperating teachers] and final performance ratings" of field experience students (p. 28); however, they caution that "the assumed importance of placing students with good role models is not specifically refuted" by their findings (p. 28), as the cooperating teachers in their study were not specifically trained or instructed to use deliberate modeling. Still, McIntyre et al. (1996) claim that this finding "is of major interest because the selection of cooperating teachers who are perceived as good role models is a pervasive criterion for placement of student teachers. It would seem that being as good role model, in of itself, is not sufficient to bring about positive behaviors in students" (p. 177).

[357] The situation is further complicated by the fact that many universities do not have full control of pre-service teachers' field experience, and placements may often be based on convenience, rather than exemplary educational quality (Goodlad, 1990, cited in McIntyre et al., 1996, p. 173) because finding and retaining effective cooperating teachers can be problematic for many universities (Guyton & McIntyre, 1990, p. 523; see also Hatch, 1999, p. 236). Guyton and McIntyre (1990) summarize the problem of the quality of field experiences as depending "too much on specific classroom sites that are not designed to prepare teachers and that are beyond the control of the institution" (McIntyre et al., 1996, p. 174); an observation that "remains true" six years later (p. 174).

[358] It should be noted that this study was only of eight institutions, four of which offered an introductory meeting as cooperating teacher preparation, three of which offered a course that cooperating teachers were encouraged (but not required) to take, and one of which offered a workshop upon request (p. 7).

[359] Not explained in these information packets or discussed at length in introductory meetings are various evaluation instruments, conferencing or collaboration skills (Ramanathan & Wilkins-Canter, 1997, p. 12).

a description of the course to which the field experience is attached; the purposes of the field experience; a description of the roles and responsibilities of cooperating teachers and pre-service teachers in the field experiences; and evaluation forms to be used by the cooperating teachers in the field experiences. (Ramanathan & Wilkins-Canter, 1997, pp. 11-12)

However, they may not be read by cooperating teachers, who often already feel inundated with paperwork (p. 12). Distressingly, many cooperating teachers may be so thoroughly unprepared for their participation in this vital component of the teacher education program that they are entirely unaware of the goals of the program of which the field experience is a part: it is "not uncommon for cooperating teachers not to have the slightest notion of the program's goals or to have any idea whether any existed" (citing Goodlad, Soder and Sirotnik, 1990)[360] (McIntyre et al., 1996, p. 171).[361] This lack of

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[360] The source of this statement was a nationwide study of teacher education programs (Goodlad) (McIntyre et al., 1996, p. 171).

[361] The story seems to be a bit more complex than this research suggests. Zimpher and Sherrill (1996) refer to the caliber of many cooperating teachers as "truly remarkable" (p. 292). Drummond (1990) concludes that cooperating teachers tended to be introspective, analytical about their behaviour, highly concerned with being proper role models and anxious about their performance: "Primarily… concerned about their effectiveness in helping student teachers become teachers" (cited in Glickman & Bey, 1990, p. 558). Zimpher and Sherrill (1996) conclude that they tend to be "committed to their role in teacher preparation," a role that they feel is very important in the preparation of new teachers (citing RATE IV, 1990) (p. 292). The RATE IV (1990) study found that half of cooperating teachers held master's degrees and 10% held doctorates or certificates for advanced study. These well-educated cooperating teachers had an average of sixteen years teaching experience and had been teaching in their present school for about twelve years (cited in Zimpher & Sherrill, 1996, pp. 291-292). Zimpher and Sherrill (1996) also claim that most cooperating teachers consider themselves "well prepared" for the task of supervising pre-service teachers (citing RATE IV, 1990) (p. 292). In fact, more than 77% said that they were "more than adequately prepared" in terms of their knowledge of effective teaching, classroom observation skills, conducting pre-service teacher conferences, and giving feedback on instruction (citing RATE IV, 1990) (p. 292). Clearly, there is a good deal of variety among cooperating teachers in terms of the number of advanced degrees they hold, their noble intentions, self-perception of preparedness and commitment to their position. However, while these phenomena may indeed be assets, they simply do not guarantee that cooperating teachers are well prepared for teaching adults, or that they carry out their responsibilities as well as they could, or indeed, should. In fact, the fact that so many cooperating teachers perceive that they are adequately prepared may be less surprising when we consider the goals they have for field experience (which tend to conflict with those held by teacher educators).

preparation implies that, besides being effective classroom teachers, cooperating teachers need no special education or qualifications in order to help educate pre-service teachers; yet research such as Koerner's (1992) "challenges the assumption that any teacher who is effective with children in the classroom has the capacity to be a successful teacher trainer" (cited in McIntyre et al., 1996, p. 174).

The continual absence of cooperating teachers' adequate preparation is even more troubling when we consider the number of studies that have recommended that universities provide cooperating teachers with sufficient preparation for their position (e.g. Glickman & Bey, 1990, p. 559; McIntyre & Killian, 1986, cited in McIntyre et al., 1996, p. 178; Ramanathan & Wilkins-Canter, 1997, p. 4).[362] The positive effects of such efforts are well-documented. Educated cooperating teachers, according to the research, demonstrated improved communication skills (Ayusel & Sparapani, 1988-1989, cited in McIntyre et al., 1996, p. 178)[363] and increased frequency of interactions with pre-service teachers, gave more feedback regarding pre-service teachers' performance (Glickman & Bey, 1990, p. 558), more reliable evaluations of pre-service teachers (Hattie, Warwick & Cole, 1982, cited in Guyton & McIntyre, 1990, p. 526) and tend to more "[actively], [sequentially] and systematically evaluate" their pre-service teachers (Killian & McIntyre, 1986, cited in Ramanathan & Wilkins-Canter, 1997, p. 3). Position-specific

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Despite the fact that most cooperating teachers felt they were "more than adequately prepared" in terms of their knowledge of effective teaching, classroom observation skills, conducting pre-service teacher conferences, and giving feedback on instruction (RATE IV, 1990 cited in Zimpher & Sherrill, 1996, p. 292), the research on the critical reflection and effective communication skills of cooperating teachers draws a very different, and rather dismal, conclusion.

[362] Interestingly, Ramanathan and Wilkins-Canter (1997) report that, in their study, while cooperating teachers tended to think that ideally, education would come from university supervisors, the supervisors themselves seemed to think it better if it came from their peers (p. 18).

[363] In this study, cooperating teachers participated in a series of short-term in-service workshops that were led by university supervisors.

education may also help cooperating teachers to investigate and more thoroughly understand supervision (Oja, 1988, cited in McIntyre et al., 1996 p. 179),[364] increase their eagerness to accept and their comfort in supervising pre-service teachers (Twa, 1984, cited in Glickman & Bey, 1990, p. 559), as well as improve their supervisory skills and their confidence (Twa, 1984, cited in Glickman & Bey, 1990, p. 559). Educated cooperating teachers also tend to be rated more positively by their pre-service teachers (Whitehead, 1984, cited in Glickman & Bey, 1990, p. 559).[365]

Pre-service teachers who work with educated cooperating teachers may have "more positive and effective" field experiences than those whose cooperating teachers are uneducated for their position (Berg, Harders, Malian & Nagel, 1986, cited in Glickman & Bey, 1990, p. 560). Indeed, the teaching performance of pre-service teachers seems to improve when their cooperating teachers are educated (Guyton & McIntyre, 1990, p. 528; see also Glickman & Bey, 1990, p. 559). Specifically, these pre-service teachers tend to "[be] more engaged in teaching full groups, prepare and plan more, and have more interactions with pupils" (Killian & McIntyre, 1985, 1987, cited in Ramanathan & Wilkins-Canter, 1999/2000, p. 102; see also Siedentop, 1981, cited in Guyton & McIntyre, 1990, p. 526; Killian & McIntyre, 1985, 1986, cited in Glickman & Bey, 1990, p. 559), as well as demonstrate more supportive behaviour (Thorlacius, 1980, cited in Glickman & Bey, 1990, p. 559).[366]

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[364] In this study, cooperating teachers were engaged in action research projects.

[365] The educated cooperating teachers were rated higher on the "use of freeing, rather than binding, interpersonal behaviors; use of an indirect, rather than a direct, supervisory style; emphasis on information, rather than opinion, in feedback; and provision of solicited, rather than unsolicited, feedback" (Glickman & Bey, 1990, pp. 559-560).

[366] Cooperating teachers in this study changed their behaviour from more directive to more collegial and demonstrated increased use of supportive behaviour.

Several studies (e.g. Ramanathan & Wilkins-Canter, 1997, p. 7; Twa, 1984, and Drummon, 1980, cited in Glickman & Bey, 1990, p. 559) have shown that cooperating teachers value position-specific preparation and perceive it to help them in their work with pre-service teachers.[367] However, making such education mandatory could be somewhat problematic. In their study, Ramanathan and Wilkins-Canter (1997) found great resistance to the idea of required cooperating teacher preparation: both administrators[368] and evaluators agreed that it would be "both unrealistic and unwelcome" (p. 5) and cooperating teachers felt it would be "unpopular" (p. 5). Possible reasons for this potential resistance to mandatory preparation deserve to be the subject of further research. Ramanathan and Wilkins-Canter (1999/2000) suggest that cooperating teachers' absence of education for their role may contribute to their ignorance about its potential benefits (p. 107).

6.5.3.2. Current selection criteria and preparation of supervisors

The situation for university supervisors does not appear to be much different. Research about the selection criteria used for university supervisors seems to be limited or nonexistent.[369] This may be because many teacher education programs may have no formal criteria for their supervisors: Guyton and McIntyre (1990) reported that only five

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[367] This may be surprising, considering Zimpher and Sherrill's (1996) report that most cooperating teachers consider themselves "well prepared" for the task of supervising pre-service teachers and that more than 77% feel they are "more than adequately prepared" in terms of their knowledge of effective teaching, classroom observation skills, conducting pre-service teacher conferences, and giving feedback on instruction (citing RATE IV, 1990) (p. 292).

[368] Indeed, in this study, only three of the seven education directors believed education of cooperating teachers was necessary (Ramanathan & Wilkins-Canter, 1997, p. 7).

[369] I could not find any data using a variety of search terms.

of the fifty states in the U.S.A. had criteria for college supervisors (p. 521).[370] Various

barriers to supervision have been identified by researchers, including lack of time,[371] [372]

"lack of support within the promotion and tenure structure,"[373] [374] and a "lack of a fit with

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[370] Power and Perry (2002) refer, perhaps rather cuttingly, to the "corps of supervision" as "often a hodge-podge of retired teachers, graduate assistants, and homemakers with education degrees" (p. 3). On a more hopeful note, Ducharme (1993) describes the education faculty who he interviewed as "individuals of great integrity who are committed to their work and hold respect for their colleagues and students, a concern for quality, and a fundamental belief in young people." He claims that education faculty "are knowledgeable about conditions in the schools, a necessary attribute for professional educators attempting to prepare young people to teach" (p. 109) (cited in Zimpher & Sherrill, 1996, p. 291).

[371] In their study of teacher education institutions, Howey and Zimpher (1989) note the "labor intensive nature of teacher preparation" (p. 259) (cited in Zimpher & Sherrill, 1996, p. 285). Zimpher and Sherrill (1996) report that teacher education faculty members average about twenty-seven hours each month (more than a day a week) in schools (engaging in activities such as supervising pre-service teachers, teaching K-12 students, providing professional development, and conducting scholarly inquiry) (p. 286).

[372] While Glickman & Bey (1990) state that education faculty at larger state universities were frustrated due to a lack of time to do an effective job supervising pre-service teachers, they report that, in general, "supervisors were likely to be satisfied with their jobs" (although there was of course some variety, especially according to kinds of institution) (p. 560). Similarly, Ducharme's (1993) study revealed a sense of career satisfaction among teacher educators (characterized by a sense of excitement and fulfilment amongst most of the interviewees) (cited in Zimpher & Sherrill, 1996, p. 289).

[373] Zimpher and Sherrill (1996) report that RATE IV identifies "the lack of feeling that the role of college-based supervisor is valued by the institution... [as] clearly cause for concern" (p. 292). Beck and Kosnik (2002) also "express concern about the minimal recognition received by faculty members who supervise pre-service teachers (cited in Wilson, 2006). Slick (1998) claims that university supervisors frequently assume positions of "low status at the university as well as at the school site" (p. 821).

[374] Glickman and Bey (1990) suggest that the need for the development of a reward structure of time allocations and resources that demonstrates universities' higher priority on pre-service teacher supervision "has been clearly demonstrated" (p. 561; see also Slick, 1998, p. 833).

professors' scholarly agendas" (Power & Perry, 2002, p. 2)[375] all of which may contribute

to tenured faculty resistance[376] (Bowman, 1979 cited in Slick, 1998, p. 822).

Like cooperating teachers, supervisors also rarely receive position-specific

education (Freiberg & Waxman, 1988, p. 8). Guyton and McIntyre (1990) claim that

many directors of field experience are "dissatisfied" with the qualifications and

preparation of supervisors (p. 520). Ramanathan and Wilkins-Canter (1997) assert that

most preparation that is available to supervisors "is cursory and practical," consisting of

"the nuts and bolts of how, what and when rather than the why of [important elements

such as] evaluation" (p. 16)[377] and that there are few attempts to provide supervisors with

the knowledge and skills they need to be effective (p. 20).[378] For example, in Ramanathan

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[375] "graduate students and junior faculty have often been assigned the responsibilities of supervising pre-service teachers because supervision has not been a role well suited to the college faculty career ladder" (Meade, 1991, cited in Zimpher & Sherrill, 1996, p. 291).

> The role of supervision of student teachers may not engender the same status as professors of education generally…. 26% of the student teacher supervisors are not full-time, tenure-track faculty. Student teaching supervisors are the only group in the RATE studies of education faculty where large percentages of individuals performing faculty functions are ineligible for tenure. This relates to the degree of self-esteem held by such individuals. Sixty-five percent of the respondents are concerned over the degree of esteem in which their roles are held. (RATE IV, 1990, cited in Zimpher & Sherrill, 1996, p. 287)

[376] Power and Perry (2002) suggest that the most significant obstacle is that the job of supervising pre-service teachers is boring (p. 1)' and that it is a role one can easily come to "despise" (p. 2). The researchers claim that one of the reasons the position is boring is because supervisors want to see pre-service teachers be innovative, "to see some risky, interesting curriculum is our top priority," but that they rarely do, as pre-service teachers tend to resort to traditional teaching methods when their supervisors are present because they want to demonstrate that they can manage their class (p. 3). In contrast, Guyton and McIntyre (1990) claim that pre-service teachers "thought experimentation [in field placements] was important, but [cooperating teachers, supervisors and administrators] did not" (p. 523).

[377] Three of the eight institutions offered courses in supervision that university supervisors could take (in conjunction with cooperating teachers), but the courses were not mandatory. Nor was the information about these courses freely and readily available (p. 15). Ramanathan and Wilkins-Canter do concede that there are some institutions in which the education is "extensive, indepth and sustained" (p. 16).

[378] While supervisors do have the opportunity to learn about supervision at professional conferences, which can provide "a rich source of information" (Ramanathan & Wilkins-Canter, 1997, p. 17), there is no mandate for them to do so. Participation at such events is elective and usually carried out on an individual basis, so the opportunities to relate such learning to particular programs and discuss it with other involved individuals may be minimal. Slick (1998) claims that "tenured faculty are neither supported nor encouraged to engage in on-going professional development and growth of the novice educator" (p. 823).

and Wilkins-Canter's (1997) study,[379] university supervisors were prepared in neither

supervision nor evaluation (p. 15) and most of the participants acknowledged that their

knowledge of evaluations did not come from any formal education but rather was drawn

from their own experience as cooperating teachers and classroom teachers (p. 15).[380] [381]

Again, the importance of supervisors receiving position-specific education has

been argued by numerous researchers (e.g. Glickman & Bey, 1990, p. 561; Ramanathan

& Wilkins-Canter, 1997, p. 18). Recommendations have included that they be educated

in "the purpose of field experience, theories of supervision, collaboration and

conferencing skills, and knowledge of evaluation tools" (Ramanathan & Wilkins-Canter,

1997, p. 16) as well as in the development of supportive verbal communication skills

(White, 1977, cited in Glickman & Bey, 1990, p. 561), and the effective use of

observation and feedback (Siedentop, 1981, cited in Guyton & McIntyre, 1990, p. 526).

Clearly, the absence of sound selection criteria and adequate preparation for both

cooperating teachers and supervisors is troubling, even in more typical teacher education

programs. In an imaginative teacher education program, it is perhaps even more essential

that both of these triad members be carefully selected and receive sufficient education as

their roles will be arguably more challenging than those in similar positions overseeing

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[379] It should be noted that this study involved only eight universities.

[380] The university supervisors in this study did not express a strong desire to be better educated (p. 15). This is in contrast to Koehler's (1984) study, in which "supervisors expressed concern about the lack of instruction to prepare them for their role" (cited in Slick, 1998, p. 823). Ramanathan (1996) suggests that the common perception that education or training is not necessary or beneficial might stem from the fact that evaluatory duties "appear to be a one-shot affair" (cited in Ramanathan & Wilkins-Canter, 1997, p. 10). The perception of supervisors that they need no further education for their position might also relate to their, perhaps not entirely justified, perception that they are "*very* confident" of their ability to be effective K-12 teachers (take on the responsibilities of teachers in the school setting): 61.8% of education faculty made this claim (citing RATE 1995) (Zimpher & Sherrill, 1996, p. 286).

[381] According to Guyton and McIntyre (1990), in the USA, almost no state provides for the evaluation of the field experience supervisor (p. 521).

pre-service teachers in more typical programs. Obviously, the selection and education of cooperating teachers and supervisors will need to maximize the degree to which these two triad members can support the development of pre-service teachers' understanding of imaginative possibilities of subject matter, pedagogy and professional agency. In the following section, I will explain how an imaginative teacher education program can make the roles of cooperating teachers and supervisors more sustainable by improving the selection criteria and the education of these two key players in the field experience.

6.5.3.3. Fostering sustainability by improving the selection and education of cooperating teachers and supervisors

By creating and implementing effective selection criteria and supporting the on-going education of cooperating teachers and supervisors an imaginative teacher education program can make these roles more sustainable. I use the term sustainability here to refer both to an individual's ability to carry out her or his responsibilities over an extended period of time while feeling adequately supported and nourished, rather than depleted, as well as a program's ability to effectively implement its goals over an extended period of time without depleting its resources (for example, exhausting the potential pool of cooperating teachers who might be willing and able to effectively participate in the program).

Cooperating teachers and supervisors who will be able to effectively support imaginative pre-service teachers will need to understand the program goals and the epistemological grounds upon which it is based (which obviously includes a sense of the imaginative possibilities of education and of teachers and an understanding of imaginative principles and practices), have some understanding about the theoretical and

practical aspects of supervision, exhibit a desire to examine their own practice and that of pre-service teachers, and, in the case of supervisors (and, perhaps ideally, but not necessarily, also cooperating teachers—as I will explain shortly), demonstrate imaginative thinking and teaching in their own professional practice.

6.5.3.3.1. Selection of cooperating teachers

Ideally, teachers who are selected to be cooperating teachers will have several years' experience as classroom teachers. However, they will not necessarily have to teach according to Egan's model of imaginative education, see themselves as imaginative teachers or be deemed imaginative practitioners by outsiders. Hollingsworth's (1989) study shows that effective supervision of a pre-service teacher requires a cooperating teacher to be willing to consciously examine her or his own practice and discuss and critique it with others (as well as engage in a similar dialogue with the pre-service teacher about his or her own practice) but not that there needs to be a "matched pairing" between the two (p. 186).[382] In other words, a teacher's inquiry into and reflexivity about her or his and others' own teaching practice is central to cooperating teacher efficacy. Since this is also a requirement for cooperating teachers overseeing pre-service teachers in an imaginative education program, it provides the first criterion for cooperating teachers.

Second, cooperating teachers must be willing to encourage pre-service teachers to develop their own imaginative teaching practice. This will involve encouraging pre-service teachers' imaginative possibility in their consideration of the subject matter, pedagogy and professional agency. Cooperating teachers must be willing to truly support

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[382] Indeed, Hollingsworth's study suggested that more learning may actually occur from disparate styles between cooperating teacher and pre-service teacher if there is conscious examination of the differences in practices/ values.

a pre-service teacher whose educational approach and philosophy may differ dramatically from their own. Therefore, cooperating teachers must be supportive of imaginative teacher education's goal to have pre-service teachers not merely thoughtlessly imitate the styles and values of their cooperating teachers, but to develop their own imaginative practice, in part through the reflection on others' and their own teaching.[383] It would be impossible for an imaginative teacher education program to have either individual or program sustainability without cooperating teachers' willingness to support the development of pre-service teachers' imaginative practice.

The third criterion for the selection of cooperating teachers is some familiarity with their expected contribution to the program. Because the role of the cooperating teacher in an imaginative teacher education program is significantly different than that of a cooperating teacher in a more typical program, we will expect potential cooperating teachers to demonstrate some understanding of these differences, as well as some knowledge of the overall goals and philosophy of imaginative education.[384] Before beginning the application process, potential cooperating teachers should be asked to familiarize themselves with particular literature/ webpages designed with them in mind; additionally, professional development days might be organized for interested teachers in

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[383] A central element of this reflection is the degree to which practices are imaginatively engaging and educationally effective for students. While cooperating teachers might be expected to support a fair degree of novelty in the practices of the pre-service teachers they are overseeing, such practices should show evidence of efficacy, in terms of both student engagement and achievement.

[384] For example, while they will not need to have an extensive understanding of Egan's work, they will need to have at least a basic understanding of it (e.g. how it differs from more popular educational theories in terms of its goals, planning and evaluation practices), a sense of the essential vocabulary, as well as an understanding of what pre-service teachers and they as cooperating teachers will be expected to know and do during field experience. Such information could be compiled specifically for potential cooperating teachers.

particular schools and districts.[385] [386] While much of this preparatory experience would focus on imaginative education in particular, potential cooperating teachers might also be asked to reflect on the consequences of taking on this responsibility. For example, some of the identified benefits for cooperating teachers include professional development, increased time available, improved self-image, improved student performance (Davie et al., 1999, and Wepner & Mobley, 1998, cited in Brink, Laguardia, Grisham, Granby & Peck, 2001), and cooperating teachers' improved self-reflection (e.g. see Bullough et al., 1997, p. 158). Potential drawbacks include: interruption of instructional program; disruption of classroom management and discipline; displacement of cooperating teacher's central role in the classroom; invasion of privacy and autonomy; dealing with a weak pre-service teacher; criticism of teaching by pre-service teacher; shifting of time and responsibility to teaching pre-service teacher; personality conflicts; increased responsibilities; and uncertainty about cooperating teacher's role (Sandholtz & Wasserman, 2001, p. 56). Being clear about such factors will help reduce cooperating teacher attrition and thereby increase individual and program sustainability.[387]

A fourth and final criterion is willingness and ability to engage in on-going education. This requires not only cooperating teachers' time commitment, but also their openness to the probability that their learning may significantly affect how they view

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[385] The question of whether those who have more thorough understanding of imaginative education (such as practicing teachers who have completed a master's degree in imaginative education) might make more effective cooperating teachers would be a research question worth pursuing.

[386] Various portraits of imaginative teachers (such as those found in Jagla, 1994) might be helpful for discussing characteristics of imaginative practice/ teachers.

[387] Some of the selection criteria for cooperating teachers will obviously be similar to those of more typical teacher education programs (such as strong subject matter understanding, good relationship with students and willingness to work with a pre-service teacher); some, however, will be distinct. For example, cooperating teachers in an imaginative teacher education program will need to be willing, and, ideally, enthusiastic, to learn more about imaginative education.

themselves as professionals and their educational values and goals. For potential cooperating teachers who might be attracted to the position in part because it offers a chance to demonstrate their own professional expertise before inexperienced pre-service teachers, the potential humility required to be a student might be rather challenging. An imaginative teacher education program should attempt to select potential cooperating teachers who demonstrate some degree of maturity and confidence about their own practice, but also a genuine openness to surprise, confusion, challenge and change. Such teachers are more likely to be individually sustained in their growth as cooperating teachers throughout the program; the recruitment of such cooperating teachers is also likely to lead to increased program sustainability.

6.5.3.3.2. Selection of supervisors

There are also four selection criteria for supervisors that will help bring about individual and program sustainability. First, individuals interested in supervising the field experience of an imaginative teacher education program must demonstrate significant understanding of imaginative education and of the K-12 school system. Supervisors must not only be familiar with and support the epistemological grounds upon which the program is based; they must also have a teaching practice consonant with imaginative principles and practices. In other words, effective supervisors will understand and foster pre-service teachers' imaginations, and effectively support the latter's efforts to foster the imaginations of their students. Supervisors should also have experience teaching in the K-12 school system, ideally using some of the principles and practices of imaginative education. This is because field experience supervisors will be responsible for providing greater guidance to both the pre-service teacher and the cooperating teacher than is the

norm in more typical programs. This requires supervisors' understanding of the challenges and opportunities inherent in classroom teaching, and how the principles and practices of imaginative education can be used in various contexts. Supervisors should also be experienced in the subject area and grades for which they are overseeing pre-service teachers. Supervisors' rich imaginative understanding and educational experiences are necessary for both individual and program sustainability.

Second, supervisors must have excellent interpersonal skills and be able to build sustainable relationships and effectively negotiate differences and conflict. Ideally, supervisors of an imaginative teacher education field experience will be adept at ascertaining the (at times likely tacit) teaching philosophies and visions of both the pre-service teacher and the cooperating teacher and will be able to act effectively as a theoretical moderator when differences and conflict arise. This skill may be similar to that needed by an academic counsellor. If all three triad members share a similar vocabulary and, having attended some of the same teaching visitations and educational sessions together, have at least some degree of shared understanding (both of imaginative education and of each others' understandings of subject matter, pedagogy and so on), there may be a greater chance that explicit consideration of differences can promote deeper understanding, rather than exacerbate confusion and conflict. Both supervisors and cooperating teachers need to share the goal of supporting the development of pre-service teachers' sense of imaginative understanding of the possibilities of subject matter, pedagogy and of professional agency. In order to do this well, a strong triad relationship is necessary. Supervisors must be instrumental in establishing, sustaining, and participating in effective and positive triad relationships.

Third, field experience supervisors should be well-educated about supervision and demonstrate rich understanding of various approaches towards supervision, including their philosophical justification, feedback methods, evaluation criteria and methods, and so on. Supervisors should have familiarity with recent research on supervision[388] (such as some of the findings cited in earlier sections) and consider ways in which potential problems (such as supervisory inefficacy) can be remedied. (In the following section, I explain that, during the field experience, supervisors should participate with cooperating teachers and pre-service teachers in the reading and discussion of at least some of this literature.) In addition to theoretical knowledge, supervisors should demonstrate application of this understanding in their own practice. For example, supervisors should demonstrate and foster an understanding of the imaginative possibilities of supervision.[389] Supervisors might consider collecting data about their own supervisory practices by videorecording conferences with pre-service teachers and cooperating teachers and critiquing the supervisory approaches utilized (latent or manifest) by themselves and by the cooperating teacher and considering how contrasting approaches can lead to confusion and conflict.[390]

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[388] It would also be beneficial for supervisors to understand the findings and limitations of the research on changing pre-service teachers' educational beliefs.

[389] At present, since we have no research on how supervisors can best foster imaginative understanding in their supervision of imaginative pre-service teachers, this will most likely be based on practical knowledge.

[390] Another way in which supervisors might enrich their situated and experiential understanding of supervision is by reading, as a group, articles such as Jensen's (1998) "Supervision from Six Theoretical Frameworks." Together, the supervisors could analyze their own beliefs, methods and resources to see if they are consistent with each other and with the goals and stated conceptual framework of the program. Such an article could also be used as a springboard for discussion on: analyses of field experience teaching to determine the perspective from which they tend to operate; the consideration of various evaluation methods and forms; and the kinds and manner of feedback given to pre-service teachers and cooperating teachers. As I suggested earlier, such an explicit treatment of issues related to supervision could have the added benefit of minimizing potential confusion and conflict amongst triad members.

Fourth and finally, supervisors should demonstrate certain personal qualities that are desirable in individuals supervising the field experience of an imaginative teacher education program. While it might be difficult for all potential supervisors to meet all the preceding three criteria and demonstrate all of the following personal qualities, it would be beneficial for supervisors to demonstrate at least several of them. Ideally, supervisors will exhibit: a sense of joyfulness (apparent in an attitude of excitement and playfulness towards subject matter, pedagogy, education and life), a sense of humility[391] (and a desire to minimize power imbalances) and developed Ironic understanding (towards her or his position, the nature of supervision, teaching, her or himself, and so on). Of course these qualities are likely to be appreciated in a supervisor in any program; they might be especially relevant to an individual supervising in an imaginative teacher education program.

6.5.3.4. The education of cooperating teachers and supervisors

While it is fair to expect that supervisors be thoroughly familiar with program goals and the principles and practices of imaginative education before beginning their position, due to the realities of cooperating teachers' busy professional lives and the program's need to recruit and, ideally, maintain a significant number of cooperating teachers, it is unreasonable to expect cooperating teachers to thoroughly educate

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[391] Much of the literature on pre-service teacher education suggests that teachers (including teacher educators) tend to be at least somewhat ignorant about the realities of their own practice (e.g. there is a significant gap between what they say they believe or do and what observers claim they do/ beliefs they enact). Therefore, supervisors' acknowledgement of the likeliness of their own hubris is crucial to understand the realities of their own practice. Ideally, supervisors in an imaginative teacher education program will assume that some, if not a good deal, of their teaching indeed may not foster the imaginations of their pre-service teachers nor manifest imaginative principles and will actively critique their own practice (and seek the input of others) based on this assumption, making concerted efforts to adapt it where necessary. In other words, they will demonstrate substantial inquiry and reflexivity towards their own practice.

themselves about an imaginative teacher education program before beginning their position.[392] Therefore, an imaginative teacher education program must take full responsibility for their on-going education. This could be done through after school and/or weekend workshops, study groups and presentations. If possible, cooperating teachers would receive some kind of compensation for their time, such as financial recompense or university tuition wavers, etc. Ideally, supervisors, cooperating teachers and pre-service teachers would all participate in these on-going educational forums as they will be an opportunity for participants to more thoroughly understand the theory and the practice of imaginative education (and, indeed, of imaginative teacher education) as it plays out in specific educational settings.

Cooperating teachers' and supervisors' participation in these ongoing educational sessions may help to increase their understanding of each other and so mitigate some of significant differences[393] that have been noted between the two groups in more typical teacher education programs: in philosophies (Vickery & Brown, 1967, cited in McIntyre et al., 1996 p. 175), in values and goals (Hatch, 1999, p. 236; Wilson, 2006); in expectations[394] for field experiences (Guyton and McIntyre, 1990, p. 522); in their

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[392] I argued earlier that part of the selection criteria for cooperating teachers should be some familiarity with, as well as a willingness/ eagerness to learn more about, imaginative principles and practices. Because I consider it an unreasonable burden on the cooperating teacher to be expected to have extensive understanding of imaginative education or of supervision before the beginning of the field experience, I suggest that their education in these areas proceed while the field experience is underway.

[393] And attendant conflict: McIntyre et al. (1996) claim that cooperating teachers, supervisors and pre-service teachers often experience conflict when working together and report that most supervisors experienced "major problems" (such as breakdown of communication between members of the triad) during the supervision of field experience (p. 178).

[394] For example, Tittle (1974) found that supervisors considered the application of theory into practice the most important issue during field experience, while cooperating teachers (as well as pre-service teachers) considered the development of self-confidence to be the most important factor during field experience (cited in Guyton & McIntyre, 1990, p. 523, and in McIntyre et al., 1996, p. 176).

perceptions of the roles and expectations of triad members[395] (Glickman & Bey, 1990, p. 561; Guyton & McIntyre, 1990, p. 522; Zimpher & Sherrill, 1996, p. 292); in the knowledge base they apply (Griffin et al., 1983, cited in McIntyre et al., 1996, p. 178); and in their decision making styles (citing Castillo, 1971; Copas, 1984; Grimmett & Ratzlaff, 1986; Kapel & Sadler, 1978) (McIntyre et al., 1996, p. 176).

Cooperating teachers' education will also need to include theoretical and practical consideration of supervision so that, as Talvitie et al. (2000) suggest, cooperating teachers can increase the degree of integration of "theoretical and research-based ideas" into their supervision of pre-service teachers (p. 87). While numerous researchers recommend that cooperating teachers be educated about supervision (e.g. Glickman & Bey, 1990, p. 559; McIntyre & Killian, 1986, cited in McIntyre et al., 1996, p. 178; Ramanathan & Wilkins-Canter, 1997, p. 4), more commonly their recommendations focus on supervision's technical aspects (such as understanding expectations and skills required) and fail to recommend cooperating teachers' education about supervision's theoretical or philosophical aspects (Ramanathan & Wilkins-Canter, 1997, p. 11). Education about supervision should include discussion of various philosophical approaches to supervision (various goals and styles), purposes for and methods of giving feedback, and consideration of alternative supervision models. Given cooperating teachers' potential to supervise as they were supervised (or as they supervised as part of field experiences in more typical teacher education programs) and our inability to

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[395] McIntyre et al. (1996) suggest that the importance of clear communication and agreement about the purposes, roles and responsibilities of each triad member tend to be "generally accepted in principle, yet underachieved in reality" (p. 177).

accurately self-assess,[396] potential cooperating teachers should have an opportunity to

engage with this information, not simply to read it or hear it explained. For example,

potential cooperating teachers could watch video clips of pre-service teachers teaching[397]

and together discuss rationales for and kinds of feedback that might be given (and the

manner in which this might occur) from various supervision styles. An article such as

Jensen's (1998) "Supervision from Six Theoretical Frameworks" might be a useful

starting place. Discussion of this article and its application to sample pre-service teaching

lessons and consideration of their own experiences of and philosophy of supervision

would be helpful in clarifying for cooperating teachers what theoretical grounds their

own practices and beliefs emanate from,[398] as well as those of their future pre-service

teachers, and the supervisors in the imaginative teacher education program. Ideally,

potential cooperating teachers would have an opportunity to engage in such activities

before beginning supervision duties, but also several times throughout the field

experience. Increasing cooperating teachers' familiarity with this kind of analysis might

also have the benefit of improving the level of discussion that tends to occur between

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[396] To highlight this point, cooperating teachers might be introduced to some of the literature I have cited (in the previous section) that shows some discrepancies between cooperating teachers' perception of situations and the reality. (For example: most cooperating teachers who feel prepared for their position receive minimal supervision preparation; most talk at conferences is dominated by cooperating teachers and deals predominantly with procedural concerns; pre-service teachers tend to be passive participants in conferences, and are not encouraged to reflect on educational decision-making or issues but merely acknowledge their cooperating teachers' words.)

[397] Though more difficult to implement, a more ideal situation would involve groups of potential cooperating teachers visiting real classrooms with current pre-service teachers and afterwards together discussing what kind of feedback might be given, why, various goals, and so on.

[398] To increase pedagogical awareness, cooperating teachers might also be encouraged to analyse their own sample lessons, resources, and so on; such self-directed analysis might also help cooperating teachers develop a sense of imaginative possibility towards their own practice and encourage their future pre-service teachers to do the same. As well, this will give cooperating teachers an opportunity to consider ways in which their own educational values and practice may or may not be consistent with the goals of imaginative education.

cooperating teachers and pre-service teachers in conferences (thus helping pre-service teachers reflect upon their own teaching practice).

Earlier, I suggested that supervisors who are selected to oversee the field experience should demonstrate significant understanding of imaginative education, the K-12 school system and both theoretical and practical aspects of various approaches towards supervision. In other words, I argued that supervisors' adequate education in these three areas is a necessary precondition for their selection in field experiences. It would also be beneficial, however, for supervisors to participate in the on-going educational sessions that cooperating teachers attend for several reasons: continual critical consideration of these areas is likely to deepen supervisors' understanding and help improve their reflexivity; their participation helps ensure a common vocabulary and repertoire of shared experiences between triad members; consideration of and practice using some of the typically inadequately developed supervisory social/ communication skills (including observing pre-service teachers, providing feedback and evaluation, participating in conferences, and negotiating conflict between triad members) is likely to improve their efficacy as supervisors and contribute to stronger and more effective triad relationships.

6.5.4. Reflexive focus on imaginative engagement

Pre-service teachers' understanding of the imaginative possibilities of subject matter, pedagogy and their own professional agency would be most effectively fostered if the field experience were designed to help foster the regular imaginative engagement of all triad members. This is unlikely to occur if the too-hectic schedules that typically

characterize field experiences are not altered: pre-service teachers, and ideally also cooperating teachers and supervisors, must be given a time especially devoted to their reflexive focus on imaginative engagement. There are numerous ways in which an imaginative teacher education program can be designed to incorporate time for regular reflexive focus on imaginative engagement. The program might create protected time during which triad members could nurture their own imaginations; activities pursued during this protected time may or may not relate directly to one's teaching. For example, a high school biology teacher may choose to dance during this time because she feels it is nurturing for her and so helps replenish her imaginative capacities. The act of dancing itself may or may not directly influence her teaching, but it may refresh her sufficiently so that she can consider her own practice more imaginatively. Another teacher might use protected time to learn more about a curricular topic about which he feels minimal affective connection in the hopes of discovering what makes it wonderful or marvelous, and various ways in which others have used its transcendent qualities in teaching, in order to increase his sense of imaginative possibility with the curriculum. A third teacher may use the time similarly to try to increase her sense of the imaginative possibility of one or many of her students. Protected time need not be hugely time-consuming: well-used, one or two hours every week might be enough to continually nurture imaginative capacities throughout the field experience.

In addition to protected time, the program could deliver workshops focused on imagination, teaching and learning that attempt to imaginatively engage the participants. For example, experts in particular curricular areas could be invited to give workshops that aim to increase all triad members' sense of imaginative possibility about the

curriculum.[399] More general topics such as fostering one's own imagination in teaching or while supervising pre-service teachers could also be the focus of such workshops. Ideally, sessions with a reflexive focus on imaginative engagement would occur regularly throughout the year; at a minimum, they would be structured into the field experience.[400] A third way in which the field experience could enhance reflexive imaginative engagement would be for action research projects to incorporate deliberate exploration of triad members' imaginative engagement in a particular curricular area. Designing field experiences to include time especially devoted to the imagination should help foster triad members' sense of possibility towards the curriculum, their students and their own practice, as well as give pre-service teachers the lived sense that such time can and must be a part of their professional practice if they want their own imaginations (as well as those of their students) to flourish throughout their careers.

6.5.5. Research on understanding of contexts

As with the other two cornerstones of an imaginative teacher education program, the field experience will also be trying to develop an understanding of context that seems to be absent from the literature. Because of this, research conducted on the field experience of an imaginative teacher education program has the potential to contribute something valuable to our understanding of what is possible in field experiences. In chapters four and five I recommended that research be conducted during the field

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[399] For example, various approaches to the role of Somatic understanding in teaching and learning (and how to incorporate it in particular topics) could help all triad members consider those topics, as well as Somatic understanding itself, more imaginatively.

[400] If such sessions occurred as part of the other courses pre-service teachers were required to take, cooperating teachers might be invited to attend (and universities could consider covering the expenses of substitute teachers if these sessions occurred during the school day). Alternatively, afternoon/ evening sessions at school sites might increase the likelihood of cooperating teachers' attendance.

experience to determine how pre-service teachers' subject matter understanding and pedagogical understanding might change as a result of their field experience participation. An imaginative teacher education program will also want to conduct additional field experience research that has different foci. Again, research should be conducted both prior to and during the field experience, as well as once program graduates enter the profession.

Research conducted prior to and during the field experience should investigate the understandings pre-service teachers tend to gain as a result of their participation in field experiences, and whether those understandings differ significantly from those that tend to be gained by pre-service teachers in more typical field experiences: the field experience is a significant learning experience; pre-service teachers should imitate to succeed; teaching is fundamentally a practical activity; and teaching communities are not reflexive. As well, researchers will want to investigate the degree to which the field experience is successful in giving pre-service teachers a situated and experiential understanding of professional agency. Obviously, researchers will want to investigate these understandings both before the field experience begins and once it is underway, and map any changes and possible reasons for these developments. Sources should include both pre-service teachers' self-reports and the observations and interpretations of others (including cooperating teachers, supervisors, students and administrators). Data can be collected in a variety of ways: through interview, written responses to prompts, observations of teaching, analysis of lesson and unit plans, videorecordings of conferences, and so on.

Because the other two triad members' understandings are likely to significantly influence those of the pre-service teacher, and because an imaginative teacher education program will also be trying to deepen the understandings of cooperating teachers and supervisors, researchers should also investigate the understandings of these triad members both before and throughout the field experience. Specifically, researchers will want to investigate the implemented program features to determine their possible effects on triad members' understandings. What influence does shifting the focus of the field experience from teaching performance towards educational inquiry have on triad members' understandings? Do the implemented selection criteria and on-going education of cooperating teachers and supervisors shape their understandings in significant ways, and do these also influence the understandings of pre-service teachers? Are triad relationships based on reciprocity, and, if so, what possible influence does this have on triad members' understandings? Does a reflexive focus on imaginative engagement bring about any noteworthy changes in understandings?

Researchers will also want to follow pre-service teachers into their classrooms to consider whether and how the field experience might influence graduates' teaching practice and understanding of professional agency. Ideally such research would be on-going but at a minimum it should be conducted during the first few critical years of teaching.[401]

Obviously, researchers should try to avoid or at least minimize the problems that tend to characterize field experience research. For example, both during field experiences

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[401] The first few years of teaching tend to involve a great deal of professional growth (Barone et al., 1996, pp. 1131- 1133); because of this, they are crucial for researchers to monitor.

and in more longitudinal research on practicing teachers, researchers will want to consider contextual factors such as the possible influence of the culture of the school in which the teaching is occurring, the particular grade and subjects taught, the roles and perceptions of students and school administrators, and so on.

6.6. Chapter summary

This was the final of three chapters examining each of the three cornerstones of teacher education. I began this chapter by describing the structure and content of field experiences of more typical teacher education programs. Next, I explained the kinds of understanding ideally developed by pre-service teachers in field experiences as I envision them, in an imaginative teacher education program (Howey's, 1996, derivative themes). I argued that imaginative field experiences should allow pre-service teachers to develop a situated and experiential understanding of subject matter, pedagogy and professional agency. I then examined the current research literature to ascertain the kinds of understanding that tends to be fostered in more typical teacher education programs' field experiences. I concluded that the understanding of context that pre-service teachers in more typical field experiences seem to develop is that field experience is a significant learning experience, successful learning to teach mostly involves imitation, teaching is fundamentally a practical concern, and teaching communities are not characterized by reflexivity. Finally, I suggested key design features of an imaginative teacher education program (Howey's, 1996, programmatic structures) that will help foster in pre-service teachers the kinds of understanding of contexts I argue are ideal: a shift in field experience focus from teaching performance to educational inquiry; triad relationships based on reciprocity; sustainable roles for cooperating teachers and supervisors, manifest

in the implementation of selection criteria and their on-going education; and a reflexive

focus on imaginative engagement. I also briefly outlined the research that an imaginative

teacher education program should conduct related to the field experience.

CHAPTER 7: BACK TO THE BEGINNING AND BEYOND

I will use this brief concluding chapter to do three things: first, discuss how the kinds of imaginative understanding I argue are needed by pre-service teachers can bring about in them and their students the educational aims I argued for in chapter one; second, summarize the key program design features I explained in chapters four, five and six; and third, briefly consider some of the long-term changes to university education faculties and schools that might be brought about by the implementation of a program based on these features.

7.1.   Revisiting the purposes of education

I began this thesis by arguing that the three central purposes of education should be the development of a breadth and depth of knowledge, personal and collective agency, and a moral compass. I then argued that the imagination is essential for the accomplishment of these aims, and should therefore be central to the education of both school students and pre-service teachers. Now that I have elucidated the kinds of understanding that I believe pre-service teachers in an imaginative teacher education program need to develop in order to support the imaginative development of their students (as well as their own), I will briefly revisit these three purposes. In doing so, I will clarify how the development of teachers' imaginative understanding of subject matter, pedagogy and contexts will help them achieve these three purposes of education, for both themselves and their students.

7.1.1. Breadth and depth of knowledge

A breadth and depth of knowledge is implicit in the development of *imaginative understanding of subject matter*. To reiterate, imaginative subject matter understanding comprises deep conceptual understanding, rich Philosophic understanding, imaginative engagement of oneself and one's students, and a sense of imaginative possibility for how a subject and topics might be taught. Clearly, teachers' knowledge of a subject is made significantly richer if their understanding of it includes these four aspects. Similarly, teachers who understand their subjects both broadly and deeply will also be more likely and able to help their students achieve a breadth and depth of subject matter understanding.

A breadth and depth of knowledge is also implicated in the development of *imaginative understanding of pedagogy*. Imaginative pedagogical understanding comprises an understanding of children's development, the mediated nature of learning, the contexts within which imaginative learning can take place, oneself as a teacher and learner, and a Philosophic understanding of pedagogy. A teacher who so understands pedagogy has a breadth and depth of knowledge about what teaching and learning can be, and has a fundamental grasp on the centrality of one's understanding of oneself and one's students in this endeavour. A teacher who understands pedagogy imaginatively is also likely to be able to teach more effectively, better engage her or his students in their learning, and so help those students also broaden and deepen their knowledge.

Imaginative understanding of contexts also broadens and deepens teachers' knowledge, and makes it more likely that they will develop this breadth and depth in their students. It is through inquiry in context that knowledge grows most effectively: when

pre-service teachers' apply, critique, extend and adapt their knowledge of subject matter and pedagogy during field experience, in the contexts of real students, curriculum and classrooms, their knowledge, now situated and experiential, gains both breadth and depth. So a teacher education program that helps foster in pre-service teachers an imaginative understanding of the three cornerstones of teacher education will be helping achieve this first purpose of education in both pre-service teachers and their students.

7.1.2. Sense of agency

As I argued earlier, breadth and depth of knowledge increases our agency because it gives us a greater sense of the possibilities from which we can choose. Pre-service teachers with well developed understanding of subject matter, pedagogy and contexts will have a good grasp of various ways in which they might make their teaching more effective and meaningful to themselves and their students. This is especially so in the context of field experience, where pre-service teachers reflect on their enacted subject matter and pedagogical understanding as members of teaching communities; in other words, it is during the situated and experiential context of the field experience that their sense of possibility is likely to be most active.

Pre-service teachers' agency is also fostered by their familiarity with a wealth of resources they can use in imaginative teaching—a familiarity developed throughout the program. Such resources include others' lessons and units they have witnessed and critiqued, the ones they have planned, taught and evaluated themselves, websites, books and videos, community members and events they can access, and so on. Pre-service teachers also develop a sense of agency with respect to negative feelings about subject

matter and teaching and learning, knowing how these can be challenged and positively changed. At the same time, they are developing understanding about the various ways in which subject matter and pedagogy can be understood in various contexts, by a wide range of individuals and groups, adding to their ability to exercise agency in many different contexts. All of these kinds of imaginative understanding will give teachers a better grasp of what their students and they as teachers can do.

7.1.3. A moral compass

The development of the imaginative understanding of the three cornerstones of teacher education will also help both pre-service teachers and students develop a moral compass. As Egan (1992) suggests, imaginative teaching necessarily involves moral consideration:

> When focusing on the means to make the lives of others meaningful to students, on humanizing knowledge, on imaginatively engaging with people's hopes, fears, and intentions, and so on, we are focusing on matters that are intricately bound up with morality…. this discussion of students' imaginative lives rarely moves far from moral issues. (p. 166)

So teachers inquiring into a subject's transcendent aspects are necessarily developing their own moral compass; they will gain an ability to highlight (either directly or indirectly) this aspect of learning to students. In other words, many of the questions that lie at the heart of Philosophic understanding of subject matter involve moral consideration: Why should this subject or topic be taught? Of what value is it to me as a teacher, the particular students with whom I work, and others in different contexts? Why should any of us care about it? As they continually ask these kinds of questions, pre-

service teachers will be trying out many different kinds of transcendent connections with subject matter, and so clarifying their own values and developing a moral compass that is intimately linked to the curricular knowledge they work with every day.

Similarly, the development of imaginative pedagogical understanding also involves the development of a moral compass. For example, understanding the mediated nature of learning means seeing as central one's relationships with one's students to the process of education, and taking steps to make these relationships as educationally beneficial as possible. As with Philosophic understanding of subject matter, Philosophic understanding of pedagogy requires that one ask questions that are necessarily morally based: What kinds of development are important to the child at this time? What potential gains and losses are involved, and how can I maximize the former and minimize the latter? Whose ends are being served: the school's, the community's, the dominant culture's, the planet's? What deeper lessons is the child learning from our interaction?

The development of a moral compass with regards to subject matter and pedagogical understanding finds its fullest expression in pre-service teachers' imaginative understanding of contexts. The development of professional agency increases one's understanding of the various paths one might take as a teacher and the potential effects of the available choices. For example, from a range of ways in which I know pedagogy can be understood in various contexts by different individuals and groups, what is the best way in which I can understand and enact pedagogy, for myself and these students, in this particular context? How can I further my capacity to connect with students with whom I feel little resonance or whose imaginative engagement eludes me? Situated and experiential subject matter and pedagogical understanding allow one to

consider how these choices and potential effects relate to both the needs of individual students with whom one works and broader social and cultural issues. In other words, it is in the imaginative understanding of contexts that pre-service teachers are most likely to see how nearly all significant educational issues are matters of value and meaning: teaching cannot in any of its significant dimensions be free of such matters—matters that are necessarily moral. Understanding the morally-bound nature of education, and the morally-bound nature of all their more significant educational decisions, is likely to help teachers better consider their choices with some degree of wisdom.

The preceding discussion is not meant to exhaust the various ways in which an imaginative understanding of subject matter, pedagogy and contexts can lead to the development of a breadth and depth of knowledge, individual and collective agency and a moral compass. The purpose is only to highlight some of the many ways in which the development of an imaginative understanding of the three cornerstones of teacher education—understanding that can be fostered by way of the implementation of the key design features I have described—can help achieve the three purposes I have argued should be central to the endeavour of education. I believe a teacher education program that implements the key design features I have described and so helps to foster in pre-service teachers the kinds of understanding I argue are essential does indeed have the potential to transform individuals—helping them become, as teachers and as humans, both vaster and better, as I have argued teacher education should do.

7.2.   Summarizing key design features

The program design features I recommended in each of the chapters on subject matter understanding, pedagogical understanding and understanding of contexts fall into

four categories: specific courses that should be included in an imaginative teacher education program; imaginative program pedagogy; research on the three cornerstones of teacher education; and significant changes to the structure and content of field experiences. I will summarize my recommendations here so that the later potential changes to schools and faculties I suggest can be considered in light of these program recommendations.

There may be many different ways of translating these recommendations into the design of concrete programs. The number of hours allocated to specific courses, the distribution of teaching duties, the timing and extent of the field experience, and many other variables will depend on the institutional contexts and resources available. However, all of the features identified here should be reflected in some way in the design of the program, if it is to have the best chance of achieving the purposes outlined above.

To begin with, an imaginative teacher education program should include five kinds of courses, each of which has an important and distinct goal.

- First, curriculum courses will aim to develop pre-service teachers' imaginative subject matter understanding (comprised of their conceptual understanding, Philosophic understanding, imaginative engagement and sense of imaginative possibility).
- Second, a specific course that acts as a 'sheltered' space and time will be devoted to the integrative development of pre-service teachers' pedagogical understanding, apart from particular courses and teacher educators' interpretation of theories.
- Third, a course will be devoted to the exploration of the relational aspect of social mediation; this will be a course in which to explore pre-service teachers' and other educators' understandings of self and relations and the role of culture in such understanding.
- Fourth, an on-going seminar that is devoted to the education of all triad members in the program will attempt to develop and deepen their imaginative understanding of subject matter, pedagogy and contexts (including an imaginative understanding of supervision).

- Fifth, during the field experience, a protected time will be devoted to triad members' reflexive focus on their own imaginative engagement.

A second important recommendation I made was that an imaginative teacher education program's pedagogy foster the imaginative engagement of both pre-service teachers and their students. I suggested all courses in the program should allow pre-service teachers to teach and learn using various kinds of understanding and the cognitive tools of each. Obviously, this means that the teaching practice of all teacher educators in the program will need to incorporate the principles and practices of imaginative education. One way in which this can be done is by teacher educators making some of their own teaching decisions explicit and thereby modeling the kind of reflexivity and inquiry the program seeks to develop in pre-service teachers.

Third, I recommended that research on all three cornerstones of teacher education should be comprehensive and continual. I argued that research on participants' entering and developing subject matter understanding and pedagogical understanding should be conducted at three key times: before and during courses that focus on developing this particular kind of understanding, throughout the field experience, and once graduates are teaching in their own classrooms. I similarly recommended that research should be conducted prior to and during the field experience, as well as once graduates enter the profession, to determine the participants' entering and developing understandings of contexts (including their understanding of professional agency). I argued that research in these areas should be conducted on all imaginative teacher education participants: pre-service teachers, teacher educators, cooperating teachers, students, specialists, and so on.

Last, I suggested that research should attempt to determine the possible effects of the implementation of the particular program features I recommended.

Fourth and finally, I recommended some significant changes to the field experience, in terms of its structure and content. I argued that the focus of field experiences should be broadened from teaching performance to educational inquiry. I argued that the relationships of triad members should be based to a large degree on reciprocity. I also suggested that in order to make the roles of supervisors and cooperating teachers more sustainable, selection criteria should be implemented and all triad members should be engaged in on-going education together. While all of the key design features I explained manifest the four program principles of inquiry, reflexivity, reciprocity and sustainability, these principles are most apparent in the context of field experience, the most integrative aspect of the teacher education program.

7.3. Possible implications for faculties and schools

It is, of course, impossible to predict exactly how a program such as the one I have described might affect faculties of education and schools, especially considering the dynamic nature of both the program itself and the research it will need to conduct. However, it is important at least to consider some possible implications for both faculties and schools: failing to reflect on the larger contexts within which an imaginative teacher education program exists, or assuming that there are likely to be no effects, seems foolhardy and bellies our knowledge about how complex systems interact. In the following brief discussion, I will again make no attempt to be exhaustive; rather, I will simply sketch, in rather general terms, some of the possible implications for faculties and schools if an imaginative teacher education program were effectively implemented.

Because people and institutions often resist change, these effects might also be considered sources for potential opposition to such implementation. I will highlight four such implications for faculties and five for schools, acknowledging that there are likely many more, also important, and that as the program develops and changes over time, more potential changes are likely to emerge.

7.3.1. Implications for faculties of education

There are four main ways in which faculties of education might be significantly affected. First, a coherent program that is based on inquiry, reflexivity, reciprocity and sustainability (manifest in more reciprocal triad relationships, courses such as a sheltered space for the development of pre-service teachers' pedagogical understanding, on-going education for teacher educators and other triad members, and so on) implies a significant shift in faculty culture. Teacher educators in an imaginative teacher education program will clearly need to work together much more closely than they have traditionally been expected to; they will need to understand each other's similarities and differences in educational philosophy and approach, and have a sincere respect for each other's interpretations, and the ways in which they differ from their own. While an imaginative teacher education program could include these kind of collaborative expectations in job descriptions for new faculty, it may be more challenging to require that teacher educators who are already tenured faculty shift their expectations about their work and professional culture. Because such collegial relationships might be significantly different from the pre-existing culture of teacher education, it would be important for the program to clarify short and long term goals for individuals and the program, and create action plans to specify how such a new kind of collaborative culture can be created (e.g. faculty

workshops, seminars, and so on). Because it is not likely that a collaborative community in a faculty will emerge spontaneously, it will need to be actively cultivated.

Second, the implementation of an imaginative teacher education pedagogy might significantly affect the ways in which teacher educators approach their own practice. Regularly attending to the imaginative engagement of pre-service teachers is certainly not something that has been a part of the practice of most teacher educators. In order to make their pedagogy imaginatively engaging, it is likely that faculty will have to seriously reconsider a good deal of the material they have taught. Especially with teacher educators who have been 'successfully' teaching essentially the same or similar material for a good deal of their career, being able to significantly alter one's approach may be challenging. An imaginative teacher education program should expect that there might be some degree of resistance to change and provide faculty with support in numerous regards (such as sample short- and long-range plans for changes in practice, numerous examples of teacher education lessons and units that attend to various kinds of understanding, narratives of faculty involved in similar change initiatives, release time for faculty to work alone or collaboratively on re-envisioning their own practice, sample rubrics to give to pre-service teachers to assess their imaginative engagement, a forum for troubleshooting, advice seeking and celebrating accomplishments, and so on). A program truly committed to implementing these kinds of changes must anticipate that different individuals will change their practice at different rates, and with various degrees of success. However, it can ensure that the program's pedagogy at least generally appeals to the imaginations of most of the pre-service teachers enrolled in the program by requiring that all teacher educators who will be involved are deeply committed to the kind of

inquiry and reflexivity that is required to change one's practice to become more imaginatively engaging.

Third, the changes I recommend require more time from teacher educators (for example, spending more time in schools during field experiences, building and maintaining more collaborative relationships with colleagues and triad members, and examining and developing their imaginative teaching practices). It is unlikely that teacher educators will be effective in carrying out these more demanding roles if their teaching assignments are not reconfigured in some significant ways: it is impossible to do a more complex and more time-consuming job better in the same amount of time as a job that is less complex and time-consuming. Faculties of education will seriously need to consider how these new responsibilities can be implemented in ways that sustain, rather than deplete, teacher educators. For example, the university might consider making field experience supervision (e.g. in terms of tenure applications and teaching assignments) equivalent to teaching a course, and providing teaching releases for professors who enrol in a course preparing them to supervise in an imaginative teacher education program, so that the bulk of preparation for the position would not be an added burden, on top of their already demanding professional responsibilities.

Fourth, and finally, an imaginative teacher education program will need to direct significant resources towards recruiting and retaining effective cooperating teachers, and towards building and sustaining faculty-community relationships. Finding a sufficient number of adequate cooperating teachers is a problem for many teacher education programs. The roles of those cooperating teachers working in an imaginative teacher education program are arguably more complex and demanding than those in more typical

programs. Because of this, an imaginative teacher education program that aims to implement the selection criteria and the on-going education of cooperating teachers and supervisors I have recommended might need to invest greater resources into researching how to best educate, recruit and retain good cooperating teachers. Resources would also have to be allocated to building and sustaining the kind of faculty-community relationships I have argued are necessary for the development of imaginative pedagogical understanding (for example, to enable a variety of educators to have input into the program and to ensure that pre-service teachers experience varied contexts of schooling). The establishment and maintenance of such relationships would require some resources in terms of program costs and faculty time and energy. It is hard to anticipate just what the costs of running an adequate imaginative teacher education program might be, but it should be borne in mind that they may be greater than is currently normal for teacher education programs.

7.3.2. Implications for schools

There are also numerous ways in which schools might be affected by an imaginative teacher education program's implementation of the key design features I have recommended. Here, I will briefly discuss five possibilities. The schools I refer to are ones that will be regular sites for pre-service teachers' field experiences, with the continual presence of imaginative pre-service teachers and their overseeing cooperating teachers, supervisors who are a part of the fabric of school life, and, eventually, perhaps some graduates of an imaginative pre-service teacher education program hired as practicing teachers.

First, the administrators of these schools, along with a significant proportion of the teachers, will be familiar with and support the goals of imaginative education. There are significant differences in expectations for pre-service teachers and cooperating teachers in an imaginative versus more typical teacher education programs; it is hard to conceive how effective relationships between an imaginative teacher education program and schools that serve as sites for field experiences can be productively maintained if a good proportion of the individuals in those schools, even those with fairly minimal involvement in the program, are not supportive of the goals of imaginative education. So schools that maintain significant relationships with an imaginative teacher education program will have a general staff culture, and, indeed, a school vision that is in line, at least broadly, with the goals of imaginative education.

Second, these schools will be less likely to manifest an "egg crate mentality" where one's practice is not witnessed or considered by others, and more likely to include analysis of one's own and other's practice as a regular occurrence (and expectation). While an inquiry-based and more collaborative approach to teaching and learning to teach certainly has benefits, there are also potential drawbacks to such a shift in school culture. For example, it is conceivable that such a shift may require teachers who work in these schools to have a great deal of self-confidence and some degree of shared educational vision. Even with experienced and confident teachers, the way in which practice is witnessed and critiqued will have to be handled by all those involved with a good degree of sensitivity. While ultimately such a shift in school culture is likely to make a stronger community of people who choose to work there, in the short term it could foster discontent among current staff who do not share such a vision—indeed, even

create two 'camps' of those who support a more inquiry-based and collaborative teaching culture and those who do not—perhaps resulting in a greater degree of attrition. The greater school-community permeability that will result from having a strong university presence in the school and incorporating a wide range of community members as resources in imaginative teaching (including for students significant educational experiences that occur outside of classrooms and schools) is also likely to minimize the "egg crate mentality." This greater sense of school-community permeability might lead to schools becoming centres where community members, artists, professionals and so on visit regularly and, to some degree, become involved with curricular development and planning.

Third, cooperating teachers who are a regular part of an imaginative teacher education program and graduates of the program who are hired at such schools may be likely to integrate, at least to some degree, the program principles of inquiry, reflexivity, sustainability and reciprocity into their own practice. For example, they may become more inquisitive about their own and others' practice, less likely to accept what had been previously taken-for-granted and more likely to exert a greater degree of professional agency. Ultimately, such individuals could become more fulfilled professionals. However, more self-directed teachers are also more likely to voice their differences and disagreements. More self-directed and demanding teachers may lead to higher levels of conflict among staff, unless those teachers are supported proactively by administrators (e.g. who continually encourage them to participate in the clarification and pursuit of common school goals) and are also personally committed to the process of dialogue,

collaboration and conflict resolution (especially in interacting with teachers who do not share many of their educational values).

Fourth, students of pre-service teachers and cooperating teacher who are involved in an imaginative teacher education program might be affected by their own experience of imaginative education. Teachers who are able to regularly engage the imaginations of their students and who are developing imaginative understandings of subject matter, pedagogy and contexts may be better able to deepen their own students' understanding. We would hope that, over time, students' increased understanding of the curriculum and their experience of imaginative education might positively impact their feelings towards both particular subjects and school. Teachers with a sense of the imaginative possibilities of students might help make students at such schools happier and more engaged in their learning. Additionally, students of teachers whose practice is based, at least to some degree, on inquiry and reflexivity might themselves potentially become more critical. For example, students at schools that are regular sites for imaginative field experiences might gain a more expanded notion—perhaps even developing Philosophic understanding—of what schools and education can be, as they may participate in conversations about the imagination, education, inquiry, research, collaboration, and so on with cooperating teachers and pre-service teachers.

Fifth, and finally, schools such as these becoming centres of research is likely to affect their culture. Schools that are research centres are likely to change their atmosphere, the degree of inquiry they promote, the kind and degree of relationships they have with universities and, more specifically, with the teacher education program, program leaders and participants and, ultimately, the degree to which theory-based

practice might be implemented. An increased focus on research in these schools may also influence how students and teachers conceive of education: they may be more inclined to understand it as involving continual inquiry into how to make our practices better match out ideals. Teachers' and students' involvement in various research projects, their developing Philosophic understanding of education and their increased agency might result in increased student and teacher leadership in numerous areas. For example, a greater proportion of the school's student and teacher population may be involved in applying for grants, leading innovative teaching projects, conducting professional development, participating in academic conferences, writing papers, and so on.

7.4. Concluding words

In describing their vision for a future for teacher education, Barone et al. (1996) suggest that

> Visions, like dreams, are often misunderstood to be ethereal entities that are devoid of worldly characteristics, unrelated to gritty empirical realities. They are, in fact, often media of discovery in which the commonplace phenomena of mundane existence are recast into useful new forms. (p. 1113)

In this thesis I have tried to paint the specific ways in which I can give "worldly characteristics" to a new vision of teacher education, one that is based on the imaginative engagement of both pre-service teachers and their students. Some, like Barone et al. (1996), may find that the task of a visionary, whose job is to "[shape] reality to fit the dream," can be a burdensome one (p. 1113). I disagree. I consider such a task not a burden, but rather an important responsibility of anyone who wants her or his vision to

come to fruition. When one feels passion about an area, has some knowledge of it, and sees ways in which it is in dire need of improvement, one is called to action. In other words, one wants to use one's knowledge and agency, no matter how humble, to bring about some positive change in the world. This thesis is my attempt to combine my own, admittedly too limited, knowledge, agency and moral compass, to help create a better future for teachers and students, by positively changing the process by which teachers are educated. I have tried to strike a balance of maintaining some of the beauty and simplicity of such a dream while also explaining some of the "gritty empirical realities" that can make the dream's new form useful to others.

EPILOGUE

My daughter, Norah, has recently turned two. Every day, she spends countless hours engaged in role play. She grabs a curly orange peel, raises it high above her head, scrunches up her shoulders and squeals, "Mum, it's really raining! You'd better get under the umbrella." She adapts the lyrics of familiar songs with impressive abandon, confidently belting out in her alto voice, "Frosty the snowman, had a great old big fat bum!" or "Oh where oh where has Mummy's lonely eye gone? Oh where oh where can it be?" She tells startling original stories, frequently makes jokes and seems to feel intense concern and tenderness for all of her stuffed animals. By any measure, Norah's imagination certainly seems to be robust. But it is only three fleet-footed years until Norah enters the doors of elementary school, and her life of formal, academic learning begins. What does the future hold for my daughter and the wild horse of her imagination? Will school be a place where her current urge to suddenly prostrate herself on the earth to get an eyelash-close look at a baby ladybug be encouraged? Will her teachers cherish and encourage her to continue to view the world with the wonder and passion that is now so pervasive in all of her waking moments? Perhaps like many parents, I simultaneously hold a dull dread and a fierce hope in my heart. I know the reality of so many children's experience, so my heart sinks when I consider the probability that Norah's schooling might crush her vibrant imagination with endless instructions to always fill in her worksheets correctly and colour between the lines. Yet I also know that there is another possibility, and so my fiercely hopeful heart clings to the chance that Norah's education

might celebrate and further foster her already vivid imagination. If the educational experiences of the Norahs of our world are to become more imaginatively engaging, then our understanding how to teach future teachers to make the imagination central to student learning, and how to make pre-service teachers' own imaginations central to the process of becoming teachers, seems to be a necessary first step in this journey. I hope this thesis, my consideration of how we might begin to achieve this goal, will, in some way, help to make the wonder that characterized Norah's birth and now characterizes her life central to education. I hope it will, in some way, contribute to both a vision of the future and a reality that can become actualized, where teaching is made wonderful.

APPENDIX A

Fettes's tools of imaginative engagement (2006, p. 6)

Tools for:	Somatic TIEs	Mythic TIEs	Romantic TIEs	Philosophic TIEs
Grasping wholes	Joyful participation	Wonderful stories	Heroic feats and quests	Powerful theories
Grasping composition	Pattern of rhythm and movement	Music of spoken language	Beauty of written form	Elegance of argument
Grasping detail	Intent observation (all senses)	Vivid imagery (oral)	Lively description (written)	Fine-grained analysis
Grasping limits	Beginnings and endings	Binary contrasts	Extremes of reality	Universals and anomalies
Grasping regularity	Prediction and control	Naming and characterizing	Collecting and organizing	Systematization and generalization
Grasping agency	Mimesis	Metaphor	Personification	Abstract agency
Grasping possibility	Interactive play and exploration	Gossip and social play	Fantasy and formal play	Hypothesis and experiment
Grasping struggle	Effort and achievement	Conflict and resolution	Revolt and idealism	Contradiction, paradox, and proof
Grasping inconsistency	Incongruity	Jokes	Comedy	Irony and satire

APPENDIX B

Sample Somatic activities to use in an imaginative teacher education program

The following are sample activities for how pre-service teachers in an imaginative teacher education program might use Fettes' (2006) tools of imaginative engagement (TIEs) to consider how to engage their students' Somatic understanding in their curricular learning. For each of Fettes' nine TIEs, I provide a brief description of the particular tool of imaginative engagement and an example of the kind of activity a teacher educator could use to help pre-service teachers think about and create activities related to the development of students' Somatic understanding.

The nine Somatic tools of imaginative engagement of the body's toolkit are: joyful participation; pattern of rhythm and movement; intent observation of all senses; boundaries of phenomena; prediction and control; mimesis; interactive play and exploration; effort and achievement; and incongruity and surprise.

The Physical Toolkit:
The body

All children come into the world with bodies. Bodies are the first ways in which we experience and make sense of the world. As such, our bodies are our first 'toolkits': they enable us to engage with and interpret all of that which is not part of us. Although our physical existence never ceases to be a hugely significant part of our experience of the world and of ourselves throughout our entire lives, it is perhaps never so heightened as in the first few years of life, when it is our only or at least our primary tool of meaning-making. Before children understand language as an oral means of communication, as a system of codes, or as a socio-cultural and linguistic phenomenon, children still can experience language; however, in these early years, it is more to the rhythm of breath and of sound, the emotional tone of oral language, and the repetition of speech patterns that children respond than to the 'meaning' encoded in words.

As teachers in the K-12 school system, we might not frequently encounter students who only experience the world through their bodies, without some development of later kinds of understanding (such as Mythic, Romantic or Philosophic understanding). However, it is important that we, as teachers, remember to use the body as a tool for learning for at least four reasons: first, some students (especially those who are younger) may very well engage with learning particular content areas most readily through their bodies; second, a well-developed sense of Somatic understanding can help to foster the development of later kinds of understanding, such as that which comes with oral language; third, we want to keep all earlier kinds of understanding as vibrant as possible once later kinds of understanding develop; and fourth, giving consideration to how we achieve bodily knowing of the curriculum may be a challenging task for many teachers—

and so may help us to foster new forms of imaginative engagement with topics we feel we know thoroughly, and are perhaps 'too' comfortable with.

Activity: Consider each of the following topics in bodily terms. If this topic were to be 'embodied,' what kind of physical form would it take? Think about size, weight, symmetry, strength, movement, etc. Would it be most like a human, an animal, a plant, a planet, a manufactured product? You might start by trying to identify the 'story' of each topic. This may help you to more easily imagine the physical form such a topic might take.

Weather
Conservation
Sharing
Osmosis
Decimals
Limericks
World War II
Musical theatre
Pi

The Physical Toolkit:
#1 Joyful participation

When I was in grade two, my rabbit, Angela, had ten babies. Poor Angela died a few days later, and my mother and I had to bottle feed the baby bunnies for weeks before they could see or feed themselves. When they were old enough, all twelve of us took a journey to my elementary school for show-and-tell. You can imagine how proud I was! My mother put the rabbit hatch at the front of the room and began explaining to my classmates the mysteries of genetics—why Angela, who had been white, and Patches, who had been black and white, could produce some babies that were white, others that were black, and a few that were black and white. On the board she drew diagrams and explained how XX and XY chromosomes combine to make various genetic patterns in offspring. My mother was a clear explainer and generally very good with children. While several of my classmates listened and some even asked insightful questions, most of them simply squirmed uncomfortably in their seats and had a hard time paying attention. There, at the front of the room, were ten beautiful new little perfect baby bunnies! And another adult chattering away, oblivious to the obviously crucial question: When would they get to hold them?

My grade two classmates clearly had developed Mythic understanding (although most had no doubt not developed the Philosophic understanding that they would have needed to properly understand my mother's genetic lesson). However, their response to the bunnies seemed to be more Somatic. By holding one of the animals—feeling the warmth of its body in their arms, the silkiness of the fur, the tremble of the whiskers and the twitching of the ears—these children were able (finally) to gain a direct experience of the rabbits as complete entities. Without the use of language or other cultural tools, the

children were able to know the bunnies firsthand, by participating in their unique bunny-ness. Dogs, butterflies, worms, trees and other physical wonders seem to captivate young children, at least partly, because these children are able to know or experience these other beings so fully, to know their being-ness, in a way that seems to saturate their consciousness. This is the joyful participation that Somatic understanding allows us to access and enjoy.

Activity: With a partner, brainstorm how you can provide opportunities for students' joyful participation with various phenomena in one of the following units. Remember that you can often set up field trips so that children can have direct experiences that might not be available to them in the classroom. You can also bring the community into the classroom, by inviting guest speakers in, or by renting or borrowing material for your own show-and-tell with the students. Beings or objects with which students can experience joyful participation need not be small enough to hold in their arms; there are many other ways various senses can be heightened through students' joyful participation.

Community
Dinosaurs
Bridges
The Arctic
Exploration
Folk dance
Space travel
Volume
Shakespeare
Peace

The Physical Toolkit:
#2 Pattern of rhythm and movement

Small children love to be swung around or bounced in the air or on a knee. They also seem to be very engaged by repeated patterns in sound and music; many parents sing lullabies to their babies, noticing that small children seem more entranced by refrains they have heard many times before. Such patterns in sound and movement help make the world more predictable for young children; patterns they can experience through their bodies help give a sense of unity and order to the universe.

Remember being a small child, how you probably loved getting on a tiny train, hearing and feeling its chug-chug on the tracks and hearing the predictable 'toot-toot' of the horn? Or how about joining in with your favourite action songs, like Itsy Bitsy Spider, B-I-N-G-O, or Ring Around the Rosy, which involved clapping, waving, circling, marching and stamping? All areas of the curriculum can be arranged in such a way to highlight their sense of pattern and prediction. Every content area has a rhythm of sound and movement; as teachers, it is our job to discover it and bring it forward to help children engage with the curriculum in a Somatic way.

Activity: Imagine you are in a foreign country where you neither speak nor understand the language. You are a student in a classroom. You cannot understand what is being said, or any written language, but you can experience and enjoy the patterns of rhythm and movement of the content being studied. How will the teacher highlight pattern so that your engagement with the curriculum is maximized? Write down some suggestions for how the teacher might help you to understand

Hibernation
Multiplication
Capitalization
Democracy
Monologue
Cancer
The scientific method
Volume
Global warming

The Physical Toolkit:
#3 Intent observation of all senses

Before we can understand and use oral language, we may be more profoundly connected to the world in ways that are perhaps no longer attainable to such degrees once we have language as an intermediary of our thoughts and our interactions. Think about how absorbed small children can become in other babies, dogs, or the sounds of the winds and the birds in the trees. Children's senses seem to be so alive that they are more intently engaged than we are for much of our lives. Of course, there are ways in which such intent observation can be practiced and heightened in older humans as well. Many people report a sense of heightened engagement with the natural world, themselves and others when they spend long periods of time in nature; others seem to achieve a similar sense through mystical experiences, such as prayer, dancing or meditation; still others seem able to access this direct and profound sense of observation and connection through transformative emotional experiences, such as falling in love, having a near-death experience, or meeting their newborn baby for the first time.

In imaginative classrooms, we will want to foster students' intent observation to help them engage, in physical ways, with the content they are studying, and so experience this heightened, and often highly emotionally satisfying, way of experiencing the world.

Activity: Did you ever do an activity in science class where you were to intently observe and record a burning candle (and all its changes) over a 5-minute period? Students generally become remarkably attentive to the minutest of details about the candle and its transformations: how high they can feel the heat above the flame, how the heat changes as the hand is lowered closer, how the nature of the heat changes on the

horizontal and vertical axes, and similar details for colour, texture, sound, brightness, movement, scent, density, and so on. This kind of intent observation is used by scientists to truly 'know' their subject. It is similar to the kind of fascination a lover may feel observing his or her beloved.

Imagine the content of the curriculum as a candle, or as 'the beloved.' What kind of list of physical observations would you have about the curriculum from studying it, in utter absorption? What kind of activities could you create for students to help heighten their intent observation of all senses with the content in question? Consider each of the following areas:

Visual (size, colour, texture, line, curves, pattern, etc.)
Aural (volume, tone, pattern, associations, etc.)
Olfactory (strength, associations, sweetness, pungency, acidity, etc.)
Tactile (size, weight, viscosity, texture, etc.)
Gustatory (strength, nature, etc.)

A haiku
Bodies of water
Negative numbers
Transportation systems
Jazz
Asexual reproduction
Nutrition
Sculpture
Ecosystems

The Physical Toolkit:
#4 Boundaries of phenomena

New babies (at least so we are told) have no sense of themselves as separate from the world; this means, in essence, that there is no world for babies, nor 'baby' either: there only is. However, as babies grow and begin to interact and engage with the world, they come to experience limits. They start to gain a sense of where they stop and 'parent' begins, or where comfort stops and discomfort begins. A sense of boundaries gives children the chance to understand essence, or existence. By experiencing the limits of things, they understand where one thing ends and another begins—in effect, what limits the 'thing,' or what 'thing' means. 'Parent,' then, begins to take on meaning.

One way in which we can help students physically engage with the curriculum is by giving them a sense of this essence—the boundaries of the phenomenon. As teachers, we may too often jump into explaining, discussing, and 'teaching' various phenomena before we give children ample time to experience their essence. Identifying the boundaries of a phenomenon is the first step in our fostering our students' 'essential' engagement with the curriculum.

Activity #1: Think about the boundaries in a particular topic. Some may be immediately apparent; others, more complex. For example, the boundaries of a tree divide into many, more specific boundaries. There is the boundary between the leaves and the bark and the air, and between the roots and the soil, but then, when we look a little more closely, this is not as simple as it initially appears. When there is water in the air, and the leaves absorb that moisture, where does the air stop and the tree begin? Similarly for the soil: When roots absorb nutrients held in the soil, where is the boundary

between soil and tree? Even within the tree, there are various, complex boundaries. If bugs live under the bark, are they part of the tree, or separate from it? Does it change if they eat—destroy—rather than help the tree? How about when the tree dies and rots? Where is the line between tree, soil, nutrients and animals now? We can ask similar questions for other attributes of the tree. What about if a tree burns? When does tree stop and charcoal begin? What are the temporal boundaries? When does the 'colour' green of a leaf begin and the 'colour' brown of the bark begin? When does this brown become black when the trunk changes into roots? What are the boundaries of colour?

Any content of the curriculum has obvious, and not so obvious, boundaries. Identify physical boundaries of both types for the following:

A sentence
A country
A book
A nest
A metre stick
A song

Activity #2: Consider ways in which you could help your students experience the boundaries of these topics. To use the earlier example of a tree, the use of a microscope could help students to see, in fine-grained detail, the water on a leaf and to watch the process of absorption. They could then consider whether there is a specific point when the water is and is not part of the leaf. With a small tree, students could physically map out its above ground boundaries: have some students touch the bark, others far-reaching branches, another on a ladder, gently touching the highest leaf, others representing the distance under the ground the furthest, deepest root would travel. (With this later

example, we could also ask students to consider when one tree starts and another ends if their roots intertwine, etc.)

The Physical Toolkit:
#5 Prediction and control

From a very young age, small children begin to use their bodies to figure out what in their environment they can count on. Fairly soon after birth, infants begin to respond to the patterned changes in their day, such as the rhythm of eating, burping, changing and napping, as well as those of light, temperature and weather, the temperatures and textures of food and drink, and moods and behaviour in the humans and animals in their worlds. The first time one of these regularities is upset—for example, the first time a child is offered food that is much colder than anything she or he has ever eaten—is likely to be met with surprise and a subsequent rearranging to the sense of prediction and control that had developed around the phenomenon.

In schools, we typically use language to talk about the regularities in children's worlds and how an understanding of such regularity can enhance our feelings of prediction and control. While language is clearly useful in this regard, we might also think of ways to help young children, especially, gain a sense of prediction and control without any intervening use of oral language. Participating in ritual might be one way to think about how we can use the body to figure out what can be counted on in the environment. As children at home might dip their toes into bathwater to determine its acceptable temperature before stepping in, school children might be encouraged to look at the sky and smell the air for signals of precipitation before dressing for lunch break, or come to notice that the teacher shares her or his mood with the class in how she or he looks at the students when they enter the room and in how (and indeed whether) she or he greets them.

382

Activity: What kind of rituals can be used to help students gain a sense of prediction and control over their environment? Think of this as the body asking and the environment responding—much like the toes are testing water temperature or the eyes and ears are assessing a person's mood. Choose one of the environments listed and brainstorm ways in which children might learn (either on their own, with peers or from an adult) how to use their bodies to figure out what can be counted on to reoccur.

The playground
The sandbox
The reading area/ library
The school garden
The hallway
The computer lab
The art room

The Physical Toolkit:
#6 Mimesis

     Mimetic learning is repetitive or imitative. Follow the Leader and Simon Says are two mimetic games that young children typically enjoy playing. A beauty of mimetic learning is that it rarely involves much verbal interchange—it tends to be based more on an apprenticeship model of observation and trial-and-error. Since mimetic activities are often highly repetitive, there may be a sense of losing oneself in the rhythm of the activity and 'getting it' without ever having to explain, discuss or define it. Many of us learn crucial childhood activities like bike-riding and rope skipping mimetically.

     Mimesis gives young children the chance to project their own understanding of agency onto other things. For example, if you ask a young child to 'be' an elderly person, he or she might move more slowly, hunch over, and squint at objects as if she or he has failing vision. In this mimetic activity, the child is demonstrating her or his knowledge or understanding of what it means to be old: while she or he may have a quick-moving, supple body and possess perfect vision and would therefore never make such actions her or himself, mimesis allows her or him to project her or his understanding of agency onto an old person.

     Early grades typically already employ much mimetic learning. Students may learn the letters of the alphabet by scripting them again and again; they may play 'school' on the playground or at home and routinize the activities of saying 'good morning' in unison, using 'hands up' for asking questions, or lining up at the end of the day. An imaginative teacher will want to highlight ways in which mimesis can help children to experience and appreciate the curriculum in various ways, however. For example, in

social studies, students could come to understand one way in which local by-laws might be changed by engaging in a mimetic activity: they could poll local residents, asking them their opinion about whether the by-law is effective and whether or not it should be changed. This is a mimetic activity in two regards: the asking of the same questions to each willing resident involves no creativity or variety—questions should be asked in the same order, etc.—in other words, one interaction should be close to imitative of an earlier interaction; and students learn, by doing, that this is one way in which laws can be changed in a community. In other words, it gives students a mimetic experience of the democratic process.

Activity: Choose one of the content areas listed. Brainstorm types of mimetic activities that could be used to help students gain a sense of agency. Remember, your activities should highlight students' use of their physical bodies (not simply their writing or analyzing skills).

Science
Physical Education
Math
Music
Career and Personal Planning
Language Arts
Woodworking
Second Language Learning

The Physical Toolkit:
#7 Interactive play and exploration

We generally think of play as requiring shared meaning: whether implicit or explicit, games have rules that the players follow. This is true from 'playing house' to playing Dungeons and Dragons to playing in the science lab. The rules of play can evolve, undoubtedly (indeed some young children seem to make the constant reworking of those rules half of the fun), but since they must be socially constructed and known, play involves the construction and inhabiting of a social space.

Part of what characterizes young children's play is the fact that it is imperfectly social. Young children playing together are not 'together' in the ways in which we tend to think of play as highly interactive. Parallel play, where two or more children play side by side but interact minimally if at all, involves each child focusing on something other than each other, but doing so beside each other, or parallel.

One way in which young children do play in an interactive way, however, is with their environment. They are typically absorbed in such tasks as burrowing under blankets or building pillow forts, throwing rocks in water, piling up blocks, mixing liquids with various solids to see what happens, and so on. Such interactive play might be thought of as the very early stages of the environmental or social scientist prodding, wondering, pushing and experimenting with his or her world to see what might happen.

Activity: What components of each of the subject areas might a child be able to play with? In much the same way as a tower is composed of bricks, each subject area has similar components that a child can prod, arrange and experiment with. Once these components are determined, consider how you could create a component-rich

environment in which the student is free to interact and explore with them as she or he

chooses.

Language
Music
Art
Biology
Math
Nature

The Physical Toolkit:
#8 Effort and achievement

From quite a young age, children frequently create tasks for themselves, often including challenges that they must overcome. They may make obstacle courses, build great balancing towers, or use simple 'tools,' such as chairs and cushions, to reach a forbidden cookie jar. Using our bodies to overcome obstacles can be deeply satisfying. Athletes often try to break their best times or furthest distances in an attempt to see how they can use the effort of their bodies to achieve their goals. Children, similarly, find great pleasure in this sense of struggle and achievement in their play and daily lives.

Teachers in an imaginative classroom will want to highlight the ways in which students can use their bodies to gain a sense of achievement. This does not always need to be sheer strength; it could also be balance, grace, concentration or speed—often best achieved through cooperative effort.

Activity: How can the curriculum be shaped in such a way that students must use their own efforts to achieve the required knowledge? For example, in a history lesson, students could build a recreation of a particular village or town in a specific time period. To do this accurately, students would have to research and acquire or make (as closely as possible) the kinds of tools and other resources that would have been available to the designers and builders at the time. The students would have to acquire knowledge about measurement, cutting, basic engineering, and building styles of the period. This could involve math, history, architecture, science, and so on. By applying their knowledge and employing their own efforts, their final goal of a historically recreated village would come to fruition. Choose a topic from those listed below and discuss, in small groups,

how it could be shaped to help students experience physical (as well as emotional and

intellectual, of course) effort and achievement.

The lifecycle of a mammal
The parts of a newspaper
Types of triangles
The Ancient Greek Olympics
The solar system
The formation of mountains
An electrical circuit
The hero's journey

The Physical Toolkit:
#9 Incongruity and surprise

Before children can understand and use language in any kind of consistent way, they begin to demonstrate an appreciation for humour. For example, a one-and-a-half to two year old will typically laugh when you take a familiar object, such as a cooking pot, and use it for another familiar, although incongruous, function, such as as a hat. Placing a pot on your head and announcing that you are now ready to go out into the cold snowy weather with your warm winter hat will typically elicit peals of laughter from young children. They know there is something wrong or incongruous with the situation. They also know that you know it. The delight results from an awareness (although unstated and most likely entirely unconscious) of this incoherence. Other similar examples are typically found in young children's theatre, such as the big scary monster who is afraid of mice or the teeny tiny girl who can lift a house with one arm.

The inverse of incongruity is unexpected congruity, which can also be delightfully humourous. For example, we often expect spouses to look and dress somewhat distinctly. So when we see a couple with similar expressions, hairstyles, and matching outfits, most of us break into laughter (unless, of course, we are looking in the mirror). Similarly, large hairy people with large hairy dogs typically elicit smiles, as do petite, fashionably dressed individuals with 'accessory' dogs in matching suits.

How can surprise, either in incongruity or in unexpected congruity, be used in an imaginative classroom? No doubt many children will find what is incongruous about a topic and inform us and the rest of the class of it. Nonetheless, we also want to be

attentive to the ways in which we can help students experience the great delight that comes from breaches to the predictable of the curriculum we are teaching.

Activity: In pairs, brainstorm images of incongruity or unexpected congruity in your subject area. You might consider famous people whose private and public lives were disparate, great failures leading to accidental great discoveries, misnomers, examples of hypocrisy, and so on. For example, in math, one might recall the story of the great individual who 'discovered' the concept of zero—a mathematical and philosophical milestone—enduring horrible punishment for his discovery by being boiled alive in oil. You might also think about remarkable congruities in your subject area. For example, in English one could use the example of Shakespeare apparently being born and dying on the same day. Rather than develop a long story for your example, try to capture it in a single, evocative image, such as the huge, hairy ogre perched on a chair trembling in fear at the tiny, completely unaware mouse.

APPENDIX C

This appendix includes a list of the major research reviews consulted for those chapters addressing research related to pre-service teachers' understanding of subject matter, pedagogy and contexts. For each of the listed sources, I provide quotations from the text to indicate its broader purposes or, where possible, to clarify the scope of the research that was reviewed in the work and the criteria that were used in reviewing the research. Where appropriate, I also identify the particular chapters that were consulted for this thesis, and cite the specific questions (related to the topic of this thesis) that the report sought to answer. Because several of the following reviews build upon the work of earlier reviews, the sources are listed chronologically, rather than alphabetically. The purpose of this appendix is to provide readers with some context for each of these research reviews; readers who would like more comprehensive discussions about the purpose, scope of research considered and selection criteria of each of the reports should consult the specific review.

Handbook of Research on Teacher Education **(1990). W. R. Houston, M. Haberman, & J. Sikula (Eds.). New York: Macmillan**.

"This volume is committed to the belief that the improvement of teacher education is integral to the improvement of schools. It was conceptualized and developed to provide a basis for improving the education of teachers at every level, from initial preparation, through the induction of beginners, to continued development as career professionals. The *Handbook* is dedicated to and designed for those persons responsible for preservice and inservice teacher education who would benefit from a critical synthesis

and careful interpretation of research to improve their own practice. Finally, the context in which this research is presented is clearly derived from the American experience. The practices, directly and indirectly implied by contributors, can only be judged when it is understood that the *Handbook* helps to define teacher education not only as a scholarly field of inquiry but also as a normative pursuit, dedicated to the education of a free people in a democratic society…. *Handbook* authors cite research findings primarily from the last decade" (p. ix).

Chapters consulted:

Ball, Deborah Loewenberg, & McDiarmid, G. William. The Subject-Matter Preparation of Teachers (pp. 437-449).

Banks, James A., & Parker, Walter C. Social Studies Teacher Education (pp. 674-686).

Brown, Stephen I., Cooney, Thomas J., & Jones, Doug. Mathematics Teacher Education (pp. 639-656).

Carter, Kathy. Teachers' Knowledge and Learning to Teach (pp. 291-309).

Feiman-Nemser, Sharon. Teacher Preparation: Structural and Conceptual Alternatives (pp. 212-233).

Freiberg, H. Jerome, & Waxman, Hersholt C. Changing Teacher Education (pp. 617-635).

Ginsburg, Mark B., & Clift, Renee T. The Hidden Curriculum of Preservice Teacher Education (pp. 450-465).

Glickman, Carl D., & Bey, Theresa M. Supervision (pp. 549-566).

Guyton, Edith, & McIntyre, D. John. Student Teaching and School Experiences (pp. 514-534).

Howey, Kenneth R., & Zimpher, Nancy L. Professors and Deans of Education (pp. 349-370).

O'Donnell, Roy C. English Language Arts Teacher Education (pp. 705-716).

Pintrich, Paul, R. Implications of Psychological Research on Student Learning and College Teaching for Teacher Education (pp. 826-852).

Tom, Alan R., & Valli, Linda. Professional Knowledge for Teachers (pp. 373-392).

Yager, Robert E., & Penick, John E. Science Teacher Education (pp. 657-673).

Yarger, Sam J., & Smith, Philip L. Issues in Research on Teacher Education (pp. 25-41).

Wideen, Marvin F., Mayer-Smith, Jolie A., & Moon, Barbara J. (1993, April). The Research on Learning to Teach: Prospects and Problems. Paper presented at the Annual Meeting of the American Educational Research Association, Atlanta, GA.

"We undertook a review of over 25 papers, 15 of which are reported in this paper. We selected recent papers on learning to teach that followed students through one or more components of their student teaching program…. Within the general area of learning to teach, this review was undertaken with three objectives in mind: 1. To examine how people present their research with a view to informing our practice; 2. To examine how different facets of programs, initiatives and interventions, both within faculties of education and at the school level, affect the work of beginning teachers; and 3. To examine how beginning teachers gain, develop and use knowledge about teaching…. We were particularly interested in the pre-entry beliefs held by beginning teachers about teaching in order to study how, or whether, these beliefs change and under what program circumstances" (p. 2).

***Handbook of Research on Teacher Education* (1996). J. Sikula, T. J. Buttery, & E. Guyton (Eds.). New York: Macmillan.**

"Similar to the first edition, this second edition of the *Handbook of Research on Teacher Education* is committed to the belief that the improvement of teacher education is integral to the improvement of schools. Both editions were conceptualized and developed to provide a basis for improving the education of teachers at every level, from recruitment and initial preparation through induction of beginners, to continued development as career professionals. The handbook is dedicated to and is designed for people responsible for preservice and in-service teacher education who would benefit from a critical synthesis and careful interpretation of research, while improving their own

practice…. How the second edition topics and treatment differ from those in the first

edition informs readers about issues and changes in teacher education today, 6 years later.

Chapters are not a rehash of the same topics, but, rather, they present fresh new analysis

of important research affecting teacher education" (p. xii).

"[Chapter] authors were asked not only to synthesize the most important research

in their areas but also to place it within a conceptual framework, to analyze trends, and to

summarize new directions…. The two editors [required] at least two critical reviewers for

each chapter. Reviewers played an important role in ensuring validity and

comprehensiveness of materials, and they were decided upon with care" (p. xiv).

Chapters consulted:

Armento, Beverly J. The Professional Development of Social Studies Educators
(pp. 485-502).

Barone, Thomas, Berliner, David, Blanchard, Jay, Casanova, Ursula, & McGowan,
Thomas. A Future for Teacher Education: Developing a Strong Sense of
Professionalism (pp. 1108-1149).

Christensen, Doran. The Professional Knowledge-Research Base for Teacher Education
(pp. 38-52).

Ducharme, Edward R., & Ducharme, Mary K. Needed Research in Teacher Education
(pp. 1030-1046).

Fisher, Carol J., Fox, Dana L., & Paille, Emilie. Teacher Education Research in the
English Language Arts and Reading (pp. 410-441).

Grouws, Douglas, A., & Schultz, Karen A. Mathematics Teacher Education
(pp. 442-458).

Howey, Ken. Designing Coherent and Effective Teacher Education Programs
(pp. 143-170).

Jones, Vern. Classroom Management (pp. 503-521).

McIntyre, D. John, Byrd, David M., & Foxx, Susan M. Field and Laboratory Experiences
(pp. 171-193).

Richardson, Virginia. The Role of Attitudes and Beliefs in Learning to Teach
(pp. 102-119).

Zimpher, Nancy L., & Sherrill, Julie, A. Professors, Teachers, and Leaders in SCDES (pp. 279-305).

Wideen, Marvin, Mayer-Smith, Jolie, & Moon, Barbara (1998). A Critical Analysis of the Research on Learning to Teach: Making the Case for an Ecological Perspective on Inquiry. *Review of Educational Research*. **68 (2). 130-178.**

"93 empirical studies on learning to teach were reviewed in order to establish what is currently known about how people learn to teach and to critique the quality of the reporting of that research" (Abstract, p. 130).

"we felt it necessary to draw from studies from the widest array of perspectives we could find and took care not to rule out studies because they were conducted with a particular paradigm…. The product of our present review can thus be viewed as a bricolage, a collage-like piece that should reflect both (a) the field's images, understandings and interpretations and (b) the reviewers' analyses of these understandings and interpretations. Our bricolage emerged through a multistep review process. First, we examined and considered each study from within the paradigm in which the author worked. Second, we stepped outside of that paradigm and attempted to determine what the study contributed to the area of learning to teach in a general way. Third, we engaged in reflexive discourse to create a collaborative interpretation and critique of the research in the manner in which it was reported…. [We undertook] a systematic review of the research on learning to teach…. Journal articles, conference presentations, and titles from the RITE database constituted our initial source of papers…. We examined mainstream teacher education journals and papers presented at Annual Meetings of the American Research Association from 1992 to 1996. A further search of the literature from 1990 to 1996 in the ERIC database, using recognized descriptors, produced 222 entries…. From these searches, we selected studies that were

(a) based on qualitative or quantitative primary empirical (collected at source) data collected from beginning teachers, (b) concerned with the perceptions and developing beliefs and practices of beginning teachers related to preservice teacher education, and (c) designed such that the researcher dealt with some aspect of how beginning teachers learned to teach… we included, primarily though not exclusively, those studies published after 1990" (pp. 131-134).

***Handbook of Research on Teaching* (4th ed.) (2001). V. Richardson (Ed.). Washington, DC: American Educational Research Association**.

"It was agreed that the *Handbook of Research on Teaching* has been and should continue to be written for students of and scholars in research on teaching. The *Handbook* is also meant to be for scholars in other fields who want to look in depth at an area within research on teaching. The emphasis in the chapters is placed on representing and organizing research that has been conducted, with some attention to suggesting lines of future research. The Board agreed that the *Handbook* is not meant to be interpretations of research for the sole purpose of the improvement of practice. Obviously, much of the research is useful in practice, and, in fact, some chapters deal specifically with the use of research in practice. However, this *Handbook* is not one that translates research into practice suggestions. Further, it is meant to describe research that has already been conducted rather than to explain underdeveloped areas that require more research attention…. We also decided that the chapters would focus on work that had been conducted since the 1986 *Handbook*" (pp. ix-x).

"[We decided that the subject matter chapters] should be relatively short, analytical-conceptual summaries of research summaries that included considerations of research methodology and next steps" (p. xii).

Chapters consulted:

Ball, Deborah Loewenberg, Lubienski, Sarah Theule, & Mewborn, Denise Spangler. Research on Teaching Mathematics: The Unsolved Problem of Teachers' Mathematical Knowledge (pp. 433-456).

Zeichner, Kenneth, & Noffke, Susan. Practitioner Research (pp. 298-330).

Wilson, Suzanne M., Floden, Robert E., & Ferrini-Mundy, Joan (2001). *Teacher Preparation Research: Current Knowledge, Gaps, and Recommendations.* **Seattle, WA: Centre for the Study of Teaching and Policy.**

"The purpose of this report is to summarize what rigorous, peer-reviewed research does and can tell us about key issues in teacher preparation. Questions about subject matter and pedagogical preparation, clinical training, policy influences, and alternative certification have been examined through research, and the results can provide directions as we work to improve teacher education nationally…. We examined more than 300 published research reports about teacher preparation and found 57 that met our criteria for inclusion in this summary" (p. i).

"As noted in the text of our report, with the advice of our Technical Working Group, we developed guidelines for selecting the reports of research to include in this summary. We included only studies with findings pertinent to the five study questions that were empirical, rigorous, published within the past two decades, and in the United States.

In our decision about whether a study was rigorous, we divided studies according to their general methodology and developed criteria for each type:

For experimental and quasi-experimental studies, they must have used random assignment to group or some form of matching for entering characteristics.

For multiple regression studies, the studies would have to have 'controlled' for relevant differences among students, other than the teacher education they received.

For follow-up surveys, we only included studies that sent surveys to a representative sample of alumni and had a return rate of at least 60 percent. For these studies, we restricted inferences to alumni perceptions, not allowing inferences about the effects of programs on other beliefs and knowledge.

For comparisons of credentialed and non-credentialed teachers, we treated them like multiple regression studies, only including studies that controlled for relevant differences among the two groups, other than the characteristics of being credentialed.

For longitudinal studies of change, we only included studies that checked for effects of attrition. We also limited attention to studies that offered evidence that the changes were not simply due to maturation and teaching experience.

For 'interpretive' studies, we limited our attention to reports that included a description of their processes for data collection and analysis and that included evidence, such as samples of interview responses or detailed descriptions of events, as part of the report" (Appendix A: Elaboration of Criteria for Rigorous Research).

Specific questions (related to this thesis) that the report sought to answer:
"Question 1: What kinds of subject matter preparation, and how much of it, do prospective teachers need?"

"Question 2: What kinds of pedagogical preparation, and how much of it, do prospective teachers need?"

"Question 3: What kinds, timing, and amount of clinical training ('student teaching') best equip prospective teachers for classroom practice?" (Contents).

Wilson, Suzanne M., Floden, Robert E., & Ferrini-Mundy, Joan (2002). Teacher Preparation Research: An Insider's View from the Outside. *Journal of Teacher Education***. 53. 3. 190-204.**

"The authors were asked by the Office of Educational Research and Improvement and the U.S. Department of Education to conduct a review of high-quality research on five questions concerning teacher preparation. As part of that assignment, they were asked to develop a set of defensible criteria for including research in the review. In this article, they summarize what the research says about the five questions posed by their funders, and they discuss the development of the review criteria. The questions included attention to subject matter and pedagogical preparation of prospective teachers, to the content and character of high-quality field experiences and alternative routes, and to research on the effects of policies on the enhancement of teacher preparation" (Abstract, p. 190).

Specific questions (related to this thesis) that the report sought to answer:

"1. What kind of subject matter preparation, and how much of it, do prospective teachers need? Are there differences by grade level or subject area?"

"2. What kinds of pedagogical preparation, and how much of it, do prospective teachers need? Are there differences by grade level or subject area?"

"3. What kinds, timing, and amount of clinical training (student teaching) best equip prospective teachers for classroom practice?" (p. 191).

Wilson, Suzanne M., & Floden, Robert E. (2003). *Creating Effective Teachers: Concise Answers for Hard Questions. An Addendum to the Report "Teacher Preparation Research: Current Knowledge, Gaps, and Recommendations."* **Washington, DC: ERIC Clearinghouse on Teaching and Teacher Education.**

"The processes used in identifying research to be included in this addendum differed from that of the original report. In the original report, we conducted library searches to locate all relevant published research. We aimed to be as comprehensive as possible. For this report, ECS [Education Commission of the States] solicited nominations from experts, educators, researchers, state department official, and policy makers. The addendum is not intended to be a comprehensive analysis of all relevant unpublished material.

ECS asked that the research reviewed in this addendum meet the following criteria:

- Be directly relevant to the 11 questions posed.
- Be focused on teacher preparation in the United States…
- Be empirical. A wide range of research traditions was included. However, authors had to offer evidence in support of conclusions, rather than only opinion or theory.
- Be original research. Literature reviews were not included, given the uneven quality and monitoring of research included in those reviews. The exception to the 'no literature review' criterion was meta-analyses, since these include tested methods for accounting for research rigor.
- Be rigorous, generally meeting accepted standards for research traditions…. We continued to use the standards that we had developed for the original report, although our thinking was further shaped by the publication of the National Research Council's Scientific Research in Education (Shavelson & Towne, 2002), which, while arguing for a range of disciplinary perspectives in education research, proposed six principles of scientific inquiry that are consistent with our original criteria:

  - Pose significant questions that can be investigated empirically;
  - Link research to relevant theory;
  - Use methods that permit direct investigation of the question;
  - Provide a coherent and explicit chain of reasoning;

- Replicate and generalize across studies;
- Disclose research to encourage professional scrutiny and critique.

In sum, the criteria for inclusion largely remained the same in terms of issues of quality and rigor. However, we did include in this addendum books, book chapters, and unpublished manuscripts if there was evidence that the work had gone through some form of peer review…. We received or located 193 additional manuscripts, articles, book chapters, and books to consider…we…discarded 129 nominations…. Sixty-four reports of research (in the form of unpublished manuscripts, evaluations, books, or published articles) are included in this addendum" (pp. 7-8).

Specific questions (related to this thesis) that the report sought to answer:

"Question 2. To what extent does subject knowledge contribute to the effectiveness of a teacher? Is there a significant advantage to having an advanced degree in the subject taught as opposed to a subject major? To having a subject major as opposed to a minor?"

"Question 3. To what extent does knowledge of pedagogical theory, learning theory, or child development contribute significantly to a teacher's effectiveness? What pedagogical knowledge is most important?"

"Question 4. To what extent does high-quality field-based experience prior to certification contribute significantly to a teacher's effectiveness? What are the characteristics of high-quality field-based experience? Do professional development schools exhibit these characteristics?"

"Question 11. Is setting more stringent entrance requirements for teacher preparation programs or more selective prescreening of preparation program candidates likely to ensure they will be more effective?" (Table of Contents, p. 3).

Eight Questions on Teacher Preparation: What Does the Research Say? (2003). **Education Commission of the States (ECS).**

"This is the first in a series of four reports about education research on teaching quality that the Education Commission of the States (ECS) plans to produce over the next two years…. The reports are intended to guide policymakers, educators and foundation officials in their efforts to improve the quality and supply of America's teacher workforce…. This report is intended as a starting point, and it provides as assessment of the research at a single point in time…. This report draws heavily on two previous scholarly reviews of the research in education. The first, *Teacher Preparation Research: Current Knowledge, Gaps, and Recommendations* was written by Suzanne Wilson, Robert Floden and Joan Ferrini-Mundy…. The second was a supplement to that publication, *Creating Effective Teachers: Concise Answers for Hard Questions. An Addendum to the Report "Teacher Preparation Research: Current Knowledge, Recommendations and Gaps [sic]"* written by Floden and Wilson, and commissioned by ECS. The reviews are of very high quality and are models of objectivity….. The discussions of the research in this report are based largely on those three analyses [including an analysis of the original report written by Patricia Lauer], although the discussion here is not always faithful to its predecessors…. Virtually all of the research included for review in this report was selected by Wilson, Floden and Ferrini-Mundy for their two earlier analysis…. Ninety-two research studies are reviewed here, out of a total of more than 500 studies that were considered…. While the review cannot claim to be

exhaustive, it is hoped that it includes virtually all of the highest quality relevant literature" (About This Report, pp. 1-4).

"The general criteria used to select the research studies to be reviewed for this report were as follows:

Directly relevant to the questions under consideration.

Original research. Literature reviews were not included because of the uneven quality and discussion of the research included in them. The exception was meta-analyses, which were included because they rely on tested methods for the inclusion and analysis of studies.

Published in a scientific journal that used independent peer review (waived for the consideration of additional literature requested by ECS [Education Commission of the States]).

Published within the past two decades. While some relevant research was conducted in the 1970s or earlier, the context of teacher education and schooling in the United States has changed so much since then that much of the earlier research would not apply now.

Research on teacher preparation in the United States. This is because differences in how undergraduate education and teacher preparation are structured across countries makes it difficult to synthesize research from international studies.

Empirical (offering evidence—quantitative, qualitative or both—for conclusions, rather than offering opinion, theory or principles).

Rigorous (meeting generally accepted standards in relevant research traditions).

Those standards of rigor employed for each research tradition can be summarized as follows:

Experimental studies and quasi-experimental studies must have used random assignment to group or some form of matching for entering characteristics.

Studies that used multiple regression analysis had to have 'controlled' for relevant differences among students, other than the teacher education they received.

Studies that used follow-up surveys had to have sent surveys to a representative sample of alumni and had a return rate of at least 60% included. For these studies, inferences were restricted to alumni perceptions, not allowing inferences about the effects of programs on the beliefs and knowledge of others.

Comparisons of credentialed and noncredentialed teachers were treated like multiple regression studies, only including studies that controlled for relevant differences among the two groups, other than the characteristic of being credentialed.

Longitudinal studies of change had to be checked for effects of attrition to be included. Attention was also limited to studies that offered evidence that the changes were not simply due to maturation and teaching experience.

For qualitative studies, attention was limited to reports that included a description of their processes for data collection and analysis and that included evidence, such as samples of interview responses or detailed descriptions of events, as part of the report" (Appendix A: Criteria Used by Wilson, Floden and Ferrini-Mundy for Acceptance of Studies for Review).

Specific questions (related to this thesis) that the report sought to answer:

"Question 1. To what extent does subject matter knowledge contribute to the effectiveness of a teacher?"

"Question 2. To what extent does pedagogical coursework contribute to a teacher's effectiveness?"

"Question 3. To what extent does high-quality field-based experience prior to certification contribute to a teacher's effectiveness?"

"Question 6. Is setting more stringent teacher preparation program entrance requirements, or conducting more selective screening of program candidates, likely to ensure that prospective teachers will be more effective?" (About the Eight Questions, p. 1).

Eight Questions on Teacher Licensure and Certification: What Does the Research Say? **(2005). Education Commission of the States (ECS).**

"This is the final report in a series of three reports about the research on teaching quality that the Education Commission for the States (ECS) produced.... The reports are intended to guide policymakers, educators and foundations officials in their efforts to improve the quality and supply of America's teacher workforce.... This report presents an assessment of the current baseline of the research knowledge relating to specific questions about teacher licensure and certification.... The review of the research literature on teacher licensure and certification presented in this report was commissioned by ECS from the RMC Research Corporation. RMC Research employed rigorous criteria in the selection and analysis of the studies they reviewed.... The review presented here represents a summary of what was identified as the more rigorous and reliable research published during the 20 years prior to the completion of the review—research published

between 1984 and 2003…. All the literature reviewed for the present report are examples of *empirical research*—studies that offer evidence for their conclusions based on observation rather than articles based on opinion or that use other studies for support…. RMC Research ultimately selected 105 studies for inclusion in their review, out of 258 articles and book chapters considered for inclusion…. that number was further reduced to the 53 studies included in this review…. The criteria that were used for selection of studies included:

Direct relevance to the questions to be investigated (the questions directly related to the topic at hand and the measures were properly defined)

Publication in a journal or scholarly book that used *independent peer review*

Publication by a research organization with a sound reputation for conducting high-quality research and with well-established peer-review processes (only including those that were nonpartisan and who used *quantitative* designs that satisfied the other criteria)

Empirical results that offered quantitative evidence (rather than offering opinions, theories, principles or frameworks)

Rigorous methodologies that met generally accepted standards in relevant research.

Meta-analyses and reviews of the research also were included if they met the criteria and if they added new information. Summaries of the literature were generally not included.

Standards for rigor were:

Adequacy of design: The design must have been developed to answer specific questions, describe how participants were selected for inclusion, operationalize terms, and present enough information to show the design was appropriately and objectively implemented.

Representativeness of data: Studies included were specific about sampling frames and the populations to which the results could generalize, and reported the response rate and issues that may have arisen from a low rate.

Sound data analysis: Studies must have used acceptable analytic techniques, controlling for the influence of variables that may *bias* results and acknowledging any limitations to the techniques employed.

Reasonable and unbiased interpretation of results: Studies should have discussed alternative interpretations of the results that were found and/or raised any issues around the *reliability* and *validity* of results associated with these studies.

While the present review cannot claim to be exhaustive, it is hoped it includes virtually all of the highest-quality relevant literature published from 1984 through 2003" (About this Report, pp. xiii-xvi).

Specific questions (related to this thesis) that the report sought to answer:
"Question 1. What kinds of pedagogical knowledge and practice are related to a teacher's effectiveness in promoting student achievement?"

"Question 2. To what extent is the selectivity and rigor of teacher preparation programs associated with teaching quality and effectiveness?"

"Question 6. To what extent does initial licensure and certification ensure a teacher's effectiveness?

"Question 7. What is the likely impact of raising teacher licensing and certification standards, specifically in raising cutoff scores on state-mandated tests?" (Table of Contents, p. iii).

Studying Teacher Education: The Report of the AERA Panel on Research and Teacher Education **(2005). M. Cochran-Smith & K. M. Zeichner (Eds.). Washington, DC: American Educational Research Association.**

"The AERA Panel on Research and Teacher Education was charged with providing a critical and evenhanded analysis of the empirical evidence relevant to practices and policies in preservice teacher education in the United States. Just as importantly, the panel's job was to recommend a new research agenda for teacher education by outlining topics that need further study, identifying terms and concepts that require clarification and consistent usage, describing promising lines of research, and pointing to the research genres and processes most likely to define new directions and yield useful findings for policy and practice.

This volume represents a systematic effort to apply a common set of evaluative criteria to a range of important topics in teacher education. It is our intention to provide balanced, thorough, and unapologetically honest descriptions of the state of research on particular topics in teacher education as a field of study" (Executive Summary, pp. 1-2).

Chapters consulted and Guiding Questions:

Clift, Renee T., & Brady, Patricia. Research on Methods Courses and Field Experiences (pp. 309-424).

Guiding Questions:

"What are the outcomes of preparation in teaching methods and in student teaching and other fieldwork and classroom experiences for teachers' learning and knowledge, teachers' professional practice, and pupils' learning? This set focuses on the evidence regarding the outcomes of preparation in teaching methods and supervised classroom teaching" (p. 14).

Executive Summary (pp. 1-36).

Floden, Robert E., & Meniketti, Marco. Research on the Effects of Coursework in the Arts and Sciences and in the Foundations of Education (pp. 261-308).

Guiding Question:

"What are the outcomes of teachers' subject matter preparation; general arts and sciences preparation; and preparation in the foundations of education for teachers' learning, knowledge, and professional practice; and for pupils' learning?" (p. 11).

Grossman, Pamela L. Research on Pedagogical Approaches in Teacher Education (pp. 425-476).

Guiding Questions:

"What are the outcomes of the pedagogies used in teacher preparation (specifically the various instructional strategies and experiences commonly used in teacher education courses, projects, and programs) for teachers' learning and knowledge and professional practice and for pupils' learning? Under what conditions and in what contexts do these outcomes occur?" (p. 17).

Zeichner, Kenneth. A Research Agenda for Teacher Education (pp. 737-759).

No Guiding Questions provided.

Zeichner, Kenneth, & Conklin, Hilary (2005). Teacher Education Programs (pp. 646-733).

Guiding Questions:

"What is the evidence related to the impact of different forms of preservice teacher education on teacher recruitment, teacher retention, teacher quality, and student learning? The comparisons examined in this summary are 4- and 5-year programs, state-sponsored alternative programs and traditional programs (4-year undergraduate or 5-year university-based extended programs), university-sponsored alternative programs and traditional programs, school-district-sponsored alternative programs and traditional programs, and comparisons of multiple programs. Several in-depth case studies of multiple teacher education programs are also examined for what they can teach us about examining teacher education programs and teacher learning during preservice teacher education" (p. 28).

APPENDIX D

This appendix provides further information about two major means by which researchers have attempted to determine teachers' conceptual understanding.[402] The appendix is comprised of two parts. In the first, I discuss the method of determining pre-service teachers' conceptual understanding by course completion. In the second, I consider the second popular method of determining pre-service teachers' conceptual understanding, by way of their pedagogical conceptual understanding. In both sections, I briefly comment on the limitations of these methods as a means of providing accurate and detailed information about pre-service teachers' conceptual understanding.

1. Pre-service teachers' conceptual understanding and course completion

While it may seem commonsensical to assume that teachers who have completed post-secondary courses in the content area will understand it more thoroughly, and thus be able to teach it better, and so have students who have deeper understanding (as evidenced by higher achievement[403]), research in this area has shown no clearcut correlations.

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[402] As I suggested in chapter four, the vast majority of studies that purport to study teachers' subject matter understanding only consider their conceptual understanding. When studies refer to the construct of conceptual understanding, I use this term, even if the authors themselves refer to it as subject matter understanding. Of course, with direct quotations, I use the terms chosen by the authors, or replace their terms with more appropriate terms (in square brackets).

[403] The best method of determining student achievement is itself a highly contested issue. Most of these studies rely on standardized tests as measurements of students' conceptual understanding of subject areas—an assumption that is certainly not supported by the entire educational community. *Studying Teacher Education's* Executive Summary (2005) suggests that "the temporal and conceptual distance between teacher education and effects on K-12 pupils makes it difficult to attribute effects to particular components of teacher preparation" (p. 13).

Of course, there are obvious problems with determining teachers' conceptual understanding by means of courses completed, the most notable of which is that "degree status is not equivalent to actual knowledge" (Wilson & Floden, 2003, p. 14; see also *Eight Questions on Teacher Licensure and Certification*, 2005, p. xviii). In other words, simply because a teacher has completed particular courses, or a particular number of courses, does not mean that he or she understood, and retained understanding of, fundamental concepts or that such understanding impacts her or his teaching (and therefore it influences student achievement). Proxies used by researchers have included number of courses in particular subject areas, GPA, and undergraduate degree majors and minors—none of which is tremendously satisfying or adequately represents the subject matter preparation or subject specific pedagogical preparation of teachers (Wilson & Floden, 2003, p. 14; see also Wilson et al., 2002, p. 192).

In addition, most studies of pre-service teachers' conceptual understanding are based on individual subject matter courses; the results of such studies cannot answer more general questions about the effects that studying subject matter might have on teachers' understanding (Floden & Meniketti, 2005, p. 266). Results are further complicated by the fact that other effects could account for differences between teaching effectiveness of those pre-service teachers who have taken more subject matter courses, and those who have taken fewer. For example, those with more subject matter preparation may have had better high school preparation, or be more enthusiastic about the subject, which could affect how they teach, or the schools that employ them, either or both of which could influence their effectiveness as teachers. Yet such factors about the causal effects of course taking are rarely (at least not significantly) considered by

researchers: the assumption is that these other factors have "a comparatively small effect" (Floden & Meniketti, 2005, p. 266).

Perhaps the most agreed-upon measure of teacher effectiveness is student achievement; yet the attempt to ascertain the relationship between teachers' conceptual understanding and teacher effectiveness (as evidenced by student achievement) has been less than wholly successful. The authors of *Eight Questions on Teacher Preparation* (2003) state that "only a few studies directly address the issue of how much a teacher's education coursework contributes to student achievement" (About the Eight Questions, Question Two, What the Research Says, p. 1; see also Floden & Meniketti, 2005) and conclude that the research is "simply too thin and insufficiently fine-grained… to identify the course-preparation requirements for teaching specific courses" (About the Eight Questions, Question One, What the Research Says, p. 3). Similarly, Ball et al. (2001) suggest that the connection between the coursework teachers take and their student achievement is "not straightforward" (p. 441) and that "the empirical support for this 'obvious' fact has been surprisingly elusive" (p. 441). Wilson and Floden (2003), as well, claim that the relationship between the teachers' level of education and student achievement is "neither consistent nor clear" and that significant variables in understanding this relationship are grade level and specific content (p. 14).[404] Similarly,

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[404] Wilson and Floden (2003) suggest that the apparent general agreement in the educational community about the conceptual understanding needed for new teachers is not supported by empirical results or reliable measures of impact (e.g. student achievement) (p. 11).

McNamara (1991) claims that "the final link" between teachers' understanding of their

subject, their teaching of it and student learning "has yet to be established" (para. 33).[405]

However, while these reviewers note the complexity in determining the

relationship between courses taken and student achievement, they also concede that this

approach "still holds considerable interest" (Ball et al., 2001, p. 441), as "numerous

studies" continue to provide support for the belief that teachers' ability and achievement

do contribute to student achievement (p. 443). Wilson et al. (2002) also conclude that

several studies have shown a positive connection between the subject matter preparation

of teachers and both student achievement and teacher performance evaluations,[406]

especially in the areas of mathematics, reading and science (p. 191). Similarly, the

authors of *Eight Questions on Teacher Preparation* (2003)[407] determine that there is

"moderate support"[408] for the importance of solid understanding of subject matter

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[405] The fact that reviewers cannot agree on whether or not there is sufficient evidence to support the need for pre-service teachers' strong conceptual understanding is, at least in part, due to the various criteria that each review committee establishes for research validity. (See Appendix C for the criteria for the reviews consulted for this thesis.) For example, Wilson et al. (2002), in their review of "empirical research on U.S. teacher education, published in the past two decades," found no reports that met their selection criteria that directly assessed pre-service teachers' subject matter understanding and evaluated the connection between teacher subject matter preparation and student achievement. They claim that the existing research "is limited, and in some cases, the results are contradictory" (p. 191). In their addendum to the original 2001 report, Wilson and Floden (2003) state that "The findings of our original report concerning this question were complicated and conflicting, with some studies suggesting that subject knowledge matters and others suggesting that it does not, or that it needs to be combined with pedagogical knowledge. The new research we reviewed does little to resolve this complexity" (p. 13). The contestation about whether or not there is sufficient evidence to support the need for pre-service teachers' deep conceptual understanding is also complicated by the fact that the reviews included in this chapter cover a fifteen-year period (1990-2005) and thus, the research deemed relevant spans more than twenty-five years.

[406] Teachers' effectiveness may be measured by student achievement (most often on standardized tests), teacher examination scores or supervisor ratings (*Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question Two, What the Research Says, p. 1).

[407] It should be noted that this report is a review of research that examined the connection between teachers' conceptual understanding and their effectiveness (as evidenced by student achievement).

[408] The designation of evidence being moderate, limited or inconclusive are as follows: "The research was considered to offer moderate support for a conclusion if (1) there were several solid empirical studies or quasi-experimental studies that supported it; and/or (2) there were more than just several correlational studies that supported it involving advanced statistical approaches such as multiple

(About the Eight Questions, Question One, Quick Answer, p. 1)—but qualify this by

saying that "the research generally is not fine-grained enough… to make it clear how

much subject-matter knowledge is important for teaching specific courses and grade

levels" (About the Eight Questions, Question One, Quick Answer, p. 1)—and that the

evidence about the necessity of a subject major[409] is "inconclusive" (About the Eight

Questions, Question One, Quick Answer, p.1; see also Wilson et al., 2002, p. 192).[410] The

authors of this report conclude that the fundamental question is not whether a particular

number of courses or a subject major is important, but which courses have a significant

impact on teachers' ability to effectively teach specific subjects—in other words, what

teachers learned from particular courses and what subject-specific understanding they

posses that makes them effective. Regrettably, this level of specificity is "lacking in the

research" (About the Eight Questions, Question One, Quick Answer p. 1, What the

Research Says, p. 3).

 Most reviewers seem to agree that the claim of "a positive relationship" between

secondary teachers' study of mathematics and their student achievement is "well-

supported" (e.g. Floden & Meniketti, 2005, pp. 282-283; see also Executive Summary,

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regression analysis or hierarchical linear modeling, and ideally, these studies were illuminated by other descriptive studies that made it more plausible that the correlations were based on a true causal relationship; and (3) there were few studies that cast doubt upon the response. In other words, there needed to be a clear pattern of support for the conclusion on the basis of solid quantitative research."

"The research was considered to offer limited support for a conclusion if it did not meet the criteria for moderate support, but (1) there was at least one solid experimental study that supported it, and/or (2) there were several correlational studies that supported it involving advanced statistical approaches, (3) there were a preponderance of descriptive studies that supported it, and (4) there was considerably weaker evidence in support of a contradictory conclusion."

"If the research for any conclusion did not at least meet the standard of providing limited support, then it was regarded as being inconclusive" (About This Report, pp. 5-6).

[409] For example, Monk's (1994) study showed no positive correlation between teachers' majoring in math and student achievement.

[410] "Undermining the view that ideal teacher preparation is a subject matter major, three studies had complex, inconsistent results, with results varying across subject areas and according to whether subject matter study was measured by number of courses or completion of a major" (Wilson et al., 2002, p. 192).

Studying Teacher Education, 2005, pp. 11-12).[411] According to Floden and Meniketti (2005), research provides a "clear answer" (p. 269) that more subject matter preparation by teachers has a positive effect on students' mathematical achievement (p. 270). Wilson and Floden (2003) conclude that "teachers' education in mathematics (either by means of a mathematics degree or a mathematics education degree) "might matter" in terms of their teaching effectiveness (p. 26). However, the connection is not as simple as more coursework is better: how much mathematical conceptual understanding is necessary may vary depending on the grade level, and even specific courses, taught (*Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question One, What the Research Says, p. 1; Floden & Meniketti, 2005, p. 268). Several studies (e.g. Monk, 1994; Begle, 1979, cited in Ball et al., 2001, p. 442; see also *Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question One, What the Research Says, pp. 1-2) show that while there may be some positive correlation between mathematical coursework and student achievement, there seems to be a "threshold"[412] beyond which

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[411] While they do acknowledge the complexity of the relationship, Ball et al. (2001) also concede that "it is impossible to entirely dismiss" the approach to ascertaining pre-service teachers' mathematical conceptual understanding by considering courses taken, and subsequent student achievement (p. 443). Floden and Meniketti (2005) conclude that "For secondary-school mathematics teaching, the studies show that more subject matter study by teachers had a positive effect on pupils' mathematical achievement. For other subject areas, the evidence is thin" (p. 270).

[412] Monk's (1994) findings of a threshold effect were also found by Eisenberg (1977), who found no benefit to teachers taking college courses beyond calculus (cited in *Eight Questions on Teacher Preparation*, 2003, About the Eight Questions, Question One, What the Research Says, p. 2).

either no effects or negative effects may be seen.[413] To complicate things further, some studies suggest that teachers' increased study of post-secondary mathematics may improve the achievement of their stronger students, but actually decrease the achievement of weaker students (Floden & Meniketti, 2005, p. 268). However, what is less clear, as revealed by the research, is what "thorough" understanding of a topic means in this context (as Floden and Meniketti point out, exactly what conceptual understanding is relevant [p. 283]; see also Executive Summary, *Studying Teacher Education*, 2005, p. 12; Ball et al., 2001, p. 443, p. 449), and to what degree conceptual understanding should be considered distinct from pedagogical conceptual understanding when considering the relationship between teachers' understanding of mathematics and student achievement. Although this method of determining teachers' understanding of subject matter may have some validity, it does not clarify the understanding that teachers have of specific topics in their subject area. The second approach to determining pre-service teachers' conceptual understanding tends to be more helpful in this regard.

The studies examining the connection between teachers' coursework in other subject areas and student achievement are, again, far fewer in number than those in mathematics. However, the results are similar, showing a "generally positive relationship" between teachers' coursework and student achievement with some

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[413] Similarly, both Monk (1994) and Begle (1979, cited in Ball et al., 2001. p. 442) found that graduate courses in mathematics have either no effect or negative effect on student achievement. See Ball et al. (2001) for a description of some of the possible reasons for these effects (p. 442). *Studying Teacher Education's* Executive Summary (2005), in contrast, claims that, at least in studies of secondary math teachers, there is a "positive association between prospective teachers' college study of mathematics and the mathematics learning of their high school pupils" (pp. 11-12). Not specified here is whether the same threshold effect was apparent, or whether specific (as opposed to merely a higher number of) math courses were considered. Betts and Frost (2000) also claim that "numerous studies have established a possible relationship between weak knowledge of mathematics and ineffective instruction" (p. 39). While one might assume that "ineffective instruction" suggested lower student achievement, this is not clarified, nor is the converse claimed: that teachers' deeper understanding of mathematics has been connected to more effective instruction.

inconsistency across various studies and teaching situations (Floden & Meniketti, 2005, p. 268). For example, Druva and Anderson (1983) found that elementary students whose teachers had completed coursework in science had higher achievement than those students whose teachers had not (cited in Floden & Meniketti, 2005, p. 269). Monk's (1994) study on science showed a "strikingly positive" relationship between teachers' undergraduate coursework in physical sciences and student achievement. As with math, there seems to be a threshold effect. However, this same study showed that teachers' undergraduate coursework in life sciences had no impact on student achievement (Wilson et al., 2002, p. 192; see also Monk & King, 1994, cited in Floden & Meniketti, 2005, p. 268). Another study (Goldhaber & Brewer, 2000) showed no significant effect on student achievement of science teachers having a degree in science (cited in Floden & Meniketti, 2005, p. 268).[414] As with math, one study (Monk & King, 1994) suggested that teachers' increased coursework in life sciences may increase achievement of high performance students but lower it for lower performing students (cited in Floden & Meniketti, 2005, p. 269). As is the case with mathematics, while the method of determining pre-service teachers' conceptual understanding by considering course completion does have some appeal, it is far less helpful than examining teachers' understanding of specific topics in various subject areas.

2. Pre-service teachers' conceptual understanding and pedagogical conceptual understanding

Some researchers (e.g. Ball et al., 2001) have suggested that a more effective way to determine pre-service teachers' conceptual understanding is by means of their

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[414] See Floden and Meniketti (2005) for further details about differential effects on grade level and undergraduate versus graduate preparation in sciences in three different studies (p. 268).

pedagogical conceptual understanding: how they shape and represent the subject for others' understanding[415] or their understanding of how to effectively teach the subject. While we would expect professors to have deep conceptual understanding of their subject, one would not have pedagogical conceptual understanding simply because one has completed advanced study in a field (p. 448). Ball et al. (2001) argue that considering coursework completed by teachers or their understanding of specific concepts (by means of interviews, tests, and so on) assumes a more direct correlation between theory and practice than is warranted (see also McNamara, 1991, para. 31). In other words, the demonstration of conceptual understanding does not guarantee the implementation of that understanding in the classroom (e.g. the ability to explain it effectively to students, to understand their various representations or misunderstandings, to lead relevant discussions and answer student questions)[416]; since the latter is what is most important in teaching, assessing simply the former is inadequate. They suggest that "what matters ultimately is… how teachers are able to *use* mathematical knowledge in the course of their work" (p. 450); McNamara (1991) similarly argues that "Teaching is very much more than devising the means of imposing adult understanding of subject matter upon children" (para. 20). For these reasons, assessing pre-service teachers' conceptual understanding by means of their pedagogical conceptual understanding is appealing.

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[415] Predictably, the construct of pedagogical conceptual understanding (more commonly referred to in the literature as pedagogical content knowledge) has been described in various ways. For example, Shulman's (1987) description includes the beliefs about why specific topics are easy or difficult to learn and the mental structures that students from various backgrounds and ages have for learning typical topics (p. 9). I include this as a separate component of subject matter understanding. Similarly, Ball et al. (2001) include understanding the "web of ideas" in a subject area, or how particular ideas connect to a topic (p. 438) in their description of pedagogical content knowledge; I consider this a component of Philosophic understanding.

[416] McNamara (1991) also suggests that studies determining teachers' pedagogical conceptual understanding have tended to focus on "conventional subject terms" and have not considered the understanding needed in planning and teaching cross-curricular units, or those organized "on the basis of theme or centre of interest" (para. 27).

As I suggested earlier, it seems commonsensical that in order to teach well, teachers need to understand the fundamental concepts of their subject. It is hard to imagine teachers doing an adequate job of teaching fractions, essay writing, or auto mechanics if they, themselves, do not understand the central concepts involved in these topics. Good conceptual understanding may be a necessary, but not sufficient, requirement for successful teaching: clearly, understanding the central facts and concepts of a subject does not in any way guarantee its effective classroom use.[417] It also seems logical that any teacher who demonstrates strong pedagogical conceptual understanding in the classroom context must certainly have deep conceptual understanding; it is hard to fathom how one could have the former without also having the latter (see Betts & Frost, 2000, pp. 38-39). Floden and Meniketti (2005) seem to concur: "we assume that if a teacher is effective in getting pupils to learn, the teacher must possess knowledge, skills, and dispositions that enable its effectiveness" (fn 2, p. 265).[418] So, while the research on the conceptual understanding demonstrated by teachers, assessed outside of their classrooms, reveals a discouragingly low percentage of those who seem to demonstrate what we could call significant understanding of the topics they are teaching, we could assume that those who have adequate pedagogical conceptual understanding of their

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[417] Most of us have probably had personal experience with a teacher who seemed to be brilliant in, and perhaps even passionate about, his or her area of expertise, but failed miserably in explaining it to non-experts or in helping novices understand its fundamental concepts. Clearly, good subject matter understanding does not guarantee effective teaching. In fact, the connection between understanding a subject and teaching it well is not as straightforward as one might initially assume.

[418] In her summary of studies on teachers' mathematical pedagogical conceptual understanding, Carter (1990) summarizes Steinberg, et al.'s (1985) study that suggests a positive relationship between the quality of a teacher's mathematical conceptual understanding and her or his pedagogy: "a relationship existed between greater knowledge of mathematics and, for example, the use of more conceptual teaching strategies, the instructional practice of identifying relationships among concepts inside and outside the mathematics discipline, and the ability to engage students in active problem-solving activities" (p. 306). While limited, such findings suggest that (at least in math), conceptual understanding may be a precondition for both pedagogical conceptual understanding and Philosophic understanding.

subject might comprise an even smaller percentage. In other words, we can assume that,

by any of the methods used to assess pre-service teachers' conceptual understanding, it is

decidedly inadequate—not at all or barely beyond the mechanical.

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